

ARY INDEX COPY

LAND CEMENT ASSOCIATION

OCT 13 1954

WESTERN

CONSTRUCTION

PORTLAND CEMENT ASSN.
ATTN: LIBRARY
33 W. GRAND AVE.
CHICAGO 10, ILL.

MA
AF
F
KR
IAN
HA
OCO
JAL
EGR
HDB
JSS



This month . . .

COVER see page 4

Timber trusses used as concrete arch falsework

Eyewitness: River diversion at Box Canyon

What asphalt plant inspectors should know

OCTOBER 1954

WHAT A PLACE FOR MARFAK!

CLOUDS of dirt and dust . . . rough terrain . . . what a place for *Texaco Marfak*! This rugged, world-famous chassis lubricant stays in the bearings, keeps dirt and moisture out, defies wear and prevents rust. *Texaco Marfak* gives you longer bearing life as well as considerably lower maintenance costs.

For wheel bearings, your most effective safeguard is *Texaco Marfak Heavy Duty*. Its tough, tenacious lubricating film seals out dirt and moisture . . . stays in the bearings . . . requires fewer repackings . . . adds to bearing life and braking safety. No seasonal change is necessary.

More than 500 Million Pounds of Texaco Marfak have been sold

To keep crawlers operating smoothly, lubricate with *Texaco Track Roll Lubricant*. It not only repels dirt and water, but fights wear so that parts life is lengthened and maintenance costs go down.

Let a Texaco Lubrication Engineer show you how to get more from your equipment at lower maintenance expense. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write: The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO SIMPLIFIED LUBRICATION PLAN

With not more than six Texaco Lubricants, you can handle all your major lubrication requirements. The Texaco Simplified Lubrication Plan saves time, money and mistakes. Your Texaco Lubrication Engineer can give you all the facts.



TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

TUNE IN . . . TEXACO STAR THEATER starring JIMMY DURANTE or DONALD O'CONNOR on television . . . Saturday nights, NBC

There is nothing Snappier with a Clam!

With Northwest equipment it's easier to keep ahead. Northwest Uniform Pressure Swing Clutches make spotting the load easier. They eliminate the jerks and grabs that set a load to swinging. Northwest Crawlers make maneuvering and changing position easier. The "Feather-Touch" Clutch Control gives ease of operation and *feel of the load* without the complications of delicate valves, pumps and tubing. There are no delays for intricate adjustments requiring special knowledge. A type gantry simplifies reducing clearances for traveling.

Both, easy convertibility that results in operation and performance over and above a mere change of booms, means increased output whether converting to a Shovel, a Dragline or a Pullshovel.

These are a few of the reasons why Northwest Cranes are repeat orders with successful contractors everywhere. If you need a Crane, either on crawlers or rubber mounted, talk your problem over with a Northwest Man.

NORTHWEST ENGINEERING COMPANY

135 South LaSalle Street, Chicago 3, Illinois



Local NORTHWEST sales agents

BUTTE, MONT., Hall-Perry Machinery Co.

RENO, NEV., Sierra Machinery Co., Inc.

CHEYENNE, WYO., Wilson Equip. & Sup. Co.

DENVER, COLO., Power Equipment Co.

MEDFORD, ORE., Cal-Ore Machinery Co., Inc.

SPOKANE, WASH., General Machinery Co.

PORTLAND, ORE., Balzer Machinery Co.

SALT LAKE CITY, UTAH, Arnold Machinery Co.

PHOENIX, ARIZONA, Superior Equip. Co.

NORTHWEST SALES OFFICES:

SAN FRANCISCO, CALIF.
255 Tenth Street

LOS ANGELES, CALIF.
3707 Santa Fe Ave.

SEATTLE, WASH., 1234
Sixth Ave. South

*Successful
Contractors
Stay Successful
with
Proved Equipment*

ARTICLES

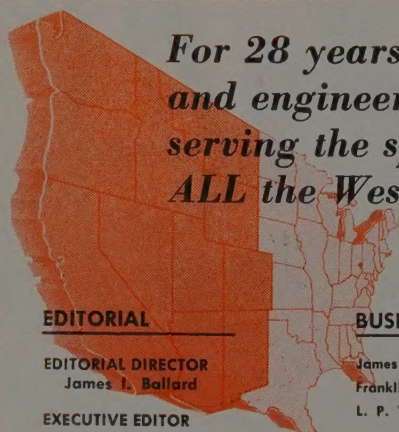
- Timber trusses for 180-ft. span concrete arch centering . . . 59
- Building with boulders: cofferdam closure at Box Canyon . . 63
By Ralph Whitaker, Jr.
- 236-ton lift by portable gantry 68
- Asphalt plants—what every inspector should know 69
By R. F. D'Alo
- Tilt-up walls will ride Portland lift-slab 72
- Processing Montana highway aggregates for \$0.70 per yd. . . 74
- Rock bolts at Monticello Dam 76
- RUBBER in today's bituminous road construction—Part II 77
By Jewell R. Benson
- Paver attachment solves Colorado resurfacing problem . . . 79

DEPARTMENTS

- Editorial Comment 57
- News 82
- Alaska Newsletter 96
- Engineers on the Move 98
- Supervising the Jobs 102
- Tricks of the Trades 114
- New Literature 120
- New Equipment 126
- Unit Prices 138
- News of Distributors 140
- Classified Advertising 144
- Advertisers in This Issue 145
- Backfill, Uncompacted 146

FRONT COVER

EVERYTHING GOING AT ONCE!
Here's the cofferdam at Box Canyon on July 31, with a big Manitowoc picking a 4-ton stone for placement, while the Eucs shuttle back and forth with more. This was diversion day, and we were there. See page 63.



*For 28 years the construction
and engineering publication
serving the special needs of
ALL the West and Alaska*



EDITORIAL

EDITORIAL DIRECTOR
James L. Ballard

EXECUTIVE EDITOR
Ralph Whitaker, Jr.

MANAGING EDITOR
John J. Timmer

ASSISTANT EDITORS
Kenneth E. Greene
Howard M. Smith

NEWS EDITOR
May A. Carroll

PRODUCTION MANAGER
Patricia N. Mann

BUSINESS

James L. Ballard President

Franklin B. Lyons Vice President

L. P. Vrettos V. P. & Treasurer

SALES REPRESENTATIVES

SAN FRANCISCO—V. C. Dowdle, 609 Mission St.
San Francisco 5, Calif. Phone YUkon 2-4343

LOS ANGELES—Jerome E. Badgley, 128 So. Mansfield
Ave., Los Angeles 36, Calif. Phone WEbster 8-8512

PACIFIC NORTHWEST—Arthur J. Urbain, 609 Mission St.
San Francisco 5, Calif. Phone YUkon 2-4343

CHICAGO—A. C. Petersen, 3423 Prairie Ave.
Brookfield, Ill. Phone HUunter 5-0532

NEW YORK—Richard J. Murphy, 107-51 - 131st St.
Richmond Hill, N. Y. Phone JAmica 9-2651

Published monthly by

KING PUBLICATIONS

Publication office
416 Wall Street
Los Angeles 13, California

Editorial, advertising & circulation
office
609 Mission Street
San Francisco 5, California

CIRCULATION

CIRCULATION MANAGER
E. F. Hubbard

ASST. CIRCULATION MANAGER
R. L. von Thurn

For change of address use prepaid
rip-out postcard bound in this issue.
Send along your old mailing label
if possible.

Subscription rate is \$4 per year in
the U.S. and countries in the Pan
American Postal Union. All other
countries, \$5 per year. Single copies
35c.

Entered as Second Class Matter at
the Post Office in Los Angeles, Cali-
fornia, under the Act of March 3,
1879. Postmaster: Please send No-
tice 3579 to Western Construction,
609 Mission Street, San Francisco 5,
California.

Copyright 1954 by King Publications

Western highways and Doc Hewes

The month of September brought with it two occasions that revived the memory of a respected Westerner. The man was Dr. L. I. Hewes, who died in 1950 after 30 years as chief of the Western Region, Bureau of Public Roads. His perception and resulting efforts during that time accounted, more than the work of any other single individual, for establishment of the highway system upon which the West has since rolled to its present high level of development.

It was in recognition of this fact three years ago that the Western Association of State Highway Officials sponsored the Dr. L. I. Hewes Award. And this publication was proud to endow the award, which has now been presented for three successive years.

Washington and California candidates tied for the honor in 1952, Texas put forth the winning representative in 1953. The winner this year was selected late in September by a special committee of WASHO at its annual meeting, held at Sun Valley, Idaho, under the guidance of E. V. Miller, state highway engineer of Idaho.

The Sun Valley meeting of WASHO, featuring presentation of the Hewes Award, thus became one September occasion recalling the memory of Doc Hewes.

Doc Hewes had been an engineering teacher early in his career, before his long association with the Bureau of Public Roads. So it was appropriate that both his professional pursuits should be linked in publication of an engineering school text, "Highway Engineering."

Hewes recognized the dynamic quality of highway engineering, that it must be subjected to continuing criticism at both the academic and practicing levels. Despite a previous two-volume work, he embarked on the current text, joined in the effort by another Westerner, C. H. Oglesby, professor of civil engineering at Stanford University.

The book was completed this year by Professor Oglesby and is now entering circulation. Carrying Doc Hewes' name and experience to another generation of highway engineers, it is the second September tribute to Dr. L. I. Hewes.

How about the unbalanced bid?

Western engineering schools are opening their doors again, and students are returning to their studies. Some have made positive steps during their vacations, working for contractors and engineers in the field. For others, the "fields" have been those of the West's farms . . . or its beaches!

For junior and senior students enrolled in the construction option offered at many schools, there now comes consideration of the complexities of contracting. The study often begins with bidding. And very shortly the students find themselves weighing the many aspects of the unbalanced bid against earlier study of engineering ethics.

There may be some wonder whether these two subjects are compatible. To know, the student must first learn why bids are unbalanced. Here are four reasons:

(1) To hide actual cost estimates. Addition of a constant percentage to each item, for overhead and profit, would soon reveal basic costs to competitors. A particularly favorable price for materials or equipment will most often be hidden by unbalancing.

(2) To guarantee overhead and profit. Items that may decrease markedly from the estimated quantity will be bid about at cost, and their overhead and profit placed with assured items. To illustrate, a contractor on embankment work may price the item of water (thousands of gallons) at a low figure and include its share of overhead and profit in his unit price for excavation, borrow, or some other dependable item.

(3) To get larger monthly estimates early in the work. In this manner the contractor finances the job on the owner's money and avoids paying interest on bank loans. Typically and strikingly, this will be done on a two-year project of grading and paving. Excavation and grading will be bid high, while second-season plant-mix or concrete will be priced low.

(4) To make a large profit where actual quantities differ greatly from the estimate. Here the contractor is taking advantage of conditions unforeseen or mistakenly overlooked by the engineer. The circumstances permitting this type of unbalancing are quite rare, and must involve unusual perception by the bidder.

There may be a variety of conclusions as to the allowability of these reasons for unbalancing. On at least one occasion, engineering students have accepted the first three reasons without question or discussion. Reaction varies on the fourth. Overall opinion seems favorable to unbalancing, and is governed by the thought that neither affected party (owner or engineer) would be concerned if the job turned sour from other causes. In short, the contractor's welfare is his own matter.

WHEN THE GOING IS TOUGH



TOUGH! Using Rear Steer to angle the-bulldozer blade and spill the material over the side of the fill. Impossible with any other grader-bulldozer.

YOU NEED THE POWER AND TRACTION OF AUSTIN-WESTERN'S ALL-WHEEL DRIVE

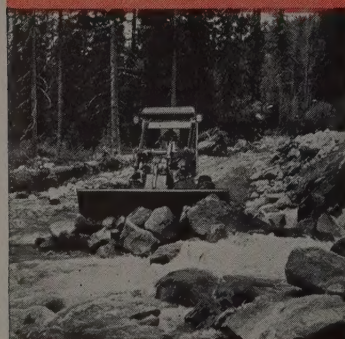
Good going or bad . . . earth, stumps or rocks . . . this fast, hydraulically operated bulldozer can do work far beyond the range of such an attachment on an ordinary motor grader, thanks to the extra power of All-Wheel Drive and super-maneuverability of exclusive All-Wheel Steer. By swinging the rear end of the grader to right or left, the machine can be used as an angledozer.

The bulldozer blade is of welded steel construction, heavily built and reinforced to handle successfully work of the rough-and-tumble variety pictured on this page, and move maximum amounts of material when the going is easier.

There is constant or intermittent need for a bulldozer on many road construction and heavy maintenance operations. On rugged Austin-Western Power Graders, this attachment eliminates the necessity of tying up extra equipment for the occasional job; is an essential on many jobs and a time and money saver on dozens of others.



TOUGHER! Rocks and earth are needed to repair this washout. Traction is ample. Powerful drivers hold front end steady.



TOUGHEST! Clearing boulders from the bed of a rushing mountain stream to open a ford around a bridge.

AUSTIN-WESTERN COMPANY

Construction Equipment Division
Baldwin-Lima-Hamilton Corporation

AURORA, ILLINOIS, U.S.A.

ARIZONA—SHRIVER MACHINERY COMPANY Phoenix
CALIFORNIA—EDWARD B. BACON COMPANY San Francisco 10
CALIFORNIA—SMITH BOOTH USHER COMPANY Los Angeles 54
COLORADO—LIBERTY TRUCKS & PARTS COMPANY Denver 1
IDAHO—COLUMBIA EQUIPMENT COMPANY Boise
MONTANA—WESTERN CONSTRUCTION EQUIPMENT CO. Billings
WYOMING—WILSON EQUIPMENT & SUPPLY COMPANY

MONTANA—WESTERN CONSTRUCTION EQUIPMENT CO. Missoula
NEVADA—C. D. ROEDER EQUIPMENT COMPANY Reno
NEW MEXICO—N. C. RIBBLE COMPANY Albuquerque
OREGON—COLUMBIA EQUIPMENT COMPANY Portland 14
UTAH—WESTERN MACHINERY COMPANY Salt Lake City 15
WASHINGTON—COLUMBIA EQUIPMENT COMPANY Seattle

OCTOBER 1954



Topping out main span concrete climaxes California's first use of - - Timber trusses for arch centering

BOWSTRING TRUSSES erected and tied to form 3-hinged arches were used this year as arch centering for a 3-span concrete bridge under construction at Dunsmuir, California. The project probably sets a record for unit loads involved, the longest arch rib requiring falsework to support 4,000 lb. per lin. ft.—nearly 400 tons in all for a 180-ft. span.

Success of the work can now be measured by recorded deflections after decentering. A maximum of $1\frac{3}{4}$ in., where computations had indicated $1\frac{1}{2}$ in.

Charles MacClosky Co. bid the

job last year at \$651,648, the prices being based on use of conventional falsework. However, since the work spans the Sacramento River and could be affected by spring runoff, the contractor considered alternative methods.

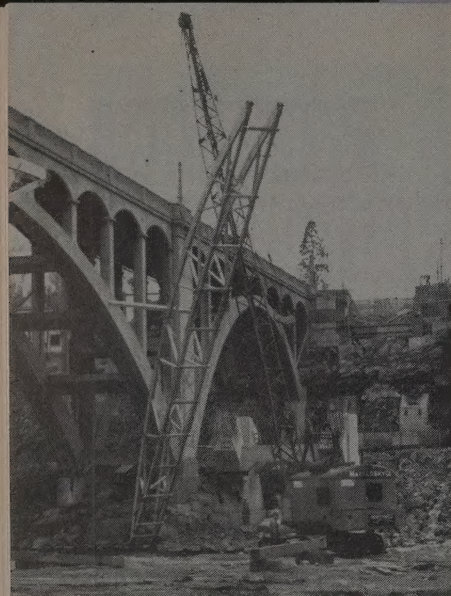
Timber Structures, Inc., of Portland, was given the job of designing the centering. This article reviews design and performance, beginning with a summary of design considerations.

Three spans were involved, having lengths of 102, 180, and 114 ft. Each span consisted of two ribs 4 to 5 ft.

wide and 3 to 4 ft. deep. It was planned to move the falsework laterally for successive rib pours in each span.

The pouring schedule for each span called for a pattern of about 10 pours, in pairs, roughly symmetrical about the crown. In addition to concrete it was necessary to provide for a live load of 1,000 lb. per lin. ft. for personnel, dunnage and equipment.

Span 1 has abutments of unequal height, is not symmetrical, and arches over an unobstructable main line right-of-way of the Southern Pacific. Spans 2 and 3 spring from piers in



UP GOES second pair of trusses for main span. Note grillage support in background, tied-back trusses at upper left.

the flood bench of the river, each rising 44 ft. Therefore, in all three cases it was desirable to be independent of the need for ground level support except at picked locations.

These requirements were all suitable to the use of 3-hinged arches in Spans 2 and 3. Supports would be high and solid at the piers. Erection would be easy. The falsework would be carried high and dry over water and ground obstructions.

Arch members might be single ribs or framed members with webs and chords. For the falsework at Dunsmuir, both types of construction were considered. Because of the heavy bending actions involved and the need for short shipping sections, it was found most economical to work with framed members. Specifically, these would be bowstring trusses. In each case two trusses, braced 4 ft. apart, would make up half an arch



PIN AT CROWN comes next. Trusses at left are a little high, can be lowered as necessary to make connection easier. Workmen on old bridge arch will set struts and cables for lateral support of completed arch assembly.

span. Two such assemblies would be pinned at the crown and rest on supports at springline on the piers.

The bridge abutments and piers doubtless would resist the thrusts of the centering. However, since the spans were to be poured separately there would be times during construction when thrusts would be unsymmetrical and widely different from the stress pattern for which the piers were designed. Therefore, four $2\frac{3}{8}$ -in. tie rods were provided to span between springline hinges of each span, completing the 3-hinged arch arrangement. They were fitted with turnbuckles for progressive tensioning during the succession of concrete placements.

Tie rods could not be used for Span 1 unless depressed beneath the railroad tracks. Also, there was the further problem of unequal abutment heights. All in all, the low span height

(40 ft.) favored a timber tower arrangement with unequal length trusses to span from tower to abutments.

No particular problem was anticipated for lateral support of any of the falsework. All work is adjacent to an existing bridge, and a simple arrangement of struts and cables would tie the centering securely.

Materials and stresses

Trusses for all spans made use of glued laminated timbers for curved top chords and sawn lumber for webs and lower chords. Water resistant casein glue was used. As an example of the sections involved, the longest span, built up of 2-in. dimension lumber, had a section measuring $5\frac{1}{4} \times 19\frac{1}{2}$ in.

Designs were made to modern standards using the National Design Specification of the National Lumber Manufacturers Association, standards of structural glued laminated lumber and Grading and Dressing Rules of the West Coast Lumbermen's Association, and the Timber Construction Standards of the American Institute of Timber Construction. Working stresses were those for Coast Region Douglas Fir to lumber grades as recommended by the above standards. Stresses were to short duration loading of 2 months, and glued laminated stresses were those for wet service conditions.

In work of this sort, deflections at various stages of construction and after decentering were all-important. First, to compensate for concrete rib deformation under dead load after decentering, California's Division of Highways requested a falsework camber of $\frac{1}{2}$ in. at the crown of each arch span, with a gradual decrease to zero at springline. Falsework cam-



SPECIAL SOLUTION met clearance requirements over railroad main line. Support under central tower included sand jacks for decentering.



"BOBTAIL" OSGOOD crane handles concrete work from top side. Putting most of counterweight under cab assured one clear traffic lane on existing bridge.

er in this amount was therefore introduced, over and above allowances for deflection of the falsework under concrete load alone. Thus an attempt was made to forecast actual deflections and rises of the falsework under all dead loads of lumber and concrete so that arches after decentering and after final concrete deformation would be to positions shown on design plans. Measurements for fabrication were to positions which allowed for all movements, whatever the cause, up to time of service. That is, calculations were worked backward from final position ready for traffic.

Deflection guarantees

As the design progressed, the state requested a guarantee that the falsework deflection at any point would vary no more than $\frac{1}{2}$ to $\frac{3}{4}$ in. from predetermined positions. It seemed impossible to estimate deflection to such close tolerance. Similar but smaller arch centering projects had been erected in other states. Spans and ratios of rise to span, however, had varied so widely that a definite pattern had not been developed. Many more variables are present in the design of this type of centering than in the design of conventional post and girt falsework.

Also, in this structure the restriction and dampening effect of sheathing and joists, of late poured arch sections, and of progressive tie rod adjustments—all these called for very difficult swivel chair decisions.

Extensive deflection computations based on the final design permitted belief that deflection tolerance would not be more than twice the amount mentioned by the Division of Highways as maximal. Positions

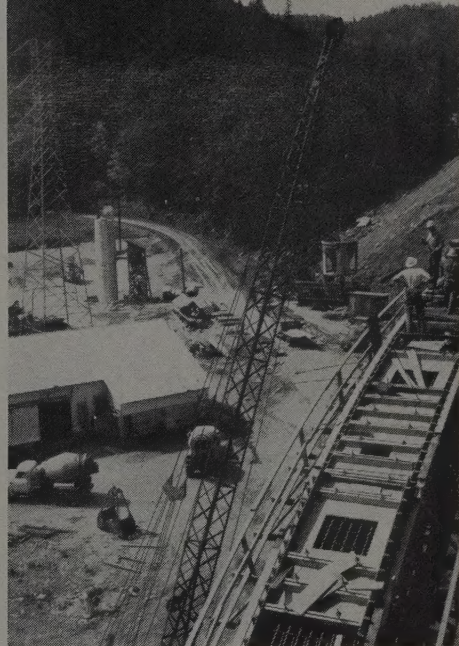
were finally set so that the falsework would come to rest high, rather than low.

Work by Charles MacClosky Co. at this stage included provision for end supports and decentering devices to be used in connection with the arch falsework. As end support, steel grillages made up of 24-ft. lengths of 20-in. I-beams were placed horizontally in the piers before the concrete was poured.

All decentering devices were de-



STEEL HANGERS from 8x16-in. cross timbers solve problem of supporting joists and forms for struts between arch ribs.



NORTHWEST needs all 75 ft. of boom to handle crown pours. 2-yd. bucket is biggest on job.

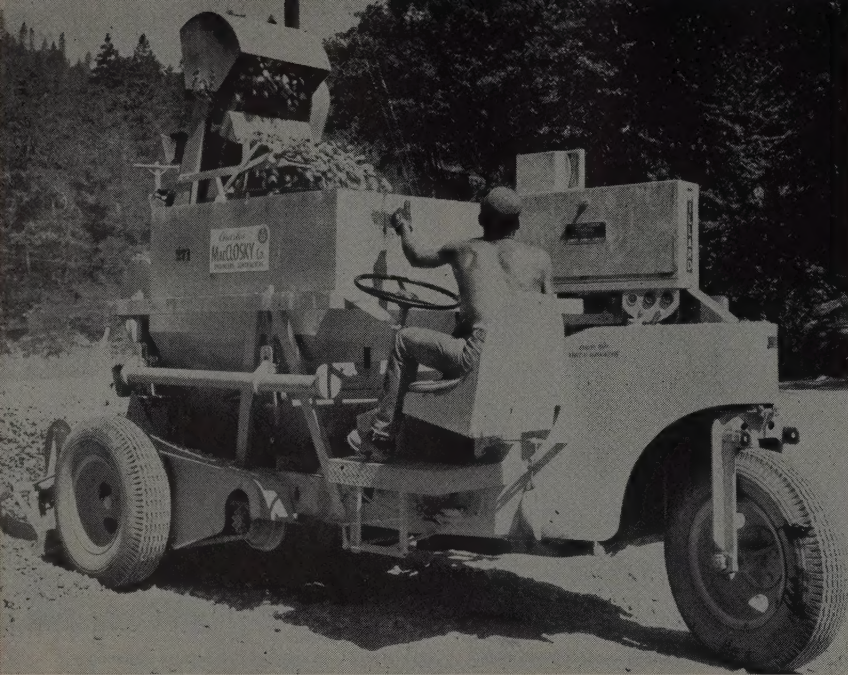
signed and manufactured by the prime contractor. Two sand jacks were provided, fabricated from steel tubing. They were used only on Span 1, for support of the centering above the tower at the arch crown. The reason for their use here was primarily for their greater stability by comparison to screw jacks.

Screw jacks were used exclusively for centering support in Spans 2 and 3, where their greater flexibility was of great help in positioning the trusses. On Span 1, screw jack support was provided at each haunch. On Spans 2 and 3, screw jacks were used at one end only. Falsework positioning at the other end was fixed by the elevation of the I-beam grillage. This provided a saving in labor and jacking equipment, but still complied with the state requirement for simultaneous decentering of all falsework under one arch. It can be seen that release of one end of the 3-hinged arch would cause proportional drop at the crown and all along the intrados of the arch.

Pictures and a review of the jacks on this job are in "Tricks of the Trades," page 118 of this issue.

Erection technique

The typical erection sequence, for Span 2, went something like this: two parallel truss sections, comprising half the span and weighing about 6 tons, were raised into position by a 50-ton Northwest crawler crane having 120 ft. of boom. Positioning at this point was only approximate. The truss rested on its grillage at one end and was supported about 6 in. high by the crane at mid-span. Then, two cables were lashed to the crown of these trusses and tied back to the north approach of the bridge, allow-



WILLARD weigh batcher bores into aggregate stockpile. Churn and bucket flight do the rest. Operator watches scale and reaches for flap gate to shut off flow.

ing the crane to release its load.

The other two trusses, similarly connected and fitted with their jacks, were raised into place. With the crane holding this second pair of trusses, the cables tying back the first pair were gradually released by hand winches until the center pin could be inserted.

Lateral bracing to the old bridge, consisting of 8x8-in. timber struts and 1/2-in. cables, was immediately installed at crown and quarter points. Next came the tie rods. Lifted into place and drawn up tightly, they completed the installation and provided the first proof of its accuracy. An adjustment of only about 3/8 in. was necessary to bring the crown to its desired elevation.

Arch form construction

Forming came next, beginning with 2x6-in. joists on edge, 12 ft. long, nailed to the top chords and cantilevering 4 ft. to provide room for a catwalk and handrail. Intrados forms were 3/8-in. plywood, nailed to the joists and thereby establishing a perfect curve for the concrete arch rib. Standard plywood panels for side forms were lifted into place by a crane and the V-shaped junctures between adjacent panels were cut and fitted separately. The forms for the extrados were held by she-bolts fastened to the joists.

In conformity with the design of the concrete ribs, a symmetrical sequence of pouring operations was followed. First, a segment of concrete (15.8 cu. yd.) was placed at the crown, serving to lock the hinge pin of the trusses. Next came simultaneous pours of 21.5 cu. yd. each at the haunches. Adjacent to them, a pair of segments of 18.25 yd. each.

Ensuing pours varied markedly: 4.4 yd. for one opposing pair and 17.45 yd. each for the next. The closure, or key, pour adjacent to the crown came to 3.4 yd.

After each pair of segments was poured, the tie rod turnbuckles were tightened. As a result, it is believed that practically all incremental thrust imposed by the concrete was taken by the tie rods.

Design vs. performance

Elevation observations at the crown and quarter points of each span provide an index to the deflections experienced, as compared to those anticipated by the designers of the centering. The two sets of figures which follow, giving first the forecast and then the actual movement, are not exactly comparable since forecast amounts include dead load deflection of the falsework itself. Records of actual deflection taken by the state, on the other hand, do not.

"Deflection" indicates a downward movement, and "rise" an upward movement.

Consider three critical points in each span—one point at the crown and one at each quarter point (center of each truss). The points are numbered from 1 to 9, starting from the center of the short truss in Span 1, the quarter point nearest the south bridge abutment and above the railroad track.

Point 1. Computed deflection was 1 1/4 in. It seemed certain that this point would deflect 3/4 in., and possibly as much as 2 1/4 in. Actual deflection was 3/4 in.

Point 2. Computed deformation at top of tower was 0.2 in. There was the possibility of no settlement at all; a maximum figure of 1/2 in. was antic-

ipated. Actual deflection was 3/4 in.

Point 3. Computed deflection was 1 in. This figure seemed certain and, it was felt, might be exceeded by 1 in. Actual deflection was 1 in.

Points 4 and 6, the quarter points of Span 2. Computed deflection was 1 7/8 in. A conservative estimate would include as much as an additional 1 in. Actual deflection was 1 3/4 in.

Point 5. This is the crown of Span 2. Computed overall deflection at this point was zero. A conservative "hedge" would anticipate possible movement of 1 in. Actual deflection was 1 1/2 in.

Points 7 and 9. Computed deflection was 7/8 in., this figure possibly to be exceeded by as much as 1 in. Actual deflection was 3/4 in.

Point 8. Computed deflection was zero. Again, this was a crown point which might rise, or might drop as much as a 1/2 in. Actual deflection was 3/4 in.

Fabrication was conservative

All the deflection computations were made on the assumption of elastic deformation of the members and inelastic slippage of the joints. As stated previously, the intention was to build high, rather than low, so the falsework was fabricated to overshoot the design marks very slightly. If exact computed deflections had been followed in fabrication, closer positions would have been obtained.

Other aspects of forming and of concrete placement on this job are worth note. For instance, while the contractor's big crawler crane was occupied with work on the second line of arch ribs, it was possible to use the existing bridge roadway as a point from which to pour concrete for the spandrel columns of the first arch ribs.

For this work the complete forms for spandrel columns were fabricated on the ground and then hoisted, with their re-steel cages in place, to position. They were held in place by cables and wood struts. Then an Osgood 200 crane worked along one lane of the existing bridge roadway to place spandrel concrete.

Built-in form support

Similar in function to the grillages imbedded in the arch haunches were 7-in. I-beams placed near the top of each spandrel column. These I-beams thereafter were used to support pairs of 8x16-in. by 46-ft. timbers serving as falsework for the transverse concrete girders and wood joists under the new concrete deck.

A difficult forming operation was encountered in the falsework for the concrete struts placed between arch ribs, because these struts are (in section) inclined at various degrees from the horizontal. The problem was solved by throwing two 8x16-in.

Continued on page 113

BUILDING WITH BOULDERS

...Morrison-Knudsen closes the cofferdam at Box Canyon

In the northeast corner of Washington the Pend Oreille County Public Utility District and Harza Engineering Co. are building a hydro project. But owner and engineer took a back seat in July as the contractor came to a point that is crucial on any dam job: river diversion. Western Construction was on hand for operation; here is the editor's first-hand report.

By RALPH WHITAKER, Jr.
Executive Editor

THE DIVERSION TUNNEL PLUG at Box Canyon Dam was blown out on July 22. A little river regulation was begun upstream (at Albeni Falls Dam) on July 10. Woody Williams flew in from Boise at 4:00 a.m. on July 31. And just 14½ hours later, at 6:35 p.m., the cofferdam was officially closed. The minimum flow was about 4,500 cfs.

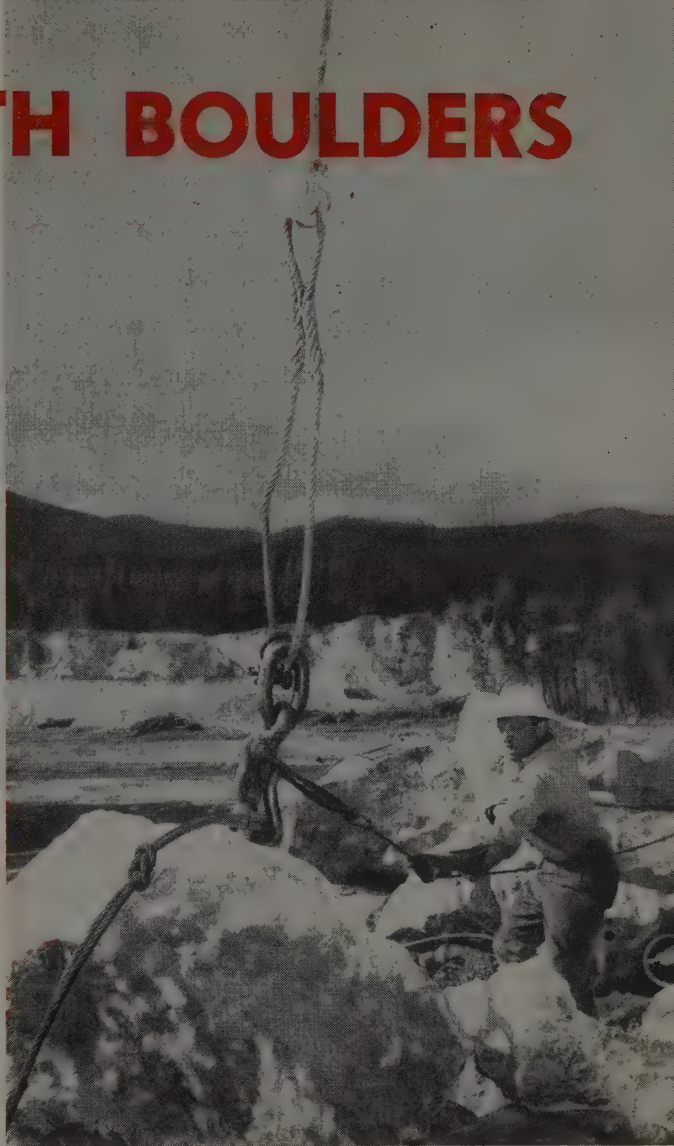
Williams didn't do the job alone. He had Simon Piedmont, Morrison-Knudsen's project manager; Odus Hantins, rigger superintendent; and a capable Manitowoc 500 out on the advancing fill. And there were three husky rock shovels back at the pit sorting out big ones and little ones to order. A dozen Eucs did the toting.

Box Canyon is a fine damsite, as the name implies. But a difficult combination of dog-legged channel and swift, deep water when it comes to placing a cofferdam. The Pend Oreille runs about 75 ft. deep. The walls are precipitous rock, but a bench on the left bank downstream gave the contractor a toe hold. Here are the shops, and here was stockpiled all the muck from tunnel, forebay, and powerhouse excavation. With an auxiliary spillway from the forebay completed, there was a path for diverted water as it foamed out of the tunnel.

There was a lot of ground work for the diversion—literally. Boulders weighing up to 15 tons were worked out of stockpile and spread out on the bank near the cofferdam site. Here they were drilled through, and then threaded with wire rope for easier handling.

While this was going on, the mechanical force gave an extra look at all equipment going through the shop on routine maintenance. The electricians weren't idle. Anticipating a round-the-clock operation, M-K rigged a lighting setup that really put the spotlight on the cofferdam. A tower was already up. New lights were added along the lower chord of the railroad bridge spanning the site just upstream from the dam axis.

Up to now, late July, the Pend Oreille hadn't run true to form. An extra heavy snow pack had caused near-record flows early in the run-off season, during May.



But June had been unusually cool. Warm weather in July had brought a second peak—very unusual—and had already stalled the diversion one week. Now, the river was falling.

On Monday, July 26, a flurry of work got under way. Shovels and trucks worked continuously for over two days, pushing the cofferdam nose about half way across. It leaked, as it was expected to do. But it didn't wash out, even with auxiliary spillway flows sweeping parallel to its downstream toe. Extra width was provided, beyond the 65-ft. design figure. This was for safety. It was also for convenience: two lines of trucks would be operating on it at times later in the week. And there would be room to move the big Manitowoc out of the way when necessary.

Thursday, July 29, was a quiet day. Drills continued to punch holes in the last few big ones. Trucks shuttled from pit to point, and the Manitowoc picked the rocks and set them in place. The right bank got all the attention, and it was a ginger job for the crane.

The Manitowoc had a 145-ft. reach when boomed out flat. It was standing on corduroy laid on the soft fill nose. And it could just reach beyond the right bank. It could spot small pieces of rock, perhaps 3 tons, near the water's edge. But it couldn't put them much higher—no reach. And it couldn't put them in the water—they'd wash away.

So a series of big "key" stones were dropped in near the far bank. Some of these were tied back to deadmen on the right bank, or to eyes set in the living rock. The



SCENE OF BATTLE was well defined as final day's work got under way. Here's teamwork—a boulder leaving the Euc while the crane spots out over the white water. Trucks had to get their beds down fast so as not to hit the crane boom when leaving cofferdam.

big ones placed in this way roughed up the channel bottom, making pockets to catch the smaller ones.

In this way, rock by rock, the cofferdam was inched up and out from the right bank. The purpose wasn't to build any length. Restricting the flow with the river still high would have endangered the fill already placed from the left bank. The idea was to scour-proof the right bank so that the final push to closure wouldn't see the right bank eroded away as fast as the cofferdam advanced toward it.

Also, a borrow pit on the right bank was vital. It had to be ready soon after closure to provide material for some quick height and width on the cofferdam. In preparation for this phase, trucks and a bulldozer had been taken to the right bank the long way around—by a bridge 10 mi. upstream. Now they were pioneering a road from the pit out across a talus slope to the cofferdam abutment. It wouldn't do to have this road chewed up by bank wash-outs. Another reason for ripping the right bank.

Another day of making ready

Friday, July 30, was another quiet day. Rock was stockpiled on the broad cofferdam crest—easy pickings for the Manitowoc. And the Eucs were given their first load, then parked in ranks, ready to go.

There was still another "insurance" maneuver. Four sections of wire rope were suspended across the narrow channel, their sag just enough to slice off a white roll of water from time to time as the river surface surged. These ropes were clipped to cables that had previously been placed. On the left bank the cables lay diagonally across the cofferdam top and led to anchorage at one of the auxiliary spillway piers. On the right bank they had been clipped to the slings on previously placed rock and then buried under later tons of boulder.

The purpose of this lacing? If the current should prove too much on Saturday, and roll the biggest rocks out of the closure, M-K would bridle each rock to these cables. The bridle would slide out along a cable as the rock was spotted, and it would restrain the rock from drifting out of the closure.

Then came Saturday. Saturday was the big day. The Manitowoc went through its shuttle routine—riggers riding the hook across to the right bank to spot a few more

rocks there. Then, just like two days before. One rock after another: hook on, pick up, swing around, boom out a bit, lower away, get the rock under water—yank that tagline!

Woody Williams was on hand, huddling with Si Piedmont to plan almost every placement. Odus Hankins guided the crane operator and passed the word back along the cofferdam specifying what size rock to grab next.

The rocks got bigger. Woody wanted to try one in mid-channel to test the current. And to test the bridle arrangement. A big boulder was hooked on, but its weight put a new stretch on the load line, and the two parts below the point sheaves wound right up on each other.

A call went out for some light manila. A guy was rigged to the fall block and two men detailed to hold the block from spinning. Now they tried again.

The big one came around. There was a pause for clipping a bridle. Then out to a selected spot, and down. The rock stuck, and it stuck without strain on the bridle. A few more were spotted the same way during the next couple of hours, for checking purposes. They all stuck and they all left slack wire showing.

Even so, loose rock wasn't let go into mid-channel. The technique was to place close to the cofferdam, or close to the far bank, and always just a little bit downstream. This way there came to be an eddy of roiled white water along side and to landward of the rocks. The Pend Oreille swept through in a narrowing crest that broke on itself below the cofferdam and swirled downstream in a series of foaming swells and troughs.

Whenever an eddy had been developed over a good area near the right bank, the Manitowoc would drop small stuff—2 to 6 tons—on the far side of it. For building in the near eddy, the Manitowoc would step aside. A couple of Eucs would dump big ones on the cofferdam nose above the eddy, and a D8 Cat would bulldoze them in together. A few truckloads of loose muck would follow, and the Cat would doze that out, and down. In fact, it would cut a trench down to the water's edge above the last rock and persuade a few more rocks down this ramp into position. Then, build up the cofferdam and call on the crane again.



THIS ONE PICKED UP easy as could be. Si Piedmont moves ahead of it with direct spotting, while guy crew holds fast to keep load from spinning.



THIS ONE DIDN'T. Sling snapped and crane boom whipped. Result: 2 hr. downtime for fouled rigging while Cats and Eucs took over.

Another theory of cofferdam work is demonstrated by this technique. Don't dump rock in from any more height than necessary. It gets caught in the main current and is swept through. Instead, keep the fill low and push material out—not down—into the water. This way the rock isn't fully exposed to the current. It will stick.

The work continued at a steady pace. There wasn't any big rush yet. Then they tackled the daddy of all rocks on this job. It may have weighed 20 tons. Hankins whistled for someone to take a picture of it being picked off the ground.

Picking the big ones is a problem in several ways. You want to boom up to avoid tipping. But you don't want to boom too high—you could collapse the boom. Or, if a line gave way, the already high boom would go right on back over the cab. This time there was plenty of crane—but either too much rock or not enough sling!

When the sling parted, the boom stayed on the right side of the machine. But it did shake a lot of rigging, and drove one part of the A-frame tackle. The Manitowoc pulled back from the end of the fill, swung around, and laid its boom on blocks hauled down from the shops. A truck crane came down to join the traffic jam and take a train for clearing the fouled line.

Warm-up for the truck team

But the offending boulder still lay there. The D8 took a pass at it. No good—it dug right in. Finally, a pair of Cats teamed up, and the big rock moved out along the fill. A ramp had already been dozed, and this eased the shore so that one Cat could handle the rock for the last few yards. The rock went in, it hung up in a good spot, and Woody Williams smiled again.

Now was a time to try the Eucs. They had been lined up deep along the haul road near the dam, and out on the dam. Now they started to raise dust.

There was a dumpman on the job. But a lot of the time he had help. Bob Rice, safety engineer, waved the trucks on to the fill. Then the dumpman took over and guided them on toward one side or the other out near the end. And Si Piedmont, himself, hopped from one truck line to the other, almost pulling them back those last few feet to just the right spot.

It looked touchy at times. The fill moved out fast now, but it wasn't being held at full height. The nose was a downhill proposition. And the D8, coming in after every four or five loads, kept a sharp ramp built at the very end. The trucks were light on their front wheels before and during dumping. They couldn't get out without lowering their dump bodies. One Euc, stopping in a slick spot, had to be retrieved by the D8.

It was a good warm-up for the coming final push. But

the Manitowoc came back on the job shortly after noon, and the pace slowed again. Big rocks consolidated the quick gains made earlier, and set up new eddies beside the fill. Again some test rocks were set in mid-channel—a lot narrower now. These stuck, a couple where you could see them just below the wave crests they built up.

That was the clincher. Now was the time to go to work in earnest.

Regulation at Albeni Falls had not had its full effect yet. The river there was being controlled to 7,000 cfs. But the channel and bank storage, and tributary flow between the two dams, meant that the river would probably never get below 11,000 cfs. Not during the weekend, at least. And water supply demands for towns and lumber mills would begin again on Monday. At 3:30 p.m. the flow at Box Canyon, excluding what was going through the tunnel, was about 15,000 cfs. The gap to close was about 80 ft.

The Manitowoc moved back—way back. Its boom came down, and a crew hopped to work switching it to a dragline rig. It would be one of the first machines across the river to work the new pit.

From here on out the whole story was in the hands of an M-K crew, assisted by a dozen Eucs, a Northwest 80 loading big rocks out of stockpile, and a pair of shovels up in the pit. These were a hulking Bucyrus-Erie 120-B electric with a 5-yd. dipper, and its little brother, a 2½-yd. 54-B. Of the Eucs, eight were 17-yd. end-dumps; four were big 25-yd. six-wheelers—the two-engine variety totting 25 yd. at a crack.

Piedmont wanted speed now, and he got it. The Eucs began to dump at the rate of one every 32 to 35 seconds. But this is misleading. The cycle was purposely interrupted at times to let the D8 shape things up. And there were occasionally a maddening few minutes when there just wasn't a truck on hand.

Selective loading at the pit

A look at the pit showed why. This was a good spot for a traffic jam. The trouble was largely traceable to the power cable leading from the 120-B. Only one tower sled had been spotted to carry this cable up in the air. So, there was only one road in and out of the pit. Sometimes the Eucs got snarled up trying to keep out of each other's way.

The 54-B worked with the smaller Eucs. About six passes made a load. Over by the 120-B was where the 25-yarders were spotted. The pit material was more varied here—more big rock. So the dipper loads weren't uniform, and five or six passes were needed. Each truck required about 2 min. 20 sec. to load. When no big trucks were on hand, the 120-B loaded the smaller ones—with one big, selected stone each.



AT THE PIT this Bucyrus-Erie was always bracketed by waiting trucks. It was no time to have a shovel stand idle.



ON THE FILL Eucls pushed the crane into the background as the work moved to a climax. Here's nice distribution: one load of rock, two of loose fill.

Most of the drilled rock came from the stockpile outside the pit. A Northwest worked there, with 17-yd. Eucls only, loading them with from one to three stones each, depending on size. Once there was a really big one that sprung the truck-bed sides just enough to jam. When the Euclid hoisted its bed on the cofferdam, nothing happened. The D8 moved in with its blade to poke around. Still nothing happened. Williams waved the truck out of the way with its stubborn load and the work went on. The Northwest had to yank that rock loose back at the stockpile!

Sometimes the shovel operators got over-enthusiastic. One small Euc came down the haul road extra slowly, taking it real easy on the bumps and curves, and staying away from any crown or superelevation. When he backed out on the fill it was easy to see why. There were just two boulders in the bed. "But that's too much, even for a Euc," said Woody Williams, "it must be 50 tons!"

Si Piedmont nodded, and the word got back to the pit fast. There were no more overloaded Eucls. But there was a continuous stream of trucks out on the fill, and the bystanders had to jump to stay clear. It was quite a crowd, enough that Piedmont had ordered coffee and a sack full of sweet rolls brought down. Nobody had taken off for lunch. They all wanted to be there for the finish.

Money and the visiting firemen

There was a little money riding on the closure. Not just the contract, but eleven whole dollars hastily thrown together in a closure pool! C. K. Willey, Harza's resident engineer, had come down to watch. Jim Sewell, one of the P.U.D. consultants, was on hand, along with Percy Campbell, the P.U.D. manager. M-K was out in force, with Williams, Piedmont, Hankins, and Rice, plus Fred Reif, the job engineer, and Clarence Harmon, equipment superintendent.

Si Piedmont's brother George, the project manager for Columbia River Constructors over at Chief Joseph Dam, was among the visiting firemen. Another family representative was Woody Williams' son, Duane. He had a special assignment: cofferdam closure was to be pegged according to the minute that Duane could lightfoot it across!

As the afternoon wore on into evening, it was apparent that this job was going to wind up sooner than anyone had figured. Sunday morning had been the target time. That would leave most of a day, with a low river flow, to reinforce the closure with extra height and width. But when the crane was let go from the job for re-rigging, it was obvious that the schedule was being beaten. Now it was a sure thing to be knocked into a cocked hat. No one would lose any sleep Saturday night—except the regularly scheduled night shift.

The trucks had done the whole job since 3:30. Now it was 6:00. There wasn't far to go. The job was under control; all the ideal techniques were in operation. Williams

and Piedmont had built a substantial fill. Now, over near the right bank, they were dumping on top of rock that had been placed by the crane earlier the same day. That rock had made a broad, shallow weir. Now it was being squeezed off.

A few big stones were unloaded on the nose of the fill, just beside the rushing water, which was now sweeping through in a deep green sheet that dropped a good 4 ft. in its passage. The rocks were dozed in. They stuck, and their top corners stayed dry! A few more like them would see the climax of the job. Woody Williams turned away from the river: "Where are the big ones?"

A look back along the cofferdam showed a line-up of Eucls all right, but all of them carried heaps of muck. Word went back to the pit on this point, fast. But it was coincidence in the order of trucks. While the muck-laden units dumped on the downstream corner of the fill, loads of rock began to stack up in line. Williams and Piedmont smiled again, and waved a truck into position.

The little Eucls all had names, carrying them on painted boards wired to the radiators. There was Muddy Maude, Dusty Dot, Sandy Annie, Gravel Gert, and probably others. Maybe somebody knows which one brought that last load.

The truck backed down the cofferdam, and slowed. The dumpman waved impatiently, and the Euc's muffler rattled again as the truck came on back. Then the dumpman's fist clenched. The air brakes hissed, and the Euc rocked a little on the steep fill nose. Its engine revved up again, the bed lifted, and the hoist cylinders began to stretch.

The rock settled a bit, and bumped doubtfully on the ribs of the Euc. Then it kicked loose, drumming and bumping its way down the bed and raising a fine dust. Down it slid, tipped off the bed, thumped on the fill and waddled down toward the water. It snapped a few sharp corners off other rocks and settled into place.

It didn't splash, except around the edges. There was too much rock already there. Duane Williams eyed the stone to see if the current would move it. No. He picked out a path—of 5-ton stepping stones—and ran across.

It was 6:35 p.m.

V. P. Campbell of the P.U.D. won the eleven-dollar pool. Woody Williams was 'way out in left field with a conservative estimate some time Sunday morning.

The Eucls kept on dumping, into Saturday night. By 9:00 p.m., trucks and the Cat could get across the new fill, and they were followed quickly by the Northwest, first excavator into the borrow pit on the right bank.

Most of the added fill first went into width. Then came height, because restrictions of the diversion tunnel required a little greater head. The water surface might rise from its original elevation of about 1,995 ft. to as much as 2,010 or 2,015. M-K figured in advance on that score.

The cofferdam was closed at about el. 2,005, minimum.



END OF THE BATTLE was in sight as twilight came over Box Canyon. This was 6:07 p.m., and the cofferdam was closed just 28 minutes later. A day's work is well illustrated by comparison of this picture and the one on page 64.

After that, el. 2,010 was the bogey, and the fill was built on that basis with a crest width of 80 ft. on top, and side slopes of $1\frac{1}{2}:1$.

A crest at el. 2,010 would divert 15,000 cfs. without overtopping. Another 5 ft. would make it safe against 20,000 cfs. And so on. On the other hand, if the river continued to fall, some of the top would be bulldozed off for added thickness later on.

This cofferdam is not sealed, in the usual sense of the word. Fine sealing material would have to go on the downstream side, and the location of the fill is such that returning diversion flows sweeping from the auxiliary spillway would wash out the fines. Sealing material upstream would blow-out from hydrostatic pressure.

So M-K used a filter arrangement. Relatively fine material was placed on the upstream face about 25 ft. thick. It was coarse enough not to seal, fine enough to slow the water and dissipate head. Its weight made it secure.

The hard luck job at Box Canyon got a new lease on life with the completion of this smooth diversion operation. Putting in the downstream cofferdam first left a still pool,

free of destructive eddies, for construction of the upstream fill. This was done within the next 5 days. Pumps had been installed by then and unwatering was begun. The pumps will remain in service all the time the cofferdams serve the job. The filter cofferdam always passes some water, and this has to be picked up and pumped out.

Conceived by its owner, Pend Oreille County Public Utility District, as a stripped-down project without frills, Box Canyon Dam has shown a tendency to get costly. Pacific-General-Shea was the original prime contractor, on a \$7,426,000 bid. But they have left the job in a state of disagreement with the P.U.D. The disagreement can be measured by the lawsuits: P-G-S is looking for about \$3,000,000 for contract "recision"; the P.U.D. seeks \$4,113,000 in connection with contract "termination."

These issues may have to be decided in the courts, but the rough construction facts remain. The seasons are short at Box Canyon, and there was a year of lost time for Morrison-Knudsen to make up.

In doing that, everything hinged on diversion this year—as soon as possible. Now, it's been done.

PROOF OF SUCCESS is a view from the right bank. Still in command, Piedmont and Williams watch another Euc add some height to the fill.



ON INTO THE NIGHT, machines worked to top out new fill, speeding the day of upstream cofferdam completion and unwatering.





TOWERS of angle iron construction were first erected over the stator, then the portable gantry on top of heavy beams spanning between towers. Connections have been made and the lift is ready.



AFTER LIFTING the 236-ton stator approximately 30 ft. vertically between the towers, the portable gantry then travels horizontally along temporary rails to set the stator on its foundation.

236-ton lift by portable gantry

HERE IS ANOTHER method for the handling of 236-ton generator stators. In the August 1954 issue, **Western Construction** presented the method of jacking and cribbing used for the two stators installed for the Southern California Edison Co. The example presented here covers the installation of four of these units at the Pacific Gas & Electric Co.'s steam plant at Pittsburg.

The first operation was unloading the four generator stators from special railroad flat cars. They were moved approximately 70 ft. across the yard on wooden rollers from the railroad spur track to temporary ground level locations at the base of their foundation pedestals. The pictures shown on this page illustrate the structural arrangement to handle the subsequent operations.

Four towers of angle iron construction were erected first. Spanning between towers, two 30-in. deep, 190-lb., wide-flange beams were set, each 30 ft. long. Rails were laid on top of

the beams and onto the pedestal foundation. Mounted on this is the Bigge Crane & Rigging Co. gantry which was both designed and built by them. It is a portable rig which can be knocked down, transported, and set up again very easily. Lifting equipment on top of the gantry consists of two heavy-duty, double-drum hoists, one a Skagit and the other a Mead Morrison. Wire rope used in the hoisting operation was Roebling "Blue Center" 1-in. diameter, 8x19 right regular lay, improved plough steel.

Gantry movement

The actual lifting of a unit about 30 ft. vertically and then its horizontal 85-ft. travel along the rails to final location required but 40 min. Foundations for the stators are separate and parallel to each other. It was therefore necessary to move the gantry and support structure each time a new stator was to be set. However, moving of the gantry from pedestal

to pedestal was a very simple problem in that the powerhouse gantry crane was able to pick up and move the gantry in one piece to the next pedestal.

This operation is probably as heavy a lifting job as ever done in the West, and certainly one performed in a rapid and unique manner. In this case, only 16 calendar days were required from start of actual erection work until all four units were in place. The stators are of such size that it was necessary to give them special routing from Schenectady, New York, through the southern states to avoid tunnels and bridges. The railroad cars were of heavy construction, having sixteen wheels each, and are the only four of their kind.

This Pacific Gas & Electric steam-electric plant is the largest of its kind west of the Mississippi River. Bechtel Corp. is the general contractor and worked closely with Bigge Crane & Rigging Co. in executing this interesting operation.

ASPHALT PLANTS

What every inspector should know

In a step-by-step description of a modern hot-mix plant, the author tells you what pitfalls to avoid if the specified mix is to be easily produced. This timely paper was recently presented before the Northeast Los Angeles Forum of The Asphalt Institute.

By
R. P. D'ALO
Assistant Highway
Engineer
California Division
of Highways



THERE ARE PROBABLY a greater number of hot-mix asphalt plants in the Los Angeles area than in any similar area of our country. Because of the availability of excellent local materials and weather conditions permitting year round operations, the industry can furnish us highest-type asphalt paving materials at competitive prices. These plants are used for the production of asphalt concrete or plant-mixed surfacing requiring close tolerance on aggregate gradation and asphalt content. The function of the plant inspector is to influence and guide the plant operations to a specified end product.

One of the most important things the inspector must do is to control the aggregate grading. I think I can best explain why by going to the surface area theory. There are many aggregate gradings specified—each one best suited to certain conditions, but there is one thing common to all mixes. That is—there is a most ideal asphalt content which will produce the highest structural qualities. The most ideal asphalt content depends on two main factors. One is the porosity of the aggregate and the other is the surface area of the aggregate. The porosity of the aggregate is a constant for any aggregate source. The surface area, because it is directly related to the grading of the aggregate, is the variable factor. In order to minimize the variable factor, the grading must be kept as uniform as possible. By keeping grading uniform, the oil demand of

the aggregate is made consistent. By doing this, and by correct proportioning of asphalt and aggregate, the desirable qualities can be had. Let us start at the stockpiled aggregate or bunkers and follow the procedure through.

Probably the most important problem in setting up a mix is the analysis and selection of aggregate to produce the proper gradation. Close co-operation between the inspector and plant operators during this phase of the work is almost sure to bring good results. The materials to be used must be of such gradation that they can be blended to grading limits. If materials are carelessly selected, stored, and proportioned at the cold feeders—the plant bins will be unbalanced to the aggregates fed. The result is shortage or overflow of materials from the bins.

Two-bin minimum

Unbalanced bins can reduce production capacities considerably and will certainly not give the desired quality to the mix. Because of this, it is not advisable to use a one-stock-

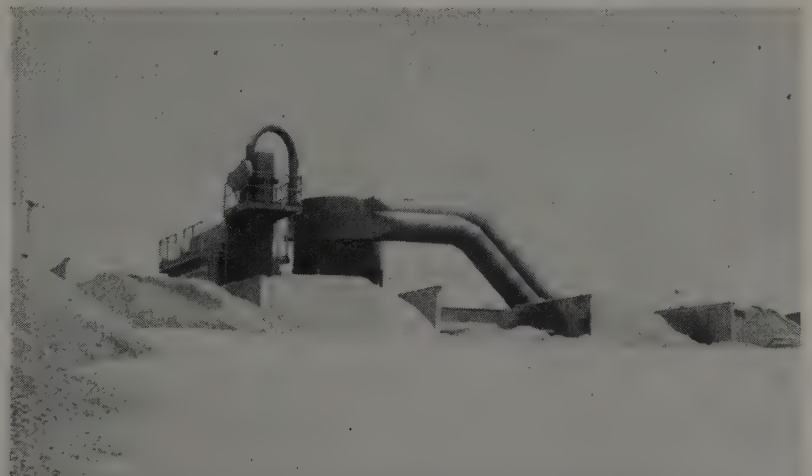
pile set-up in any high type bituminous mixtures. Any variation in the single stockpile is sure to show up in the end product. A minimum of two aggregate sizes—sand and coarse aggregate, allow belt feeder control over minor stockpile variations.

Once the materials have been selected, they should be sampled for laboratory tests. The tests will show all pertinent information of the materials which applies to the specified mix. The tests include aggregate gradation, stability of the final mix at various asphalt contents, specific gravities of aggregates, hardness, porosity factor, sand equivalent, and recommended oil ratio. With the accurate analysis of the lab test results, the inspector can prepare for in advance, or often avoid, expected problems. This done, the weights are set up from typical bin gradings, and the actual operations begin.

Positive aggregate feed

The aggregates are blended at the stockpiles or bunkers to a conveyor belt. The coarse aggregates are usually fed by gravity flow, and the sands or fine aggregates fed by some means to control a positive and steady flow. Belt feeders, vibrator feeders and reciprocating pan feeders are usually used. In all types an adjustable gate is provided to control a positive volume flow of each aggregate size fed to the plant. This is one function which should be considered all important to satisfactory plant operations.

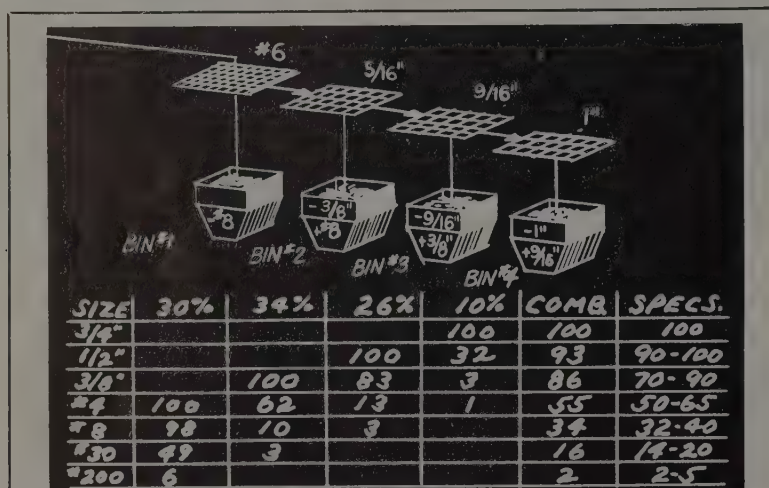
The aggregate so combined travels



INTERMINGLING of aggregates is prevented by this excellent bunker layout that has partitions extending above ground. Aggregates are hauled in by truck and dumped directly into bunkers to prevent segregation.



ADJUSTABLE COARSE AGGREGATE feeders are of the gravity type such as shown here. They have a positive locking pin. Belt feeders or vibrator feeders are usually used for fine aggregate. Aggregate sizes are noted on the bins.



SCHEMATIC DIAGRAM of a typical screen and bin set-up. Each bin grading is shown as well as the percentage of each in the combined grading. Continual uniformity of bin gradings is essential to smooth plant operation.

by means of conveyor belt or bucket elevator to the drier to be dried and heated to the applicable mixing temperature and to make the end product a workable mixture for placing and compacting on the street. A pyrometer is fitted to indicate the heat of aggregate leaving the drier. A heat indicator is quite useful to the fireman in controlling uniformity of temperature on jobs which permit steady uninterrupted running. The temperature should be such as to allow good workability, but not so high as to damage the asphalt.

The function of the dust collector is to collect the usable fines (which usually pass the #30 U. S. Standard testing screen size) and return them to be mixed or to be wasted as necessary.

The dry hot aggregates then travel

up the hot elevator to the gradation control unit which is located at the top of the plant tower. The screened aggregates are then stored in separate bins, ready for batching and mixing.

Control of material size

A schematic diagram, shown elsewhere on these pages, shows a typical screen and bin set-up. The aggregate is separated according to size and stored in the bin numbered according to aggregate size. Below each bin is shown a grading of samples taken from each bin and the percentages of each bin set-up to meet grading specifications on the right. In order to keep the combined aggregate within specified limits, the bin gradings must be kept uniform

by limiting allowable undersize in the bins.

This screen set-up is quite universal. If you will notice the largest screen is 1-in. opening. All material over one inch is rejected. The grading specification calls for all material to pass a 3/4-in. size. The 1-in. screen could allow material oversize to the specifications into the No. 4 bin. This grading is made with this screen set-up by selecting materials fed to the plant which will all pass the 3/4-in. sieve and meet the combined grading specified. The same thing applies to any mix.

The grading in the No. 1 bin must be controlled from the stockpiled sands because it is impractical to screen on anything smaller than a #6 screen. Should the sand have too high a fines fraction, gradings can often be brought within limits by wasting a portion or all of the fines from the dust collector. A low sand equivalent of stockpiled sands may also be corrected by wasting from the dust collector.

Proper sampling

Hot plants are sampled as the material falls from the bins to the weigh box when batching. Unless the necessary care is taken, duplicating samples may be difficult even if the bin gradings are consistent. A true cross section of the bin must be had in the sample. In order to do this a sampler with a restricted opening on top allows getting into the stream of the material before filling the container.

Mix variations

It is not wise to be constantly changing the mix because of variations in the bin gradings. Instead the source and cause of the variations should be found. These variations may be a result of excessive fluctuation of feeding rates from the bunkers, or it may be that the use of a bulldozer is intermingling the aggregate stockpiles. Whatever the cause, immediate action should be taken to correct it. Changing the mix from day to day will not correct it, but instead will add to the non-uniformity.

To batch, the aggregates and asphalt are proportioned by direct weighing on springless dial or multiple beam scales. The aggregates are drawn from the bins in a certain order of discharge to a weigh hopper, and weighing is accumulative. The asphalt is weighed on separate scales in a special weighing receptacle. The penetration type asphalts, being a semi-solid at ordinary temperatures, must be continuously circulated from the heated storage tanks. By means of a two-way valve arrangement, the asphalt is diverted into the weigh bucket until the correct weight is obtained, and then recirculated. All scales used in weigh-



RESTRICTED OPENING SAMPLER is used to catch aggregate between bins and weigh box.

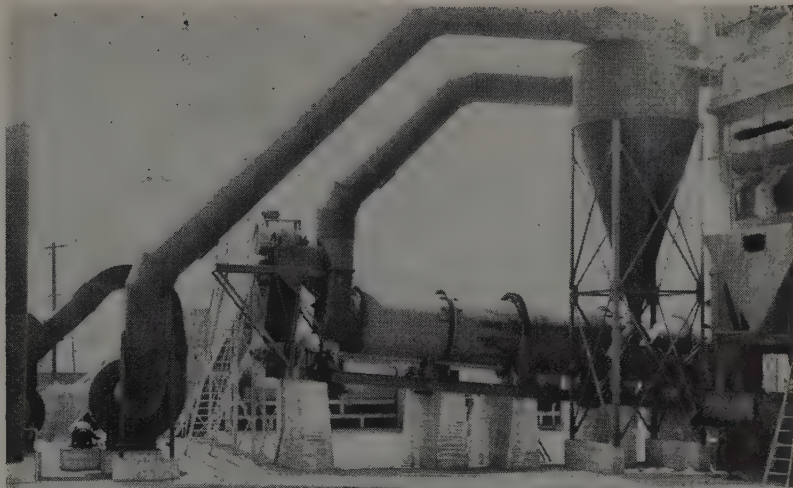
ing should be verified as to accuracy, and should be free of plant vibration so as not to affect the accuracy of weighing. An automatic weighing device is usually specified for the highest type mixes to eliminate the human element in batching. The batch total weights can be checked by net weight of trucks over the platform scales.

Mixing time control

The proportioned materials are then dumped into the pugmill for mixing. Delivery of asphalt to the pug is usually accomplished by a gravity distribution splash pan along the side of the mixer, or by gravity distribution (or pressure) spraying bars along the center of the mixer. The mixer consists of a housing with two oppositely-rotating geared shafts with shanks and paddles so arranged as to produce complete mixing. The pugmill is equipped with a timing device—usually a signal device interlocking the pug gate—so that it cannot be discharged until the mixing time has expired.

Incomplete mixing

In present day operations incomplete mixing is quite uncommon. The mixing should be so complete that by laboratory extraction tests the asphalt content will check reasonably with what is being used in the mix. One thing that it might be well to remember is that should mixing be visibly incomplete, it could be caused by poor distribution of asphalt in the pug. Poor distribution is evidenced by a coating of the pug, shafts, and shanks on one side or other of the mixer. The distribution of asphalt in the pug can be adjusted by plugging off nozzles on one side or by adjusting the movable vanes in the splash pans. If this should fail to correct the trouble, it is probably caused by the pug itself. Worn liners and paddles may be the cause, or—less obvious—it could be the pug timing. Too much deviation from the factory-recommended timing can so reduce the agitation within the



HOT GASES traveling through the drier carry fines and are collected in the conical dust collector. Most of this dust is recombined with aggregates leaving the drier.



ENTIRE PLANT LAYOUT and function is shown here. Aggregates from the bunkers on the right are combined on the conveyor belt and carried to the drier. Hot aggregates from the tower go up the elevator to the right of the tower and the dust up the elevator on the left. From the top of the tower down are the gradation control unit, the bins, the weigh box, and the pug with discharge into the truck below. Heated storage tanks furnish asphalt to the tower.

pug as to make mixing poor even after extended mixing time.

These are but a few of the things the inspector should check in inspecting hot plants and materials to work with them.

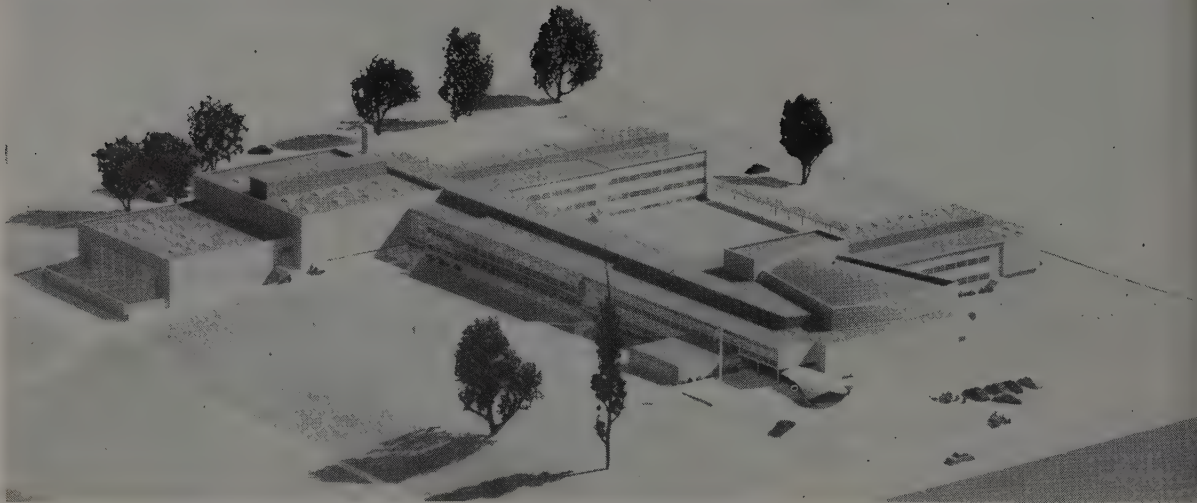
Final requirements

In the end product, the mix should have a uniform grading which will produce a uniform non-skid texture, as well as a uniform oil demand of the aggregate. It should have a uniform temperature for workability and compaction on the street and should have a uniformly correct oil ratio. It should meet all specified requirements of structural qualities.

If the mix meets those essential requirements, the street operations and structural section being equal, the roadway will require little or no

maintenance for many years.

In recent months, the Division of Highways has included specifications in the Special Provisions and Contracts that are soon to be adopted as standard. These require controls not before specified. These controls, having been rigidly held to by more standardized inspection procedure, are found to be adaptable to all plants. Those who have received these contracts have standardized plant equipment. The specifications are found to be quite workable for control in the production of asphalt paving materials. The industry has been very cooperative in working with us in changing over. It is believed that by adopting these specifications another step forward has been made toward better paving materials for better roads.



Thorough planning on Portland school job features - - -

(1) Pre-bid brochure introducing lift-slab (2) Tilt-up shear wall panels riding slabs

A NEW ADAPTATION of the old will soon be erected in Portland, Oregon. The old referred to here are the two techniques of tilt-up wall construction and the lift-slab method of raising floors. The new twist comes when the two are combined in one building at the same time. Although not yet constructed, the features of this project are well worth noting in advance.

The contract for the Woodrow Wilson High School was awarded to the L. H. Hoffman Co. last July. Prior to that, 180,000 cu. yd. of excavation was required to remove the knoll of a hill. Footings are now being located and excavated for about two-thirds of the project. The balance will be started later, perhaps next spring. No concrete has been poured as yet.

Scope of work

The project consists of classroom and cafeteria areas of flat concrete plate construction, an auditorium utilizing long bowstring steel roof trusses, steel balcony cantilever trusses, and poured concrete side-walls; an administration area constructed of steel deck and framing; a gymnasium covered by a steel deck on long span steel joists that jump from the tilted-up concrete walls 32 ft. high to two carrying trusses 20 ft. apart spanning 102 ft.

The flat concrete plates are 10 in. thick, span up to 29 ft., are of rock aggregate 3,000-psi. concrete, and are supported on steel columns 6½ in.

square and 8 in. square made up of two angles welded toe to toe. It is upon these slabs that the interior tilted-up concrete shear walls ride.

Other shear walls, both interior and exterior, are reinforced grouted brick masonry 12 in. thick. The shear walls are specified to be in place before the temporary diagonal construction bracing is removed. Besides the diagonal construction bracing for construction stiffness, all lift columns have their bases buried about 1 ft. into concrete pedestals to give near fixity to the columns.

Pre-bid brochure

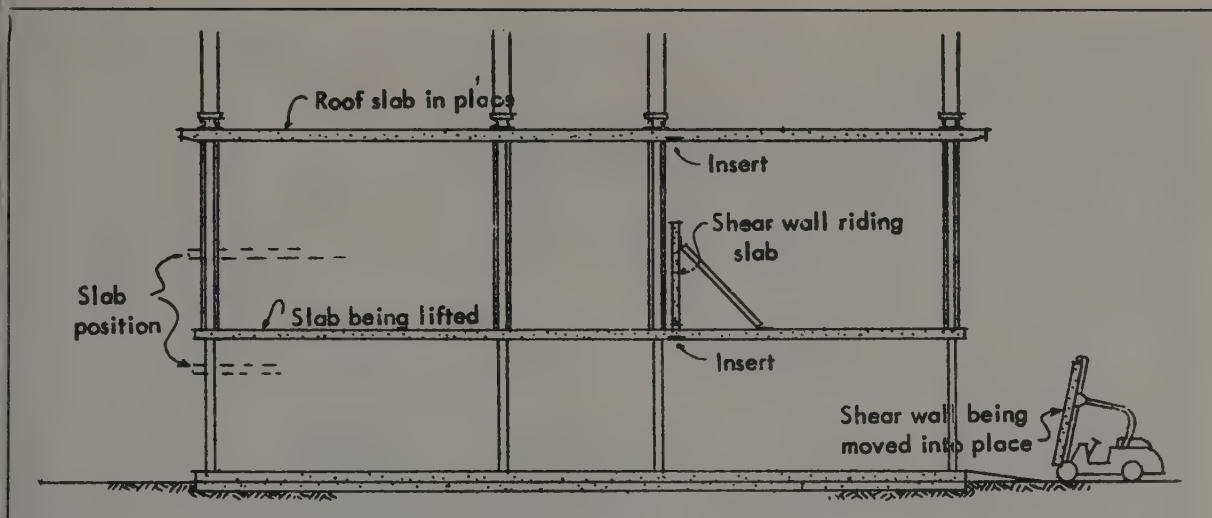
A booklet was prepared by the architects, Edmundson & Kochendoerfer, for distribution to contractors and subs who were interested in the project prior to bidding. This was distributed in an effort to acquaint the local construction industry with lift-slab, since it has not been used in Portland before. Apparently, it was effective, for the bidders—who did not already own their own forms—used lift-slab in their bidding, even though it was optional with them. Now the L. H. Hoffman Co., which has a large supply of prefabricated forms on hand, has decided to use lift-slab and let their forms lie in the warehouse.

That portion of the project dealing with the use of a 3-story combination of tilt-wall and lift-slab is well described in the booklet as follows: "In order to further exploit the prefabrication of parts the interior shear

walls are designed to be built as follows:

1. In convenient locations outside of the actual building area the ground is to be leveled and waste slabs constructed by means of pouring a thin concrete slab over the earth. This may be from 1½ in. thick upward and is merely to furnish a smooth and level flat form on which tilt-up slabs may be poured. It will later be broken up and disposed of.
2. On these waste slabs, edge forms will be constructed, concrete placed and shear walls poured in a horizontal position. Steel lugs are cast into corners and edges of slab at indicated locations.
3. Shear walls may be stacked one on top of the other in the same manner as the floor slabs if separated by a separating medium.
4. When the roof slab has been lifted high enough to be out of the way, the shear walls may be tilted up and handled by means of a fork-lift truck. They are to be placed in their proper location on the floor and braced vertically with temporary braces similar to such as ordinarily used for tilt-up wall construction.
5. When the floor slab on which shear walls are placed is lifted into position, the shear wall rides up with it.
6. When the uppermost floor has been lifted high enough to be clear, shear walls for the next floor may be set in place ready to ride up with its floor slab.
7. When all slabs are in place and rechecked for level and settlement of footings, shear walls are plumbed and realigned. The space between shear wall and slab, that must be allowed for handling, is then dry packed, and the lugs welded to the floor and ceiling as detailed. The lowest wall is to be dry packed first, then the one above, then the topmost one."

The building is designed for seis-



mic loadings as well as wind and other normal loadings. The exterior facing of the classroom areas will be glass and metal panels. These are of porcelain faced steel, and are set in the same frames as the glass, forming spandrels at the floor lines.

Heating is by means of a split system. Strip convectors are placed un-

der the windows and back of the spandrels. Ventilation equipment is in a penthouse that extends the full length of the roof over all corridors. Ventilation is by vertical risers through corridor walls down to the rooms, with very few horizontal ducts used. Neither corridors nor classrooms require furring to hide

ducts; toilets and ceilings under the laboratories are the only areas where furring is used.

Other persons and firms interested in this project are R. Evan Kennedy, structural engineer; Thomas Taylor, mechanical engineer; Matson & Klawa, electrical engineers; Northwest Lift-Slab, the lift contractor.

Prefab steel bridge in the boondocks



COMPLETED STRUCTURE at the left is composed of an 80-ft. and a 60-ft. span. Erection shown above was by means of a high line "floating" the outboard end, while 10-ft. panels were added at the opposite end. Completed cost is only half that of a comparable log structure.

HIKERS AND PACK TRAIN parties going into Kings Canyon National Park may wonder, as they cross Kings River near Bubbs Creek by means of a new steel bridge, how the 140-ft. structure (80-ft. and 60-ft. spans) was delivered to the site. It is in a rugged and remote area some 8 mi. above the end of the highway at Cedar Grove.

Transportation was difficult. The complete and fully prefabricated superstructure had been shipped to Cedar Grove on one large semi-trailer as a routine operation. Then it required two weeks to shuttle the materials 5 mi. along a pioneer road to Copper Creek with a small truck and from Copper Creek to Bubbs Creek (3 mi.) by means of a 5-ft. wide trailer towed by a narrow gauge Cletrac

trail tractor. Most of the timber decking was packed in by mules.

Trusses consist of high-tensile steel Bailey bridge panels (577 lb. each) pinned together at 10-ft. intervals. Bolted steel floorbeams and stringers support a salt-treated pre-cut timber deck. No single part is longer than 10 ft. nor exceeds the weight of a panel.

Erection was accomplished by means of a high line "floating" the outboard end of the trusses while panels were added at the opposite end. This procedure permitted the steel assembly to be completed from one convenient location, much the same as in the cantilever launching of a standard Bailey bridge. Steel erection was handled by park personnel and was completed in 6 working days.

Total cost, including materials, hauling, abutments and pier, was \$11,000, which is approximately half the estimated cost of a log bridge at this location. Experience with log bridges indicates a service life expectancy of only 10 years.

The prefabricated superstructure was furnished by Bailey Bridge Equipment Co. Credit for overcoming difficult transportation problems and for working out most of the details of erection goes to Charles Wallace and Robert Davis, trail construction supervisors, and to Clyde Bradshaw, foreman on the job. H. J. Allcock is park engineer and E. T. Scoyen is superintendent of Ash Mountain, Sequoia and Kings Canyon National Parks, California.



Contractor slashes crushing costs

Price nosedives as Montana contracting firm crushes difficult pits to produce 60,000-ton maintenance stockpile

WHEN A 60,000-CU. YD. gravel crushing job came up early this year in the Kalispell Division of the Montana State Highway Department, there were many inside guesses regarding bidders, methods, and prices. According to Montana's construction department at Helena, the 1953 average for that type of maintenance-by-contract work had been \$0.775 per cu. yd. The Kalispell job was not easy. It called for nine crusher set-ups, some difficult pit conditions, and about 250 mi. of travel in the nine moves. The best inside guess, taking these factors into consideration, was something close to \$1.00 per cu. yd.

The bids were opened, and when the smoke had cleared, the Butte, Montana, contracting firm of Naranche & Konda had bid a flat \$0.70 per cu. yd. How?

Rock plant description

Naranche & Konda showed how. So fast did work progress on the assignment, that 60 days after starting, the last of the stockpiles was scheduled to be finished. Taking the most difficult pit first, near Lakeside, the firm moved in a new Pioneer 46-VE all-electric rock plant. It was the first job for the machine. Purchased from Westmont Tractor & Equipment

Co., in Missoula, Pioneer distributor for that area, the new machine was moved, from Naranche & Konda's Butte yard, 215 mi. in only 8 hr. The move was made with all of the unit intact, without damaging spring highways. This was done under a special permit which the State of Montana issues for heavy construction equipment. Even the roll crushers were left in for the move.

Six hours after the machine had stopped at the first pit, it was set up and operating. It is expected that the set-up time can be reduced to 4 hr. as plant personnel become more familiar with the plant.

The plant is a stock model 46-VE, complete with 40x22 rolls, a 3½ deck, 4x12 ft. set of vibrating screens, and a 10x36 jaw crusher. Power for the rolls and jaw crusher is supplied by a Caterpillar D13000 diesel engine through a Blood Bros. slip joint, universal and driveshaft. This direct-drive feature proved to be well suited to the very first set-up, because the pit site was cramped for space, and it would have been impossible to set the plant in at that location at all if it had been equipped with a long drive belt. But the new 46-VE, compact and powerful, was set in with room to spare for the necessary hauling trucks, feeder trap, and pit dozer.

Auxiliary power on the plant includes a D13000 diesel-electric set, which generates electricity for the various motors on the plant conveyor system.

What happened in three days

Only three days after Naranche & Konda had moved in, many an inside guesser was scratching his head, remembering that the firm had bid the work considerably lower than it had gone for years. Still, within three days running time, the new plant had thrown out a 4,000-cu. yd. stockpile of ¾-in. minus maintenance gravel, under difficult operating conditions.

The first pit consisted of alluvial pit-run gravel, of which about 50% required crushing to meet the following specifications:

SIZE SCREEN	PER CENT PASSING
¾	100
No. 4	40-75
No. 10	35-60
No. 200	4-10
PI	15 or less

Wet pit condition

It was early spring, and the pit contained much heavier moisture than it would later on in the summer. The only labor concession made to the pit was the hiring of a laborer to throw out the worst oversize rock coming up in the input feeder conveyor. Aside from that, the entire pit-run supply was passed through the plant. Because of the sure, fast crusher adjustments on the 46-VE, both roll and jaw crushers could be changed quickly to adjust to changing pit conditions.

The raw material was shoved by a Caterpillar D8 dozer to a portable wheel-mounted beveled trap, which covered a 3-ft. pan-type feeder. Material leaving the plant went to a 30-cu. yd. surge bin, which was tapped by several trucks hauling the crushed aggregate to a nearby stockpile.

"We should do this job in 60 days," said contractor M. J. Naranche. "We have good lights all over the place for night operation, and the plant will produce as efficiently at night as it will in the daytime. We have another



COMPLETELY PORTABLE, all electric Pioneer 46-VE crushing plant was set up in 6 hr. and ready for production. This plant produced 4,000 cu. yd. of ¾-in. minus gravel in the first three days.

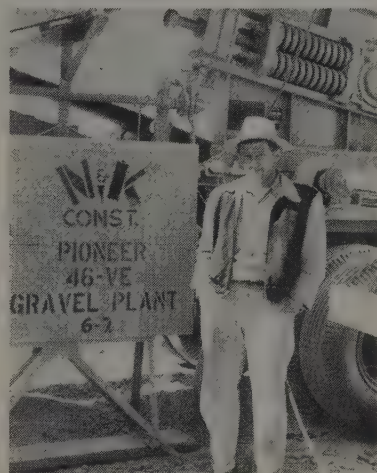
Pioneer plant, too, and we traded in a 40-V on this one. This unit is one of the safest crushing plants I've seen," Naranche explained. "Look at those head pulleys. There's nothing exposed for a man to get caught in. Anyone halfway careful could work safely around here for years."

Stretching Montana's dollars

Naranche & Konda is producing the nine stockpiles under Montana's basic contract system policy. The crushed material will be used by maintenance crews for premixed cold patching work, and especially for "half-sole" repair bituminous jobs, roadmixed during the warm summer months, which will reclaim many a section of worn pavement in the Kalispell Division. It is definitely a maintenance function which, taken over by a contractor with modern equipment and a sharp pencil, has lowered costs for the Montana State Highway Commission. It has helped stretch the highway dollar. That is especially important in Montana, too, because the state is the third largest in the nation. Its entire population is only 600,000 . . . no greater than the City of Seattle, Washington.

Long trips coming up

So confident is Naranche & Konda that their equipment has the necessary production features to handle high tonnage at low cost that the firm bid hard at a recent Montana highway letting. The firm was successful in landing five jobs in the state, ranging from the western to eastern parts. Since it is well over 600 mi. from one side of Montana at Kalispell to the North Dakota line at the other, it will be necessary for this equipment to

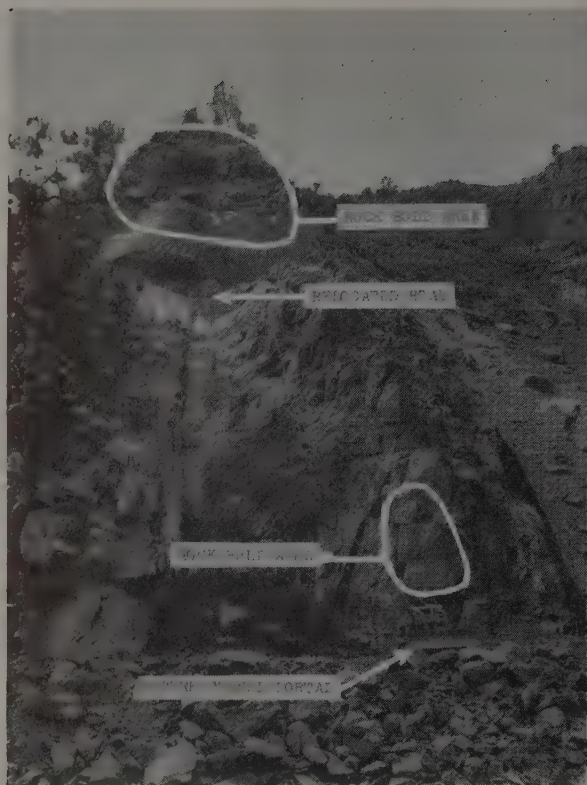


M. J. NARANCHE put in bid price of \$0.70 per cu. yd., a low figure considering the nine plant setups required.

make fast, long moves to get rid of one job and get on the other.

By the time the midsummer oiling season comes, many thousands of tons of maintenance aggregates will be in the stockpiles, and many miles of improved highway can then be set up for motorists by the maintenance crews of the Treasure State . . . one of the most scenic in America.

All Montana State Highway Commission work of this nature is under the general supervision of Scott P. Hart, state highway engineer, with W. F. Bawden as maintenance engineer. Ray Spurzem is the division construction engineer at Kalispell, and Fred Wells is division maintenance engineer. M. J. Naranche has personal charge of the new crushing plant and its allied equipment.



Rock bolts at Monticello Dam

The contractor says, "I am convinced that we will see a continued increase in the use of rock bolts, as their field of application has only been scratched to date."

HERE IS A CLOSE-UP analysis of the practical use made of rock bolts by Gates & Fox at the Monticello dam site. Last month's issue of *Western Construction* carried a general description of this project and two earlier issues described the overall aspects of rock bolt usage.

On the right abutment, and about 250 ft. downstream from the dam axis, there was an excavation problem of number one priority. The relocated highway would pass along here on the canyon wall about 20 ft. above the future dam crest. Immediately below, near the stream, would be the downstream portal of the diversion tunnel. And, before any work could begin on this tunnel, it would be necessary to finish the road first.

Extensive scaling avoided

The sandstone abutment rock has bedding planes that are nearly vertical. Also, many horizontal fractures. This is quite evident in the photographs shown here. After blasting for the new road, it was easily seen that extensive scaling of large

overhanging rock might be necessary.

This is where Gates & Fox's previous experience with rock bolting paid off. One-inch diameter bolts in 6-, 9-, and 12-ft. lengths were used to hold these fractured chunks of rock in place. With usage number one of the bolts completed, work was started on slope clearing below the road.

Made good portal

The second major use of the bolts became apparent as rock excavation for the portal progressed. Large, loose rock chunks were encountered about 60 ft. above the portal. It was decided to rock bolt these in place for two reasons. It would obviously save on excavation, and it would also maintain weight so that lower strata would remain in place for a good portal.

The net result of using about 500 lin. ft. of bolts both above the road and above the portal is best put by the contractor. "If conventional scaling had been done in these areas, we would have delayed the project by at

least two weeks, along with the additional cost of the yardage excavation." This two weeks saved is also equal to over 300 ft. of 15- x 15-ft. pilot tunnel work that followed immediately.

Equipment used

The methods and equipment used in both cases were similar. Drilling on the overhanging rock faces was done by letting a man down over the edge by rope. A light jackleg Ingersoll-Rand #R38 was used as a jackhammer to drill 1¼-in. diameter holes. Bolts, furnished by the Commercial Shear and Stamp Co., were fastened at the rock face with 8x8x¾-in. plates where bolts were normal to the surface—or with angle plates where the bolts entered at an angle. Tensioning was done with an Ingersoll-Rand air wrench.

Gates & Fox were one of the first contractors in the West to use rock bolts. This occurred on the diversion tunnel work at Keyhole Dam in Wyoming about 4 years ago. Kirk Fox is running this particular job for his firm.

RUBBER

in today's bituminous road construction

THE DIFFICULTY in observing differences between rubberized and unrubberized asphaltic concrete pavements when the observations are based on toughness and abrasion resistance has been mentioned previously. While this is true, large differences between rubberized and unrubberized surfaces may still develop due to the increased "flexibility" of the mixture made from rubberized asphalt. The changes in toughness, tenacity, temperature susceptibility, impact resistance, elastic recovery and many other properties all tend to increase the collective property of "flexibility," about which so much has been said during the past twenty years, and so little done.

By no means does the addition of 3% rubber to the 5% of asphalt in an asphaltic concrete mix make a "rubber road." The actual increases in flexibility which do occur must usually be measured by delicate laboratory tests. Yet, the increase definitely is there, and where conditions of use may be critical it is probable that the rubberized asphalt pavement will show less distress than its unrubberized counterpart. To substantiate this, some decrease in crack-through on rubberized overlays over old portland cement concrete pavements has already been noted. It is through this feature that the use of rubber in asphaltic concrete pavements can best be justified.

Increasing asphalt durability

While the physical changes obtainable by rubberizing asphalt are of great importance, the possible effect of rubber toward increasing the durability of asphalt can by no means be ignored. However, before discussing durability, it may perhaps be best to define this factor so that its meaning may be better understood.

The durability of an asphaltic material may be defined, for simplicity, as the ability of that asphalt to retain, for an appreciable period of time (for some purposes perhaps a year; for other purposes, perhaps 20 years), those physical properties essential to the performance of the service to which that asphalt is placed. In this definition, it is assumed that the asphaltic material used for the definition originally possessed the essential physical properties needed for that service. We are concerned, at this moment, only with the retention of those properties over an appreciable period of time.

A most important question that is frequently asked of rubberizing is:

SECOND of two installments

The first article presented last month discussed the desirable changes introduced by the direct addition of 2% to 3% of raw rubber to the asphalt. Such rubberized asphalt was then considered with respect to toughness increase, low temperature ductility increase, temperature susceptibility decrease, and durability increase.

By JEWELL R. BENSON
Consulting Bituminous Engineer
Denver, Colorado

are the initial physical changes produced in asphalt by rubber long-lasting? It is indicated that the answer to this question is yes. However, this answer must be qualified by the following conditions: that the rubber be highly dispersible and compatible with the asphalt used, and that positive indications of a high degree of peptizing be given. This infers that rubberizing must be performed under controlled procedures, so that the final product may be subjected to tests which will confirm these conditions.

With these definitions and conditions, we are ready to proceed to a discussion of the effect of rubber on the durability of an asphalt.

Reactions affecting durability

The factors which cause asphaltic materials to change physical properties in service are exceedingly complex. This is one reason why we do not have a simple laboratory test by which we may determine beforehand the potential durability of an asphalt. However, if we use care in interpretation of our data, we can at least determine the direction of changes made towards increasing durability.

For the purposes of our analysis, it may be assumed that asphaltic materials tend to lose their essential physical properties in service, through five basic reactions, as follows:

1. Syneresis
2. Thixotropy
3. Volatilization
4. Oxidation
5. Polymerization

A given asphaltic material, depending on its source, method of re-

fining and type of service, may eventually become unserviceable through any one or more of these reactions, and may frequently change from one reaction to another as aging progresses. A given asphalt may be very weak in any one reaction, and strong in all others, but if excessively weak in any one, the end results would be the same—loss of serviceability. All factors must therefore be considered. Our data indicate that all of these reactions are favorably affected by the addition of rubber in a large number of asphalts investigated. This deduction is derived from the following tests:

Loss of heavy oils

Syneresis is an exudation (literally, "squeezing") reaction occurring in asphalt, in which certain heavy oils, normally acting as plasticizing oils (keeping the asphalt soft and alive), become incompatible with the basic asphalt structure and are forced to the surface of the asphalt, where they are lost. This makes the asphalt harder and eventually "dead." The reaction occurs more frequently in highly blown asphalts, but may occur with any material. The degree to which the reactions occur may be measured by holding small specimens of asphalt in contact with absorbent paper, placed in layers over the specimen and held in place by a small weight (Schweyer Stain Test). After a given period in an oven, the papers are examined and the degree of exudation determined by the number of papers through which the stain has penetrated. This may vary from a value of 2 to more than 14. In one comparison between rubberized and unrubberized asphalts, it was found that the stain of the rubberized materials was decreased by from 5% (originally of low stain) to more than 35%. This is a very substantial reduction in syneresis and may be interpreted as favorably affecting durability when this factor is present to an appreciable degree in the asphalt concerned.

Normal asphalt aging

Thixotropy is an odd reaction occurring in nearly all asphalts. It consists of an internal rearrangement of micellar or molecular structure with time, usually giving harder, more dead materials. However, if this asphalt is heated, mechanically worked, vibrated, or dissolved and recovered by distillation of the solvent, it returns to almost the consistency and

Author's note on costs:

The subject of the cost of using rubber in highway construction has been studiously avoided by many of the groups promoting the use of rubber for this purpose. This has been due, in part, to the use of proprietary materials or to special processes requiring high costs in preparation of the final product. With these processes, the cost of rubber usually has exceeded 50c per lb., while in some cases, the cost of the rubber, in place, has exceeded \$1.00 per lb. Actually, rubber, particularly synthetic rubber, is a relatively low cost material, available in plentiful supply.

If simple, basic methods were used to produce rubberized asphalts, using the quantities discussed in

these articles, it is indicated that the cost of such asphalts should not exceed about 10c per gal. for asphalt cements (above the cost of the unrubberized material), while some cutbacks might be produced in the range of less than 5c per gal. overage. The availability of rubberized asphalts at these prices will depend on the arrival of that time when rubber is no longer promoted as rubber, but instead, the highway engineer will have recognized the value of rubberized asphalts as such, and will purchase these materials of his own accord, without pressure from outside groups. Until that time, fancy prices for rubberized asphalts will probably continue to prevail.

character of the original material. The effects of thixotropy are sometimes evident in "dead-end" streets where the pavement, using mixes identical with other more heavily traveled areas, suffers from much more cracking and shrinkage than the traveled ways. The degree to which an asphalt may be affected by thixotropy may be determined by comparing the penetrations and ductilities of fresh specimens against those aged in quiescence (quiet and dark) at room temperature for 28 days. (The aged specimens are not altered or disturbed in any manner after aging and before testing, except immersion in the water bath to bring to accurate testing temperature.) The data from such tests on some materials having high thixotropy indicate that through the addition of rubber the rate of thixotropic change is slowed to but 40% to 90% of the unrubberized materials. This, again, is a favorable reaction and should increase durability.

Other asphalt reactions

Volatilization, oxidation and polymerization are all big words, but they signify simply (1) evaporation, (2) a combining of asphalt with oxygen (a slow "burning"), and (3) a molecular condensation reaction in which two similar molecules combine to form a new molecule having properties different from the original two. These reactions are initiated and accelerated by such factors as actinic radiation (ultra-violet from sunlight), heat, exposure to air, and sometimes catalysts in the form of moisture and salts from aggregates.

Approximate test for reactions

While it is difficult to determine the effect of these factors separately, an approximation of the sum of such reactions may be obtained by subjecting a thin film of the asphalt to elevated temperatures. By placing a 0.001-in. thick film of asphalt on a glass microscope slide and subject-

ing the slide to a temperature of 325 deg. F. in an oven, the film will eventually become hard and brittle. This state is determined by removing the slide from the oven at intervals, cooling to room temperature, and scratching the film with a needle. The brittle film is easily observable.

Comparing a number of rubberized with unrubberized asphalts in this manner, it is found that the time required for the rubberized asphalt to become brittle is extended to from 25% to 35% longer. (A special rubber nearly doubled the time). These reactions mean less sensitivity to heat in the process of asphalt going through a mixing machine and, to greater or lesser degree, greater resistance to asphalt change under conditions of service. Many more tests may be, and have been, made; but it is believed that those described show the most significant data. This may be summarized by stating that: **NEARLY EVERY REACTION BETWEEN ASPHALT AND RUBBER WHICH HAS BEEN INVESTIGATED SHOWS A POSITIVE GAIN TOWARD INDICATED BETTER DURABILITY.** These indications are sufficiently strong that it would appear that neither industry nor the highway engineer could well afford to ignore them, particularly under existing traffic conditions when improvements in materials and construction are so badly needed.

Rubberized asphalt forms

To obtain the maximum benefits from rubberized asphalts, they must be available in the form of cements, cutbacks and emulsions. All of these can be produced without serious difficulty if proper materials and procedures are used. In addition, it appears that the rubberized versions of these materials may be made to conform to the general structure of asphalt specifications as they are written today. Flash points, viscosities, penetrations, and curing or breaking

characteristics may follow conventional values. However, certain changes must be made in the procedures used in testing rubberized asphalts.

It is indicated that eventually perhaps a toughness requirement might well form an addendum to an existing specification, particularly where the rubberized asphalt is to be used for surface treatments. A low-temperature ductility test should be included in all specifications to act as a control on the amount and kind of rubber used, to insure that thorough dispersion of the rubber has been obtained, and to guard against accidental depolymerization of the rubber that might occur if the rubberized asphalt is held at temperatures above 400 deg. F. during manufacture.

To test cutbacks, two distillations are necessary. One of these is taken to the normal 680 deg. F. to determine curing characteristics, but the residue from this distillation must be discarded since the rubber has been completely depolymerized. A second distillation must be made, using CO₂ or natural gas as a sweep medium, keeping the temperature of the asphalt below 375 deg. F. at all times, until all distillate is removed. In this case, the distillate is discarded, and tests are made on the distillation residue for penetration, ductility at low temperature, loss on heating, etc. None of these operations are excessively complicated, yet they furnish good control over the quality of the material used.

In truly rubberized asphalt emulsions, the basic asphalt is first rubberized to the required degree, and the emulsion made from this stock. Emulsions treated by the addition of latex to the already prepared emulsion constitute an entirely different class of "rubberized" materials, to which the conclusions of these articles do not apply.

Field handling and usage

In the handling of rubberized asphalts in the field, primarily only one precaution need be taken. This is to avoid depolymerization of the rubber due to excessively high temperatures. The synthetic rubber (butadiene-styrene) used as the basic rubber in these articles, forms relatively stable combinations with asphalt at temperatures below 375 deg. F. and temperatures of 400 deg. F. may be tolerated for short periods of time. However, at temperatures above 400 deg. F., depolymerization becomes rapid and the effect of the rubber is lost. Since 400 deg. F. represents, for most construction operations, an already excessive temperature and is controlled by existing specifications, this factor should not prove serious. All other handling and usages may be performed by existing and conventional practices, without extra cost to the contractor or contractee.

This paver attachment is solving a problem in Colorado



AS HOT-MIX PAVER SPREADS 2-in. course over steel welded wire fabric reinforcement, the fabric is prevented from entangling the conveyor screw by job-devised hold-down shoes at each outside track. A 10-ft. long T-plate between tracks completes the hold-down device.

THE ASPHALTIC CONCRETE resurfacing of old pavements using welded wire reinforcement embedded in the surfacing is expanding in usage in the West. A project recently completed in Colorado by the department of highways appears to have solved one of the main problems: to prevent the fabric, which is laid on the existing pavement ahead of the paver, from becoming hooked up or entangled in the paver as it passes along and spreads the asphaltic concrete resurfacing.

How it was done

Headed up by maintenance engineer Walter Harris, the highway department men developed attachments for the asphalt finishing machine which solved the problem. The attachments, or "hold-down" devices for the paver consisted of three component parts. A 1/4-in. thick steel plate 1 ft. wide by 2 ft. long was bent into a V-shape. This was attached horizontally to the paver just outside of the cat rack and immediately ahead of the conveyor screw. It was held by pin and hinge along the free end of one leg of the V. With the apex of the V pointing forward, the trailing end of the bottom leg of the V-shaped plate slid along the wires of the fabric directly in front of the conveyor screw. A heavy coil spring, attached between a bracket welded to the apex of the V and the conveyor screw housing, exerted tension on the upper leg. This torque about the hinged upper leg caused the bottom leg of the plate to exert downward pressure on the fabric and thus prevent it from rising and hanging up in the conveyor screw.

With these two V-shaped devices holding down the welded wire fabric outside of the cat tracks, a third device was developed to flatten the reinforcement between the cat tracks. The Colorado engineers attached to the underside at the front of the asphalt finisher a 10-ft. long steel plate which extended between the tracks back to the conveyor screw. This plate was T-shaped with the wide end, or cross bar of the T, trailing along the fabric just ahead of the conveyor screw. Pressure was applied to this cross bar by means of a compression spring between it and the underside of the Barber-Greene. This downward pressure, as with the V-shaped devices, prevented the steel fabric from entangling in the conveyor screw.

Others have the same trouble

The general paving problem facing Colorado is similar to that faced by other Western states. A four-lane, divided highway is being built between Denver and Colorado Springs. The old U. S. 85 and 87 between these same towns is being incorporated into the new, larger highway wherever possible and practical. However, the older concrete pavement was laid down some 25 yr. ago, and portions of it are now badly cracked. It was on a 1,600-ft. stretch of this old highway that an experimental 2-in. surface course with the fabric reinforcement was used.

The objective is to reinforce the

bituminous mat to a point where the cracking in the old pavement beneath will not carry through to the new surfacing. As part of the records to be kept on this section, the district materials engineer carefully mapped out all the cracks in the old pavement. This will aid in identifying the extent and nature of cracks in the new surfacing, should they appear with time and usage.

The reinforcement in this case was 30-lb. welded wire fabric in flat sheets, with 10-gage wire spaced 3 in. longitudinally and 6 in. transversely. The sheets were 11 1/2 ft. wide by 8 ft. long. Actual cost of placing the fabric from a stockpile on the project, including trucking and labor, was less than \$0.02 per sq. yd. In placing the sheets, they are lapped one transverse space (3 in.) and are tied with hog rings, on the longitudinal wires only, for expansion and adjustment.

Colorado's first experience with wire reinforcement occurred on one of the state highways leading through the city of Pueblo at a bridge crossing. The bridge had a laminated timber plank deck and would not hold a bituminous wearing surface—as soon as the wearing surface was placed it began to develop cracks. This spring it was resurfaced using wire reinforcement and the results have been gratifying to date. The wearing surface has not developed any cracks.

Mark U. Watrous is chief engineer for the Colorado Department of Highways.



TRUSS framing in the main 90x140-ft. color studio. Temporary shores were required for tilt-up walls erected prior to trusses.



TWO TIERS of 20-ft. wide wall panels make up the 46-ft. wall height. Lower tier is 27 ft. high and upper tier 19 ft. high.

Record erection for structural steel and precast concrete tilt-up combination

ON MARCH 26, THIS YEAR, The Austin Company received a contract for the design and construction of a 60,000-sq. ft. structure for National Broadcasting Co. Only three weeks later on April 19, the working drawings were started. Two weeks after that—field work began. By October 1, about the time you will be reading this, the building will be closed in and substantially completed. **ONLY FIVE MONTHS FROM DESIGN TO FINISHED STRUCTURE.**

The new studio is being constructed on part of the 48-acre site in Burbank, California, where NBC already has two large black-and-white television studios. Three structures combined make up this new studio, (1) the color studio 90x140 ft. in area and 50 ft. high, (2) a technical

building to the north 50x140 ft. in area and 27 ft. high, and (3) a dressing room building to the south 32x140 ft. in area and 27 ft. high. The latter has a penthouse over. Connecting these buildings to the existing black-and-white studios is a service corridor. The three structures described above have common walls on the 140-ft. long dimension.

Erection speed was assured by the type and size of structural members chosen. All were capable of being handled by truck-mounted cranes. The central color studio has walls 46 ft. high. This height is composed of 27- and 19-ft. high precast concrete panels with the 19-ft. panels on top. These are secured to 14-in. 68-lb. wide flange columns. Column spacing is on 20-ft. centers along the 140-ft. length with a total of seven bays. A

clear span of 90 ft. is managed by use of Pratt-type steel trusses.

The smaller adjoining buildings have 27-ft. high precast concrete walls corresponding to the first wall lift of the color studio. Clear spans here of 32 ft. and 50 ft. are handled by heavy steel beams. Hangers welded to the beams will receive wood ceiling joists.

Along with steel erection, the required total number of 84 concrete wall units were precast. Lower wall units measure 27x20 ft. and are 6 in. thick. Upper wall units are 19x20 ft., also 6 in. thick. This gives lifting weights of 20 tons and smaller. All slabs were cast on 2½ in. thick casting slabs located near their final intended positions. It was possible to stack the smaller units to provide more working room. A compressive

strength of 3,000 psi. in the concrete was required and obtained with 28 days curing and the use of Hunt's process.

Steel columns were erected in the main studio and temporarily shored. Roof trusses were not put up until after and the shoring was necessary to carry the working stresses applied while the precast wall units were tilted up into position. Four pick-up points were used on each of the large panels. The top points were .20 of the length from the top of a panel and the bottom points .45 of the length from the top of the panel. Permanent connection of the panels to the structural steel columns was by means of weld plates. Where the 19-ft. high panel sits on top of the 27-ft. high panel, a dry V-joint was provided.

Tilt-up time requirement

The actual lifting of the 35,000 sq. ft. of walls only required four days. This is an average of over 20 panels per day.

One interesting point not to be overlooked concerns the many lineal feet of interior nailing strips for acoustical materials. These were placed prior to wall tilt-up by driving pins through them into the concrete with a powder-actuated tool. This is one of many features that speeded up the entire building program.

The problem of placing the steel roof trusses last was made possible by omitting one vertical section of panels in the end wall of the main color studio. A truck-mounted crane could pick up a truss at a time, wheel it into the building, and place it in position.

According to Gordon Strang, who is supervising construction for NBC, engineers will begin installing several hundred miles of wiring and tons of control equipment around October 1. TV viewers will then be able to receive broadcasts from the new studio on either color or black-and-white sets about January 1955.

Alaskan construction to reach new cost peak

MILITARY CONSTRUCTION in booming Alaska, which has averaged over \$100,000,000 since 1949, is expected to top \$145,000,000 by the end of this fiscal year—July 1954, through June 30, 1955. Eighty-one projects will be finished by December 1954, completing the heaviest concentration of defense building in any six-months period since the start of the program.

Sites for 64 of the jobs are at Fort Richardson, Elmendorf, Ladd, and Nielson Air Force Bases. Others are at Big Delta, Whittier, Kenai, Naknek, Takotna, Galena, and Vales. Construction is fairly diverse, consisting of housing units, warehouses, power plants, and general utilities.



SERVICE CORRIDOR in the foreground connects old studios to new construction. Near structure has 27-ft. high walls and clear-span 50-ft. long steel beams. Color studio is next.



LOWER PANELS were tilted up by use of four pick-up points. Upper panel now going into place uses only two. Truck-mounted cranes were able to place all main structural elements.

ARIZONA

FIVE MILITARY INSTALLATIONS in Arizona will be the scene of 40 new construction projects to be awarded by the Corps of Engineers at a cost of about \$16,000,000. The installations, and the maximum sums allotted to each, include Davis-Monthan, \$5,700,000; Luke Air Force Base, \$2,200,000; Yuma County Airport, \$16,300,000; Gila Bend, \$1,800,-

000; and Yuma Test Station, \$700,000.

MODERNIZATION plans for increasing the size of the State Capitol building are being considered by the State Building Commission. They include spending \$2,000,000 to remodel the present building completely and add 198,500 sq. ft. in the shape of two new wings at a cost of \$5,000,000. Construction will not start until the final plans are approved and sums are released by the Legislature.

Diver gets cold in the desert

A DEEP-SEA DIVER and the surrounding desert made an unusual combination at Horse Mesa Dam, located 63 mi. northeast of Phoenix. For three days, E. R. Cross, a master diver extraordinary, made preliminary inspections of penstock screens at the base of the dam. Object of the inspection was to determine the need for repairs of the penstock screens and other allied equipment. It was felt that a considerable amount of mud and heavy debris had lodged there preventing a full flow of water for electric generating purposes.

Dives up to 250 ft. deep were made in complete darkness in the cold 40°F. water. Inspection was entirely by hand feel. Based on the diver's findings, the Salt River Power District has decided that Apache Lake will be lowered 50 ft. and a bulkhead placed around the penstock area. Workmen will then recondition the penstock, paint the interiors and exteriors, and repair the tunnel gates. This method, to cost an approximate \$80,000 will save nearly \$50,000 over the method of total drainage of the lake. Work commences October 1.



E. R. Cross, master diver, emerges after grueling underwater stay in depths to 250 ft. It takes nearly 2 hr. to come up from that depth after only 25 min. work.

RECENT MAJOR CONTRACT AWARDS and low bids in Arizona include a low bid of \$372,941 by the Isbell Construction Co. of Phoenix for surfacing and grading on US 60 northeast of Globe. **Martin Construction Co.** of Tucson submitted a low bid of \$158,091 for 3.5 mi. of grading and surfacing on state highway 84 at Picacho. **Arizona Sand & Rock Co.** of Phoenix submitted a low bid of \$171,993 for 12.5 mi. of roadwork on SR 84 near Maricopa. **Tiffany Construction Co.** of Phoenix submitted a low bid of \$153,986 for 3 mi. of grading, drainage, and base material in Phoenix.

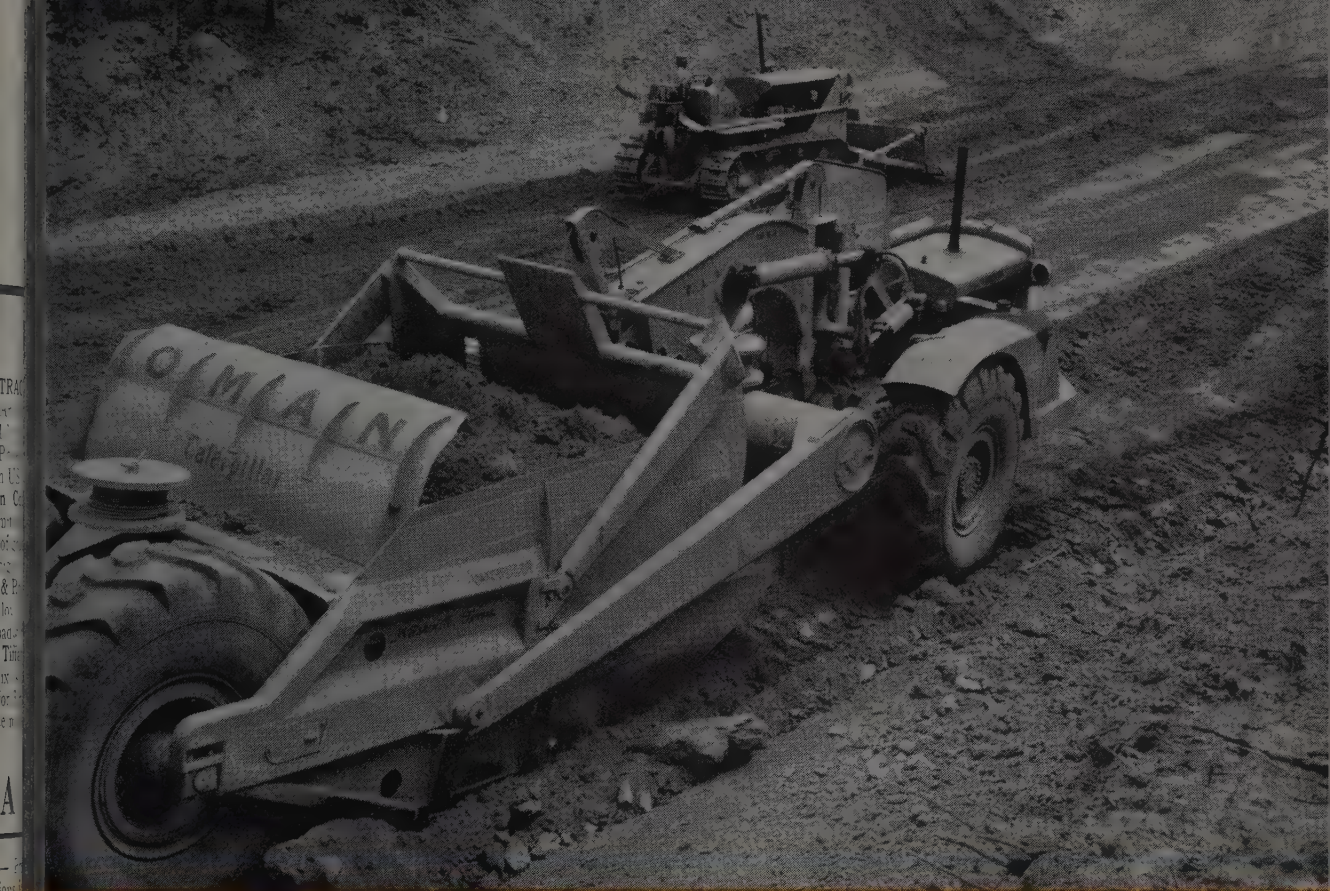
CALIFORNIA

SOUTHERN CROSSING — Preliminary plans and specifications for the southern crossing of San Francisco Bay, approved by the Corps of Engineers on April 8, (**Western Construction** — June 1954, p. 100) are scheduled to be submitted to the Legislature in January 1955. A complete report, included the total estimated cost and the amount of revenue bond financing needed, should be ready by the end of 1955, according to Governor Goodwin J. Knight.

CORNING CANAL — The first 7½ mi. of the Corning Canal of the Sacramento Valley Irrigation System will let out to bid soon at an estimated cost of \$980,000. The canal will be 22 ft. wide across the bottom and 48 ft. wide at water level, according to R. S. Durant, Bureau of Reclamation engineer.

SAN MATEO HOSPITAL — Construction on a \$2,500,000 addition to the San Mateo County Community Hospital is well under way. The building, to be two to four stories high and cover an area of 144,000 sq. ft., is expected to be completed in November 1955. The structural steel members, fabricated and erected by Bethlehem Pacific, will be welded instead of riveted. Robert E. McKee, General Contractor, Inc., of Los Angeles, holds the contract. Henry P. Tarratt is director of building construction for San Mateo County.

A PARALLEL TUBE under the Oakland estuary to Alameda has been authorized by the State Highway Commission. The Commission has appropriated \$500,000 from the cur-



PROFITABLE PRODUCER FOR OMAN on the West Virginia Turnpike

For money-making production on its contract on the West Virginia Turnpike, Oman Construction Co., Nashville, Tenn., relied heavily on rugged yellow equipment. This high-speed, high-capacity 225-HP CAT* DW21 with No. 21 Scraper is one of the units in its line-up. Typical performance: along with another DW21 team and a D8 with No. 80 Scraper, this rig moved about 3500 yards of shale, sand and clay per 10-hour day over hauls of varying distances. Like Oman's other Caterpillar-built rigs, it worked day after day with a minimum of down time. In the background: a D8 with No. 8A Bulldozer.

What's back of the DW21's profitable performance? Among other factors, it's the *only* two-wheel earth-mover designed and built by *one* company, with every part *matched* for maximum efficiency. Its capacity, speeds and power are *balanced for big production—loading, hauling, dumping*. For example, its capacity is 20 yards heaped, 15 struck. Its 2.16 m.p.h. in low gear matches push-loading speeds, and its 20.0 m.p.h. in fifth provides maximum practical off-road going. Its power is honest—225 HP at the flywheel that won't "smother" on adverse grades. Other advantages: Good

visibility. A turning radius of 90°. Positive ejection that dumps even sticky materials fast. And hydraulic steering that gives the operator "feel of the road" control, an asset in tight spots and barreling along.

Another asset: Wherever a contract takes you, your nearby Caterpillar Dealer backs you up with prompt service—*on the job*. Ask him to show you performance figures on the fast-stepping, high-capacity DW21. Name the date—he'll demonstrate!

Caterpillar Tractor Co., San Leandro, Cal.;
Peoria, Ill., U.S.A.



CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

**USE CAT EQUIPMENT
FOR ON-SCHEDULE
PERFORMANCE**

rent highway budget for design and right-of-way acquisition for such a tube and its approaches.

GARVEY RESERVOIR in Southern California was 93% complete at last reports. Morrison-Knudsen Co., Inc., and R. A. Westbrook, who have averaged crews of 38 men working on the project, expect to have the job finished by the time this appears in print.

The Garvey Reservoir to Southern Avenue pipe line, which includes 8 mi. of 72-in. pipe, is 83% complete. Ukropina, Polich, Kral, Steve Rados, Inc., and Ukropina also expect to finish by September 20.

The Southern Avenue to Victoria pipe line, a 7.8-mi. section of 72-in. pipe, is now 92% complete. P. and J. Artukovich, contractors, estimate

that their crew of 80 men will finish by September 30.

HIGHWAY CONSTRUCTION will continue in high gear in the immediate future, according to all indications. The State Highway Commission has allocated funds for a number of major projects, including: \$1,300,000 for grading, surfacing, and structures on 10.8 mi. of Sign Route 71 in Riverside County; \$700,000 for grading, surfacing, and structures on 2.1 mi. of Sign Route 150 in Santa Barbara County; \$2,000,000 for grading, surfacing, and structures on 2.2 mi. of U.S. 101 in Santa Barbara County to bring the roadway up to 4-lane divided standard; \$800,000 for grading and surfacing 2.1 mi. of U.S. 101 in Mendocino County; \$470,000 for grading and surfacing 7.3 mi. of

U.S. 395 in Lassen County; \$150,000 for surfacing 5.5 mi. of Sign Route 12 in Sonoma County; \$3,630,000 for grading, paving, and structures on 4.2 mi. of the Ramona Freeway in Los Angeles County; \$345,000 for building an underpass and approaches on the Los Angeles River Freeway in Los Angeles County; \$450,000 for building an over-crossing and interchange ramps on the Santa Ana Freeway in Orange County; \$175,000 for grading and surfacing 1.6 mi. of State Routes 190 and 207 in San Bernardino County; and \$600,000 for building a bridge across the Santa Clara River in Ventura County.

BLASTING MOVIE—A 15-min., 16-mm. sound film entitled "The Inside Story" has been produced by the Atlas Powder Co. for showing to construction, quarrying, and mining engineers at company meetings or in professional society sessions. It shows how modern methods make blasting an orderly and controlled sequence, explains the principles of blast detonation, and discusses alternate velocity loading. Prints are available from Atlas offices in San Francisco and Seattle.

RAMONA FREEWAY—The State has awarded a contract on construction of a 3.9-mi. section of Ramona Freeway through El Monte. The 6-lane freeway will eventually run for 30.5 mi. from the San Bernardino County line to a junction with the Santa Ana Freeway in downtown Los Angeles. This part of the job has been allotted \$8,550,000 in the 1954-55 budget, making it the largest single contract in the history of California highway construction, according to Frank B. Durkee, director of Public Works.

SEWAGE DISPOSAL is big business in California. The State Water Pollution Control Board has reported that more than \$24,000,000 in sewage disposal and treatment structures are now under construction and that \$62,000,000 more of such projects are being planned for the next several years.

PLEASANT VALLEY DAM—The Los Angeles Department of Water and Power is planning a \$2,776,000 re-regulating dam across the Owens River about 10 mi. north of Bishop. A 3,825 acre-foot reservoir will store water for a 2,350-kw. power plant, which will be hooked into the 34,500-volt transmission line from the Owens Gorge power system. Department men are stripping and sluicing the right bank of the Gorge in preparation for construction of the dam.

RECENT MAJOR CONTRACT AWARDS and low bids in California include an award of \$206,828 to James B. Allen of San Carlos for construction of a bridge and approaches across North Fork American River

World's largest tires for snow, swamp, desert

THE FIRST MODEL of this 23-ton exploratory vehicle and prime mover is on its way to the North country for test as a trail blazer through deep, soft powdery snow. Eight of the huge tires, each one 10 ft. high and 4 ft. wide, are mounted dual fashion on the four electric wheels of the Sno-Buggy. This high number of tires provides such a high degree of support and flotation that only 5 psi. tire pressure is required. The electric wheel announced by LeTourneau in 1953—and used here—is well suited to mobile equipment intended for rough, shifting, or spongy ground.

Each wheel has its own built-in electric drive motor and gearing system, simplifying the design for the all-wheel drive and steering system.

Overall width of the dual-wheel Sno-Buggy is 24 ft., overall length is 27½ ft., and ground clearance is 3½ ft. There is a 400-hp. engine and generator to provide power for the drive motors of the wheels. Steering is controlled by the operator by the use of small electric switches. Braking power is by a regenerative electric system. Rolling along, this buggy can do 8 mph. either in forward or reverse.



HERE IS 23 Tons that rolls along on a tire pressure of only 5 psi. Each wheel is 10 ft. high and 4 ft. wide. All electric drive system simplified design.

OUR INTEGRATED OPERATION PERMITS MAXIMUM CONTROL OF QUALITY



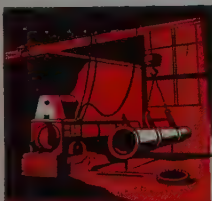
Ore and Coal Mines



Coke Ovens



Blast Furnaces



Pipe Plants

U.S.
cast iron
PIPE

FOR WATER, GAS, SEWERAGE
AND INDUSTRIAL SERVICE

From start to finish, our wholly integrated operation makes it possible for us to control quality at every step. Beginning with our mines, quarries and blast furnaces. Ending with our modern casting machines and laboratories.

Responsibility for quality rests squarely on the shoulders of a wholly integrated producer. He shares that responsibility with no one.

In addition to being able to control the quality of pipe-making raw materials at their sources, our Quality Control of pipe production gives further assurance to customers that the quality level of U. S. Cast Iron Pipe is in excess of standard specifications. Our pipe is produced to our own quality control specifications, more exacting than the established specifications under which cast iron pipe is normally purchased.

U. S. PIPE & FOUNDRY COMPANY

GENERAL OFFICES: BIRMINGHAM 2, ALABAMA

A wholly integrated producer . . . from mines and blast furnaces to finished pipe.



MAJOR CUT OF 175 FT. ON US 99 UNDER WAY

D & H Construction Co. of Sacramento is doing a "plastic surgery" job along US 99 between Roseburg and Myrtle Creek, Oregon. When the job is finished in 1955, the heavy traffic will be treated to a straighter and shorter drive between these two points. Some 2½ million cu. yd. of dirt and rock will be moved. Two major cuts of 175 ft. and 98 ft. will be made through mountains, and 200 ac. of timber and scrub growth will be cleared on the \$1,359,784 contract. Here a Cat DW20 tractor and No. 20 scraper is push loaded by D8 towing a ripper.

near Auburn. Guy F. Atkinson Co. of South San Francisco submitted a low bid of \$1,288,816 for 0.9 mi. of graded roadbed in the tidal area flats near San Francisco. Baldwin Contracting Co. of Marysville submitted a low bid of \$171,926 for 5 mi. of grading and surfacing near Strathmore, Tulare County. Baun Construction Co. of Fresno received a \$245,076 award for 5.8 mi. of widening and surfacing on SR 20 east of Williams. Brighton Sand & Gravel Co. and R. M. Skarnes of Perkins submitted a low bid of \$174,329 for 1.3 mi. of roadwork and the construction of two reinforced concrete and steel bridges across the Mokelumne River near Lockeford. Cen-Vi-Ro Pipe Corp. of South Gate submitted a low bid of \$1,376,755 for earthwork, pipelines, and structures on the Friant-Kern Canal of the Central Valley project. Cox Bros. Construction Co. of Stanton received a \$231,933 award for 2.9 mi. of grading and surfacing on LaHabra Road and construction of a reinforced concrete bridge in Orange and Los Angeles counties. John Delphia and Humboldt Constructors, Inc. of Eureka received a \$754,265 for grading and roadwork in the National Forest of Humboldt County. Louis C. Dunn of Los Angeles submitted a low bid of \$1,029,992 for construction of a high school in Upland. Fredericksen & Kasler of Sacramento submitted a low bid of \$333,333 for 12.9 mi. of grading and surfacing on US 99 in Imperial County. Donald Graves of San Jose submitted a low bid of \$172,092 for 12 mi. of surfacing near the Oregon state line in Modoc County. Wells P. Goodenough, Inc., of Palo

Alto received a \$2,689,907 award for construction of a reinforced concrete dormitory, dining room, kitchen, and lounge at Stanford University.

Fredrickson Brothers of Emeryville received an award of \$333,110 for 4.1 mi. of grading and construction of a reinforced concrete bridge in Yolo County. Fredrickson & Watson Construction Co., and M & K Corp. of Oakland submitted a low bid of \$1,659,775 for construction of the Eastshore Freeway between Market and 11th Street in Oakland. Charles L. Harney, Inc., of San Francisco received a \$605,779 award for grade separation structures at the Richmond end of the Richmond-San Rafael Bridge. Carl M. Halvorson, Inc. of Portland submitted a low bid of \$633,227 for grading and surfacing in Plumas National Forest. Hydraulic Dredging Co., Ltd., of Oakland submitted a low bid of \$703,362 for 1 mi. of sand fill embankment near the San Francisco-Oakland Bay Bridge Toll Plaza. Peter Kiewit Sons' Co. of Arcadia submitted a low bid of \$5,960,242 for 3.9 mi. of the Ramona Freeway in Los Angeles.

Charles A. Langlais Co. of San Francisco submitted a low bid of \$505,570 for construction of a traffic control system on the lower deck of the San Francisco-Oakland Bay Bridge. Lowe & Watson of San Bernardino received a \$251,166 award for 6 mi. of grading and surfacing on SR 138 near San Bernardino. Madonna Construction Co. of San Luis Obispo submitted a low bid of \$1,598,111 for 2.7 mi. of grading and surfacing and five reinforced concrete bridges near Pismo Beach. E. H. Moore & Sons of San Francisco re-

ceived a \$1,309,600 award for construction of a junior high school in San Leandro. Robert E. McKee, Inc., of Los Angeles submitted a low bid of \$1,948,000 for construction of a junior high school at Glendale. George W. Peterson & Jack W. Baker, Jr., of Los Angeles submitted a low bid of \$722,658 for construction of four reinforced concrete box girder bridges between Kiel St. and Ovada Place, Los Angeles.

Piombo Construction Co. of San Francisco submitted a low bid of \$623,573 for 2.7 mi. of grading and surfacing on US 40 near Applegate in Placer County. Arthur B. Siri., of Santa Rosa submitted a low bid of \$378,472 for 2.7 mi. of grading and surfacing in Napa County. Carl N. Swenson of San Jose submitted a low bid of \$353,478 for construction of a reinforced concrete bridge and approaches in Los Gatos. A. Teichert & Son, Inc., of Sacramento received a \$652,265 award for 4.9 mi. of grading and surfacing in Eldorado County. Ukropina, Polich, Kral and John R. Ukropina of San Gabriel received a \$737,020 award for construction of a reinforced concrete bridge north of Redding on US 99.

COLORADO

STATE HIGHWAY SYSTEM—It will take about \$148,000,000 to bring the 8,000 mi. of federal aid primaries and secondaries which became part of the state highway system on January 1 up to standard, according to Mark U. Watrous, chief engineer of the Colorado Department of Highways. He disclosed this fact while addressing the Steamboat Springs Chamber of Commerce. The figure of \$148,000,000 came from the latest Rural Highway Sufficiency Rating Study, which won the Golden Milestone Award of the National Highway Users Conference.

Watrous listed the following accomplishments of the Department in the 18-month period from January 1, 1953 to July 1, 1954:

- Put 127 projects under contract, covering 879 mi. at a cost of \$30,000,000.

- Made 73 agreements with counties for 560 mi. of road work at a cost of \$2,300,000.

- Completed 41 projects in the oiling program covering 281 mi. at a cost of \$250,000.

DENVER BUILDING BOOM—Building construction in Denver is booming right along and should surpass the all-time high of 1953, if things keep up as they are going. Building permit evaluations had passed the \$54,000,000 mark by mid-summer, according to George R. McCormack, chief city building inspector.

HERE'S HOW THE BLAW-KNOX "Complete Paving Package" LICKS RISING PRODUCTION COSTS

● You get the most efficient concrete paving outfit available, because every piece of "Complete Package" equipment is built by one responsible, experienced manufacturer, with each unit engineered to match the others in size, capacity and performance.

● You have the advantage of one nation-wide distributor source for prompt parts and maintenance service . . . you get preventive maintenance when all your equipment belongs to one family. It's standard practice for your Blaw-Knox trained service man to check each "Package" unit on each service call, to stop trouble before it starts.

● You can get all your equipment on one order, in one shipment, with one financial contact . . . or you can start with a "Minimum Package" to fit your particular job, then buy additional units as your needs increase and your profits grow.

● Various combinations of your "Package" units handle a wide variety of jobs. Use your aggregate and cement batching plants with Blaw-Knox Concrete Buckets for big engineered construction jobs, or add Hi-Boy Trukmixers for ready-mix operations. With a Blaw-Knox "Complete Package" you're ready to handle any concrete paving or concrete construction contract!

CLAMSHELL BUCKETS



AGGREGATE
AND CEMENT
BATCHING
PLANTS



PRECISION SUBGRADERS



MULTIFOOTE PAVERS

SPREADER-VIBRATORS

FINISHERS

PAVING FORMS

BLAW-KNOX COMPANY
BLAW-KNOX EQUIPMENT DIVISION
PITTSBURGH 38, PA.
Offices in Principal Cities

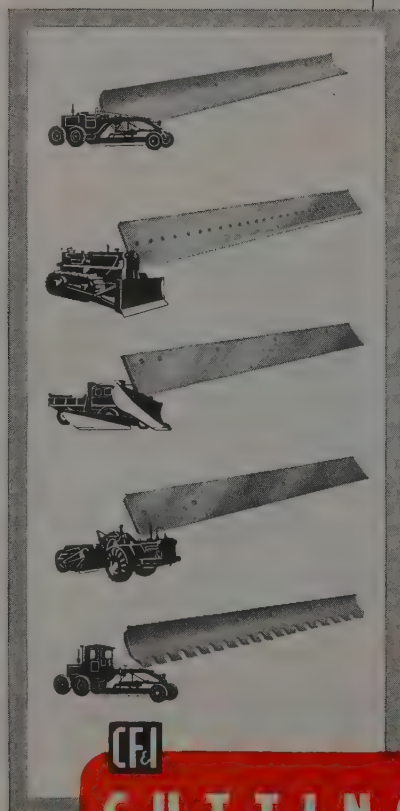
BLAW-KNOX

**SEE YOUR
BLAW-KNOX DISTRIBUTOR *Today!***

BLAW-KNOX PACIFIC COAST BRANCH: 818 Monadnock Bldg., 681 Market St., San Francisco 5, Calif.

what blade do you use

when you're scraping the face of the earth?



CF&I

CUTTING EDGES

THE COLORADO FUEL AND IRON CORPORATION

That's when you need a cutting edge that's extra rugged and long-wearing. And that's what you get when you specify CF&I Cutting Edges for your scrapers, graders, dozers, snowplows and allied equipment.

Every cutting edge produced by CF&I is hot-rolled from special analysis steel selected for toughness and abrasion resistance.

CF&I Cutting Edges are available in a wide variety of lengths, widths, thicknesses and hole spacings; flat or curved, with beveled or square ends; and in different finishes. All are the product of quality control that's complete from ore through every stage of processing.

CONSTRUCTION on a \$4,500,000 industrial, business, and residential development north of Denver in Adams County was scheduled to begin momentarily. Burns Realty and Trust Co. will handle the construction.

RECENT MAJOR CONTRACT AWARDS and low bids in Colorado include a low bid of \$625,000 submitted by Lowdermilk Bros. of Denver for 7.2 mi. of grading and surfacing in Clear Creek County. Mead & Mount Construction Co. of Denver received a \$1,587,000 award for construction of a 6-story library and auditorium building in Denver.

IDAHO

PROGRESS ON CLEARWATER

Pacific Northwest Power Company of Spokane, Wash., has received an 18-month preliminary permit from the Federal Power Commission for its proposed Brucers Eddy and Penny Cliffs dams (**Western Construction**—Sept. 1954, pp. 90-92, June 1954, pp. 108-110, March 1954, p. 76). Pacific Northwest is a joint venture of four power companies in the Pacific Northwest which have banded together to build the project. They include Montana Power Co., Washington Water Power Co., Pacific Power & Light Co., and Portland General Electric Co.

INCREASED HIGHWAY CONSTRUCTION

during recent years in Idaho has been noted by E. V. Miller, State Highway engineer. He said that between July 1, 1951, and July 1, 1954, the state has contracted for more than \$37,500,000 worth of road construction. This is more than was accomplished in the preceding 5-year period.

RECENT MAJOR CONTRACT AWARDS

and low bids in Idaho include a low bid of \$224,832 submitted by J. F. Anderson of Spokane for 6 mi. of grading in the Coeur d'Alene National Forest in Shoshone County. Murphy Bros. of Spokane received a \$467,338 award for 7.7 mi. of roadwork and a concrete bridge in Latah County.

MONTANA

HUNGRY HORSE GLORY HOLE

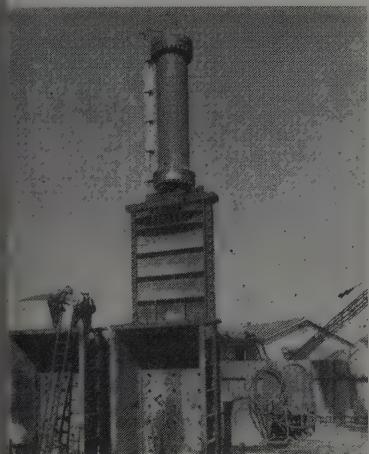
—The Glory Hole Ring Gate at Hungry Horse Dam on the south fork of the Flathead River in Montana was tested recently. The gate, which is 64 ft. in diameter, feeds overflow water through a low spillway tunnel which runs around the powerhouse. The amount of water to be released or re-

2652

Albuquerque • Amarillo • Billings • Boise • Butte • Casper • Denver • El Paso • Ft. Worth
Houston • Lincoln (Neb.) • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland
Pueblo • Salt Lake City • San Antonio • San Francisco • Seattle • Spokane • Wichita

ained is controlled by the height of the ring gate.

MONTANA POWER PROJECTS
The Montana Power Co. of Butte has filed applications with the Federal Power Commission for preliminary permits for two proposed hydro projects on the Flathead River in Lake and Sanders counties. The first project would be a concrete dam forming a reservoir near Polson on the Flathead River, a powerhouse with an installed capacity of about 20,000 kw., and a 100-kv. transmission line. The other project would be a concrete dam about 19 mi. south of Polson, a powerhouse with an installed capacity of 120,000 kw., and a 100-kv. transmission line.



SLIDE GATES AT LUCKY PEAK DAM

Six high-pressure slide gates were recently designed and built by Paceco for the Corps of Engineers of the Walla Walla District for regulating the flow of water in the outlet works of Lucky Peak Dam near Boise. The gates have a clear opening for the passage of water of 5 ft. 3 in. by 10 ft. 0 in. and are designed to operate at a head of 245 ft. without deflecting more than 0.008 in. at the center of the gate leaf.

In order to avoid the complex rib system required for cast iron, all main members were made of cast steel, which required less ribs and stiffeners and resulted in an overall weight saving of about 25%. Operation of these gates is by means of a 30-in. diameter hydraulic cylinder operating at 1,500 psi. pressure. Stroke is 10 ft. 5 1/4 in. and the hoist has an operating speed of approximately 1 fpm. Gross weight of one unit is 40 tons.

ONE-PIECE PAVEMENT — An unusually long section of plant-mix pavement, all in one piece, is under construction in Montana in three separate contracts. The job is a 62.5-mi. length of Crow Agency-Ashland Highway on State Route 8 east from Billings. It is in various stages of construction from production and placement of base coarse gravel through cushioned gravel to plant-

WELLMAN "Williams" MULTIPLE ROPE BUCKETS

*Designed for
digging bigger
payloads*



THE double main hinge design of these WELLMAN "Williams" buckets gives you many advantages including: lower head room when boom or crane operations are cramped; stronger, more compact construction; and a really "long reach".

These tough, top-quality buckets are fast operating and give the operator perfect control at all times.

If it's a WELLMAN—it's built to dig and last while digging.

THE WELLMAN ENGINEERING CO.

CLEVELAND 4, OHIO

*Mail
coupon
for free
bulletin*

The Wellman Engineering Company
7026 Central Avenue, Cleveland 4, Ohio

Please send me bulletin on:

- | | |
|--|--------------------------------------|
| ☐ Clamshell Buckets | ☐ Stone Grabs |
| ☐ Dragline Buckets | ☐ Log Grabs |

Your Name _____

Address _____

City _____ State _____

Position _____ Company _____

mix oil mat. Contractors are Lou Richardson of Miles City, 38.4 miles under a \$541,327 contract; Nilson-Smith Construction Co., Great Falls, 12 mi. under a \$172,437 contract; and Northwestern Engineering Co. of Rapid City, South Dakota, 12.1 mi. under a \$154,651 contract. Personnel on the job include L. W. Brown and Paul M. Johnson, division construction engineers (at two separate times) and Cecil Owens project engineer. Completion date is October 31, 1954.

RECENT MAJOR CONTRACT AWARDS and low bids in Montana include an award of \$168,796 to Isbell Brothers Construction Co. of Riverton for 7.6 mi. of grading and surfacing on the Broadus to Wyoming state line road in Powder River County. Bob Gibson & Sons of Billings received an \$87,716 award for 1.0 mi. of grading and road-mixed surfacing on the Three Forks-Townsend road in Broadwater County. Otis Williams & Co. of Kennewick received a \$362,760 award and another of \$279,919 for 4.8 mi. of 6.7 mi. of grading and gravel surfacing on the Ovando-Rogers Pass Road in Powell, Lewis, and Clark counties.

NEVADA

NEW NEVADA HOTELS—Two luxury hotels in Reno are being planned by Western companies. Hotel Silver Lode will cost between \$4,000,000 and \$5,000,000 and Hotel Silver Queen will cost between \$2,

000,000 and \$3,000,000. Meanwhile, actual construction has already started on two other hotels. A \$500,000 addition to the Riverside Hotel in Reno is due for completion in April. Bishop, Younger, and Bradley are general contractors on the job. In Las Vegas, construction started October 1 on a 10-story, \$3,500,000 downtown hotel to be called The Fremont. It is being backed by Louis Lurie, San Francisco financier.

AIRPORT CONSTRUCTION at Reno's Municipal Airport is well under way. Isbell Construction Co. is laying the base for runway construction, while Dinwiddie Construction Co. is building hangars and other buildings at the same field. The two contracts total about \$2,500,000. They were awarded by the Corps of Engineers in behalf of the Air National Guard.

RECENT MAJOR CONTRACT AWARDS and low bids in Nevada include a \$171,287 award to J. A. Tiberti Construction Co. of Las Vegas for building construction at Nellis AFB near Las Vegas.

NEW MEXICO

MIRAMONTES PARK—A \$1,000,000 residential addition to Miramontes Park in Albuquerque will be built by J. E. Brown, a local contractor.

SIMMS BUILDING—The exterior of the 12-story Simms Building in Al-

buquerque, a \$2,000,000 construction contract being performed by Lembke-Clough and King, has been completed. Final work remaining to be done includes plastering and interior painting.

RECENT MAJOR CONTRACT AWARDS and low bids in New Mexico include a \$328,571 award to O. D. Cowart of Albuquerque for 11.8 mi. of grading and surfacing on US 85 in Mora County. Floyd Haake of Santa Fe received a \$156,520 award for 7.1 mi. of grading and surfacing on SR 58 in Colfax County. Lowdermilk Bros. of Espanola submitted a low bid of \$367,000 for 6.3 mi. of grading and surfacing in Otero County. E. M. Silver of Albuquerque received a \$142,923 award for 10.2 mi. of grading and surfacing and one concrete bridge on SR 63 & 50 near Pecos, San Miguel County. Henry Thygesen & Co. of Albuquerque received a \$145,386 award for 2.1 mi. of grading and surfacing on US 85 near Santa Fe.

OREGON

\$12,500,000 HOTEL—A 750-room, reinforced concrete hotel with aluminum facing is being planned for downtown Portland by Leo F. Corrigan, a Texas financier. Preliminary estimates indicate that the building will cost \$9,000,000, land will cost \$1,500,000, and furniture and fixtures will come to \$2,000,000, making a total of \$12,500,000. Plans and specifications are being prepared by Barnett, Haynes & Barnett & Associates, industrial designers in San Francisco.

ROSEBURG SEWER STUDY—A firm of consulting engineers has recommended long-range sewer improvements for Roseburg at a cost of \$2,500,000. The report was made by the firm of Cornell, Howland, Hayes and Merryfield of Corvallis.

CONSTRUCTION of a 90-ft. reinforced concrete bridge across Delp Creek in Lane County and grading on 1.8 mi. of road will start as soon as bids have been received and the contract awarded, according to F. E. Andrews, acting division engineer for the Bureau of Public Roads in Portland.

A DIM FUTURE was foreseen for construction of the proposed \$65,000,000 aluminum plant at The Dalles by Harvey Machine Co. The annual appropriation bill for the Interior Department did not provide funds for the electric distribution facilities for the project. There has been no construction on the plant since last year, when a 40 x 80-ft. structure was erected.



CONSTRUCTION CAMPS CLOSING DOWN IN ALASKA

The big familiar camps at Elmendorf, Eielson, and Ladd air force bases will be permanently shut down at the end of this year. Originally operated by Birch, Johnson & Lytle (BJL) through a subcontract with the Universal Foods Services, Inc., they are no longer necessary because of increased local facilities for housing.

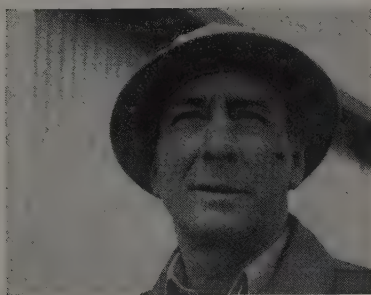


These four Washington Whirley cranes work 'round the clock on The Dalles Dam being built by The Dalles Powerhouse Constructors on the Columbia River. Tiger Brand ropes on these cranes are all in good condition after several months of hard service.

Tiger Brand helps cut costs on The Dalles Dam!



Load lines on the cranes are $\frac{7}{8}$ " Tiger Brand Wire Rope. This one carries $9\frac{1}{2}$ tons of concrete per load. Booms are 150 feet, with an 85-foot gantry and 75 tons of counterweight.



C. W. Bingham, Rigger Supt., says, "I know that the combination of good maintenance and a top-quality rope like Tiger Brand gives me much longer trouble-free service, cuts down costs".



To cut costs on your construction operation, rely on tough American Tiger Brand Wire Rope.

It's got extra stamina, stands up far longer under hard service. For information or field service, contact your local distributor.

FREE BOOKLET!

UNITED STATES STEEL CORPORATION—COLUMBIA-GENEVA STEEL DIVISION
1403 RUSS BLDG., SAN FRANCISCO 8, CALIFORNIA

Please send me your free booklet, "Longer Life From Your Wire Rope". WC-10

Name

Address

City State



USS TIGER BRAND Wire Rope

United States Steel Corporation • Columbia-Geneva Steel Division

UNITED STATES STEEL

Lightweight airborne crane for parachuting



A SELF-PROPELLED, rubber-tired airborne crane is being developed by the Wayne Crane Division of American Steel Dredge Co. The Wayne Crane contract calls for development and fabrication of a small, lightweight crane with a heavy-work

capacity, capable of being dropped by parachute from cargo airplanes flying over combat zones. As with all equipment being developed by the laboratories for air drop operations, the crane must remain within the critical transport limitations of 16,000 lb., 37-ft. length, 8-ft. 4-in. width, and 6-ft. 9-in. height. Construction equipment is considered airborne only if transportable as a unit and capable of operation within 1 hr. after delivery.

This equipment is being especially designed under the direction of the Corps of Engineers' Research and Development laboratories of Fort Belvoir. In airborne tests conducted to date, a 100-hp. airborne tractor dozer, a 4-cu. yd. scraper, a 14,500-lb. motor grader, tractor saws, towed scrapers, and crawler tractors have been successfully dropped. Other items include cranes, air compressors, rock crushers, 6-cu. yd. scrapers, and rollers. Where road, airfield, and other construction jobs must be rushed to completion, easy transportation by air will pay off.

RECENT MAJOR CONTRACT AWARDS and low bids in Oregon include a low bid of \$12,708,180 submitted by **Guy F. Atkinson Co.** and **Ostrander Construction Co.** of South San Francisco for construction of the navigation lock, north non-overflow dam and north fishladder at The Dalles damsite. **J. W. Briggs** of Bend submitted a low bid of \$209,583 for 4.1 mi. of grading and construction of two bridges in Lane County. **Columbia Empire Constructors, Inc.**, and **P. S. Lord, Mechanical Contractors** of Portland submitted a low bid of \$129,792 for grade separation structures in Douglas County. **Deith Bros. Construction Co.** of Medford submitted a low bid of \$187,679 for 6.5 mi. of grading on the Quartz Creek road in Umpqua National Forest.

Halvorson Construction Co. of Burley received a \$269,961 award for 6.6 mi. of grading in Lane County. **L. H. Hoffman** of Portland received a \$3,210,000 award for construction of a high school in Portland. **Tim Lillebo** of Reedsport received a \$174,000 award for construction of a bridge over Isthmus Slough in Coos County. **Earl L. McNutt** of Eugene received a \$1,251,712 award for 18.3 mi. of grading and construction of a bridge on the Old Oregon Trail in Malheur County. **Northwood Construction Co.** of Vancouver received a \$415,120 award for 0.3 mi. section of roadwork in the Olympic National Park. **Porter W. Yett** of Portland received an \$848,165 award for 6.3 mi. of paving on the Portland-Salem Expressway

near Gercaia. **Parker-Schram Co.** of Portland received a \$778,228 award for 7.4 mi. of paving on the Portland-Salem Expressway north of Salem. **Scheumann & Johnson** of Seattle received a \$692,568 award for construction of the powerhouse, intake canals on the Nisqually Power Project. **United Builders, Inc.**, of Beaverton received a \$139,195 award for construction of a reinforced concrete grade separation structure on the Banfield Expressway in Multnomah County. **Warren Northwest, Inc.**, of Portland received a \$167,614 award for 10 mi. of paving 12 mi. north of the Oregon-Nevada state boundary.

UTAH

\$8,000,000 CHEMICAL PLANT—The Salt Lake Chemical Co., a firm with headquarters in Dallas, Texas, has announced that construction will begin immediately on an \$8,000,000 anhydrous ammonia plant at Salt Lake City. Completion is scheduled for December 1955.

SALT LAKE SEWER—Construction has started on the \$8,900,000 sewer system of the Salt Lake City suburban sanitary district. **Schmidt Construction Co.** of Grand Junction is doing the job. The firm of **Caldwell, Richards and Sorensen** are consulting engineers on the project.

RECENT MAJOR CONTRACT AWARDS and low bids in Utah include a low bid of \$169,902 submitted by **L. A. Young Construction Co.** of Richfield for 7.8 mi. of grading and drainage on Panguitch road in Dixie National Forest, Garfield County.

WASHINGTON

PUYALLUP SEWER—Construction on additions and betterments to Puyallup's sewer system and water works were scheduled to begin early in September. **Gray & Osborne**, a Yakima consulting engineering firm, prepared the plans. The first portion of the work will be financed by the issuance of \$1,000,000 in bonds.

GORGE HIGH DAM—Bids for construction of the \$17,000,000 Gorge High Dam, including a highway and two bridges, are scheduled to be opened October 6 by the Seattle Board of Public Works. The project will include a dam 200 ft. high and 650 ft. long, to be constructed as a combination arch and gravity type. Plans were prepared by **J. L. Savidge**, a Denver consulting engineer. The larger reservoir to be formed by the dam will increase power output by 47,000 kw., according to **Paul J. Raver**, City Light superintendent.

LAKE WASHINGTON BRIDGE—The State Toll Bridge Authority has selected the Montlake-Evergreen Point site for a second bridge across Lake Washington. This site was selected after the Navy had reported that plans for a bridge across Sand Point Naval Air Station were not acceptable. Preliminary design work should take about 8 months, according to **Charles Andrew**, chief consulting engineer for the Toll Bridge Authority. Estimated cost is expected to range between \$19,000,000 and \$20,000,000. Construction is expected to take about 2½ years.

SEATTLE ARTERIAL PROGRAM—**W. E. Parker**, Seattle city engineer, has proposed a \$36,000,000 program to build arterial highways, viaducts, and bridges in an 8-year program. The City Council is studying the plan before authorizing bond issue propositions to be placed on the November ballot so that the program can be paid for. **Parker** says the program should increase arterial traffic capacity by 15% to 30%. He recommends immediate right-of-way acquisition to avoid rising costs.

TOLL ROAD STUDY—The Tudor Engineering Co., in association with **J. E. Greiner Co.**, Baltimore, Md., consulting engineers, have been commissioned to make a civil engineering study to determine the feasibility of constructing a toll road from Tacoma

FOR THAT **EXTRA** MARGIN IN SHOVEL PERFORMANCE...



**BUCYRUS
ERIE**

WARD LEONARD ELECTRIC EXCAVATORS

MORE OUTPUT even under the toughest conditions . . . more loads per shift in any quarry or mine . . . extra loads for that **EXTRA MARGIN** in performance . . . that's what you get from this exclusive combination of shovel front-end features:

1. **TWO-SECTION BOOM** provides maximum strength with minimum weight. The lower section is rigidly connected to the A-frame . . . takes the heavy stresses of the digging cycle in stride because it is part of the main machine.
2. **TUBULAR DIPPER HANDLE** is much lighter than equivalent two-member handle, yet equally strong. Its ability to rotate in the rubber-cushioned saddle block eliminates torsion during the digging stroke, minimizes shock loads.
3. **TWIN DUAL HOIST ROPES** assure a steady, positive digging action with automatic shift of hoist power to that part of the dipper lip where it is needed.
4. **INDEPENDENT ROPE CROWD** is simple, positive and quiet. Shipper shaft pinions and handle racking are eliminated. Crowd machinery is located on main deck rather than on boom—swing inertia is reduced, the operating cycle speeded up.
5. **QUICK CONVERTIBILITY** to dragline of the independent motor type. Hoist and drag functions are powered by separate motors, eliminating operating clutches and brakes.

These features—plus many more—make Bucyrus-Eries the finest heavy-duty excavators ever built: yard for yard, dollar for dollar, pound for pound.

Write today for complete information on the 4½-yd. 110-B, the 6-yd. 150-B, or the 8-yd. 190-B.

**Bucyrus-Erie
Company**

**SOUTH MILWAUKEE
WISCONSIN**

10L54C



ROCK RIPPER



Rips materials you never could rip before

Fast penetration in hardest materials

Hydraulic down pressure puts full weight of tractor on standards for fast, full penetration. Rips many materials that formerly required shooting.

Really shatters rock for easy loading

Curved standards provide natural draft to keep points down, produce underground quivering action that seeks out cracks and weak spots. Shatters rock and hard materials to easy-loading condition...you get bigger loads faster, with less scraper wear and damage.

8,800 lbs.* of rugged strength

Takes full power of largest track-type tractors and either rips rock or stalls tractor. ATECO drawbar takes the pull—no strain on tractor case.

*with three standards; 7,500 lbs. with two.

Available for Caterpillar D7 and D8, Allis-Chalmers HD20, and International TD24 tractors. Sold exclusively through your Caterpillar distributor. See for yourself how an ATECO ripper boosts yardage and saves equipment. Call your "Cat" dealer for a demonstration NOW.

#27

AMERICAN TRACTOR EQUIPMENT CORPORATION

Designers and manufacturers
since 1920

Mack Woodruff
PRESIDENT

9131 San Leandro Blvd.
Oakland 3, California

BULLDOZERS • ROADBUILDERS • RIPPERS • SCRAPERS • LOADERS

to Everett through Seattle. The proposed road would be 65 mi. long and would require a revenue bond issue of about \$175,000,000 to pay for the job.

RECENT MAJOR CONTRACT AWARDS and low bids in Washington include a low bid of \$533,967 by Bay Construction Co. and Don L. Cooney of Seattle for 46.7 mi. of transmission line for the Chief Joseph-Snohomish project in Douglas and Chelan counties. Cisco Construction Co. of Portland submitted a low bid of \$409,082 for construction of guided missile control and launcher sites near Redmond. Donald M. Drake Co. and George A. Fuller of Portland submitted a low bid of \$5,514,000 for construction of buildings, paving, and utilities at Moses Lake Flight Center. N. Fiorito Co. of Seattle received a \$261,115 award for construction of the First Ave. South bridge and approaches in Seattle.

Peter Kiewit Sons' Co. of Longview submitted a low bid of \$214,809 for construction of a prestressed concrete girder bridge over the Spokane River at Harvard Road in Spokane County. Northwest Construction Co. of Seattle received a \$641,939 award for 1.0 mi. of grading, surfacing, and paving in Everett on SH 1, and submitted a low bid of \$193,597 for grading and surfacing 3 mi. in King County and another low bid of \$316,625 for 5 mi. of grading and surfacing in King County. P. L. Saddler of Wenatchee submitted a low bid of \$307,085 for 12.0 mi. of grading and surfacing in Grant County. Strong & MacDonald, Inc. of Tacoma received a \$583,272 award for 5.0 mi. of grading and drainage on SH 2 in King County.

WYOMING

WYOMING'S HIGHWAY DEPARTMENT is stepping up its programming of highway projects to take advantage of increased federal aid funds this year, officials said. The state is due to receive \$4,000,000 for primary highways, \$2,500,000 for secondary roads, \$200,000 for urban highways, and \$2,000,000 for the interstate highway system. Wyoming will provide \$4,365,000 in state funds to match the federal money.

GLENDON PROJECT — Construction on the long-delayed Glendon project was certain to start some time in the fall. This news was assured by the appropriation of \$1,000,000 by a House-Senate conference committee before Congress adjourned. The project was approved in 1944 but was never started because no money was provided. The job is expected to take 5 years to complete.

It includes a dam in central Wyoming, two power generating units, and related facilities.

RECENT MAJOR CONTRACT AWARDS and low bids in Wyoming include a \$302,311 award to **Big Horn Construction Co.** of Sheridan for 10 mi. of surfacing on the Wheatland-Cheyenne road near Chugwater. **England & Roth Construction Co.** of Rapid City received a \$343,632 award for 10.6 mi. of grading and surfacing in Weston County. **Knisely-Moore** of Douglas submitted a low bid of \$582,000 for 6.7 mi. of grading and surfacing in Bighorn National Forest. **Taggart Construction Co.** of Cody received a \$315,620 award for 0.3 mi. of grading and surfacing in Natrona County.

ALASKA

RECENT MAJOR CONTRACT AWARDS and low bids in Alaska include a low bid of \$1,581,592 submitted by **Grove, Shepherd, Wilson, and Kruge, Inc.** of Seattle for construction of a 160,000-sq. ft. warehouse of reinforced concrete and masonry, railroad spur, and utilities at Fort Richardson. **Lytle & Green Construction Co.** and **S. Birch & Sons** of Seattle submitted a low bid of \$1,699,134 for reconstruction of 42.5 mi. of the Alaska Highway located between the Canada-United States border and Mile 1265. **Peter Kiewit Sons' Co.** of Longview submitted a low bid of \$1,287,423 for construction of a major part of the Fairbanks water distribution system.

Here and There

MONSTER EISENHOWER ROAD PLAN—President Eisenhower has called for a 10-yr. plan to modernize the country's highway system by spending \$5,000,000,000 a year on a federal-state cooperative program. The plan was presented by Vice President Richard M. Nixon, addressing the annual conference of state governors at Bolton Landing, N. Y. He spoke in behalf of the president who was unavoidably absent. Robert M. Reindollar, president of the American Road Builders' Association, praised the speech and said it contained several of the main recommendations which ARBA has been presenting for years. The governors' conference had previously gone on record with the demand that the federal government should stop collecting gasoline and automobile excise taxes and let the states run their own roadbuilding programs.



Rock Ripper



Works wherever your tractor can go

Tractor mounted

Compact, easy to handle in narrow cuts and tight spots. Swivel-mounted standards pivot on turns for effortless steering.

No interference with dozing or push loading

Mounted ripper retracts out of the way instantly. You're always ready for bulldozing or push loading with no time lost unhooking a trailing ripper. Ripper balances dozer weight for easier handling, better traction.

Multiplies work power of your tractor

With an ATECO ripper on back and dozer in front, your tractor is a high-capacity earthmoving tool matched to high speed scraper operations. It shatters hard materials to easy-loading condition, push loads for fast heaped loading, keeps cut in shape for efficient scraper loading...all with less wear and tear on equipment.

Available for Caterpillar D7 and D8, Allis-Chalmers HD20, and International TD24 tractors. Sold exclusively through your Caterpillar distributor. Let him prove how an ATECO ripper outperforms any other ripper you've ever seen. Call him NOW for a demonstration on your job.

#26



SPEEDS TREE FELLING, TOO. Root knives replace regular ripper standards. Will cut roots 10" to 12" in diameter, down to 30" below surface. Cuts supporting roots so trees can be dozed over in 5 minutes or less.

AMERICAN TRACTOR EQUIPMENT CORPORATION

Designers and manufacturers
since 1920

Mack Woodruffe
PRESIDENT

9131 San Leandro Blvd.
Oakland 3, California

BULLDOZERS • ROADBUILDERS • RIPPERS • SCRAPERS • LOADERS

ALASKA Newsletter

By CLIFFORD S. CERNICK, Anchorage

TERMINATION DUST—The high ranges of Alaska's mountains are getting their first dusting of snow, known in Alaska construction jargon as "termination dust." In early days of the post-war construction boom, the term was coined by a construction stiff and the phrase has stuck. It signifies that the construction season is about at an end, that projects which have gone full-blast all summer must now prepare to close down because icy winter weather is just around the corner and before many days have passed the earth will be frozen to the hardness of concrete. This fact, and the fact that soon Alaska will become a land of virtually total darkness for the next six months, make outside construction next to impossible.

GOING-HOME TIME — It's the "going-home" time for the army of construction workers that drifted north in late spring when the midnight sun was melting the hardness out of gravel pits and the sound of "cats" ripping the muck was being heard all the way from Eskimo villages in the Arctic to storm-lashed seacoasts in the Aleutians. Anchorage now is a principal way-station in this annual migration of construction workers. Airline offices report a brisk business, with plane seats at a premium as hundreds of construction men head "outside," the term used here to describe the United States. While waiting for planes, some of the men are having a last fling in the city's gaudy, neon-spangled bars. A few of them—slightly dazzled by a season's earnings—are letting their guard down and falling victims to the modern counterpart of the old Klondike dance hall leeches—gum chewing B-girls. These creatures abound in the dimly-lit bistros, avidly seeking not gold dust but greenbacks. Heavily-bearded construction men, lonesome after a long summer out in the bush country, often are easy prey.

TIMBER-BELLS RINGING—Bar-tenders here say the the "timber-bells" are ringing again. These melodious bar-bells, hung over the long racks of bottles in most taverns, chime out when some well-fixed sourdough or construction worker decides to buy everyone in the house a drink. The bells have been silent all summer. Sourdoughs have been working their diggings up on the creeks. Construction stiff's weren't there to ring them—they were too busy. Now both sourdoughs and construction men are back in town.

FEWER JOBS — MORE JOB-SEEKERS—As scores of construction projects prepare to go into mothballs for the winter months, hundreds of workers are getting their final checks. The majority of these are going "outside." Some, however, are remaining in Alaska and swelling the ranks of the jobless here. Charles C. Pugh, manager of the territorial employment office here, says large numbers of construction workers are jobless because of the seasonal slowdown in the tempo of Alaskan construction work. Despite the fact that the 1954 construction season is waning, he says, there is still an influx of construction workers seeking non-existent jobs.

UNEMPLOYMENT ROSTER — To give some idea as to the number of unemployed construction workers here, Pugh issued a list of unemployed by construction crafts. At the present time there are 94 carpenters, 152 laborers and 127 truck drivers seeking work in Anchorage. Other jobless include 20 engineering equipment operators, 55 mechanics, 11 plumbers, 20 painters and 32 electricians. Pugh reported that 301 applicants were placed in jobs through the employment office during the past month, but this figure includes jobs of all types, most of them of a non-construction category. A total of 1,378 persons are jobless, including 560 who have registered for employment within the past month.

OUTLOOK FOR 1955—Federal appropriations for the next fiscal year will reach a grand total of \$103,770,691 according to Alaska's delegate, E. L. Bartlett. Of principal interest to the construction industry is the \$9,500,000 to be spent for the Alaska Public Works program, \$8,000,000 for the construction of roads, \$12,870,000 for air force construction and \$6,059,000 for army public works. Under the next year's Alaska public works program, eighteen projects have been approved for allocation of funds. These include jobs at Anvik, Juneau, Nenana, Seldovia, Fort Yukon, Skagway, Anchorage, Nome, Kake, Haines, Petersburg, Sitka, Valdez, Fairbanks and the University of Alaska.

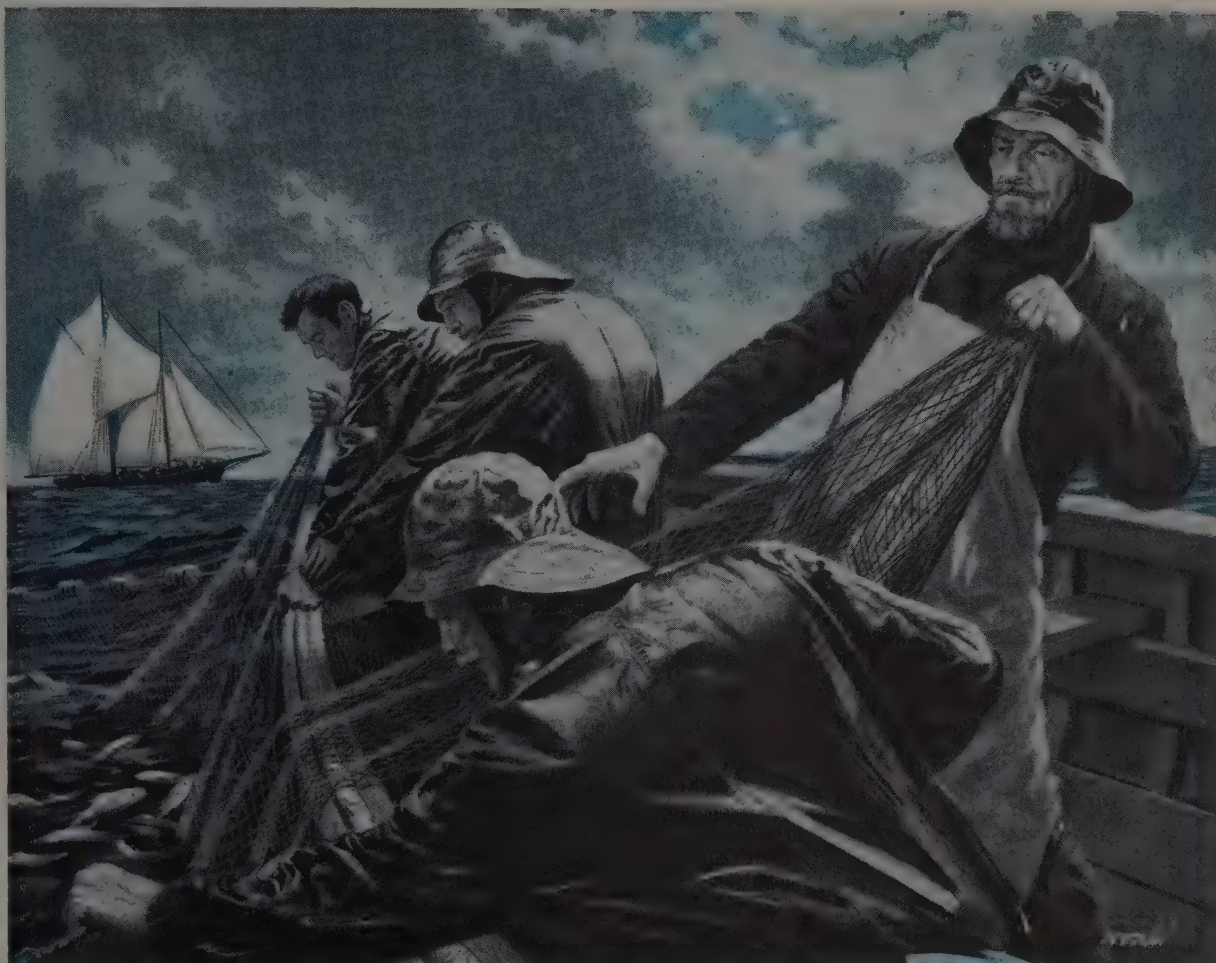
WHAT IT MEANS—While that figure of \$103,770,691 appears sizable for next year's federal expenditures in Alaska, it will be considered in a new light when it is realized that this is approximately \$36,000,000 under appropriations for the year previous.

This reflects the general trend of governmental expenditures over the past few years. This trend is markedly downward. What it means is simply that Uncle Sam is going to be spending less for construction in Alaska each year in the foreseeable future. The "boom" years of Alaska construction are well nigh at an end. The outlook for the future seems to be shaping up as a time of diminishing activity, reduced expenditures in all categories, smaller and fewer contracts.

YEARS OF CHALLENGE—Construction-wise, the years ahead should not be considered pessimistically by those in the Alaska construction industry. Instead, the coming years of diminished expenditures should be years of challenge for far-sighted builders. If you are a contractor doing business in Alaska, you're going to face stiffer competition for the available jobs. You'll have to estimate a little closer to nab a contract and once you've got it, you'll have to shave costs to the bone in order to keep out of the red. If you're a construction worker, you'll have to scramble a little harder for a job. Don't be surprised if wage scales are trimmed somewhat — as work grows scarcer and competition for available jobs more pronounced, "boom" wages are going to take a beating in some categories. Considered realistically, objectively, there will still be plenty of jobs and plenty of contracts: but only for those who keep on their toes. As one veteran construction boss recently put it: the next couple of years will separate the men from the boys.

A BUNCH OF "IFS"—The slightly somber construction picture outlined above would of course be knocked into a cocked hat in a jiffy providing . . . any of the many firms seeking oil in Alaska strike a gusher . . . the international outlook becomes more tense, resulting in an upsurge of defense spending in the North . . . a heavy influx of population causes a significant increase in commercial construction and home-building.

CONSTRUCTION NEWS CAPSULES—Feasibility of piping natural gas to Anchorage from the Gubik area of northern Alaska is discussed in a report just published by the Alaska development board. The project would call for construction of a 650-mile pipeline . . . Harry Morrison, president of Morrison-Knudsen Co., Inc., recently made a tour of the firm's Alaskan construction jobs . . . Two television stations are planned in Fairbanks . . . A study of Alaska's highway program has been ordered by the Secretary of Interior . . . Anchorage will receive more than a million dollars of the \$9,500,000 Alaska Public Works program for the coming year.



today—it's a bigger catch with **MUSCLES OF STEEL**

Five billion pounds of fish yearly. It's a catch that would make the oldtime Gloucester fisherman gasp—yet it's all in the day's work for America's modern fishing industry. And it's a job that couldn't be handled without the aid of *muscles of steel*—indispensable wire rope.

Whether off the Newfoundland Banks, along the Gulf Coast, or in the waters of the Pacific, powerful winch-equipped trawlers depend on Wickwire Rope to haul in their heavily laden nets.

On landlubber assignments, too, Wickwire Rope has a vital role in helping American industry do a better and more efficient job. In the oil fields and the logging camps. In the mines and the quarries. On construction and highway projects. In numerous and varied materials handling operations. On all of these jobs, Wickwire Rope consistently demonstrates its ability to deliver performance that is unrivalled for long-lasting economy and reliability.

every industry benefits from wire rope

WICKWIRE ROPE



PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION



2534

THE COLORADO FUEL AND IRON CORPORATION—Abilene (Tex.) • Denver • Houston • Odessa (Tex.) • Phoenix • Salt Lake City • Tulsa
PACIFIC COAST DIVISION—Los Angeles • Oakland • Portland • San Francisco • Seattle • Spokane
WICKWIRE SPENCER STEEL DIVISION—Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.) • New Orleans • New York • Philadelphia

ENGINEERS on the move

Rear Admiral C. A. Trexel, CEC, U. S. Navy (ret.) has joined the Tudor Engineering Co., San Francisco. The other two partners in the firm are Ralph A. Tudor and Leslie A. Helgeson. Tudor was Under Secretary of the Interior until his resignation as of September 1, 1954.

* * *

Frank W. Callahan, Sacramento, Calif., has been appointed manager-labor director of The Associated General Contractors' Northern California Chapter. He replaces J. Robert Mitsch, who resigned to enter private business. Callahan joined AGC in 1947 after four years of labor and public relations work with the San Francisco District, Corps of Engineers. Previously, he had been labor expeditor for Pacific Bridge Co. and recruitment officer for Marinship Corporation. He has been held representative for the past seven years. David M. Day, a staff member since May 1953, has been named assistant manager.

* * *

L. W. Brown, division construction engineer at Billings for the Montana State Highway Commission, was reassigned as special assignments engineer at Helena as of September 1. Also reassigned at the same time were Paul M. Johnson, from resident construction engineer at Billings to division construction engineer; and Charles S. King, special assignments engineer, Helena, to assistant construction engineer.

* * *

George H. Kelleway, chief of the military planning branch of the North Pacific Division Office of the Corps of Engineers, who was in Casablanca for two years with the Corps in connection with air base construction activities, has returned to the Division office in Portland to resume his duties as branch chief.

* * *

Among recent personnel changes in Division 7, Bureau of Public Roads, San Francisco, are the following: J. N. Storrs has been transferred to Honolulu to assume the duties of assistant district engineer in the Hawaii District. Several Division 7 engineers are temporarily detailed to Division 8, Portland, Ore., to assist in the highway engineering work of that division: Osborne Anderson, M. H. Christensen, V. E. Carson, D. W. Ferguson, A. E. Grisom and R. C. Arwood.

In Division 9 of the Bureau of Public Roads, Denver, Colo., the following changes among the engineers are reported: George M. Williams, division engineer, has been transferred to a more responsible position in the Washington office of BPR. L. F. Copeland, division bridge engineer, retired Aug. 1 after a 41-year career of engineering in the Federal Government. He entered the Federal service with the Supervising Architect's Office in 1917, and transferred to BPR in 1917. F. W. Ambos, field locating engineer for the Division, retired Aug. 21 after 21 years of service.

* * *

Sam Ruvkun and J. E. Hughes were recently appointed to the position of assistant to vice president of Kaiser Engineers. Ruvkun, a licensed engineer, was formerly a project engineer in various company assignments. Hughes joined the Kaiser organization as an engineer at the Richmond shipyards in 1941, and for the past seven years has held the position of office engineer.

* * *

Col. Philip I. Baker, recently retired from Army service, is the new head of the structural division of Carroll E. Bradberry and Associates,

Colonel
Baker



consulting engineers of Los Altos, Calif. Colonel Baker has wide experience in all types of steel, reinforced concrete, masonry, and timber structures.

* * *

M. E. Bunger has returned to the United States from Jordan and plans to retire. In Jordan he was chief of water resources for the Kingdom of Jordan and while there prepared the plans for the irrigation of the Jordan Valley.

* * *

Bowerman, Hobson & Winter recently moved their offices in Woodland Hills, Calif., to more spacious quarters at 4638 Hollywood Blvd. Members of this architectural-engineering firm are Ralph Bowerman,

architect; Charles Hobson, architect; and Paul Winter, structural engineer representing among them 36 years experience in all phases of the architectural and engineering fields.

* * *

Irving B. Purdy has been elected a vice president of Merritt-Chapman & Scott Corp., responsible for administration of the industrial and building construction division. Prior to joining the M. C. & S. organization seventeen years ago, Purdy was associated with Henry J. Kaiser Co. on construction of the San Francisco Bay Bridge and Bonneville Dam, and earlier was chief engineer of Truscon Steel Co.'s Northwest Division.

* * *

R. C. Setterstrom has been elected president of the Northwest Electric Light & Power Assn., covering Oregon, Washington, Idaho, Montana, Utah, and British Columbia. He is industrial development engineer for The Montana Power Co. in Butte.

* * *

John D. (Dave) Davenport has been made project engineer on Wanship Dam, a USBR project on the Weber River, in Utah, being built by the Utah Construction Co. Prior to this recent appointment, Davenport was Utah's field engineer at its Arco (Idaho) project.

* * *

H. L. Dickinson of the Sacramento District, Corps of Engineers, is now chief of the San Joaquin Valley Operations Office, Fresno, Calif., in charge of operation and maintenance of six dams, including Pine Flat and Isabella. Also all Corps construction projects in the San Joaquin Valley are under his supervision. He recently had been project engineer for Halvorson Contractors at Tecolote Tunnel, Santa Barbara, and prior to that was project engineer at Isabella Dam for the Engineers.

* * *

Jack G. Fisher, is project engineer for Thorne & Marble Co., Seattle, at Mountain Home AFB, Idaho. Work involves bulk storage and hydrant refueling. Fisher formerly held a similar position with E. V. Lane Corp. on Larson AFB, Moses Lake, Wash.

* * *

Major John H. Carlson is now located at the 38th Parallel in Korea, as Executive Officer, 151st Engineering Branch (c), in charge of road maintenance, construction (building), etc. for the U. S. Army.

* * *

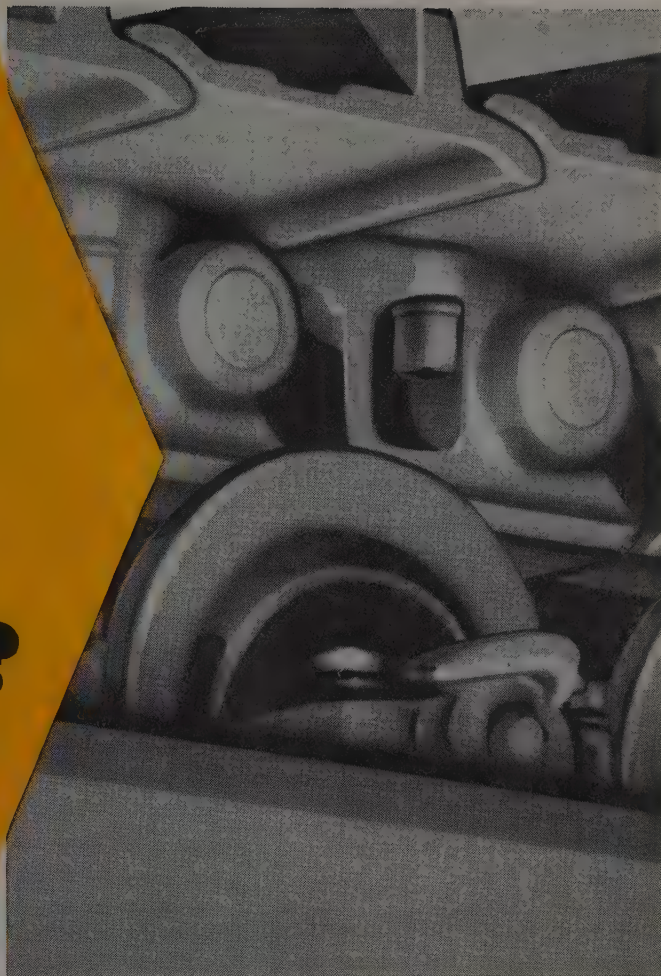
Donald E. Cardarelle, until recently chief of party for Kaiser Engineers, Inc., at Fontana, Calif., has gone into business as associate in the firm of John E. Cardarelle & Sons, civil engineers and surveyors, with headquarters in Minneapolis, Minn.

* * *

Charles N. Reynolds, Oregon state highway commissioner, and W. C.

Do you recognize this TORTURE CHAMBER?

It's somewhere in your operation. Its victim is choked with bone-dry dust... doused in slimy muck and... hammered and squeezed between hot, metal plates.



It's the track roller assembly on your tractor and its victim is the track roller bearings. They take this torture day after day! But there's a *sure* way to protect this important part of your tractor.

In heavy-duty Shell Tracrol Lubricant, Shell scientists have created a tough-bodied, water resistant lubricant that's specially made to meet *all* track roller bearing problems. For example:

DUST Ordinary lubricants are quickly contaminated in dust. Tough Shell Tracrol Lubricant seals out dust, dirt, sand and mud—protects against wear long after ordinary lubricants have become harmfully abrasive

WATER Other lubricants are "watered down," quickly lose body, or are flushed away. Water resistant Shell Tracrol Lubricant resists dangerous scouring and keeps right on protecting vital bearing metals even after *continuous* immersion in water

SIDEHILL LOADING Ordinary lubricants are squeezed away from vital bearing surfaces under these severe pressures. Adhesive, squeeze-proof Shell Tracrol Lubricant sticks and stays and protects even under the most extreme pressures

SHELL TRACROL LUBRICANT protects track roller bearings under all conditions



Williams, assistant Oregon state highway engineer, have been named members of a survey team to visit Alaska to study highway conditions in the territory. According to the announcement from the office of the Secretary of Interior, they will be accompanied by an Interior staff assistant.

* * *

E. A. Moritz, Boulder City, Nev., has been named by Governor Russell as a member of the Colorado River Commission. Moritz retired as regional director of the Bureau of Reclamation's Region 3 two years ago. Soon after his retirement he was named by the Secretary of the Interior as chairman of a national committee to study and recommend a plan for reorganization of the Bureau and a report of the findings was made in April 1953.

* * *

Recent staff changes in the district office of the Corps of Engineers at Sacramento, Calif., include the transfer of **Lt. Col. John B. Beckham** and **Lt. Col. Earl G. Peacock** to assignments with the Far East Command, and the appointment of **Col. Denis B. Grace** as the new assistant to **Col. William J. Ely**, district engineer, succeeding Beckham. Grace will be the disbursing officer for the district, handling the current \$40,000,000 military and civil construction program in the Sacramento region.

* * *

Claude Davolt, county engineer of Cowlitz County, Wash., retired from public office effective September 1. His successor is **Henry D. Martin**.

* * *

The appointment of **Glen A. Yake** as city water superintendent of Spokane, Wash., has been approved by the city council. He succeeds **Elmo James** who retired the end of September after 44 years of city service. Yake has been chief engineer for the Haskins Co.

* * *

Project engineers in the employ of the Los Angeles District of the Corps of Engineers who recently received reassignments include: **E. K. Hultberg**, assigned to the Yuma County Airport and Yuma Test Station, replacing **G. A. Lilley**, who was made project engineer at Whittier Narrows Project, succeeding **J. G. Morgan**, who was project engineer at this project since 1950 and had served with the Los Angeles District since 1935. Morgan retired after 27 years of Government service.

D. C. Baer was assigned to the Kingman Weather Station Project, Kingman, Ariz. In addition to his other duties, **Harry F. Althaus** is now project engineer at the Winslow Weather Station Project at Winslow, Ariz. **W. W. Zimmerman** has relieved **W. S. Cowart** at Los Angeles River, Victory to Los Feliz Project. Cowart went to Arcadia Wash

DEATHS

Edward F. Emmick died July 21. Until his retirement last May, he had worked for the Washington State Highway Department as design engineer.

* * *

Joseph Terteling



Joseph W. Terteling, 59, partner in the nationally-known construction firm of J. A. Terteling & Sons, Boise, Idaho, died recently of a heart attack while vacationing with his family in Honolulu.

* * *

Charles E. Braddock, died Aug. 28 after a long illness. He was well known as a civil engineer in the San Francisco Bay area where he had worked on many public and private construction projects. At one time he had been resident engineer on the San Clemente Dam and the Posey Tube.

* * *

John H. Sellen, Sr., a Seattle civil engineer, died Aug. 19. During World War II, he was with the Army Engineers and in the past few years had been associated with his son's firm, the John H. Sellen Construction Co., Seattle.

* * *

Leon H. Taylor, 90, died recently in Los Angeles after a brief illness. He was the man who engineered the

System as project engineer, in addition to his other duties. **C. S. Maxwell** was assigned to Saw Pit Debris Basin, and **H. N. Gray** to Mt. Gleason, Site 04.

* * *

Edwin A. Rand, mechanical engineer in the Engineering Division,

CORRECTION

An item in the August issue of *Western Construction*, page 112, was in error. The assignments of **H. F. Wallace**, **G. A. Patterson** and **E. A. Wilkerson** as resident engineers on jobs in State Highway District 1, Washington, were made by **D. D. Forgey**, District Engineer in Seattle.

P. C. Leonard, himself a resident engineer in the district, did not make the assignments. We are sorry he has been embarrassed by our editorial mistake.

Rush T. Sill, consulting engineer and geologist and partner in the firm of Ruscardon Engineers, Los Angeles, died in a plane crash in Lower California (Mexico) on August 19. He was 72.

It was in consulting practice since 1930 that Sill became widely known in Western construction. He served on many consulting boards, especially where dams and tunnels were involved. Among his clients were the Los Angeles Department of Water & Power, heavy contractors, and the Bureau of Reclamation. Only last year he was one of three men reporting to the Bureau on means of solving the construction difficulties of Tecolote Tunnel (*Western Construction* — August 1954, p. 59).

A two-part article on tunneling practice marked Sill's last appearance as an author in *Western Construction*, in 1951. But only last summer his consultation and guidance were acknowledged by **Seth Woodruff**, author of a two-part article on rock bolt support in tunnels. This was evidence of his progressive spirit and interest in the profession. Engineers and contractors alike will long remember his services to the construction West.

Truckee-Carson irrigation project in Nevada, where he worked from 1901 through 1907. In late years he was associated with his brother at Reno in a civil engineering firm until his retirement in 1947, when he moved to Southern California.

Los Angeles District, Corps of Engineers, retired September 1 after nearly 20 years of service. During his Government career he worked on the design and construction of various power plants in Utah, Oregon, Arizona, California and Texas. After his separation from the Army in 1946 with the rank of lieutenant colonel, he returned to the Los Angeles District.

* * *

Kenneth Brunner was recently appointed chief construction engineer for the association of **J. S. Hamel** and **A. A. Dorman**. Brunner, formerly a design engineer with **Koebig** and **Koebig** of Los Angeles, is working on the Disneyland project located south of Anaheim, Calif.

* * *

San Diego Section of the American Society of Civil Engineers recently elected a new roster of officers to serve a one-year term. **William J. Bobisch** of La Mesa, Calif., was chosen president. **Jean L. Vincenz**

CALENDAR

Nov. 4-6—Associated Equipment Distributors, joint-meeting of Regions 11, 12 and 14, Broadmoor Hotel, Colorado Springs, Colorado.
Jan. 10-13—American Road Builders' Association, annual meeting at Roosevelt Hotel, New Orleans, La.
Jan. 23-28—Associated Equipment Distributors, annual meeting, Conrad Hilton Hotel, Chicago.
Feb. 7-9—Association of Asphalt Paving Technologists, annual meeting, Jung Hotel, New Orleans.

was elected first vice president; **George R. Saunders**, second vice president; **Charles A. Smith**, secretary, and **Martin P. Capp**, treasurer. **Robert K. Fogg** is immediate past president.

* * *

Col. Leland H. Hewitt, U. S. Army (ret.) recently received an appointment from the President as U. S. Commissioner on the International Boundary and Water Commission, United States and Mexico. The former commissioner, **Lawrence M. Lawson**, retired Feb. 13, 1954.

Technical data

The American Concrete Institute announces publication of "Bibliography on Prestressed Concrete." This 86-page book lists 2,000 American and foreign literature references on the subject of prestressed concrete, published from 1896 through 1953. A separate section lists about 60 U.S. and foreign patents. The 8½x11-in. format is punched for easy filing in 3-ring binders. The book was prepared as a part of the work of ACI-ASCE Committee 323, Prestressed Reinforced Concrete, and is priced at \$2.00. Address Book Editor, American Concrete Institute, 18263 W. McNichols Rd., Detroit 19, Mich.

* * *

Bulletin of the Seismological Society of America (April 1954, 2nd part), entitled "An Engineering Study of the Southern California Earthquake of July 21, 1952 and Its Aftershocks," (Vol. 44, No. 2B) by **Karl V. Steinbrugge** and **Donald F. Moran**, is now available from the Society. Book sells at \$2.00 a copy. Remittances should be made payable to the Seismological Society of America and addressed to Perry Byerly, Bacon Hall, University of California, Berkeley 4, Calif.

A complete workshop for use everywhere a many-duty power saw is needed. The CUB has a ¾ h.p. motor with 7,000 RPM blade speed and 12,500 RPM for shaping, etc.

COMET CUB

\$267⁷⁵*

Economy saw with 1 h.p. motor and 10" blade. Has all the safety and quality features found in more expensive units.

COMET UTILITY

\$375⁰⁰*

Lowest price of any saw of comparable capacity. Has 14" blade, 1½ h.p., and will perform all wood-working functions with hairline accuracy.

COMET JUNIOR

\$450⁰⁰*

Choice of fully-rated 2, 3, 5 or 7½ h.p. motors. 16" blade. Large work capacity. Ideal for builders and industrial uses.

COMET CLIPPER

\$570⁰⁰*
UP

Accommodates blades to 20". Makes cuts 6" deep. Can accommodate 1" material to 30" wide and will rip 40" wide.

COMET SENIOR

\$750⁰⁰*
UP

*F.O.B. Los Angeles

which
COMET
 fits
 your
 job
 best?

All COMET saws offer the highest quality and safety. Each is designed with ample overload capacity and many extra features to reduce operator fatigue. Write for catalog information or ask your COMET dealer for an on-the-job demonstration.

CONSOLIDATED
 MACHINERY & SUPPLY CO., LTD.
 2033 Santa Fe Ave.,
 Los Angeles 21, Calif.

MANUFACTURERS OF
 TIMBER CUTTERS, PANEL CUTTERS,
 TRAILER MOUNTED SAWS AND
 METAL-CUTTING MACHINES

SUPERVISING the jobs

L. G. Shriver, Jr., is project manager, and Meade Harker is general superintendent handling a contract for Morrison-Knudsen Co., Inc., involving mining and hauling phosphate ore at Soda Springs, Ida., for Monsanto Chemical Co. John Williamson is master mechanic.

Soon to be completed at the Monsanto plant is the second multimillion dollar electric furnace producing elemental phosphorus. Wigton-Abbott Corp. is the contractor. W. L. French, as project manager, is directing the work, assisted by R. R. Robertson. General foremen are: Alex Ristow, ironworker; Ernie Weed, carpenter; and Ernest Runyan, labor. Walter Krupa is millwright su-

perintendent. Pipe is subcontracted to W. S. Hickey, for whom O. V. Mitchell is superintending, with the assistance of M. P. Kennedy, general foreman. Electrical work is being handled by H-T Electric Co., with John Benard superintending, assisted by C. N. Wetmore and Leo Knudson, general foremen.

Monsanto personnel are J. M. Depp, construction engineer; and E. C. Trammell, F. A. Eldred, G. C. Bradley and W. C. Robbins, field.

* * *

R. J. Sundling is project manager on a contract recently awarded to Sundling Construction Co. for 7.3 mi. of grading and surfacing on Highway

10, Big Timber to Livingston, Mont., a \$196,000 job for the State. General superintendent of the work is W. A. Culp. L. W. Adams is plant operator, and R. H. Rogers is mechanic.

* * *

Paul H. Swanson is project manager, and William J. Kennish is general superintendent for Palisades Contractors (J. A. Jones and Chas. H. Tompkins Co.) on this joint venture's contract at Palisades Dam for the USBR. John C. Mundt is assistant to Swanson. Others among the key men are: Excavation—Harold Taylor, Gears Bierhaus and George Carey, shift superintendents; Sam Ware, Bud Haymond, Bud Sisk and David Sims, Jr., foremen. Jim Brown is master mechanic. Other foremen are Joe Howell, Dick Whitmore, Joe Hamby, Frank Shaw, James Scheimer and Bob Goodfellow. Carpentry and concrete—Charles Silva, superintendent; Dick Cain, concrete superintendent; H. P. Russel and Morris Nelson, assistant carpentry superintendents; Bill Linneberger, Gus Odegard, Bill Emerson, Leo Haag, Virgil Haag, Don Enfield, Charles Stiles and Clarence Craig, carpentry foremen. John Nesheim and Harold Hansen are labor foremen. Earl Haderlie, F. L. Buckland, Ervin Thomas, Ralph Winner, Arnold Bush, Kenneth Clement and Ralph Haderlie, concrete foremen. General labor foremen are Hilton Morris and Myron Sanders. John Hanson is rigging superintendent, assisted by E. J. Kesler, Harold Ness, Frank Barney and Robert Brown, steel foremen. Foreman on the batch plant is Lloyd Clark. Richard Fegert is rock superintendent, and Howard Goodwill and Harold Fenton are drill foremen.

Other key men are "Dutch" Foster, tire foreman; Mel Newbold, parts manager; Ollie Marriott, warehouse superintendent; Pete Jaeger, purchasing agent; Wayne Call, personnel manager; Bud Bithell, chief accountant; Don Orcutt, paymaster; H. G. (Pappy) Moore, camp manager. George Watson is office manager.

L. B. Kuhnle is project engineer; Quenton Holmes, office engineer; Dick Carleton, design engineer; Dick Corry, field engineer, Cordell Stock, party chief; Art McGown, safety engineer, and Scott Gardner, costs.

Statewide Steel Erection Co. is doing the reinforcing steel. A. K. (Gus) Boyd is in the superintendent spot, assisted by Bruce Bray. Foremen are: Robert Jackson, Ronnie Henrikson, Carl Anderson, Dorance Wainscott and Gene Varner. The office is managed by Lyman Jenkins.

For the USBR, Eugene P. Boyt is head of the mechanical branch; Morris I. Kaufmann, mechanical engineer; and Bill J. Morton, electrical.

Down-time By Domagalski



"Did it come through okay, Jack?"

Western Construction



Leschen engineers tell you how to determine

Proper Use of Wire Rope with Wire Rope Core

First, what is it? It is a completely metallic rope made with a separate wire rope as a core, instead of the usual fiber core.

Why is it used? The steel core resists extreme pressure of individual strands on the core under very heavy loads. Here, a Red-Strand steel core rope substantially outlasts a fiber core rope. The extra steel in the core increases rope strength and safety by 7½%, compared with wire rope with fiber core. For occasional heavier loads this eliminates time and expense of changing sheaves, blocks and equipment to suit a bigger fiber core rope.

Red-Strand steel core rope answers the problem of crushing when rope is spooled in multiple layers on small diameter drums and winches—or when heavy loads are dragged or pulled. It also resists the damaging effects of excessive heat.

Where is it used? For extra strength and to resist heavy load pressure: on shovel and draglines—for drag, hoist, crowd and frequently boom ropes; on dredges, trench hoes, cranes and similar heavy duty equipment. To resist crushing: on bulldozers, scrapers, coal cutters, coal loaders, logging, arch and

choker lines, and on rotary drilling lines. To resist excessive heat: on hot ladle cranes.

Which make should you use? Red-Strand steel core wire rope is highly recommended by its users for its higher-than-rated quality and longer-than-expected service. That saves money.

What's the next step? Talk to your Leschen distributor or Leschen field man. They're well qualified to answer your specific questions about Red-Strand steel core wire rope—or to help solve other wire rope problems. That means profit for you.



Where stress, pressure and crushing occur on rope jobs like this and on rotary drilling lines and winches. On these jobs it pays to use higher-than-rated quality Hercules Red-Strand wire rope with wire rope core.



Where tons of molten steel are to be lifted by wire rope, great strength and resistance to intense heat are required. Here Hercules Flattened Strand wire rope with wire rope core delivers much longer-than-expected service.



Hercules Red-Strand wire rope made by
LESCHEN WIRE ROPE DIVISION
 THE WATSON-STILLMAN COMPANY
 (A SUBSIDIARY OF H. K. PORTER COMPANY, INC.)
 St. Louis 12, Missouri



With Atkinson Ostrander at The Dalles Dam are (from left) **Charles Mason**, rigger superintendent; **Lewis Sheddy**,

powerhouse superintendent, and **John Bowman**, carpenter superintendent. **V. R. Bradley** is general.

L. P. Sowles as field manager is directing the execution of the contract of the American Pipe & Construction Co. at the Palisades Dam in Idaho. **H. T. Jobe**, who was project manager, recently transferred to the company's main office at Southgate, Calif., to resume his duties as general superintendent. Project superintendent at Palisades is **Al W. Zito**, and the project engineer is **Ed Butler**. **Frank Luck** is timekeeper. **J. M. Crumley** is division welding engineer.

Gordon Blake is project welding foreman; **Tony Gallo**, boilermaker foreman; and **Bert Kauffman**, rigger foreman. Also working at the project for American Pipe are **Chet Conlin**, boilermaker, and his helpers, **Dick Zito** and **David Zito**; **Bob Hudson**

and **Harley Walters**, welders; and **Orv Falkenstein**, layout man.

Oscar Feezer, who until recently was with Palisades Contractors at Palisades Dam in Idaho, has left for Punjab, India, to work on the Bhakra Dam as an instructor supervisor, mechanical.

Ray Brofield, project manager, and **Joe Hurtado**, general superintendent, head the personnel working for Nomellini Construction Co. on its \$886,000 contract for construction of a jail building at Modesto, Calif. Hurtado has the assistance of **W. Hamilton** and **Wayne Streeter**. **Johnny Faulheim** is in charge of reinforcing steel for Statewide Steel Co. **Clarence Durkart** is directing the

John W. Vichrey, Jr., general superintendent, is directing a freeway paving job of the California State Highway Department between Tracy and Altamont Pass on Highway 50, for **Gordon H. Ball & San Ramon Valley Land Co.** Others among the

Vichrey

contractor's key men are **Floyd Davis**, master mechanic; **Bill Wentworth**, concrete superintendent; "Shorty" **Dumas**, in charge of plant operation; and the following foremen: **J. L. Valek**, welding; **Joe Jur-**

Jurovich, Ball and Davis

kovich, grade; **Martin Bojcich**, headerboard; **Leo Zillich**, soil cement; **Nate Ball**, labor; and **Fred Straub**, truck. **Sam Matthews** is office manager, and **Bob Davis** is in charge of purchasing. Representing the Highway Department are **H. E. Atherstone**, resident engineer, and **Elton Fletcher**, assistant engineer.

electrical installations. **Roy Hill** is steamfitter foreman for **Hansen Mechanical & Electrical Co.**

* * *

Elmer Nelson, general superintendent, and **Robert Hansen**, project engineer, are top men for **Hagstrom Construction Co.** which is building a 76-bed hospital at the Great Falls AFB, Great Falls, Mont., for the Corps of Engineers. Others among the supervisory personnel on this \$1,430,427 project are the following foremen: Carpenter—**Alf Anderson**, **Laurence Longley**, **J. P. Mooseau**; labor, **George Urbach**; cement finisher, **Finar Renning**.

"**Vic**" **Junger**, general superintendent, **Frank Ritter**, steel foreman, and **George Likness**, structural foreman, are top personnel for **Superior Steel Contractors**, which firm has the reinforcing and structural steel. General superintendent **Albert Carlson**, and **Wallace Bell**, plumbing foreman, are on the job for **Carlson-Duluth Co.**, on the plumbing and heating contract. **Harold Snyder** is superintending the electrical work, assisted by **Al Lorange**, foreman, contract for which is being executed by **Rowe Electric Co.** **Don Nordland** is supervising the roofing and sheet metal work for **Austin Heating & Sheet Metal Co.**

Roy E. Pollard is inspector for the Corps of Engineers on this work.

* * *

E. E. Frost, general superintendent, under the over-all direction of **Millen Simpson** of the contracting firm of **Ball & Simpson**, is heading the construction work on Highway 108 (Sonora Pass), a \$900,000 project recently awarded the Bureau of Public Roads. **Hugh Davis** is assistant superintendent. **Tony Young** is master mechanic. **Larry Wigell** manages the office and **Bill Rose** is timekeeper. Elevation at the working site is 6,500 ft. and the roadway extension involves 85% solid granite. Completion date is scheduled for October 1955. Engineers for the BPR are **Mr. Jackson** and **Harry Sahagan**.

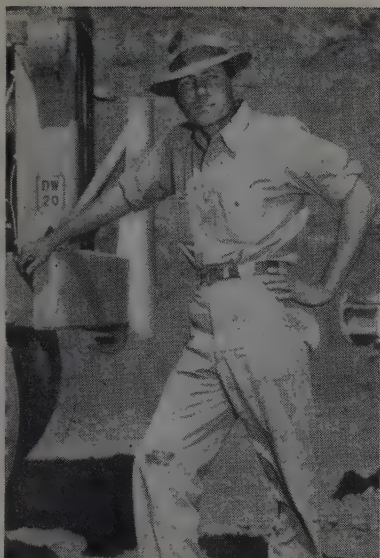
* * *

Walter Crosby, project manager, and **Jim Everett**, general superintendent, are top men on the \$390,000 contract of **Nomellini Construction Co.** for erection of a cold storage plant at Modesto, Calif., for **Merchants Refrigeration Co.** Others among the job personnel are **Ray Wallstrom**, foreman; **Zill Hensley**, finish foreman; and **Luther Miller**, pusher.

* * *

M. L. (Bud) Smith is directing the construction of a medical clinic project at Modesto, Calif., for **Howard J. White, Inc.**, which recently received the award at about \$300,000. **L. V. Ingram** is one of the key men among the job personnel.





M. H. Hasler, Jr. (above) is general foreman on day shift for highway work being done by D & H Construction Co. south of Dillard, Oregon.

Russell Kamp, assisted by Chuck Robin, is superintending an \$812,000 contract recently awarded to Granite Construction Co. at a cost of about \$812,000 covering street construction for the city of Merced, Calif. Assisting these two supervisors are the following foremen: **Cliff Jasper**, paving; **Harley Davidson**, grading; **Clyde Covington** and "**Rocky**" **Rockwell**, rock; and **Gordon McGowan**, concrete. Office manager is **Earle Wallace**.

On a \$160,000 contract for highway construction near Merced being executed by the Granite Company, Kamp is also superintending, with the assistance of Robin. **Rollie Barton** is foreman on grade; **Larry Burton** is plant superintendent, and **Ysi-bro Mariscal** is batch plant foreman.

Billy Christiansen is top supervisory man for Granite on some subdivision work near Merced for C. R. Fisher Sierra Gardens. Key men on concrete are **Jack Pruitt** and **Loay Hall**.

* * *

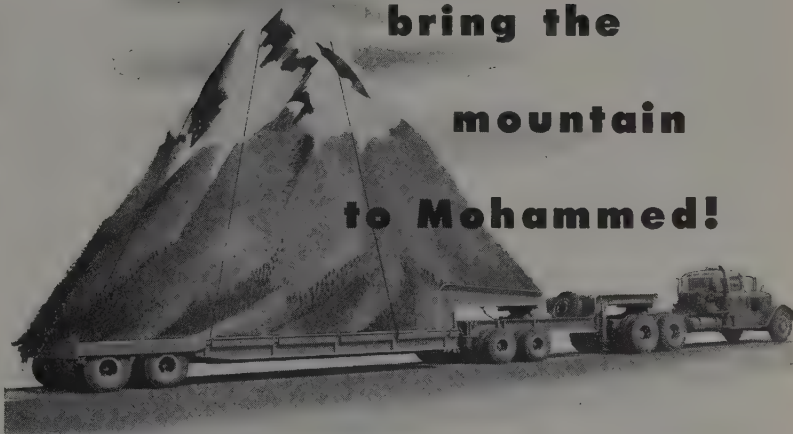
William W. Dawdy is project superintendent for Pipe Linings, Inc., on a recent \$323,907 award from the City and County of San Francisco. The following men are assisting in the work: **John A. Gay** and **Elmer Dawdy**, lining superintendents; **Arthur S. Brannen**, excavation superintendent; and **Arthur Dussault**, pipeline foreman. This is the third consecutive contract awarded to Pipe Linings for cleaning and cement-mortar lining in Hetch Hetchy Aqueduct, and will mean a completed lining distance on this project of 204,828 lin. ft., in sizes from 72- to 58-in. diameter.

now they can

bring the

mountain

to Mohammed!



The moving
of a mountain...

is no longer impossible with the present day earth-moving and excavating equipment in the construction field.

However, with equipment of this size, especially engineered trailers must be used to move them from job to job.

Utility is proud of their record with progressive operators all over the West who depend upon them to build equipment for this difficult task — men who know from experience that Utility Trailers will operate year after year with greater dependability and lower maintenance cost.

If your hauling requirements need especially designed equipment, or a standard trailer, UTILITY is your best buy.

The sales representative in your area (they're in every principal Western City) will be glad to explain in detail why the name UTILITY is the recognized standard of trailer quality.



The WESTERN CONSTRUCTION camera at TIBER DAM

Chuck Hensman, our field representative, was all over this Reclamation job in August. Nearly everyone got in front of his camera. So, except for the lens busters, here are the men building Tiber Dam!

Guy H. James Construction Co. and Wunderlich Contracting Co. have the prime contract—about \$13,000,000—on this job near Chester, Montana. **RIGHT:** here are the top men, in the usual order: *John New*, grading superintendent; *F. A. Blecker*, project manager; and *J. R. Williams*, chief engineer. The office staff includes *Faye Conroy*, engineer, and *W. S. Aman*, manager.



Here are *Fred Turnham*, pit foreman; *Pat Stewart*, grade superintendent; *L. E. Bunting*, pit foreman; *Glen Phillips*, fill foreman; and *Sam Crawford*, night superintendent.



In the usual order: *Ray Spittler*, spillway superintendent; *David Sewell*, welder; *Clyde Clutts*, carpenter superintendent; and *Charles Ott*, carpenter foreman.



LEFT: *A. C. McDaniel*, assistant concrete superintendent, and *Ray Spittler* again, spillway super. **CENTER:** *Fred Bearer*, equipment superintendent; and



Jack Robbins, shop foreman. Others on equipment are *W. S. Hunt*, parts manager; *C. C. Murphy*, shop foreman, and *Max Morelock*, lube foreman.



RIGHT: *Ben A. Hull*, welder foreman, and *Phillip Botts*, dirt foreman. Other dirt foremen are *M. B. Marsons*, *E. F. VanDorn*, *C. E. Waggoner*, *T. R. Karns*.



Carpenter foremen include *T. J. Stevens* and *C. J. Keeton*. Not shown are *Dallas Pitts* and *B. G. Hutchison*.

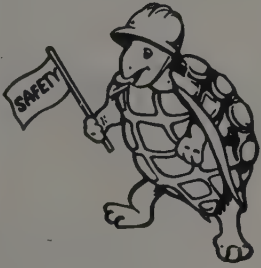


All foremen: *Dale Rouley*, concrete; *D. J. Krebs*, labor; *C. L. Morse*, clean-up. Not shown is *Clyde Wiseman*, labor.



Harry Vontz, saw filer; *Roy Banning*, carpenter foreman, and *Harold Carey*, plant foreman.

Turtle Club



Floyd Capps, an employee of Macco Corporation, qualified for membership on May 10, 1954, at Redondo Beach, Calif., where he was supervising a construction crew. The workmen were removing some sheet piling when a steel pin, 3½ in. in diameter and weighing 18 lb. broke in the extractor and was thrown to a height of 12 ft. and a distance of 30 ft., striking Capps a direct blow to the head.

Sterling R. Caviness was only slightly injured, but qualified when he got a hole in his hat when a heavy object fell on him May 20, 1954, while employed by Columbia River Constructors at Chief Joseph Powerhouse, Bridgeport, Wash.

New applicants should write Editor, **Western Construction**, 609 Mission St., San Francisco 5, or E. D. Bullard Co., 275 Eighth St., San Francisco 3.

A million dollars worth of tunnel work at Tiber Dam is under subcontract to A. J. Cheff Construction Co. Completion of this 2-yr. chore was scheduled for last month. Pictured



Cheff and Bonderenko

here are Oscar J. Cheff, general superintendent, and Ed Bonderenko, master mechanic. A couple of other men "broke" our camera: Earl Cheff, tunnel super, and Ed Castle, carpenter super.



Tough Digging in Close Quarters

IN PORTLAND, MAINE, the soil in many places can be downright troublesome, with large stones and boulders mixed in with smaller stones and gravel, a combination that makes tough digging. Add to this the fact that trench lines in many places run right alongside rows of trees, poles and other obstructions and you've got a really mean job of trenching.

Yet this CLEVELAND Model 95 "Baby Digger" is moving right along on the job—as shown by the discharge from the conveyor—coming through with the same dependable performance that has made it an outstanding favorite for over 30 years.

This is the kind of job where CLEVELAND'S famous multi-speed transmission really pays off, enabling the operator to select the *right* combination of power and speed for the particular job condition from more than 30 available combinations of digging wheel and crawler speeds.

The "Baby Digger's" compactness and maneuverability also played important parts in completing this job right on schedule in spite of numerous obstructions. The large boulders deposited to the left of the trench in the photo show that good use was also made of CLEVELAND'S reversible conveyor on this job.

Write for descriptive bulletins and specifications, or get the full story on CLEVELANDS from your local distributor.



THE CLEVELAND TRENCHER CO.

"Pioneer of the Modern Trencher"

20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO



TOP: (left) *Reece and Thompson*; (center) *Wilkerson and Sims*; (right) *McClurg and Heinrichson*.
BOTTOM: (left) *Ford*; (center) *Davis and Beckerley*; (right) *King*.

E. P. Ogle is project manager and H. J. Bowles is job superintendent working under the general supervision of J. W. Cullen, vice president of J. A. McNeil Co., Inc., contractor doing the concrete and earthwork on the Anaconda Aluminum Co. plant at Columbia Falls, Mont., a \$3,000,000 project.

C. A. Schmeltzer is office engineer, and Michael Gaines, cost engineer and office manager. W. C. Duffy is detailer. Dick Harvey is field engineer. Area superintendents are J. E. Thompson, W. V. Reece, Floyd Sims, E. A. Hokanson, Ross Womack, and E. J. Cuba (re-steel).

Foremen: Carpenter—Erv Leach and Al Wilbert (general); Grant Carpenter, Bill Brown, E. L. Kelly, H. G. Lewis, S. E. Guiney, D. W.

A. T. Mercier, project manager, and Ed Perkins, superintendent, are supervising the construction of a public high school at Pittsburg, Calif., a \$1,000,000 job recently awarded to Acme Construction Co. Z. H. McCarley is labor foreman.

* * *

Mac Lyles is project manager for a pipeline job of the California State Highway Department on S.H. 152 near Los Banos, for W. M. Lyles Co. Kenneth O'Shields is general super-

Stone, J. R. Hazelwood, E. E. Thompson, S. A. Wilkerson and George French. Cement finisher—"Mac" McClurg and L. J. Heinrichson. Labor—G. W. Senner. Among the other job workmen, Frank Hamilton is employed as a saw filer.

Subcontractor on the steel erection is American Bridge Co. (Foley Construction Co.) Joe A. Davis is general superintendent. W. G. Beckerley is erecting engineer. Steel foremen are: Kenneth J. Shubert, Howard C. Easterly, Charles J. Burlison, Emmett E. Watts, James Faulkner, Leon M. Prine, Charles L. Crawford and Joseph W. Byars. Graver Tank Co. has the subcontract for tank erection, with H. L. Ford superintending. Glen Gerry Co. is doing the excavating and grading, with Frank J. King, superintending.

intendent and R. D. Zapp is his assistant. Job is just about finished.

* * *

Practically the whole crew for Hakes Erection Co. at Tiber Dam turned out for the Western Construction camera in August. But the focus was bad, and we'll have to settle for names only! Vern Hakes, owner, is on the job, with John Thay as erection superintendent and Milton Kenley as foreman. Among the ironworkers are Elmer Taylor, Paul Pickett,

Max Stewart, Bill Heilig, Wilbur Limpp, and Eddie Klundt. Dan O'Fallon runs their crane. Sorry about the picture, men!

* * *

Louie Mohr is superintendent for F & S Contracting Co. which received a contract involving backfill material for mines at Butte, Mont. General foreman on the work is Les Smith. Project is being built for Anaconda Copper Co.

* * *

In addition to the names already reported in *Western Construction*, July 1954, we give below a list of further personnel working in Oregon for The Dalles Powerhouse Constructors at the Dalles powerhouse. "Bill" Money, assistant general superintendent, and David A. Kelly, assistant field engineer. Also Duane F. Lent, chief draftsman; Vikfors Schleis, draftsman; H. C. Barker, expeditor; and E. R. (Shorty) Corns, assistant expeditor. And Sid Stewart, general carpenter superintendent; Joe Heckert, carpenter superintendent; and "Dutch" Peters, labor superintendent, as well as the following foremen: Elwood Peterson, shop; "Pete" Peterson, carpenter; and Denty Young, rigger. Roy Quick is crane operator; Joe Steelman, cat operator; Monty Gay, compressor-house operator; and Frank Sharkey, truck driver. Ed Chaddic is wagon drill operator and Don Sant is a heavy-duty operator.

Directing the work of Wyatt & Kipper Engineers, Inc., contractor on the piping and plumbing subcontract for the first phase of the powerhouse, is Earl M. Roark, superintendent. Other important personnel on this job are George Morgan and A. W. (Bill) Watson, day shift foremen; and Phillip Randall, swing shift foreman.

Working at the site for Steel Constructors, are "Charlie" Fitch, steel foreman, and the following ironworkers: Bill Wychoff, Dick Fordyce, Jim Gilbert, Win Weybright, Art Beaddy, John Buckholz, and Bill Kasari.

* * *

A. J. Vercruyssen, general superintendent, and L. C. Snell, job superin-

MEN OF STEEL

Superior Steel Contractors has a big sub at Tiber Dam, for re-steel fabrication and placing. They've been at it for a year and a half; should be finished this year. Pictured here are M. M. Barber, co-owner of Superior, and Charles "Lindy" Myers, the job super.

The steel crew includes (top row): Lindy Myers again, the super; Vern Miller and Forrest Rockney, ironworkers. In the front row are three foremen: Val Hawthorne, Clint Myers and Leonard Butler.





C. C. (Whitey) DeArmand, superintendent (above), is head man on Ford J. Twaits Co.'s contract for construction of a \$1,500,000 chemistry-biology building, being erected at Pasadena, Calif. C. A. Gruber is engineer on the same project, and Dave Reece is job accountant. The structure is designed for three stories above ground and two below.

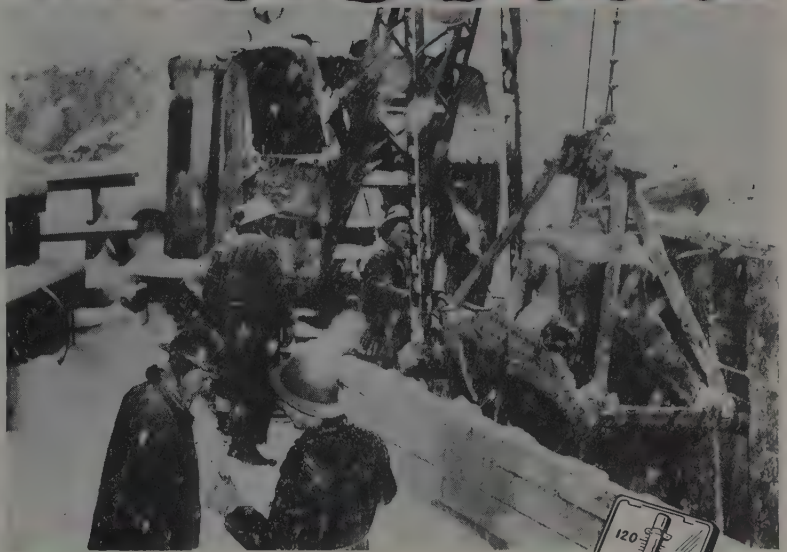
tendent, are top men among the personnel of Rice Bros., Inc., which has 7.2 mi. of grading and surfacing work on Route 3 and Paynes Creek Bridge east of Red Bluff, Calif., a \$184,433 job.

* * *

Among the principal personnel directing the work of Guy F. Atkinson Co., contractor on Cherry Valley Dam under construction in California (Western Construction, Sept. 1954, pp. 57-60, 105), are the following: "Gus" Steiner, project manager; Ray N. Atkinson, assistant manager; "Hank" Quade, project engineer, assisted by H. R. Anderson, field engineer. Also Errol Platt, business manager; Fred (Buck) Bales, paymaster, and Larry French, his assistant; Paul Miller, accountant; Pooley Dillinger, in charge of warehouse; Steve McCandless, camp manager; and Taylor Blasingame, Don Dawson, Tom Owings, timekeepers.

Also supervising for Atkinson on this job are to be found: Excavation—Joe Canto, superintendent; "Blackie" Costner, Wayne Wooten, Les Nedrow, Mainess Leach and H. R. Martin, excavation foremen; Jim Henry, dozer foreman (all on the day shift). "Slim" Chapman, shift superintendent; Ernie Gressot, Marty Sheeran, Ed Spooner, William Harnit and John (Woody) Woods, excavation foremen (swing). Bill Warrens is fill foreman on the graveyard. Fill—Les Pettit, E. M. Daley and Less Reid, day foremen; Dale Smith and T. E. (Whitey) Norton, (swing).

Frosty OWEN



at HUNGRY HORSE DAM

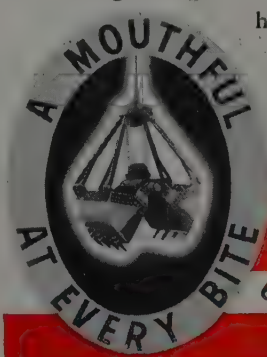


In a majority of "run-of-the-mine" jobs and most of the exceptionally noteworthy projects you'll find Owen Buckets handling important digging and material handling operations.

That is true whether it is a bridge abutment, a dam foundation, caisson work, deep trenching, aggregate handling or "what have you."

The Hungry Horse Dam is an example. Thirty degrees below zero weather didn't stop operations or hinder this Owen Bucket in performing the desired service required in deep down digging of frozen clay, shale, etc.

You, too, can depend on Owen.



THE OWEN BUCKET CO.

6060 Breakwater Ave., Cleveland 2, Ohio

BRANCHES: NEW YORK, PHILADELPHIA, CHICAGO, BERKELEY, CALIFORNIA, FT. LAUDERDALE, FLORIDA

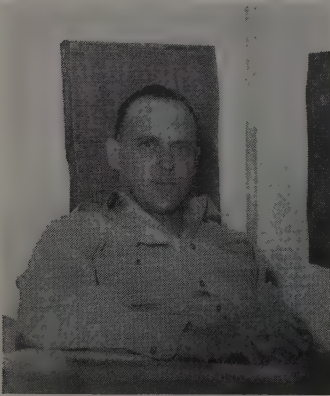
Box Canyon Dam: M-K on the Pend Oreille again



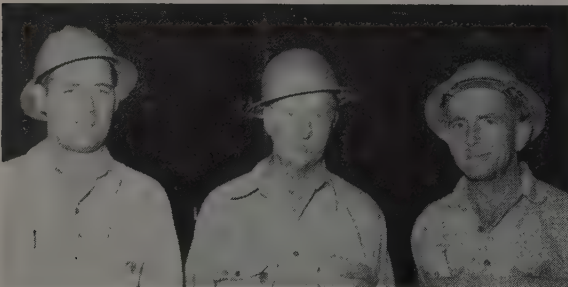
Long forebay channel hugs left bank below dam. White water from the diversion tunnel is stopped short of the powerhouse and turned out to the right just beyond boulders stockpiled for river channel cofferdam closure.



A relaxed moment for small talk and cleaning glasses is the only time to catch *Odus Hankins*, rigger superintendent, and *Simon Piedmont*, project manager. They moved the Pend Oreille as described on pages 63 through 67.



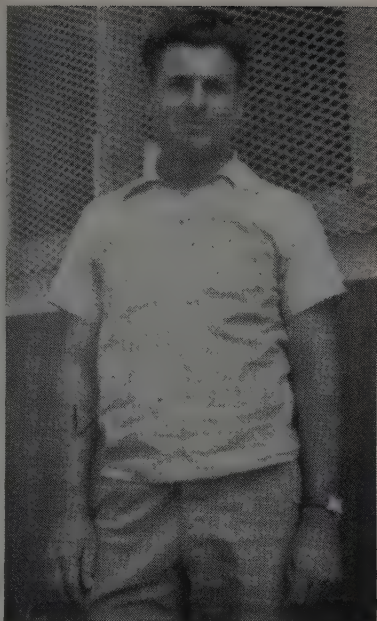
LEFT: *C. K. Willey* is resident engineer for Harza Engineering Co. Utility District consultants are *H. A. Sewell* and *J. A. Sewell*. **RIGHT:** *J. A. Sewell*, assistant resident engineer, and *P. V. Campbell*, manager of Pend Oreille County Public Utility District.



ABOVE: Their job was to have all machines ready to go on the cofferdam closure. They are *Ed Hardin*, shop foreman; *Clarence Harmon*, equipment superintendent, and *Kenneth Wilmuth*, shovel foreman.

RIGHT: This bunch had the job all lit up—and they fixed the flash gun on *Western Construction's* camera! Here are *Harry Smith*, chief electrician; *Paul Kruger*, business agent; *Don Lantz*, line foreman, and *Homer Steele*, electrical general foreman.





John L. Skaggs (above) is project manager, and **Harold Corner** is general superintendent on a tilt-up structure going up at Modesto Junior College in California, a \$230,000 contract recently awarded to **Floyd G. Borchardt**, contractor.

Drill and shoot—**Carl Schmidt**, superintendent; **Tom Yant** and **Ed Myers**, drill foremen, and **Sam Molan**, powder foreman (days); **Jake Absher** and **Dave Appier**, drill foremen (swing).

Moe Crader is truck dispatcher; "Fuzzy" **Casstevens**, tire superintendent, and **Al Main**, electrical superintendent (days). On the swing, **Jake Coffey** is truck dispatcher; **Vern Lough**, tire foreman; and **Hank Hoover**, electrical foreman. **Bert Louis** is master mechanic, **Rex Moss** is his assistant; **Bob Whitfield** is welder foreman, and **C. N. Sowash** is mechanical foreman (days). On the swing shift, **Oitis Roling** is master mechanic, and **Bob Jephson** and **Gordon Melton** are mechanical foremen. Working the graveyard are **Jack Keller**, assistant master mechanic; and **Bill Stirewalt**, "Slim" **Ervin** and **Ervin Wakeman**, mechanical foremen.

* * *

Vincent A. Plancich is project manager and **Clyde Gerfers** is general superintendent on a \$1,974,898 contract for the erection of a 3-story reinforced concrete hospital at Fairchild AFB, Spokane, Wash., being executed by **Lewis Construction Co.** **Adam Pierson** as carpenter foreman is another key man working on the job. Work is expected to be complete the end of 1955.

* * *

Dan B. Munn and **Robert E. Perkins** personally have been directing a \$190,258 contract awarded their company for grading and surfacing work



BROS tip sheet

EQUIPMENT NEWS FROM A FAMOUS NAME IN ROAD MACHINERY

BROS PORTABLE STEAM GENERATORS HAVE CLEAN, SIMPLE "CENTRALIZED" CONTROLS

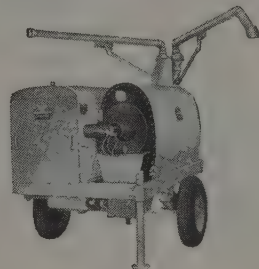


Portable Steam Generators by Bros feature a unique scotch marine two-pass gas travel design with numerous small tubes. This design makes heat release even and thorough, speeds up steaming time, and reduces expansion and contraction wear on the boiler unit itself. Available in skid-type or semi-trailer.

You don't need a skilled engineer or a man with four arms to run a Bros Portable Steamer! The clean, orderly working-end design of the Bros 30, 45, 60 and 100 hp models is a welcome relief from the "gingerbread" portable boilers of the past. Centralized controls are within easy arm's reach, and there is nothing "hanging out". You can close it, lock it up and leave it! Bros has been making boilers for 72 years, and you won't find a more effective portable boiler on the market!

TWO-WAY HEATING ACTION OF BROS CIRCULATOR MAKES BOTH HEATING AND PUMPING FASTER

For the heating and pumping of bitumens in places where steam is not needed, the Bros Asphalt Circulator and Heater works fast and at low cost. The exclusive "two-way" heating action applies heat fast to both inside and outside of material chamber. You can leave material in the chamber, re-heat it and inject it as a "hot slug" to break loose cold or stiff cars. Four distinct pumping speeds in conjunction with various burner adjustments provide the ultimate in heating control.



A low center of gravity and "balanced" design help to make this Bros Asphalt Heater and Circulator very stable. You can maneuver it around easily, and it "trails" excellently at road speeds. Available in skid-type or semi-trailer.

"Quickies" for your information

If you're specifying a distributor, remember the Bros "Bituminizer." It has a new working-end design that really simplifies operation.

New star of the Bros Portable Steam Generator family is the big 100 hp "super" steamer, a truly portable unit for pile driving jobs or asphalt plant operations.

To do three jobs with one rig, ask about the new Bros "Dual-Heat" which combines a portable steamer and a circulator. Steam heating, oil-fired circulating heating, and pumping!

Bros "Spraymatic" distributor spray bar has a new type of nozzle that cannot clog. Eliminates that undesirable "streaking".

Road Machinery Division, **WM. BROS BOILER & MFG. CO.**
1155 Tenth Avenue S.E. • Minneapolis 14, Minnesota

DISTRIBUTED BY

Arizona Equipment Sales
Phoenix, Arizona
Western Equipment Co.
Boise and Idaho Falls, Idaho
Mountain Tractor Co.
Missoula & Kalispell, Mont.
Seitz Machinery Co., Inc.
Billings, Mont.
Sierra Machinery Co.
Reno, Nev.

The Harry Cornelius Co.
Albuquerque, New Mexico
Crook Company
Los Angeles, Calif.
McKelvy Machinery Co.
Denver, Colo.
Nelson Equipment Co.
Seattle & Spokane, Wash.
Portland, Ore.
Wilson Equipment & Supply Co.
Cheyenne & Casper, Wyo.



ROBERTSON-CAVE, Inc., is pushing a \$166,000 project for grading, surfacing, and oiling on Highway 89 near Vaughn, Montana. Caught by our camera are (left) **James D. Cave**; (center) **Lyle Rogers**, superintendent; (right) **Vernon Moody** and **Bob Gall**, state highway department aides; **Dale Moore**, resident engineer, and **Jim Dolan**, rodman.

in Sierra County, Calif. **Thomas Croft** has been assisting as road foreman.

* * *

C. G. Marrs, project manager, and **W. O. Richey**, superintendent, are directing the construction of an office building for the Colorado State Highway Department, Denver, contract for which is held by **C. H. Leavell & Co.** This \$1,895,994 structure is 4-story, central core, with 2-story side wing, and is of reinforced concrete brick stone. Completion date is scheduled for August 1955.

R. B. Cook is superintending the construction of Manhattan Beach storm drain, Los Angeles, for **Peter Kiewit Sons' Co.**, an \$814,259 award. Job engineer is **Paul Eller**, and office manager is **Les Thoma**.

* * *

Kermit Galbreath, superintendent; **Clyde May**, crusher foreman; and **Melvin Eisenbarth**, hot plant foreman, are Big Horn Construction Co.'s key men on the construction of 10 mi. of surfacing and miscellaneous work on the Wheatland-Cheyenne



Ellis **Strand** **Pittman** **Daley**



Rainwater **Peterson** **Crane**

Paul W. Wise, project manager, and **Paul O. Varner**, assistant project manager, head the supervisory force of **Morrison-Knudsen Co., Inc.**, which has under construction the Jackson Lodge project at Moran, Wyo., for **Grand Teton Lodge & Transportation Co.**, a \$4,200,000 undertaking.

Max L. Daley is project engineer. **Gail E. Dawson, Sr.** and **Vernon C. Harder** hold superintendent spots, and **Ancil D. Knowles** is concrete superintendent. Master mechanic is **William W. Drake**, and **Harold W. Mendenhall** is warehouse manager. **Charles A. Pittman** manages the office; **Douglas L. Ellis** is chief accountant, and **Eugene O. Strand** is paymaster. Foremen are: **Charles B. Barnett**, **Clyde C. Briggs**, **Harry Lison**, and **Henry Wind**, carpenter;

Lloyd E. Clapp, concrete; **Johnnie McTee**, steel; **Daniel H. Everett**, roofer; and **Jesse H. Liggett** and "Red" Pilcher labor. **Ted Haley** is heavy-duty mechanic; **S. E. Rainwater**, welder; "Rus" Hollenbeck, dozer operator. **James V. Armistead** is camp manager, and **J. C. Dearth**, camp steward.

Plumbing and heating is subcontracted to **Murray Burns Plumbing & Heating Co.**, with **William J. Evans** superintending the work. **Foy Earnest** is general foreman; **Carl Crane**, heating foreman; and "Pete" Peterson, plumbing foreman. **Electric Service Co.** holds the electrical subcontract and **C. E. Butka** is supervising, assisted by **Arnold Warpness**, foreman. Superintending for the painting subcontractor, **Northwest Painting Co.**, is **George Mackin**, with **Vern E. Elliott** as foreman.

road, between Chugwater and Little Bear in Laramie County, Wyo. This job went to **Big Horn** at a cost of \$302,311.

* * *

"Herb" Neudahl is project superintendent, and **Robert Hansen** is project engineer, handling a \$647,100 job for **Hagstrom Construction Co.** covering hangar erection at **Gore Field**, Great Falls, Mont., for the **Montana Air National Guard**. Foremen for Hagstrom are "Dell" Leatherwood, steel; **Harold Snippen**,



TOP: Snippen, Neudahl, Dyer, Vieth.
MIDDLE: Stack, Smith, Harris.
BOTTOM: DesJarlis, Craig.

carpenter; **William Dyer**, labor; and **Bryant Vieth**, plumbing.

Ray Lawrence is working as superintendent for **C. W. Schmid** who has a plumbing and heating contract at a figure of \$167,000. **Owen Francis** is carpenter foreman, and **Eddie Rounds**, labor foreman. **Glen Craig** is superintendent for **H. Halvorson, Inc.**, contractor on a crash truck station, motor service shop, warehouse, etc., being built at a cost of \$184,000. Assisting in the work as carpenter foreman is **John DesJarlis**. **R. O. Smith**, **Tom Harris**, and **Harold Stack** are C. of E. men.

* * *

Fred W. Kuehn is foreman on a \$165,015 contract of **Berke Bros.** and **C. R. O'Neil**, consisting of 1.9 mi. of grading, north of Myrtle Creek, **Douglas County, Ore.**

* * *

J. E. Baydler is superintendent for **McCammon-Wunderlich Co.** and **C. K. Moseman** on a new state highway job in California between **Garnet** and **Thousand Palms** which recently got under way.

H. E. McCutcheon is superintending the work of constructing 6 bridges for **Jack L. Adams Co.**, sub-



John Marcott, project manager, and **W. E. (Sam) Samway**, general superintendent, head up a \$250,000 building being erected by **Swinerton & Walberg Co.** for **Kress & Co., Modesto, Calif.** Work consists of a new reinforced concrete structure and remodeling of the present building, with completion date put at December 1.

contracting the work. **Jim Greig** and **Fred Rentz** are carpenter foremen, while **George Falls** is foreman on concrete and labor.

M. E. Nelson is resident highway engineer for the State and **Francis Morrill** is resident bridge engineer.

* * *

Robert H. Bjerknes, job superintendent; **Leonard Steinert**, mechanic; and **Earl Owens**, crusher foreman, are head men on a job of **Inland Construction Co.**, just completing in **Garfield County, Mont.**, a \$128,063 project of 12.6 mi. of gravel surfacing and oiling on the **Jordan Circle road**.

* * *

R. W. Cowles, superintendent, assisted by **J. F. Rechs**, general foreman, and **E. T. Thomas**, concrete foreman, is supervising a \$1,600,000 job for the **Bechtel Corporation**. Work consists of designing and constructing a 360x480-ft. concrete tilt-up factory in **East Los Angeles, Calif.** **J. J. Derdenger** is doing the purchasing.

* * *

Vince Doran is project manager and **R. E. Woolworth** is project office manager on a \$2,839,489 contract held by **Morrison-Knudsen Co., Inc.**, to build military installations at **Middleton Island, Alaska**.

* * *

H. B. Nicholson holds a \$1,943,000 contract to build **Brentwood Palisade Junior High School, Pacific Palisades, Calif.** **William J. Shirley** is superintendent, and **S. M. Fisher** is office manager.

* * *

John Shumway, superintendent for **United Builders, Inc.**, is directing the construction of a 223-ft. reinforced concrete grade separation (prestressed concrete girders) on **Halsey St. near 68th Ave., Multnomah County, Ore.** Work on this \$139,195 contract started September 1 and is expected to be completed in 270 days.

Continued on page 120

ARCH CENTERING

... continued from page 62

by 30-ft. timbers across the top of both arch ribs at the crown. Steel rods $\frac{3}{4}$ in. in diameter were then hung from these timbers, in turn supporting the form work between ribs.

This particular operation calls attention to the fact that, on this bridge, practically no falsework support from the ground was necessary after the initial pouring of the main piers. The single exception was the wood tower supporting the centering of Span 1.

Concrete supply

The matter of concrete supply for this job was important. Here was a situation calling for many separate pours of varying sizes (all of them relatively small) over a long period of time, in difficult positions and at a variety of elevations.

The situation seemed to call for complete batching and mixing facilities at the job site. But it seemed advisable that they should be held to a small scale and designed for the greatest possible flexibility. Here's how it was worked.

Two sizes of concrete aggregates and sand are stockpiled at the job on the flood bench of the river. Bulk cement is held in a 300-bbl. silo. Completing the equipment setup for this "one-man ready-mix plant" is a **Willard weigh batcher**, an electric conveyor, an automatic cement weighing hopper, and two $3\frac{1}{2}$ -yd. transit-mix trucks. This plant adequately furnishes all the required concrete at a rate of 20 to 25 cu. yd. per hr.

Willard weigh batcher

The **Willard batcher** has proved to be a practical and economical machine. Because it is self-propelled and mounted on rubber tires, the operator drives it up successively to the three stockpiles of aggregates and, by means of a large horizontal rotating screw acting as a churn just above the ground surface, feeds the aggregates into a vertical bucket conveyor that dumps into a weighing hopper. When the weighing scale shows that the required weight of material is in the hopper, the operator flips a metal gate which prevents any additional aggregate from entering the hopper.

The batcher is then driven over a conveyor belt and the aggregate released from the hopper to the belt, which catapults the aggregate into the transit mix truck. This conveyor belt passes under the cement hopper. Thus, a full charge of cement is loaded simultaneously.

From the batch plant the trucks easily supply the cranes doing the work—either the **Osgood** up on the bridge deck, or the **Northwest** operating down beside the river.

The use of only two transit-mix trucks makes for a nice balance on the job. Loading time at the batch plant is fast and travel distances are short. These facts, coupled with the considerable time needed to spot a single concrete bucket over various points in the forms to complete its discharge, mean that apparent transit-mixer delays provide just about the right mixing time.

Subcontracts

MacClosky's contract includes about 1 mi. of road approach consisting of bituminous plant-mix on cement-treated base. This work has been subcontracted to **Morgan Construction Co. of Redding**. Other subcontractors and suppliers on the job include **Joseph T. Ryerson & Son, Inc.**, for reinforcing steel, which is being installed by **Kirch & Sons of Redding**.

Curbs, gutters, and highway retaining walls are being constructed by **M. V. Allen of Redding**. **Todd & Cantrell of Sacramento** are constructing the concrete balustrade.

Bridge pier excavation, including cofferdams, was subcontracted to **Macco Corp.** Their work was supervised by **Giles Parker**, with **Lee Horton** as assistant.

Concrete aggregates are being furnished by **Thompson & Jensen of Mt. Shasta City**, bulk cement by **Calaveras Cement Co.** **West Coast Supply Corp.** furnished all forming materials.

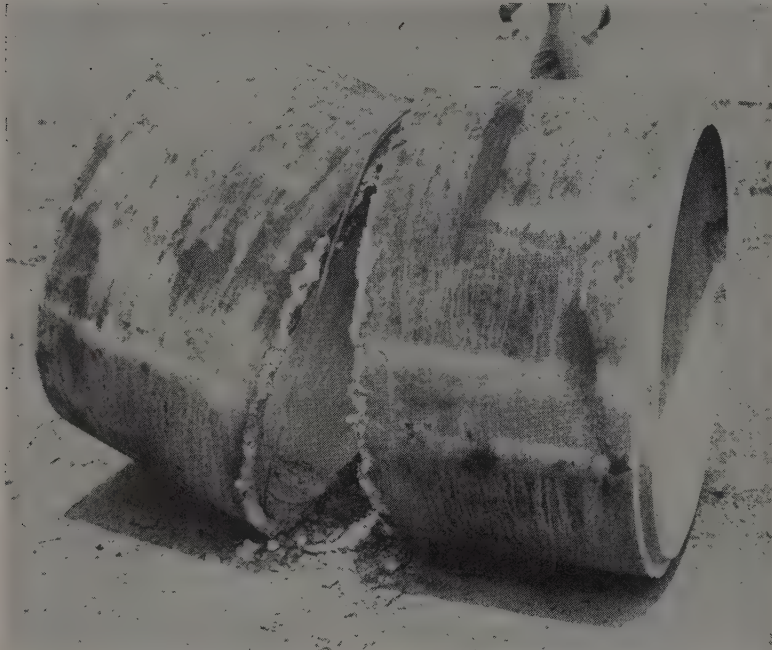
The unique arch centering was assembled and erected by the fabricator, **Timber Structures, Inc.** Design and construction was carried out under the direction of **Verne Ketchum**, chief engineer, and **Charles Woodworth**, assistant chief engineer. The work was done under the direct supervision of **George Birkemeier**, chief division engineer. Assembly and erection in the field were under the direction of **Larry Winkelman**, erection superintendent, with supervision by **Tom Keenan**.

Personnel

Vern Leiding of **Los Angeles** is general superintendent for **Charles MacClosky Co.** Handling this almost unprecedented method of concrete arch construction with great enthusiasm and with equal success, he is assisted by **Martin Cornelius**, carpenter foreman; **Reuben Sell**, labor foreman; and **Denny Bagley**, job engineer.

For the **California Division of Highways**, the work is under the direction of **F. W. Panhorst**, bridge engineer. **Fred C. Marshall** is resident engineer at **Dunsmuir**. Under his direction bridge inspection is being provided by **Herman Godwin**, **Dale Wilson**, and **Alfred Adams**. Inspecting approach construction are **M. Van Schaik** and **Richard Rowland**.

TRICKS of the TRADES



Cutting concrete pipe with primercord

A UNIQUE WAY of cutting reinforced concrete culvert pipe in the field with explosives is currently being subjected to experimentation by United Concrete Pipe Corporation at their Baldwin Park, California plant. Preliminary results indicate that it may be a faster and cheaper method.

It is believed that J. A. Payton, a contracting firm operating out of Riverside, California, was the first to successfully cut concrete pipe with explosives in this manner, having adapted the procedure from their customary practice of cutting obstructing rocks with primercord.

United Concrete Pipe Corporation has conducted experiments with various sizes of reinforced concrete culvert pipe with varying wall thicknesses, with the assistance of Jack Cunningham of the Atlas Powder Company. Atlas 100 grain primercord was used and detonated with electric blasting caps. The primercord must

be carefully wrapped around the pipe, especially for a miter cut. Varying numbers of turns of the primercord around the pipe and the position of the cord, i.e., side by side or on top of other turns, were found to be very important in producing the desired amount of fracture in each size of pipe. The blast travels through primercord at an approximate speed of 18,000 ft. per sec., producing an instantaneous effect. A distinct, clean crack can be obtained completely around the inside of the pipe to permit chipping away the concrete and cutting the reinforcing steel within a 1-in. area, leaving clean cut edges.

It is estimated that cutting concrete pipe in this manner will save 75% to 80% of the labor costs involved in the current method of using an air hammer, or hammer and chisel, which requires a cut of 4 in. in width and leaves a jagged edge to be smoothed.

Cutting concrete pipe with explosives apparently is faster, cleaner, and possibly cheaper than usual methods but it does have the obvious drawbacks of noise, concussion, and dangerous characteristics inherent in any explosive. United Concrete Pipe Corporation is continuing its experiments which are expected to be concluded shortly.

2222 Review Questions for Surveyors

PROBABLY THE MOST comprehensive set of surveying questions ever published is now available. It is entitled "2222 Review Questions for Surveyors" and written by Russell C. Brinker, head of the civil engineering department at Virginia Polytechnic Institute.

It all began with 1,313 questions published some years ago, and has grown rapidly as additional parties have contributed material. It is intended that this ring-bound booklet will be used to supplement the standard text, note forms, and field books. The author states, "Of course this compilation does not exhaust all of the possible questions in the broad field of surveying. No single book or volume could. But just as one good story told about the proverbial salesman always suggests others, so the wide range of subjects covered in these pages will stimulate thought and produce new versions."

The price and order address are \$3.00 per copy from R. C. Brinker, Box 153, Blacksburg, Virginia.

With winter coming—use "pre-mixed" anti-freeze

OFF-THE-ROAD EQUIPMENT operators and other large volume users of anti-freeze lose thousands of dollars each year because of inefficient, wasteful methods of cold weather cooling system care. If not enough anti-freeze is used, engines can be ruined by a sudden drop in temperature. Using too much anti-freeze is a needless waste of money. The answer to the problem, says Du Pont anti-freeze experts, is the use of a "pre-mixed" anti-freeze and water solution to service fleet equipment.

Usually, at anti-freeze time, the chief mechanic (or whoever is in charge of preventive maintenance) decides what degree of protection his equipment should have. That is, how much anti-freeze each vehicle will need to keep its cooling system from freezing. Then, the proper amount of anti-freeze, specified on the anti-freeze manufacturer's protection chart, is poured into the radiator. Water is added and the solution is then checked with a hydrometer. This time-consuming operation is repeated from vehicle to vehicle.

As winter passes, some of the coolant is lost—usually because of leaks. So additional anti-freeze is added, generally more than is necessary. This is a waste. What is more, this procedure requires additional checks with the anti-freeze tester throughout the winter. Frequent checking of engine radiators during the cold weather is an obvious waste of time and effort.

Equipment operators who have followed the premixing plan suggested by this anti-freeze manufacturer agree that pre-mixing saves time and money. It also provides insurance against freeze-up damage to an engine that may not have been properly protected because someone read the anti-freeze tester wrong.

Making a pre-mixed solution

Pre-mixing works like this: the anti-freeze is mixed together with water to make a solution which will protect the cooling system to the lowest expected temperatures in the area. The mixing can be done in a separate tank, or in the standard 54-gallon drums in which Du Pont "Zerone" and "Zerex" are delivered. In the latter case, an empty drum or other container is used to drain off some of the anti-freeze to allow room for the water.

Once the mixture has been made, a careful reading is made with the hydrometer to make sure the solution provides the desired protection. All that is necessary to make the equipment ready for cold weather is to drain out the cooling systems and refill with the new pre-mixed solution. Drivers and others are then instructed to keep cooling systems filled to the proper level throughout the winter by adding more of the pre-mixed anti-freeze solution, drawn from the tank or drum. Some operators have a drum of the anti-freeze and water mixture installed on a service truck which makes the rounds of field operations. It doesn't take long to service all the radiators—anyone can do it.

Many advantages

Once the anti-freeze tester is used at the time the solution is first mixed, there is no longer any need for it. Since nothing but the pre-mixed solution is added to the cooling systems, there is no change in the degree of protection.

Zerone and Zerex, the Du Pont anti-freeze products, are claimed to be well-suited to this practice of pre-mixing. Once mixed, the product will not require any additional stirring, shaking, etc., before being used. Other brands of anti-freeze, which use an oil-type rust inhibitor, must be agitated or stirred again in some way before being used, since the inhibitor will not stay in solution while standing.

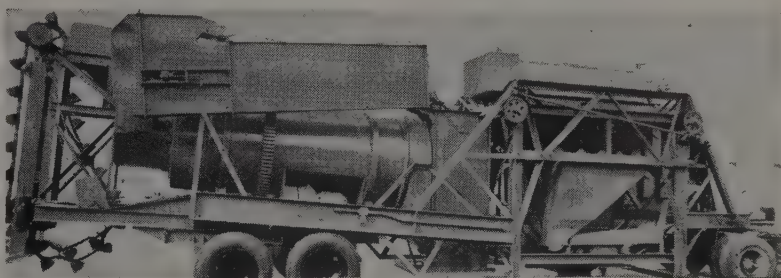
Pre-mixing offers distinct advantages to the equipment user no mat-

Announcing A NEW

STANDARD

PORTABLE BATCH TYPE ASPHALT PLANT (MODEL TM)

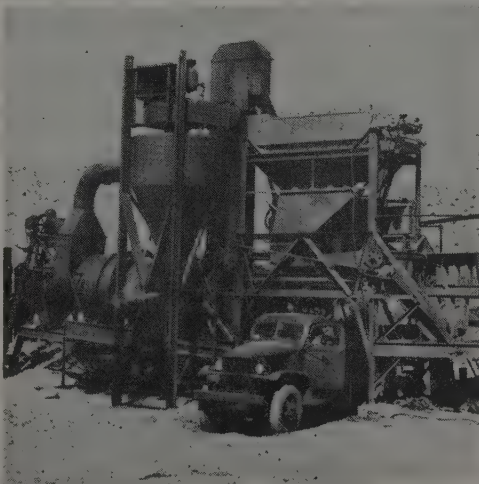
At last . . . a completely portable *batch type* asphalt plant . . . designed to meet the demand for a plant portable enough to move economically yet provide the capacity and accuracy required for specification work. Capacity is 40 to 50 tons per hour. Ordinarily operated by one man. The exclusive STANDARD "Self-Lift" erecting device elevates the mixing cage in as little as 30 minutes. Fast dismantling, hauling and erecting eliminates need for long, expensive asphalt hauls.



HAUL IT Anywhere!

Perfect for rural areas . . . for hard-to-reach locations, for state highways and county and township roads. Truck tractor hauls plant easily. Now you can profitably handle jobs that size and distance formerly eliminated or made extremely expensive.

READY for OPERATION — In A Few Hours!



The push button operated "Self-Lift" automatically raises or lowers the mixing section in minutes. The entire unit, including cold and hot elevator, can be put in working position in as little as 2½ hours. Estimated erection or dismantling time for complete plant, including boiler and storage tank, is approximately one day. Built for years of the most rugged service, the STANDARD portable plant will stand up under both heavy asphalt production and the added stress and strain of constant erection, dismantling and road shock.



Send today for bulletin giving full information on the STANDARD Model TM, Portable Asphalt Plant

10-PR



STANDARD STEEL CORPORATION

5049 Boyle Ave., Los Angeles 58 • 7 East 42 St., New York 49

ter how large or small his operation. By using a pre-mixed anti-freeze solution, the time spent on cooling system care is cut to a minimum. Operators can be sure that no more anti-freeze is used than is absolutely necessary. There is no waste. What's more, they can have the assurance that their engines are properly protected against the cold. There is no worry about inaccurate or careless hydrometer checks that may lead to costly repairs.

Cold weather starting easier with glow plug

PROLONGED TESTS have proved the new Caterpillar direct electric starting system completely dependable. In one test, a D4 tractor was left to stand outdoors all winter with no protective housing. An office girl (with no previous tractor experience) started the tractor early each



Getting off to a fast start is Kay Eirk of the Caterpillar organization.

morning, except for weekends, to demonstrate the ease and simplicity of the starting unit. After a weekend "soaking" of cold weather, Monday morning starting proved a real test of the system.

Records were kept of temperature and cranking time. A preheat time (time glow plug is energized before cranking) was established and varied from 0 to 4 min. depending on how cold it was. The surprising results show an average cranking time of 1.15 sec. for the days the temperature recorded below freezing. Not once did the engine fail to start after being preheated with the glow plugs. Batteries maintained a full charge regardless of length of heating time or weather temperature.

This all-weather direct electric starting with newly-developed glow

TOOLS of the TRADES

Use the coupon on page 125 for free information on any of these items

1

PREVENTIVE MAINTENANCE—Worthington Corp. has announced the availability of Mailer L-676-M1, an information sheet on preventive maintenance designed to help operators of YC and DYC compressors find existing troubles in their machines and be alert to ways in which these troubles can be prevented. This sheet illustrates the specific trouble, cartoon-style, and lists a number of possible causes to be checked. Such operating troubles as failure to deliver air, insufficient capacity, insufficient pressure, vibration, overheating, overloading motor, knocks, and high or low intercooler pressure are included.

2

SELF-LEVELING POINTS, which are claimed to give positive ignition distribution, improved combustion, cooler operation, three to five times longer life, and positive contact have been announced by Premco Products, Inc. They are designed so that current is carried at three points of the contact and the self-leveling cap contacting ball-bearing will always adjust to level 3-point contact for more efficient operation.

3

HEAVY-DUTY CUTTERS—Interstate Drop Forge Co. has announced a new line of Hardy heavy-duty cutters for cutting reinforcing bars, hard bolts, chain, steel strand, and guy wire. The manufacturer says the cutters have been designed with greater leverage, ease of operation, comfort in all positions, and long service life. These cutters are available in capacities up to 9/16-in. diameter.

4

POP TESTER—Interstate Diesel Service, Inc., announces a Pop Tester for use in shops rebuilding GM 71 and 110 series injectors. It is designed to allow the mechanic to predetermine what the popping pressure of a given spray tip, crown valve, stop, and spring is before it is assembled. This makes it possible to interchange parts before assembly to insure that the pop will be above minimum standards when the injector is built.

5

AN IMPROVED TOOL for ripping the outer covering of non-metallic sheathed cable has been announced by Holub Industries, Inc. Improvements include long handles for a good grip, cadmium plating to prevent rusting, and holes stamped in the handle to measure wire sizes from Nos. 14 to 6. This tool, which is 5 in. long, is identifiable as

6

CAST IRON WELDING ROD—All-State Welding Alloys Co., Inc., announces a new copper-coated, cast iron welding rod which permits the average torch welder to get 48,000 psi., machinable welds that are free of blow

holes. It has a working temperature of 1,400 deg. F., develops a Brinell hardness of 170 to 200, and requires 600 to 800 preheat. Known as All-State No. 3 General Purpose Cast Iron Rod, it is recommended for repairing breaks and cracks, filling blowholes, building up worn parts, and other salvage or production work. Available in 3/16 and 1/4-in. diameters. Rod length is 18 in. Standard package weighs 10 lb.

7

RIP-RESISTANT CONVEYOR BELT—The B. F. Goodrich Co., Industrial Products Div., has developed a new type of rubber conveyor belt which has ribbons of high tensile steel wire inserted at up to 3-ft. intervals to prevent accidental rips from running the entire length of the belt. Available in many types of belts, including all types of hot material conveyors.

8

TORQUE-CONVERTER—engine combinations are available as optional equipment on certain models of Bucyrus-Erie Co. excavators. They provide maximum (stalling) torques from 200 to 225% of full load torques of straight friction drive for a given excavator. An automatic balance of torques and speeds permits the engine to operate close to governed speed at all times while machinery speeds vary to meet the torque demands made by type of work and material being handled.

9

A BRUSH CUTTING ATTACHMENT for standard Models 30, 35, 3A, and 3-3/4D chain saws has been announced by Lombard. It can be attached quickly by one man. This combination leaves both hands of the operator free for control. The weight is taken by a shoulder strap and a contoured plate against the thighs. Recommended for a land clearing combination because of its quick changeover from a brush cutter to a chain saw.

10

OFF-THE-ROAD TIRES in sizes ranging from 12.00x20 to 27.00x22 are being made with Nygen fabric by The General Tire & Rubber Co. Nygen's strength resists breaks and bruises from the power of earth movers working at high speed in rough terrain, according to the manufacturer. These tires are also recommended for vehicles engaged in strip mining and quarry work because of their water-resistant features.

11

ABRASIVE SAW BLADE—Chicago Wheel & Manufacturing Co. has introduced its Handee abrasive saw blades which come in 7- and 8-in. diameters. They are made for masonry and general purpose cutting and have a special universal bushing which enables them to be used on most popular makes of portable tools made for the construction craftsman.

plugs became available August 1 for the Caterpillar D4 track-type tractor. The completely automatic push button starting unit—the latest word in operator conveniences—provides positive starting with fingertip control from the D4 tractor seat.

The tractor's 24-volt electric starting system, using heavy duty components coupled with long life, inexpensive batteries, is designed for simplicity and dependability under the most rigorous working conditions. The batteries are protected from possible damage by being neatly installed under the hood in the space formerly used to house the gasoline starting engine.

Incorporated into the system are glow plug attachments that provide positive starting in below freezing weather. They prevent battery life from being drained away through prolonged cranking of the diesel engine during cold winter months. These glow plugs are the same effective cold weather starting aids offered as attachments for several models of Caterpillar Industrial and Marine Engines and Caterpillar Diesel Electric sets for the past two years.

Withstands terrific shocks

The glow plug used by the Caterpillar Tractor Co. has been developed through years of research in cooperation with General Electric Co. About the size of an ordinary pencil, the glow plug is actually a heating element, part of which extends into the precombustion chamber of the diesel engine. However, its construction must be such that it will be of sufficient strength to withstand the terrific combustion shocks encountered.

There is a marked similarity between the construction of a glow plug and the heating element of the domestic electric range. A fine resistance wire fits inside a tube or sheath and the entire cavity is filled with magnesium oxide. The tube is run through a die to reduce the diameter of the sheath and to compact the magnesium oxide very tightly around the resistance wire. The magnesium oxide acts as a support and as an electrical insulator between the wire and the sheath.

Magnesium oxide is a fair heat conductor, however, so that when electric current is applied to the wire, the heat is transferred to the sheath. The process is very rapid with the sheath attaining a temperature of 1,800 degrees within 30 seconds. This heats the air in the precombustion chamber and aids considerably in igniting the fuel injected onto the chamber when the engine is cranked.

Colors for safety hats

INDUSTRIES THAT PREFER metal head protection may now establish a hard hat color code with the

new Bullard aluminum non-fading metallic-colored safety hats and caps. Produced with special metal dyes, both the "Roughneck" and "Shorty" models are available in the following six colors at no extra cost: yellow gold, bronze, blue, grey, green, and the standard, silver.

More than a year of research with special dyes has gone into the development of the new aluminum color processing. Weather tests made with the new dyes indicate no fading after 1,000 hours of exposure to the hot brilliance of the Arizona desert sun. Because of the improved production methods, the color process does not increase the cost and the hats or caps may be ordered in any quantity.

Enclosed scaffolding

HOW TO KEEP WINTERTIME construction jobs progressing on schedule by using enclosed scaffold-

ing for protection of workmen is the theme of the September issue of "PS Scaffolding Methods," a quarterly publication for the construction field. Practical examples of various cold weather enclosures for both "hanging" and "built-up" types of scaffolding are described and illustrated by on-the-job photographs. Information on types of protective scaffold coverings especially suitable for specific wintertime building conditions is also included. Copies of the September "enclosed scaffolding" issue of "Scaffolding Methods" are available on request from The Patent Scaffolding Co., Inc., 1695 Mission St., San Francisco 3, Calif.

Classification of heavy-duty oils available

A 48-PAGE BOOKLET listing the trade-names of over 1,200 lubricating oils offered by 366 oil companies as

You Get Greater Profits from Smaller Investment with this All-Purpose Unit



SCHRAMM AIR COMPRESSOR..TRACTOR..BACKHOE..LOADER
ENTIRELY DESIGNED & BUILT BY SCHRAMM, INC.

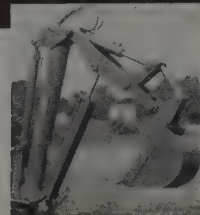


SCHRAMM BACKHOE AND SHOVEL

- Digs faster than cable-operated backhoe
- Twice the power of backhoes on agricultural type tractors
- With shovel bucket, operates smoother, outperforms all other 1/4 yard shovels

SCHRAMM LOADER

- Bucket capacity full cubic yard
- Lifts 2500 pounds



The Schramm Pneumatractor with new Backhoe and Loader gives you a 125 c.f.m. air compressor . . . tractor . . . backhoe . . . shovel . . . loader . . . crane . . . sweeper . . . snow plow . . . bulldozer . . . backfill tamper . . . platform scaffold . . . winch . . . auger . . . wagon drill!

For complete details, write today for illustrated booklet.

SCHRAMM, INC.

The Compressor People

WEST CHESTER • PENNSYLVANIA

Schrammair YOUR JOB!

WELDED DESIGN ELIMINATES 73 TONS OF STEEL ...cuts costs 10%

THE welded design for the New York International Airport Hangar was bid at \$449,018.00. A riveted design was quoted at \$451,110.00.

Although the structure was originally planned for riveting, the welding alternate used 5% less steel ... saved \$2,092.00 on construction costs.

The welded steel hangar cantilever trusses extend 134 feet on either side of the center frame. The trusses were shop fabricated and shipped in half sections, field assembled by arc welding.

Savings like these can be realized on many types of structures when designed for welding.



Fig. 1. 347-ton welded framework at Idlewild Airport. Designed to house 5 large and 3 small transports. Designed by Port of New York Authority. Fabricators and Erectors, Lehigh Structural Steel Company.



Fig. 2. Erecting shop-fabricated half-sections to form 134' trusses by arc welding.

SEND FOR additional data on welded design by writing for "Lincoln Studies in Structural Arc Welding".

THE LINCOLN ELECTRIC COMPANY
Dept. 4305, Cleveland 17, Ohio
**THE WORLD'S LARGEST MANUFACTURER
OF ARC WELDING EQUIPMENT**

meeting certain requirements for heavy-duty industrial engines has just been published by the Internal Combustion Engine Institute, 201 North Wells Street, Chicago 6, Illinois. The ICEI, a non-profit organization of internal combustion engine manufacturers, spent many months of study and research in order to group engine oil brands offered for heavy-duty gasoline and diesel engines.

In the booklet the oils are divided into three types: (A) Those represented by the oil supplier as meeting the requirements of U. S. Military Specification MIL-O-2104 and/or the British Defense specifications DEF/2101, wherein the diesel engine test uses a fuel of 0.35% minimum sulfur content; (B) those represented by the oil supplier as meeting the requirements of U. S. Military Specification MIL-O-2104 wherein the diesel engine test is modified by using a fuel of 0.95% to 1.05% sulfur content, and (C) the oils represented by the supplier as meeting the more severe requirements of a "Superior Lubricant (Series 2)."

The booklet combines the results of previous efforts of several engine manufacturers to list lubricating oils. It should be helpful to any engine owner who is contemplating the purchase of a particular brand of lubricating oil in that he can ascertain, by use of the booklet, just what properties are claimed for that oil by the oil supplier whose trade name is on the oil. A nominal charge of 20 cents each to cover printing (plus postage for the shipment of more than one copy) is made for the booklets by ICEI.

Farmer's Agricat (below) also contractor's item

THE ADAPTATION of farm tractors to industrial jobs merely con-

tinues from its 50 yr. of Cat crawler development. Oscar Starr, Caterpillar top engineering and production official, puts it this way. "The farmer first made the tractor practical. Then other heavy industries like logging, road building, oil fields, etc.—adapted it to their work."

Here is the little Agricat shown busy on foundation grading for the Orinda Excavating & Paving Co. This is a large home development project near Richmond, Calif., that will house several hundred families. Originally intended as a garden tractor, this versatile piece of equipment is ready to bulldoze, rip, and spread material in confined areas. It is a common thing to see such equipment being used by contractors for fine grading sidewalks and large pipe trench bottoms, in addition to the use shown here.

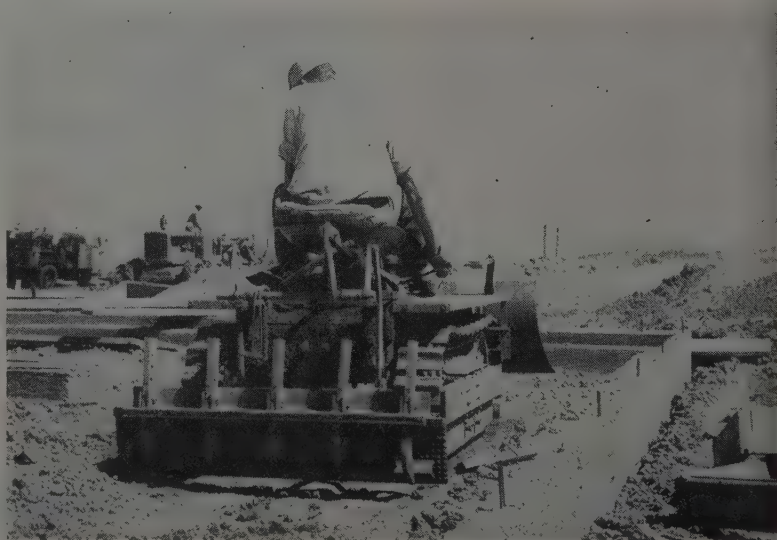
JACKS on the job at Dunsmuir bridge

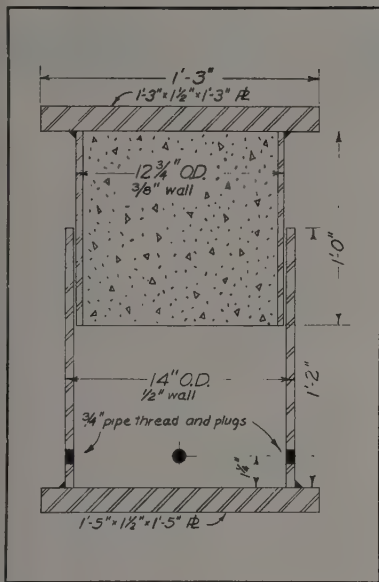
DECENTERING DEVICES used by Charles MacClosky Co. on construction of a concrete arch bridge at Dunsmuir, California, were important in the operation of unique falsework fabricated especially for the job. The falsework design and its function are reviewed in an article this month beginning on page 59.

For adjustments in falsework erection and for decentering, both sand jacks and screw jacks were employed.

Here is a drawing of the sand jack—two were used to support a central falsework tower beneath one arch span. In operation, the jack cylinder was charged with sand, which could be removed by unscrewing four threaded plugs spaced around the jack base. Machine work on both types of jacks was done by Kinco, Inc. of Los Angeles.

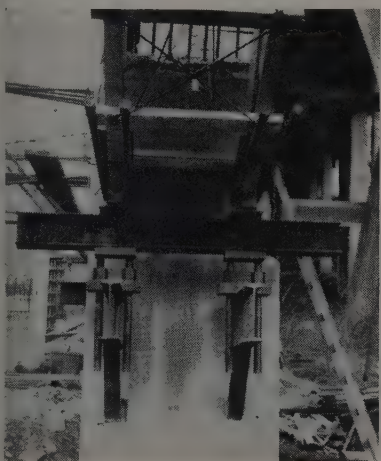
The heaviest of the screw jacks consisted of dual steel rods 3 in. in





diameter, passing through a steel bearing plate 3 in. thick. The nuts were separated from the plate by case hardened steel washers.

For erection purposes the jack assemblies were secured to the false-work trusses as follows. First, 12-in. wide flange beams were bolted to the truss shoes. Then the jacks were bolted to the bottom flanges of these



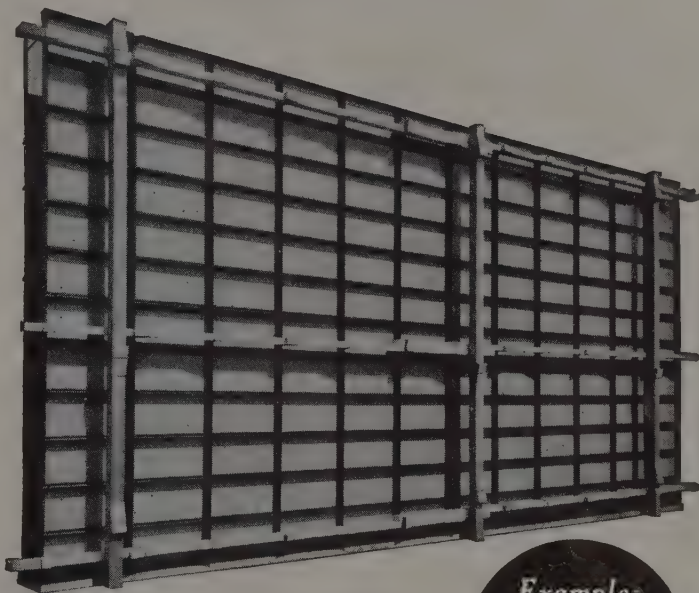
beams and a pair of trusses (side by side), including jacks and beams, was hoisted into position.

Here are the contractor's observations of the operation of the jacks when decentering.

Sand in the two sand jacks tended to bulk, and it was necessary to start the flow by rodding. The contractor was prepared to attach a water jet and discharge valve, but these were not needed.

Under full load, the screw jacks for the main span centering could not be turned by hand, even with a wrench 4 ft. long. So a winch truck provided the power for releasing these jacks.

UNI-FORM Concrete Forms GUARANTEE Material and Labor Savings on Your Concrete Jobs!



Example:

This wall—24 ft. long x 12 ft. high can be UNI-FORMED for 50% less than with conventional forms.

- ONE SIDE ALIGNMENT and BRACING SAVES UP TO 50% MATERIAL and LABOR
- USE STANDARD LUMBER LENGTHS—NO CUTTING OR FITTING—GET MAXIMUM LUMBER RE-USE
- SIMPLIFIED ASSEMBLY permits inexperienced crews to form fast . . . accurately . . . no waste motion

Universal Concrete Form Specialists will assist your men On The Job TO INSURE MAXIMUM FORMING SPEED...EFFICIENCY...SAVINGS

RENT with a Purchase Option . . . Try Before You BUY

Write for the new UNI-FORM catalog

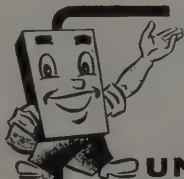
SEE YOUR LOCAL DISTRIBUTOR

K. C. CONSTR. SUPPLY CO. Denver, Colo.
BOW LAKE EQUIPMENT COMPANY Seattle, Wash.
UNIVERSAL FORM CLAMP CO. San Leandro, Calif.
UNIVERSAL FORM CLAMP CO. Los Angeles, Calif.

MANUFACTURED BY:

UNIVERSAL FORM CLAMP CO.

GENERAL OFFICES AND FACTORY: 1238 N. Kostner • Chicago 51, Illinois



Copyright 1954 by UNIVERSAL FORM CLAMP CO., Chicago 51, Ill.

Bernie Carroll, project manager; Paul Suckow, project engineer; and Paul Hamby, grade superintendent, are top personnel on a \$399,194 contract recently awarded to Stolte, Inc. and Gallagher & Burk for runway extensions at the Naval Air Station, Alameda, Calif. The job features new corrugated metal contraction joints and trial of new compaction methods by the Navy.

Allen Sackett, superintendent; Lawrence Fox, master mechanic; Russell Stover, grade foreman, J. Zumwalt, assistant grade foreman, and Art Sabin, rock foreman, comprise the top personnel for J. W. Briggs, contractor who recently received an award for grading and surfacing a section of The Dalles—California highway north of Madras, Ore., including a 120-ft. concrete bridge.

J. R. England and Hubert M. Roth of England & Roth Construction Co. are directing the execution of a \$343,632 road contract of the company, England as office manager, and Roth as construction superintendent. Project is in Weston County, Wyo., and consists of grading and surfacing 10.6 mi. of road from Newcastle to Clareton. Foreman on the job are: H. E. Roth, D. F. England, R. A. Millard, R. J. Schurger and E. J. Boll.

A. L. Acton is superintendent for Taggart Construction Co. working in Natrona County, Wyo. on 0.3 mi. of grading and surfacing on the Midwest-Casper road. George Monighan is timekeeper and Gail George is shifter. This \$315,620 job is expected to finish in mid-1955.

Burt Brewer, superintendent, with the assistance of Axel Malmstrom, concrete and excavation foreman, is supervising grading and surfacing of the South Fork Snoqualmie River Bridge in King County, Wash., for Anderson Bridge Construction Co. which is doing the work at a cost of \$176,087. Contractor hopes to beat the snow on the upper bridge at el. 1880, 5 mi. below the summit.

L. Branco, manager of the railroad division; J. J. Fleming, project manager; Dick Kline, general superintendent; T. C. Stein, superintendent, and Norman Odden, master mechanic, comprise the top personnel for Mannix International Corp. on this contractor's \$1,731,414 job consisting of relaying and rehabilitation work on 59 mi. of the Alaska Railroad from Seward to Portage. This is a 400-day job which has been under way since the middle of July.

John Carrol is job superintendent on 3.4 mi. of grading and surfacing

on Highway 12, Coal Creek to Longview in Cowlitz County, Wash., a job recently awarded to Peter Kiewit Sons' Co. on a \$276,696 bid. Ted Brown is office manager.

Charles H. Foster is supervising for Morrison-Knudsen Co., Inc. on 6.6 mi. of surfacing on Highway 15 from Smiths Ferry south, in Valley County, Ida., a \$280,031 award. Roy Foss is office manager.

M. J. Graff is superintendent for Robert E. McKee, Inc., contractor on the \$2,168,576 project covering maintenance hangar apron and access taxiways and utilities at Riverside, Calif. W. Talbott and I. S. Weddell are engineers. H. B. Johns is in charge of the office. Working as car-

penter foreman at the project is E. G. Britt.

R. W. Bailey, superintendent, and J. R. Patton, project engineer, are key men on construction of Woodrow Wilson Junior High School going up at Glendale, Calif., a \$1,948,000 structure under contract to Robert E. McKee, Inc. Beth Dudley is payroll clerk, and purchasing is in charge of L. F. Beaudreau and W. L. Eatinger.

Under the guidance of Max L. Burdick, president and general manager of Statewide Plumbing & Heating, and with Vice President Kenneth C. Balis acting as general superintendent, and Vice President J. E. Hughes in the capacity of plumbing superintendent, the \$1,093,259 contract of this company for Group A, sewage collection lines for the City and County of Salt Lake, Utah, got under way the middle of August. About two years is the length of time for completion of the work.

Gail Loop, superintendent, assisted by E. V. Fisher and Ed Wang, foremen, is directing Big Horn Construction Co.'s \$437,406 contract for 4.6 mi. of grading and surfacing and miscellaneous work on the Salt Creek Canyon road in Lincoln County, Wyo. Job office manager is J. D. Squier.

Walter Petersen is general superintendent, and Arnold Malley is job superintendent for Manson Construction & Engineering Co. which has a \$1,283,265 contract for 0.4 mi. of grading and surfacing on Highway 13, Chehalis River Bridge approaches in Grays Harbor County, Wash. Warren Brown is project engineer and Clyde Sherman is design engineer. Project involves concrete T-beams and box girders for concrete bridge approaches.

Sal DeQuarda is superintending a contract which was recently awarded to V. Maggiora on a bid of \$114,568 for a sewage separation unit at Berkeley, Calif.

Ross Bevan, project manager, and Eugene Howerton, superintendent, are in charge of construction of a sewage collection system and disposal plant at Ely, Nev., a \$126,291 job recently awarded to Detweiler & Detweiler.

James W. Jones, select borrow foreman; Norman Moe, crushing foreman; and Bill Radovich, hot plant foreman, are key men working for Nelson-Smith Construction Co. on 12.0 mi. of grading and surfacing on the Crow Agency-Broadus road, Big Horn County, Mont., a \$172,437 contract.

SAFETY

Job accidents take their toll

THESE were the accidents that resulted in death or serious injury on the West's construction jobs during the last reported month.

Kenneth Rudisill, 29, was reported killed on Aug. 5 on a highway construction job near Cottage Grove, Ore. He had recently joined the George Stacy Construction Co. as a tractor operator, and was crushed to death when the equipment overturned.

ACCIDENTAL DEATHS and serious injuries on the West's construction jobs are reported each month in the interest of safety-on-the-job.

Ernesto Perea, 39, New Mexico State Highway Department employee, died instantly Aug. 3 when he was crushed beneath a tractor he was driving while hauling a mowing machine. As he came to a bridge the tip of the mowing bar struck an abutment of the bridge, throwing him down an embankment, and the machine came down on top of him.

Merle Tobias, Portland, Ore., and George Graham, Kalama, Wash., are known to have lost their lives recently when a tug and barges were sucked into the undertow of Bonneville Dam spillway, 4 mi. west of Portland. At time of going to press three others, Magner Larsen, Astoria; Leonard Boylan, Cathlamet, Wash.; and Don Lewis, son of Frank Lewis, former resident engineer at the dam, were still missing and presumed to have drowned. All men were employed by a construction company making repairs to the dam.

NEW LITERATURE

Free copies of any of the items in this section may be obtained by using coupon on page 125.

12

Shovel, crane specification sheets

Schild Bantam Co. has published two specification sheets describing a shovel attachment. Bulletin TSH-301 contains shovel specifications, capacities, information about optional equipment, and job action photos for Model T-35, $\frac{3}{8}$ -yd., 6-ton, truck-mounted shovel. Bulletin CSH-301 gives the same information on the Model C-35, $\frac{3}{8}$ -yd., crawler mounted, shovel-crane.

13

Concrete form guide

Universal Form Clamp Co. has published a 26-page catalog illustrating and describing its line of concrete forms, concrete form ties, and concrete accessories. It contains drawing and specification tables on each unit, a reference table for selection of the proper form tie, and a form design formula and chart for developing stud, wale, and tie spacings which should be especially valuable to the superintendent of any job involving concrete pouring.

14

Trenchmobile catalog

A 2-color, 8-page catalog describing applications for the improved Parsons 88 Trenchmobile has been published by Parsons Co. It is illustrated with many photographs showing the machine, its operating parts, and performance on the job.

15

Medium-weight dragline bucket

A medium-weight dragline bucket is described in an illustrated catalog published by Page Engineering Co. This 4-page folder pictures the bucket in operation on the job, describes its various vital parts, and contains a specification table for each size bucket from $\frac{3}{8}$ - to 3-yd.

16

Catalytic purifiers for engine exhausts

Oxy-Catalyst, Inc., has published a 4-page folder describing OCM cat-

alytic exhausts intended to remove harmful exhaust fumes from internal combustion engines. It contains suggested uses, a photograph of the exhaust, and several testimonials from satisfied users.

17

Sauerman field reports

Sauerman Bros., Inc., has published two field report sheets describing how a tractor-scraper combination can work in spaces which allow none of the head room required by other machines and also how to make a boom machine reach farther and dig more. Both reports are copiously illustrated and go into great detail in explaining how to solve the specific problem described.

18

Orton torque-control catalog

Orton Crane & Shovel Co. has published Catalog 87, a 16-page, color booklet describing the firm's torque-control and its application to crawler cranes. It contains tips on operation, illustrating the ease and ability with which these cranes may be maneuvered, and also takes up in detail the important features of the units. Detailed specification tables and drawings are included.

19

Onan power plant booklet

A 16-page, two-color, pocket-sized booklet, "Power Points Digest, Volume 10, No. 3," has been published by D. W. Onan & Sons Inc. It describes how these plants are used for contractors' portable power needs, as emergency standby units, and as magnet chargers for cranes and trucks.

20

Steam generator for pile driving

Bulletin 63 is a 4-page, color leaflet, published by McKiernan-Terry Corp., describing the McKiernan-Clayton steam generator for pile driving. It contains photographs of the unit, a section of pertinent questions and answers on its use, a specification table, and a graphic diagram explaining how the complete circuit of the generator works.

21

Lincoln engine-driven welders

An 8-page, color booklet has been published by The Lincoln Electric

Co., to illustrate its line of shield-arc, engine-driven welders. It has specification tables, photographs, and drawings of each unit. Suggested uses are also included. Photographs and descriptions of undercarriages are found at the end.

22

Scaffolding system booklet

A 12-page bulletin describing the Brainard scaffolding system has been published by Brainard Steel Division of Sharon Steel Corp. It explains, in simple pictures and easy to read directions, the assembly, handling, and maintenance of this scaffolding. Also describes accessories and typical assemblies. Ends with a list of safety rules to make handling of this scaffolding more secure.

23

Prestressed concrete handbook

Prestressing, Inc., has published a 42-page data manual which is a compact explanation of prestressed concrete construction. Its four sections take up structural design, construction methods, equipment, and the results of recent research into this method of construction. Contains many drawings, photographs of structures in the process of construction, charts, and design formulae. This handbook should be in the library of every engineer concerned with prestressed concrete construction. Send for your free copy by filling out the coupon on page 125.

24

"Igas Joint Sealer"

Sika Chemical Corp. has published a 4-page, color leaflet describing its Igas Joint Sealer, a non-meltable, mastic waterstop. It describes the properties and advantages of using this compound, gives installation instructions, and describes two basic joint designs which are reported to solve most joint problems.

25

Non-shrink grouting

A 16-page, color booklet called

"Embeco Non-Shrink Method of Grouting" has been published by **The Master Builders Co.** Printed in big, easy to read type, it contains photographs taken on the job, lots of drawings, and pages of charts. The last page is made up of recommended mixes and estimating tables.

26

Complete Air Reduction welding catalog

Owners of Air Reduction cutting and welding equipment are advised to send for Catalog ADC 702B, a new 36-page catalog covering the company's complete line of torches, tips, and accessories for oxyacetylene cutting and welding. The book contains tables of specifications, illustrations, charts, and descriptions. Published by **Air Reduction Pacific Co.**

27

Scaffolding assembly, use catalog

Advance Scaffold Division of Beaver Art Metal Corp., has published a 16-page general catalog and parts list on its line of Advance tubular steel scaffolding and materials hoisting towers. It contains photographs taken on the job, drawings of typical scaffolding assemblies, descriptions and drawings of scaffold accessories, suggested applications,

and a page of safety rules and regulations. Recommended for superintendent on jobs where lots of scaffolding is used.

28

Core drilling machine bulletin

An 8-page, two color bulletin describing the Model 142 core drilling machine of **Sprague & Henwood, Inc.**, is available at no cost. It contains such information about this high-speed, heavy-duty, diamond core drilling machine as complete specifications, working data, and listings of accessory equipment needed for diamond core drilling. Ask for Bulletin No. 160.

29

Dorrco jet sizer

The **Dorr Co.** has published a 6-page, two-color folder describing the physical characteristics, control mechanism, theory, method of operation, applications, and advantages of the **Dorrco jet sizer**, a hindered settling hydraulic classifier. Contains a cut-away drawing describing the basic parts, line drawings showing

various sizes and capacities, and a list of the advantages to be gained in using this machine. Ask for your free copy of Bulletin No. 2342.

30

Galion Model 450 motor grader

The **Galion Iron Works & Manufacturing Co.** has published a 6-page catalog in color describing its new Model 450 tandem drive motor grader. It contains detailed information on construction and operating features, a complete specification table, and a 3-page-wide cutaway drawing of the unit showing its important parts in color.

31

Construction project electric systems

General Electric Co. has published Bulletin GEA-6196, an 8-page, color bulletin containing case histories of engineering help and electric equipment furnished by General Electric on construction of tunnels and bridges.

32

Gasket sealability

Johns-Manville has published a 12-page bulletin, "How Flange Surface Finishes Affect Gasket Sealability and Joint Performance." It discusses



It's Barnes Again On Another Tough One!

Two Barnes 90M Self-Priming Centrifugal Pumps are doing an outstanding job of controlling the water level in the gypsum quarry of the Celotex Corporation at Port Clinton, Ohio. No tougher job could be given any pump. Discharge lines running straight up for 100 ft., then taking off at an angle for 20 ft. more; water high in sulphur content and laden with grit and silt. These Barnes pumps are on the job day in and day out—one for 7 years the other for 3 years. Only maintenance was to shim impeller of one pump to bring it to recommended clearance. If Barnes is tops on tough jobs—what a buy they are for your dewatering job.

Barnes Self-Priming Centrifugal Pumps range from 1-in. to 6-in. suction and discharge sizes; capacities from 2,000 to 90,000 G.P.H. and choice of Gasoline, Diesel, Electric or Pulley Drives.

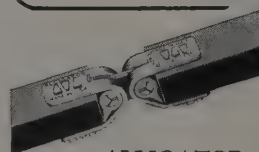
Buy the Best . . . Buy Barnes

Distributors:

Central Equipment Co., Berkeley, Calif.
P. L. Cooks Co., Portland, Oregon
R. L. Harrison Co., Inc., Albuquerque, New Mexico
The C. H. Jones Equipment Co., Salt Lake City, Utah
H. W. Moore Equipment Co., Denver, Colorado
The Rix Company, Inc., San Francisco, Calif.
Universal Equipment Company, Seattle, Wash.

BARNES MANUFACTURING CO., Mansfield, Ohio; Oakland 21, Calif.

WHICH V-BELT is best for you?



If the correct size of endless V-Belt is not readily available, or if you have to tear down machinery to install, then the best belt to use is open-end V-Belting fastened with

ALLIGATOR V-BELT FASTENERS

★ In this way you can make up V-Belts in *any length* to fit *any drive* the fast economical way—V-Belts that perform exceptionally well.

★ In contrast to link-type belts these ALLIGATOR fastened V-Belts have just *one strong joint . . . stretch and follow-up maintenance are reduced to a minimum.*

ALLIGATOR INTRODUCTORY V-BELT DRIVE UNITS

contain V-Belting, Fasteners and Tools—everything you need in one compact package to make up V-Belts quickly. Available in sizes A, B, C & D.

Ask for Bulletins V-215 and V-216
Order From Your Distributor

FLEXIBLE STEEL LACING COMPANY

4704 Lexington Street, Chicago 44, Illinois



the effect of flange surface finishes upon the performance of a gasket and provides a basis to help select the flange surface finish most suitable for a given gasket. Also explains why the right finish makes it easy to achieve an initial seal and obtain the best joint performance in service. Send for your free copy.

33

Custom designed power plant equipment

Pacific Coast Engineering Co. has published a 28-page full-color booklet entitled "Custom Designed Equipment for Hydro-Electric and Steam Power Plants and Water Works." It contains drawings and photographs of equipment installed in various major projects by this company and lists various types of products made for specific jobs. Recommended for design engineers on major projects. Send for your free copy by filling out the coupon on page 125.

34

340-page Link-Belt catalog

Link-Belt Co. has published a 340-page standard products catalog designed for easy and rapid selection of stock products. It has a flexible cover, thumb index, capacity charts, and dimension tables to aid in selection of the proper product for the intended use. Products shown include conveying, elevating, and power transmission components. Send for your free copy of Catalog 950.

35

Electrified construction tools

General Electric Co. has published Bulletin GEA-6195, an 8-page, color bulletin containing case histories of various electrified construction tool applications on dam construction projects. Bulletin describes long span and standard trusses.

36

Boiler bulletin

Cleaver-Brooks Co. has published Bulletin AD-135, a 4-page, two-color bulletin which describes the company's line of CB50-80 small boilers. Contains photographs of boilers and accessories, drawings, and specifications.

37

Longspan and standard trusses

Pittsburgh-Des Moines Steel Co. has published a 4-page bulletin de-

New . . .

Different . . . Better

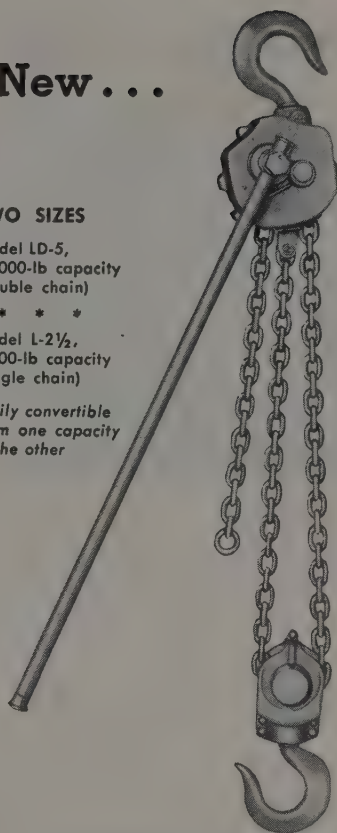
TWO SIZES

Model LD-5,
10,000-lb capacity
(double chain)

* * *

Model L-2½,
5,000-lb capacity
(single chain)

Easily convertible
from one capacity
to the other



COFFING Super Power COIL CHAIN

RATCHET LEVER HOIST

For over two years the entire production of Coffing's new Super Power Ratchet Lever Hoist has gone into military service. Now it is available to bring new standards of ratchet hoist performance to civilian users. These are just a few of the advantages this new hoist offers:

SIMPLE in design

Parts are simple, rugged and few in number to assure continued top performance. May be disassembled in the field for fast, efficient servicing.

The only 5-ton hoist of this type using but two chains, contributing to faster operation and lighter weight.

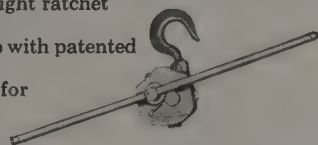
CONVENIENT to use

Handle adjustable for close-quarter applications — also may be operated from opposite side of hoist.

The 5-ton model weighs but 58 lb — lightest weight ratchet hoist in this capacity on the market.

Only 70 lb of handle pull needed to lift 10,000 lb with patented compound lever principle.

You get coil chain flexibility plus free chaining for quick adjustment.



TOUGH for safety and dependability

Ratchets and pawls are specially hardened alloy steel — every load-holding ratchet is tested at 30,000 lb.

Housing is certified malleable iron to protect hoist from rust and damage.

Handle is designed to bend before hoist is overloaded beyond safe limits.

For full details,
write for
Bulletin WC10L.

IN PUNISHING "DROP TEST," the Super Power had to withstand the shock of a 10,000-lb load dropped 4 in. — an impact load of over 40,000 lb. After several hundred such tests of Super Powers, there has never been a hoist failure!



COFFING HOIST COMPANY • DANVILLE, ILLINOIS

Originators of the Ratchet Lever Hoist

QUICK-LIFT ELECTRIC HOISTS • HOIST-ALLS • MIGHTY-MIDGET PULLERS • SPUR-GEAR HOISTS
DIFFERENTIAL CHAIN HOISTS • LOAD BINDERS • I-BEAM TROLLEYS

Proper Placement Promotes Profits



There are no delays on this job—no waiting for concrete or tie up of crews when the concrete placing job is equipped with a Gar-Bro concrete bucket, floor hopper and concrete carts. They are basic tools of the industry. On this municipal stadium job 420 cu. yds. were placed in 10 hours



When bucket and crane could not reach the center of a reservoir floor, a fleet of Power-carts shuttled the concrete from a Gar-Bro Portable Hopper to the floor slab forms.



Contractor saves money by discarding fixed tremie stations and using movable Gar-Bro elephant trunks to chute concrete deep into wall forms. Gar-Bro 1-yd. buckets and collection hoppers were used.

40 ft. under water, concrete was placed with a special 4 cu. yd. Gar-Bro bucket converted by addition of a crown top. Gate was air-operated by remote control from barge.

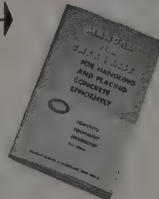


Write for 60-page Concrete Handling Manual

Includes useful tables, references, correct and incorrect methods, unusual jobs solved and other data.



GAR-BRO MANUFACTURING COMPANY
Los Angeles 21, California, 2415 East Washington Boulevard
Peoria, Illinois, 1600 North Adams



scribing long span and standard trusses produced by the company. It includes drawings of a variety of types of trusses and illustrations of buildings under construction involving pitched, bowstring, longspan, flat, cantilever, and sawtooth trusses.

38

Air Reduction welding catalog

A 52-page, color catalog which describes and illustrates Air Reduction products for users of light welding and cutting equipment has been published by **Air Reduction Pacific Co.** It covers gases, welding and cutting equipment, and accessories. It is designed to acquaint customers with how each item operates and the jobs to which it is best suited. Contains complete specifications and information on stock numbers for easy ordering. Ask for Catalog ADC 662B.

39

High-speed portable earth drill

Soiltest, Inc., has published a 4-page, color bulletin describing its McCulloch high-speed portable earth drill. Contains photographs of the unit in action on the job, suggested uses, and a complete page of specifications.

40

Armco steel buildings

Armco Drainage Metal Products, Inc. has published a 6-page, color folder on its Steelox steel buildings. Contains photographs and drawings of the buildings, drawings of accessories, and suggested uses. One photograph of the building is accompanied by paragraphs of text pointing out the advantages of using these buildings.

41

Athey rear-dump earth mover

Athey Products Corp. has published a 6-page folder describing how the rear-dump Model PR21 works, how it's built, and how it should be used. Send for your free copy of Form No. PR-1014.

42

Simplex forms

Simplex Forms Systems, Inc. has published an 8-page folder describing this new company's line of concrete forms. Contains photograph taken on the job, drawings of various features of the forms, and explanations of the money-saving advantages to be gained by use of these forms.

43

Cat diesel engines

Caterpillar Tractor Co. has published an 8-page, color booklet con-

taining job descriptions and photographs showing how torque-converter-equipped diesel engines have proven profitable. Included are descriptions of installations in such varied types of equipment as locomotive cranes, drilling rigs, and shovels, as well as a complete chart of Cat diesel engines and their horsepower ratings. Send for Form No. D457.

44

Standard Steel portable asphalt plant

Standard Steel Corp. has published a 4-page bulletin describing its new portable batch type asphalt plant. It contains photographs of the plant, various vital parts, and accessories. A side elevation drawing shows the plant set up for operation. Ask for Bulletin No. 541.

45

Power-take-off drives for tractor-trailers

Stow Manufacturing Co. has published Bulletin No. 542, a 4-page, color folder describing a new power-take-off drive developed for tractor-trailers. It has photographs of the drive, drawings of the drive in position on tractor-trailers, installation instructions, and a page of instructions on how to order the drive for a specific unit.

46

Galion Allsteel dump bodies

The Galion Allsteel Body Co. has published a new 4-page, 2-color catalog which describes Galion Allsteel bodies Model 12N-3 and hydraulic hoists Models 600, 700, and 710. It contains photographs, line sketches, and cut-away views. Construction details and mechanical features of bodies and hoists are discussed. Full specifications are included.

Literature briefs . . .

47

CP ROTARY COMPRESSORS are described in Bulletin SB-3084-2, published by Chicago Pneumatic Tool Co.

48

TIPS ON HOW to cut time and costs with carryable generators are contained in a bulletin published by Homelite Corp.

49

CATALOG No. 25 describes standard sluice gates made by Chapman Valve Manufacturing Co.

50

AN ILLUSTRATED BOOKLET, "Welded Wire Fabric Reinforcement for Asphaltic Concrete Resurfacing

Over Concrete Pavement Slabs," has been published by Colorado Fuel and Iron Corp.

51

A MANUAL on hard-surfacing has been published by Victor Equipment Co.

52

WIRE ROPE CATALOG G-16 has been published by Macwhyte Co.

53

SIMPLEX CONVEYOR CARRIERS are described in bulletin No. 453, published by Stephens-Adamson Manufacturing Co.

54

FACTS AND SPECIFICATIONS on portable crushing plants are contained in Bulletin 1000, published by Diamond Iron Works.

55

SHIELD ARC WELDERS are described in Bulletin 1337, published by The Lincoln Electric Co.

56

DESIGN SUGGESTIONS and details on steel forms are contained in Bulletin 2430, published by Blaw-Knox Co.

57

THE LITTLE MONSTER, an asphalt mixing plant on wheels, is described in Bulletin LM-1, published by Madsen Iron Works, Inc.

CLIP AND MAIL THIS COUPON

▶▶ for your free copies of

NEW LITERATURE

▶▶ or for more information on

NEW EQUIPMENT

described in the following pages.

WESTERN CONSTRUCTION

READER SERVICE
609 Mission Street
San Francisco 5
California

Send me free booklets and information indicated by numbers circled:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

Send complete information about products advertised on:

Page by

Page by

Page by

Name

Address

Position COUPON FOR

Organization OCTOBER 1954 ISSUE

NEW EQUIPMENT

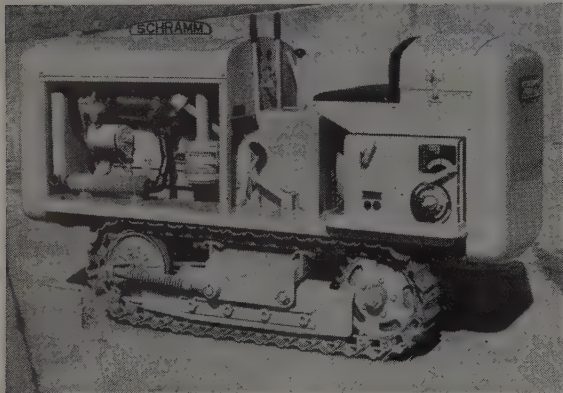
More information on any of the items in this section may be obtained by using coupon on page 125.

58

Welder mounted on self-propelled crawler

To offset the difficulty of getting a welder to the place where it is needed, Schramm, Inc., has mounted a 300-amp. gasoline-engine-driven welder on a self-propelled crawler.

Power from the engine is transmitted to the tracks



through a chain, a differential, and a final bull gear drive. Steering is accomplished by brakes on the drive wheels. The machine can turn on its own center. Total overall width is less than 32 in. Four forward speeds and one reverse are provided.

59

Portable crushing plant designed to produce two sizes of low-cost gravel or rock

Iowa Manufacturing Co. has announced a new single pass, portable crushing plant for producing two sizes of low-cost gravel or rock on jobs where accurately graded material is not important. The plant consists of a 6 x 6-ft. loading hopper equipped with sloping bar grizzly with 7-in. openings; an 18-in. reciprocating plate feeder with adjustable feed stroke and gate; a 2 x 6-ft., double deck inclined vibrator screen; a 10 x 24-in. roller bearing jaw crusher; a 24-in. x 25-ft. channel frame delivery con-



veyor; a 14-in. x 20-ft. sand conveyor; and a 36-hp. gasoline engine. The plant weighs 24,500 lb.

This unit was designed to produce aggregate for city streets and alleys, county and township road maintenance, small state contracts, jobs in isolated locations, base or blanket course jobs, and other jobs where portability and fast set-up are important. Capacities vary with type and condition of material. However, production of 40 to 75 tons per hr. of 1½-in. material can be expected under proper operating conditions, the manufacturer says.

60

Sierra Movall, a new end dump wagon, can carry 31 tons of earth or rock

C & D Manufacturing Co. announces the Sierra Movall, a new, cable-operated end dump rock and dirt wagon with a maximum carrying capacity of 31 tons. Struck capacity is 19 cu. yd.; heaped capacity is 25 cu. yd. Principal features include an 11 x 19-ft. target area for shovel



loading, positive cable-controlled ejection, ability to dump from jack-knifed position, and independently controlled air brakes.

Approximate shipping weight is 29,750 lb., less tractor. An interchangeable gooseneck fits the wagon for use with DW20 or DW21 tractors. The double bottom is made of 2-in.-thick hardwood with a ¾-in. steel top plate and a ¼-in. steel bottom plate. Interior surfaces are protected by abrasion-resistant wear strips. Descriptive literature available on request.

61

Washington Densometer incorporates new principle in field testing of soils

In the June 1954 issue of *Western Construction* there appeared an article entitled, "Are you getting good compaction?", which was written by Herb Humphres, senior materials engineer for the Washington Department of Highways. In it, Herb described the state's experiences with the Washington Densometer, a new method for field testing of highway soil density.

Now an announcement has been received that this piece of equipment is being manufactured commercially by D. G. Parrott & Son. Designed and tested by highway engineers, it offers the advantages of accurate testing of

a wide range of soils, fine or coarse, and a range of hole sizes from 0.000 to 0.500 cu. ft. It is light in weight, compact, portable, and simple to operate and maintain. Readings can be taken in about 3 min. after the hole is dug. Successive determinations on any number of thin layers can be made in the same hole up to 22 in. deep, singly or in successive lifts. Recommended for engineers and contractors engaged in earthwork.

62

Gar Wood designs world's largest ditching machine

Gar Wood Industries is now designing the largest ditching machine in the world, one capable of digging a 15-ft.-wide by 30-ft.-deep ditch, the sales department says. To be called Buckeye Model 435, it is intended for excavation of intercepting and outfall sewer trenches, water diversion aqueducts, and other large ditches.

Model 435 will cost about \$100,000. Approximate dimensions are: length, 81 ft.; height, 15 ft.; width, 12 ft., excluding dirt discharge conveyor; weight 65 tons. The machine will be crawler-mounted at the digging end and supported by rubber-tired wheels in front. Two diesel engines with torque converters will supply power to the crawlers and digging drive. It will also have hydraulic power steering.

63

Improved Hopper Conveyor model permits use with any size, style dump body

Power-Pack Conveyor Co. has announced an improved model of the Hopper Conveyor to be used for backfilling curbs and trenches and for road-widening work. Wheel spacing has been widened to 9 ft. 5½ in., the front edge of the Hopper has been lowered to permit use with any



size and style of dump body, and attachment to the hauling unit and release when the truck load of material is placed has been simplified by addition of tension ratchets for the connecting cables.

Another new feature is the removable conveyor assembly which permits use of the Hopper for full-width spreading of salt, cinders, topsoil, gravel, and the like. The conveyor can be used separately for handling bulk materials and other construction supplies. Form HC 105 describes this unit in detail.

64

Windrow loader operates at capacity of 4 cu. yd. per min.

Barber-Greene Co. has developed its Model 550 windrow loader, a medium capacity, low-cost, easily maneuverable machine. It operates at a capacity of 4 cu. yd.

HARD-PACKED CLAY couldn't stop this McKIERNAN-TERRY PILE HAMMER



To prepare the foundation for the concrete spillway of a new Texas dam, many, many piles were needed ... 2,127 of them. In addition, the piles had to be driven into resistant, hard-packed clay.

It might have been a tough and lengthy job, but not to the powerful, fast-driving McKiernan-Terry 11B3 Double-Acting Pile Hammer wisely selected by the contractors, Reynolds & Williams and Noonan Construction Co.

Contractors all over the world have learned from experiences like this that McKiernan-Terry Hammers can always be depended upon for speedy, economical pile-driving jobs.

Write for Bulletin.

McKIERNAN-TERRY CORPORATION Manufacturing Engineers

Also manufacturers of coal and ore unloaders and bridges, grab buckets and special machinery
16 PARK ROW, NEW YORK 38, N.Y.

Seattle and Spokane: Star Machinery Co.; Portland, Ore.: Cremer Machinery Co.; San Francisco: Edward R. Bacon & Co.; Los Angeles: Garlinghouse Brothers; Salt Lake City: C. H. Jones Equipment Co.; Denver: Mine & Smelter Supply Co.; Albuquerque, N. Mex.: R. L. Harrison & Co.

MK 360

McKIERNAN TERRY



11B3 Double-Acting Pile Hammer included in the McKiernan-TERRY line of 16 sizes of double-acting and single-acting pile hammers and 2 sizes of double-acting extractors.



per min. The machine consists of an 18-in. loading belt conveyor and mechanical feeding mechanism mounted on a rubber-tired, Model 50 John Deere tractor. It will turn around completely in a radius of 8 ft. 6 in. Travel speed is 10 mph. It has a discharge height of 10 ft. with an overhang of 8 ft. under the conveyor boom. Power-operated hydraulic rams lift the loading boom for transport.

Pilot models have been tested all over the country during the last 2 years. In one instance, a loader picked up moist sand and clay, bladed from a street surface to bring it to grade preparatory to paving. It handled 200 truck loads, from 3½- to 4-yd. capacity, in a 9-hr. day. In another instance, sand, loam, and a high percentage of gravel and rock were placed in 5-yd. trucks. In one 6-hr. day, 158 trucks were loaded. Windrows of earth and sod were loaded at a capacity of from 3 to 4 yd. per min. in another instance.



Model HR complete as shown for AC HD-5 \$398.00
f.o.b. Billings, Montana

A hydraulic control unit providing 18 to 55 GPM of 1000 p.s.i. hydraulic power for fast, accurate control of scrapers, levelers and other drawn or tractor-mounted equipment.

*Available for all wheel and track-type tractors.
Dealer and distributor inquiries invited.*

H-S ENGINE CO.

N. P. Industrial Site

Billings, Montana

H
Y
D
R
A

U
N
I
T

65

Portable Gardner-Denver compressor has capacity of 125 cfm.

Gardner-Denver Co. has announced a new, 2-wheeled, portable compressor which has a capacity of 125 cfm. It is recommended for use on small construction jobs, street and utility repairs, and other projects having similar compressed air requirements.

Model WH-125, as it is called, has a 2-stage, water-cooled compressor driven by either a gasoline or diesel engine which operates at moderate speed.

Experience has shown that water-cooled compressor cylinders limit operating and discharge temperatures when the weather is hot. In cold weather, warm water from the engine can be circulated through the compressor water jackets before the clutch is engaged, and therefore the compressor can be warmed up and fully lubricated as soon as it starts turning over, the manufacturer reports. Reference No. 862.

66

Bucyrus-Erie adds air-controlled, 3-cu. yd. shovel to its crane-excavator line

A 3-cu. yd. shovel, Model 71-B, has been added to its line of crane-excavators by Bucyrus-Erie Co. The new machine, which is readily convertible to dragline, clamshell, or lifting crane, offers twin rope crowd, fully inde-



pendent boom hoist, full air control, torque converter drive, one-piece cast steel frame, and various other parts.

MASTER DISTRIBUTORS

for

**CONTINENTAL — WISCONSIN ENGINES
ROCKFORD CLUTCHES**

ENGINES — CLUTCHES — PARTS AND SERVICE

for

**TRANSPORTATION — INDUSTRIAL
AGRICULTURAL PURPOSES
ENGINE REBUILDING AND OVERHAUL**

Courteous reliable service at reasonable cost

CONTINENTAL SALES & SERVICE CO.

POWER SPECIALISTS

3817 Santa Fe Avenue, Los Angeles 58

LOgan 5-6381

This model is powered by a 6-cylinder GM diesel engine. Operational safety is increased by use of friction steering and digging brakes.

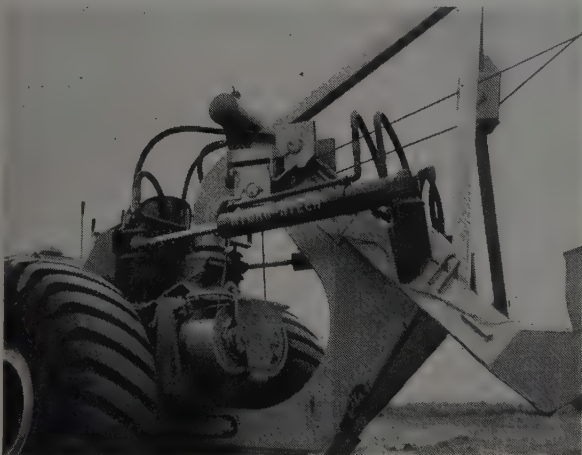
The 27-ft. shovel boom is welded structural steel. Standard boom for lifting crane, dragline, and clamshell is 60 ft., extendible to 110 ft. with removable inserts. All crane-type booms are equipped with a pendulum type boom angle indicator. This unit incorporates power-controlled lowering of the boom. Boom hoisting and lowering is accomplished with a single hand lever.

An important feature is the use of friction steering and digging brakes on the 71-B. Straight propelling and sharp turns are accomplished through two multiple jaw clutches and a pair of steering brakes. A simple mechanical interlock prevents disengagement of both steering clutches simultaneously.

67

Shepherd Hydro-Steer offers effective hydraulic steering control for Tournapulls

Effective hydraulic control in steering becomes automatic on LeTourneau Super C Tournapulls fitted with Hydro-Steer, according to its manufacturer, **Shepherd Tractor & Equipment Co.** This unit consists of heavy-



duty hydraulic rams mounted between the tractor and scraper. Directional control is maintained by two mono-directional hydraulic systems which permit change in ram position only when controls are actuated.

This unit, which is completely self-contained and requires no engine power, will hold the Super C in a straight line regardless of outside conditions. It is available as a complete kit that can be installed with regular welding equipment. Standard operator controls remain the same and require no change in method of operation.

68

Peterson power tilt for bulldozer gives blade control under full load

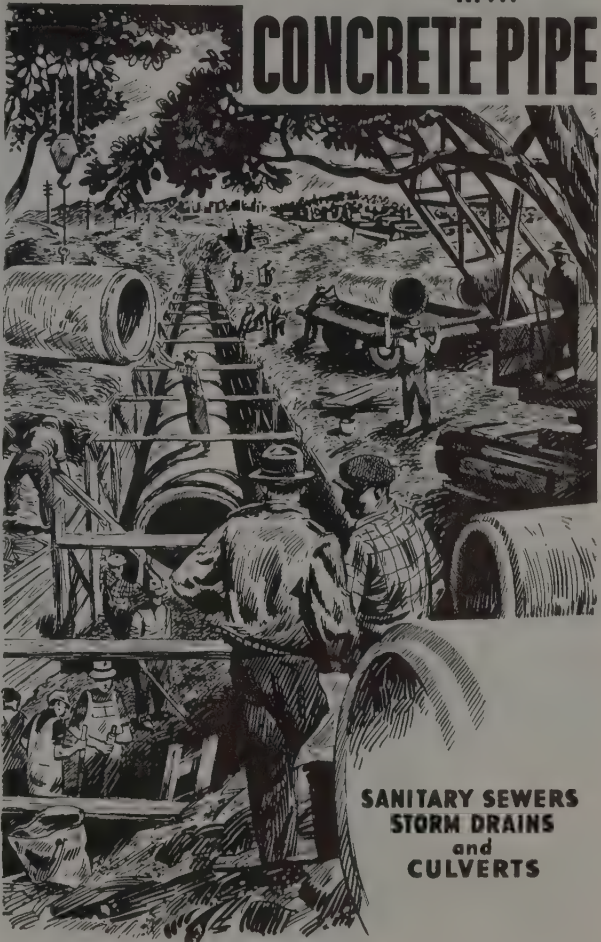
A new hydraulic power attachment for Caterpillar 8S and 8U bulldozers gives fully controllable blade action, even under full load. The unit allows tilting either corner of the blade a maximum of 22 in. below the other. The added flexibility should save passes and increase accuracy on sidehill and ditching work.

A hydraulic cylinder replaces the existing manually adjusted tilt brace on one push arm. Other parts of the standard "package" include front-mounted hydraulic pump, foot pedal control, and all piping and hose. The package is available from **Peterson Tractor & Equipment Co.** for Cat D8 tractors. It can be built to order for smaller Cats. A dual control valve permits utilizing the Ateco hydraulic system on machines so equipped.

You get all these advantages

in ...

CONCRETE PIPE



**SANITARY SEWERS
STORM DRAINS
and
CULVERTS**

● CAPACITY

In sanitary sewers and storm drains of concrete pipe, maximum hydraulic capacity is assured by the smooth interior of both the pipe and the joints, promoting a steady, even, undisturbed flow with a minimum of friction.

● ECONOMY

Low first cost, low installation costs, low maintenance costs and quick delivery on the job from the plant of your nearest association member — all these factors contribute to the lasting economy of concrete pipe for storm drains, sanitary sewers and other drainage problems.

● DURABILITY

After many years of constant service, thousands of miles of concrete pipe testify to the long life of this modern, convenient form of construction. Made to meet the highest standards of engineering specifications for every type of use, you can look to concrete pipe for exceptional durability.

● STRENGTH

Designed to support all types of loads and fills and capable of resisting the impacts of the heaviest travel, concrete pipe has proved its stamina time and again under the stress and strain of railroad traffic, airport landings, modern freeways, city streets and county roads.

For literature and specifications pertaining to all types of concrete pipe write to Dept. C—

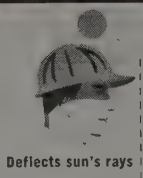
Western CONCRETE PIPE Association

P.O. BOX 152 FRESNO CALIFORNIA

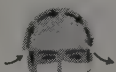
C-6

McDONALD PRODUCTS

...Safety designed
with comfort in mind!



Deflects sun's rays



Air Cooled



Radial ribs deflect
falling objects...
winter comfort, too



Weighs only 9 oz.

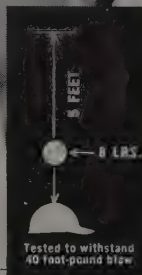


Flared to protect ears

and now ...the new McDonald safe-T-cap

Companion to the famous McDonald SAFE-T-HAT... and the world's lightest—weighs only 9 oz. complete. Cool, comfortable, easily adjusted to any head size. Radiating ribs deflect, rather than absorb head blows. Flared to protect ears—yet does not interfere with carrying material on shoulders.

Write for bulletin and prices today!



Tested to withstand
40 foot-pound blow



B.F. McDonald
COMPANY

Manufacturers & Distributors of
Industrial Safety Equipment

5721 W. 96th St., Los Angeles 45, Calif.
Other Offices in San Francisco & Houston

Please send information and prices on
Safe-T-Cap.

NAME _____
FIRM _____
ADDRESS _____
CITY _____ STATE _____

69

Demo portable electric rotary hammer

Demo Tool Corp. has announced its portable electric rotary hammer with a detachable bit for horizontal and overhead drilling of reinforced concrete, masonry, and similar mate-

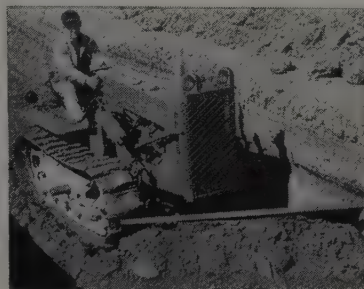


rials. It rotates at 1,000 rpm., strikes 6,000 blows per min., and can be operated by one man. It weighs 9½ lb. is 15 in. long, and operates at 10-15 psi. Powered by a 115-volt, 5-amp., AC-DC Thor electric motor. It drills self-cleaning holes from 3/16 to 1¼-in. diameter through all materials, including reinforced concrete, without change of bits or drills, the manufacturer says. Coupled core tubes enable the drill to go 40 ft. deep.

70

Angling bulldozer designed for crawler tractor

No. 61 bulldozer, a new angling bulldozer for use with the John Deere No. 40 crawler tractor, has been announced by John Deere. It has a replaceable cutting edge of ½-in. hardened steel. The blade and moldboard are curved to form a smooth contour that rolls instead of pushes the dirt. Blade can be angled 11½ and 25 deg. to the right or left,



or used straight. Frame is a one-piece welded unit.

71

New Dresser service saddle

Dresser Manufacturing Division has announced its new Service Saddle (Style 91). The line includes 2 through 12-in. I. D. for tapping asbestos-cement, cast iron, and steel pipe. The saddles come either heavily galvanized or with a special plastic dip. Included are flat straps with rolled threads to give greater bearing surface on the pipe to prevent cutting or crushing. The saddles are supplied with either corporation stop thread or IPS thread taps up to 2 in. in size.

72

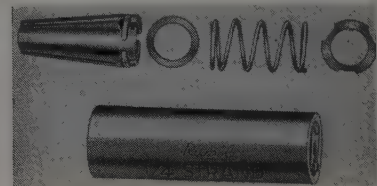
Harnischfeger lightweight welder

Harnischfeger Corp. has announced Model WN-150, a new gasoline-engine-driven arc welder which weighs 425 lb. and is 20 in. high and 45 in. overall. Capacity is 20 to 200 amp. The design incorporated low weight and small dimensions so the unit could be jeep mounted or carried in small trucks. Power is supplied by a 2-cylinder, air-cooled, gasoline engine. Descriptive literature available.

73

Prestressed concrete gripping chuck

A new, reusable gripping chuck for end-anchoring wire, strand, or rod in prestressed concrete construction has been announced by Reliable Electric Co. Known as Steelcase Strandvise, it



consists of a heavy steel casing with an internal taper. The three-jaw chuck comprises several hundred sharp, wedge-shaped teeth which engage the wire automatically, a positioning spring, and necessary washers. It will hold the wire firmly under tensions as low as 300 lb. and anchors wires ranging from 150,000 to 290,000 psi. at 4,000- to 20,000-lb. tension. Available in six sizes.

74

Soil testing equipment

Tinius Olsen Testing Machine Co. has announced a new line of soil testing equipment which includes unconfined compression machines, triaxial testers, consolidation load frames, direct shear machines, consolidometers, compaction molds, and related equipment.

New truck carries balanced loads

International Harvester Co. has designed a one-man, centered cab to permit balanced carrying of lengths of steel, pipe, or lumber longer than

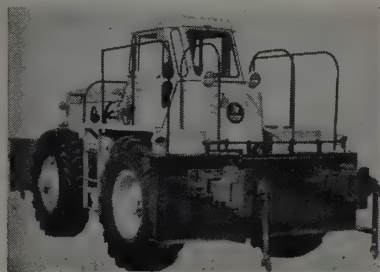


the overall length of the trucks. The cab is 50 in. wide and includes an outrigger frontload support on the chassis and lower front fenders protected with floor plate. Carrying space extends 21 in. along each side of the cab, which has a hatch in the roof to provide entrance or exit in case the right and left doors are blocked.

76

Hercules engine powers towing tractor

Hercules Motors Corp. has announced that its Model JXLD is now powering the Hough TM Payloader,



towing tractor. Model JXYD, which has a piston displacement of 339 cu. in., develops 272 lb. ft. of torque at 1,400 rpm. and produces 131 hp. at 3,200 rpm.

77

New "packaged" compressor

Ingersoll-Rand has announced a new packaged air compressor which comes in two power ratings, 75 and 100 hp. Known as the PHE, it is an opposed-cylinder, balanced design driven by a direct connected, induction motor. Basic design is a two-stage unit for 80-125 psi., but other cylinder arrangements are available for higher pressures or pumping vacuums. Both units are 8 ft. 3¼ in.

Residence Hall!

—Men's Residence Hall, University of Wash., Seattle

—Donald M. Sharp Memorial Community Hospital, San Diego

Bridge!

—Cub River Bridge, Lewiston, Utah

—1000 Lake Shore Drive Bldg., Chicago

Hospital!

Luxury Apartments!

4 Good Reasons for MASONITE Concrete form PRESWOOD®

One contractor uses it for super-smooth ceilings. Another finds these dense, all wood formboards cutting stoning time as much as 50%. A third likes it because it gives him many re-uses. And a fourth appreciates the better paint job it makes possible.

Consider this about Masonite Concrete Form Presdwood:

- Less than ½ the cost of other smooth-surface materials
- Won't split, splinter or crack
- Can be curved for arches, columns, etc.
- Easily worked with ordinary carpentry tools
- Large 4' x 8' and 4' x 12' panels. Fewer fins.

Free Booklet and Sample!

PRESWOOD
WOOD MADE BETTER

NATURALLY STRONGER WITH LIGNIN

MASONITE®
CORPORATION

Dept. WRC-10, 111 Sutter St., San Francisco 4, Calif.

MASONITE
CONCRETE FORM
PRESWOOD
and PRESOLITE

Please send me a sample and your booklet on Concrete Form Presdwood.

Name.....

Firm.....

Address.....

Town.....Zone.....

County.....State.....

"Masonite" signifies that Masonite Corporation is the source of the product

ANOTHER BIG STEP FORWARD! by LUBRIPLATE LUBRICANTS

The introduction of LUBRIPLATE Lubricants established a new high standard for industrial lubrication. Now, a recently patented improvement in the production of LUBRIPLATE results in even greater lubrication efficiency. Under today's operating costs, reduction of down time, less parts wear and replacements, as well as lower power consumption, far outweigh any differential in the initial cost of LUBRIPLATE Lubricants.

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Write for your free copy of the new and enlarged LUBRIPLATE DATA BOOK—a most valuable treatise on modern lubrication!

LUBRIPLATE DIVISION
Fiske Brothers Refining Co.
Newark 5, N. J. • Toledo 5, Ohio



long, 4 ft. 7½ in wide, and 5 ft. 6 in. high, and both take about 65½ cu. ft. of foundation space. Shipping weight of the 75-hp. unit is 6,665 lb. Shipping weight of the 100-hp. unit is 6,815 lb. Ask for Form 3155 for more information.

78

Heavy equipment tires are 8 ft. tall

United States Rubber Co. is making tires that weigh 2,600 lb. and stand 8 ft. tall for use on earth-mov-

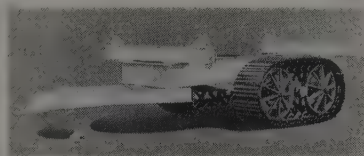


ing equipment, bottom dump trucks, and self-loading scrapers. Called U. S. Royal Con-Trak-Tors, they have a 40-ply rating and are 30.00-33 in size. The largest Con-Trak-Tor costs \$4,949.50. The next largest, 27.00-33, costs \$3,886.10.

79

Cross-country trailer

A trailer, which was designed to haul heavy and bulky loads anywhere track-type tractors can travel, has been announced by **Athey Products Corp.** It is called the Universal Forged-Trak Trailer. The basic frame is constructed of structural



steel with cross bracing of channel and angle sections. Five sizes, ranging from 6 to 30 tons, are available. Loads up to 56 ft. long can be hauled. Loading height with platform and 30-ton wheels is 47 in. With 6-ton wheels it is 43 in.

80

Gurley variable power eyepiece

W. & L. E. Gurley has announced that its Variable Power Eyepiece, which eliminates the need for more than one eyepiece for changes in magnification, is now standard equipment on all products. The single eyepiece makes possible a change from high to low magnification and back again with stops anywhere in between. It provides a clear, flat field, devoid of aberrations, at any magnification selected.

81

New GMC diesel powers Preparerizer

Pettibone Wood Manufacturing Co. has announced that its Model P-600 Preparerizer is now equipped with a GMC 671 diesel engine with



four-speed transmission. Other changes include a new breaker bar for faster breaking of hard asphaltic materials, new drive-on paddle plates, and reduction from 48 to 24 in their number. Descriptive literature available.

82

Hydraulic power steering unit

Leland T. McGee Manufacturing Company, Inc., is marketing a hy-

PREFERRED by CONTRACTORS

Less initial cost—Lower upkeep

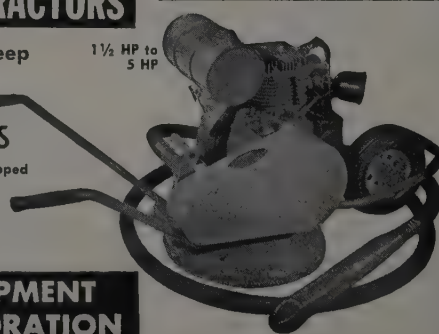
MARVEL CONCRETE VIBRATORS

GV-1, GV-2 & GV-3 Models Now Equipped
with Automatic Centrifugal Clutch as
Standard Equipment.
Interchangeable Flexible Shafts.

Write for full information

**MARVEL EQUIPMENT
CORPORATION**
215-217 EAGLE ST. • B'KLYN 22, N. Y.

1½ HP to
5 HP

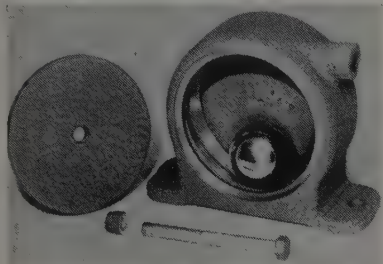


draulic power steering unit which can be installed on any Ford or Ferguson tractor without disturbing or discarding any of the regular tractor steering mechanism. It offers the advantages of 1,500-lb. power steering pressure, positive, finger-tip control of the steering wheel, and use of the McGee Radial Ball-Piston hydraulic pump. Descriptive literature available on request.

83

Airoviber breaks up bulk materials

Airoviber, a device to move bulk materials by breaking up arching and jamming in bins, hoppers, chutes, feeders, and other places where bulk



materials hang up, has been announced by Viber Co. It consists of a steel ball blown at high speed around a ground and hardened steel track in the housing by an air jet. The weight of the ball develops a strong centrifugal force which the vibrator transmits through its mounting into the object to be vibrated.

84

Larger fuel tank for Cat D8

A new 98-gal. fuel tank to replace the old 69-gal. unit has been added to the D' track type tractor by Caterpillar Tractor Co. It will permit 40% more hours of operation without refueling.

85

New Galion batch body

The Galion Allsteel Body Co. has announced a new batch body which is divided into four aggregate compartments by waterproof batch boxes.

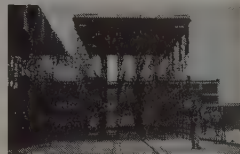


New Technique for Shoring—It Rolls!

The contractor on this job really saved by erecting shoring units with standard Ezebilt steel-panel Scaffold-for-Shoring, then mounted them on adjustable screwjacks (with casters) like this—

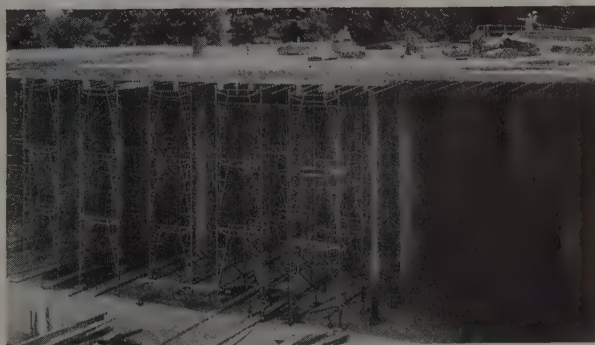


After the first concrete slab was poured, (at 21-ft. height) the entire shore-unit was lowered on the casters, then rolled on to the next bay—with the forms intact!



One rolling rig shored 4 slabs, —no tearing-down and re-erecting shoring —no re-handling or re-setting forms—and, Gravity-Lock's "no bolts to master", gave faster, cheaper erection. *You can save on any shoring job with Universal 'Scaffold-for-Shoring', then use the same Panels for your masonry work.*

UNIVERSAL Ezebilt SCAFFOLDING



INDUSTRIAL PROJECT BY MELLON-STUART COMPANY, PITTSBURGH, PA.

California—BURLINGAME

EZEBILT SCAFFOLDING COMPANY

1313 ROLLINS ROAD

PHONE: Diamond 4-5661

California—LOS ANGELES

AMERICAN-UNIVERSAL OF CALIFORNIA, INC.

3146 RIVERSIDE DRIVE

PHONE: NOrmandy 4-6425

Colorado—DENVER 8

THE UNIVERSAL COMPANY

1426 ULSTER STREET

PHONE: DUDley 8-1624

Utah—SALT LAKE CITY

CONTRACTORS EQUIPMENT & SUPPLY CO.

251 RIO GRANDE STREET

PHONE: 22-0501

Washington—SEATTLE 2

UNIVERSAL EQUIPMENT COMPANY

1549 EASTLAKE AVENUE

PHONE: CApitol 2136

PREVENT DELAYS

ON-
THE-
JOB

with
fast, sure

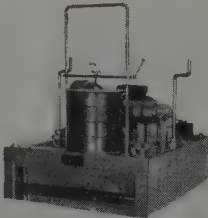
GILSON Screen Testing

Failure to meet sizing specifications costs time and money.

The GILSON Mechanical Testing Screen cuts out error and guesswork in meeting sizing specifications for crushed stone, gravel, slag, coal, ores, and similar materials.

A GILSON Test Report is the standard of industry. It is your guarantee that every carload, every truck-load is as-ordered. And GILSON does the job *fast*—five minutes or less per complete test.

A Sand Attachment for handling 8-inch sieves is optional equipment.



Here's Why You Want GILSON —

No more guesswork on sizing
No more tedious screening by hand

1. Makes tests quickly and accurately
2. Two to seven separations simultaneously
3. Screen trays independently removable
4. Trays balanced to same tare weight
5. Visible separation to refusal
6. Few moving parts
7. Sturdy construction
8. Size range 4" to 200-mesh

Write now for additional information.

GILSON SCREEN CO.
MALINTA, OHIO

Hinged covers keep the cement dry in wet weather. A full-width, hinged bottom plate on each box gives even distribution of cement over the aggregate during discharge. Model 12N-7 has a capacity of 54 cu. ft. in each aggregate compartment and 18.6 cu. ft. in each cement batch box. Model 12N-5 bodies are available in 9- to 11-cu. yd. capacities.

86

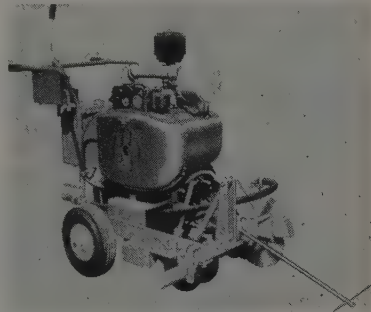
Electric plant weighs 170 lb.

Universal Motor Co. has announced a portable electric plant which delivers up to 2,200 watts, weighs 170 lb., is 12½ in. long, and is 18 in. wide and high. Model 41-B has a 4-cycle, air-cooled, 4.3-hp. engine operating at a speed of 3,600 rpm. Model 41-ES has electric starting in addition. Descriptive specifications bulletins are available.

87

Pavement cutting machine

Windsor Machinery Corp. has announced its new pavement cutting machine. It weighs 1,000 lb., and cuts 8½ in. deep with 22-in. blades. Blade



diameters range from 12 to 22 in. Powered by a Kohler 26.8-hp. motor. Special features claimed for this cutter include a cooling and flushing system to remove all loose abrasives, depth of cut control, and a hydraulic system to balance the unit's weight for easy maneuverability. Descriptive specification sheet is available.

88

American Coleman high-speed tractor

The American Coleman Co. has announced a new all-purpose tractor which has an all-wheel drive and weight balanced between the front and rear axles. Optional specifica-

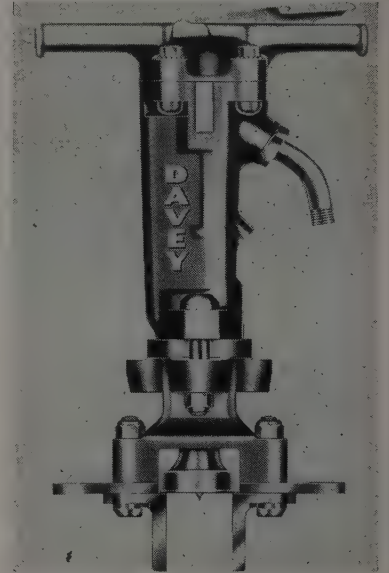


tions include: Wheelbase, 90-in. minimum. Tread, 62½ to 85 in. Top speeds, 15 to 80 mph. Drawbar pull, 5,000 to 30,000 lb. Axle capacity, 5,000, 9,000, or 17,000 lb. Tires, Alltreads and plies in 16, 17, 18, 20, and 22-in. rim size. Engine type, diesel, gasoline, or LP gas. Horsepower, 65 to 150.

89

New, heavy-duty sheeting driver

Davey Compressor Co. has announced Model DSD-90, a new, heavy-duty sheeting driver. It consists of a DB-90 paving breaker with



an SD-90 sheeting driver attachment. The driver weighs 125 lb. It is 28½ in. long, 15½ in. wide, and 7 in. deep. The SD-90 attachment weighs 70 lb., is 12½ in. long, 14 in. wide, and 7 in. deep. The unit will handle 2, 2½, and 3 in. size sheeting.

90

Sweat band cools head by evaporation

E. D. Bullard has announced the Allsafe Drybrow, a cellulose sponge sweat band which cools the head by the principle of evaporation. The manufacturer claims that production has been stepped up as much as 10% during periods of high temperature by use of these bands.

91

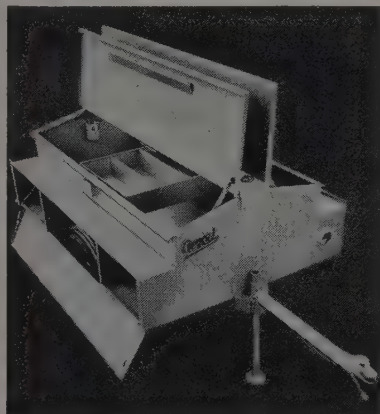
Kohler engine adds hand clutch

A hand clutch has been added to the 26.8-hp. K660 air-cooled engine by Kohler Co. The wet type, lever operated clutch, designed to engage at all engine speeds, is mounted on anti-friction ball bearings. The revised unit has been designated as model K660C.

92

Tool box trailer can carry 2,000 lb.

Aeroil Products Company, Inc., has announced a new tamperproof, all-steel tool box trailer which can



carry up to 2,000 lb. of tools and equipment. Storage capacity is 30½ cu. ft. The box may be unbolted from the chassis, leaving the chassis free for utility hauling or allowing the box to be mounted on a pickup truck.

93

Mall electric power trowel

Mall Tool Co. has announced its new electric Pow'r Trow'l, Model

TE-4, which comes equipped with 14-in.-wide steel finishing trowels set in a 36-in. diameter ring. Special features include power switch mounted on handlebar, auxiliary carrying handle mounted under operating handle, tool tray for holding extra weight materials, and a single-phase, 60-cycle, air-cooled electric motor. This trowel weighs 128 lb. Priced to sell for under \$400 nationally.

94

Masonite anchor kit

An anchor kit for attaching Masonite Peg-Board panels to concrete, brick, or other smooth wall surface is being introduced by Masonite Corp. No special tools are needed. The anchors adhere to Presdwood, plaster, or gypsum wallboard. Priced to sell for about \$2 per kit.

95

Stronger Tilt-Top trailers

Miller Research Engineers have announced a new frame design that adds extra strength at the platform



edges of their machinery hauling trailers with the intention of permitting the user to utilize the full capacity of the main frame members. The new platform edge support members are being incorporated into the entire Tilt-Top line.

96

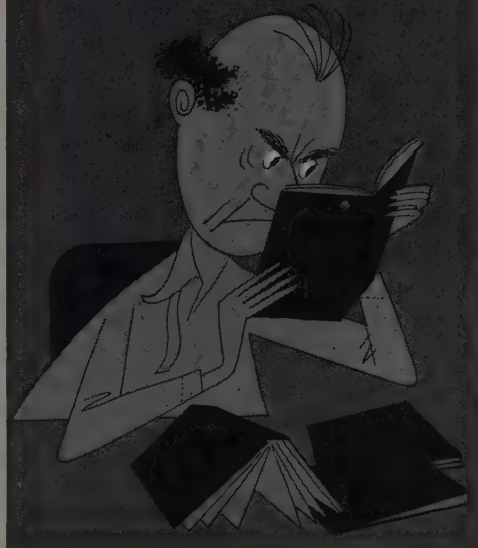
New Oliver all-purpose tractor

The Oliver Corp. has introduced a new, all-purpose tractor called the Super 55. Wheel base is 73 in. and



hood height is less than 51 in. Front and rear wheel tread is adjustable from 48 to 76 in. Rear wheel rim diameter is 28 in. Weighs 3,000 lb. Engine choice is between 7-to-1 gasoline engine and a full diesel.

*In the dark
about wholesalers?*



The answer's in the YELLOW PAGES!



The Yellow Pages contain accurate, up-to-date listings of wholesalers, manufacturers and local distributors in your area. Besides their names, the Yellow Pages tell you where they are and how to reach them. So, check the Yellow Pages first. It's the business-like way to reach almost all other business firms and find the product or service you need.

You'll find it fast in the YELLOW PAGES!



Pacific Telephone

97

Heavy-duty dump trailer

The Galion Allsteel Body Co. has announced a new, heavy-duty dump trailer for use in off-the-road excavation work. Known as Model 19TTE, it has a body capacity of 20 cu. yd., a payload rating of 60,000 lb., and a lifting capacity of 75,000 lb. The design, which includes 6-in. rear-to-front body taper, floor corners rounded to a 6-in. radius, barn door type tail gate, and 45-deg. dumping angle, assures clean discharge of sticky materials, according to the manufacturer.

98

New line of tractor shovels

Clark Equipment Co.'s Automotive and Construction Machinery divisions got together to develop a new line of Michigan tractor shovels ranging in size from 15 cu. ft. to 2¼ cu. yd. The torque-converter transmission power train is a basic part of the unit, which was field-tested for six months before production started.

99

New conversion slide rule

A new conversion slide rule bearing 64 linear, liquid, energy, and miscellaneous factors on one side plus a

complete Trig Scale arrangement on the other has been announced by Pickett & Eckel, Inc. The new model, called the 903-T Single-Setting Conversion Rule, is made of light, weather-proof alloy. It is 12⅞ in. long by 1¼ in. wide by 3/32 in. thick. It has white facing and weighs 2¾ oz.

100

Goodyear offers tubeless tires

Goodyear Tire and Rubber Co. has announced a full line of tubeless tires which is said to give blowout and puncture protection, increased mileage, better balancing, easier steering, cooling running, and less pressure buildup. The tire is easily mounted and normal punctures can be repaired while the tire remains on the wheel. A repair kit containing an assortment of small, medium, and large plugs is available.

101

Approved emergency light

Carpenter Manufacturing Co. announces a new, low-cost, automatic stand-by light which conforms to the latest requirements of the National Fire Code and is fully approved by Underwriters Laboratories. The glass jar battery delivers 91% of rated capacity after 30 min. of use. Its extra-heavy, pure lead plates, pat-

ented leak-proof terminals, and low specific gravity assures long shelf life with a minimum of maintenance. New features include external switches, a red pilot light when battery is on high charge, and an amber light when battery is ready for service. This unit, known as Model 116, is described in Leaflet B.

102

New Lessmann loader

Lessmann Manufacturing Co. has announced its new GFT loader with front wheel drive and rear wheel



steering. It has a ¾-yd. bucket, 54-hp. Ford engine, overall width of 80 in., and overall height of 75 in. The unit weighs 10,800 lb., has a turning radius of 11 ft. 8 in., and has a lifting capacity of 4,000 lb.—3,000 lb. with crowd extended. Descriptive specification sheet available on request.

103

Onan develops lightweight engine

D. W. Onan & Sons, Inc., announces a 2-cylinder, 4-cycle, air-cooled, gasoline powered engine which weighs 140 lb. and develops a maximum of 19 hp., with accessories, at 3,600 rpm. Known as Model VB, this high-compression, overhead valve engine is of basic aluminum construction. Equipped for manual starting with electric starting attachment optional. Recommended by the manufacturer for use on construction machinery, welders, pumps, compressors, and the like.

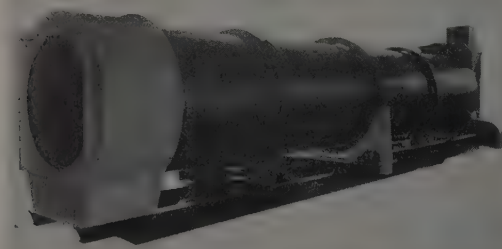
104

International engine and power unit

A new Model U-282 carbureted engine and power unit has been announced by International Harvester Co. to replace Model U-269. The new unit will develop 66.3 net hp. at 1,800 rpm. to 75.5 net hp. at 2,400 rpm. for intermittent load application. Maximum net torque is 204 lb.-ft. at 1,225 rpm. Internal changes include an in-

★ **SUPERIORITY AT MANY POINTS** ★ ★

- **MEANS HIGHER DAILY PRODUCTION**
- **LONG TROUBLE-FREE PERFORMANCE**



MADSEN AGGREGATE DRYERS

Available in standard sizes from 32 to 84 inches in diameter and from 10 to 40 feet in length. Choice of power, electric motor or engine — low-pressure air-oil, steam-oil or gas fired.

A point-by-point check of the superior features of MADSEN Aggregate Dryers shows why MADSEN Dryers lead the field in efficiency. Here are some of the plus-values you get with MADSEN:

- Unique cold end cowl design with externally replaceable bottom liners.
- Minimum fuel cost per ton of material dried.
- Fully-enclosed cast steel cut tooth gears.
- MADSEN - pioneered girth sprocket drive or girth gear for long-lived power application to the shell proper.



MADSEN IRON WORKS, INC.

14100 E. ROSECRANS AVE., P. O. BOX 38
LA MIRADA, CALIFORNIA



Equipment that Serves ®

crease of $\frac{3}{4}$ in. in the bore and decrease of $\frac{3}{8}$ in. in the stroke. Piston displacement is 282 cu. in.

105

New transit weighs 9 lb.

Umeco Optical Division announces a new, lightweight, 5-in. survey transit, Model 100. It weighs 9 lb., has a 5-in. diameter horizontal circle, and has a $4\frac{1}{2}$ -in. diameter vertical circle. Both read to 30 min. and have verniers reading to 1 min. The 9-in. tele-

scope has a 23 power magnification and is equipped with stadia lines at a fixed 1:100 ratio.

106

Liquid zinc controls rust

Zinktron, a laboratory-developed method of surface protection, has been announced by **Constad Laboratories**. It was designed to prevent rust on equipment, implements, or any iron or steel surface. It is applied with paint brush or spray gun. Recent tests revealed that objects protected with Zinktron successfully withstood 1,000 hr. of salt spray, equal to about five years of normal exposure. Technical data sheets are available on request.

107

New Adams motor grader

J. D. Adams Manufacturing Co. has announced its new 330 motor grader which is powered by a 75-hp. International diesel engine. It has a 12-ft. blade and weighs 29,500 lb. The transmission includes eight forward speeds up to 25 mph., four reverse speeds up to 13 mph., optional "creeper" gears from $\frac{1}{4}$ to $1\frac{3}{4}$ mph., rubber-mounted engine for floating power, and a dual braking system. Optional equipment includes power-



shifted moldboard, bulldozer, scarifier, snow removal equipment, and an elevating grader attachment for larger machines. Descriptive literature available on request.

108

New Felker masonry saw

Felker Manufacturing Co. announces the Di-Met, a newly designed, improved masonry saw for both wet and dry cutting. It performs angle, skew, step, and through cutting. Other equipment includes a $1\frac{1}{2}$ -hp., 110-220-volt AC, single phase motor and an independent electric circulating pump to supply coolant to the blade. Descriptive literature available on request.

GEORGE PENNISTON, SHAWNEE SCOUT OWNER SAYS:

"I like the Shawnee Scout because it enables me to get in and dig where no other shovel can go. I'm able to dig under an 8 ft. ceiling. I was so well pleased with my first Shawnee (it was an older model traded in on his present Scout) that I bought a second one."



SHAWNEE SCOUT DIGGER

- DIGS UNDER 8 FT. CEILING!
- DIGS WHERE LARGER SHOVELS CANNOT GO!



Operators like George Penniston of Independence, Mo., like the Scout for its speed and ability to work in close quarters. With a 20-inch bucket, Mr. Penniston recently dug ditches 4 ft. wide and 5 ft. deep which shows the versatility of a Scout. His fuel consumption is about a gallon per hour. He is presently digging 200 ft. of sewer line on the project, possible due to the 12 ft. depth digging ability.

Distributed by:

H. B. EQUIPMENT CO.
18912 S. Normandie
Los Angeles, California
California

FARM AID EQUIPMENT CO.
2932 E. Trent
Spokane, Washington
Throughout the Northwest

Manufactured by: **SHAWNEE MFG. CO., INC.**, 1947 N. Topeka, Topeka, Kansas

Special Hoists

FROM STANDARD PARTS

One of Eight Special Electric Incline Hoists with 36" diameter x 26" face drums, built for unbalanced duty of 1,500 lbs. at 200 FPM.

- By modifying and re-combining our standard parts, Superior-Lidgerwood-Mundy can engineer hoists to meet your specific requirements at the lowest possible cost.

WRITE FOR BULLETINS AND CATALOGS

SUPERIOR-LIDGERWOOD-MUNDY CORPORATION

Main Office and Works: **SUPERIOR, WISCONSIN, U.S.A.**
New York Office, 7 Dey Street, New York 7, N. Y.

UNIT PRICES

Selected abstracts for Western projects

HIGHWAY—Rolling, leveling, structures, and surfacing on 6.82 mi. of State Route 96 in New Mexico

New Mexico—Rio Arriba County—State. Allison and Haney of Albuquerque were awarded a contract for 6.82 mi. of rolling, building structures, and surfacing on State Route 96, Coyote-East road. Unit prices were as follows:

(1) Allison and Haney.....	\$ 122,989
(2) Henry Thygesen & Co.....	124,285
Lowdermilk Bros.....	145,905
Peter Kiewit Sons' Co.....	153,401
Lump Sum Removal of old structures.....	(1) 100.00 (2) 300.00
13,865 cu. yd. Excavation—unclassified.....	30 .35
110 cu. yd. Excavation for pipe culverts.....	1.75 2.00
26,307 sta. yd. Overhaul.....	.015 .03
2,624 mi. yd. Haul.....	.045 .10
78,255 ton mi. Ton mile haul.....	.07 .07
91 hr. Mechanical tamping.....	4.00 5.00
100 hr. Rolling—tamping roller.....	10.00 10.00
191 hr. Rolling—steel tired roller.....	7.50 6.50
526 hr. Rolling—pneumatic tired roller.....	5.25 6.00
4,475 ton Leveling course.....	.80 .93
1,100 M gal. Watering.....	1.25 2.50
272 lin. ft. Stand. reinf. conc. pipe—24-in. diam.....	6.60 6.35
64 lin. ft. Stand. reinf. conc. pipe—30-in. diam.....	9.15 8.50
58 lin. ft. Stand. reinf. conc. pipe—48-in. diam.....	19.40 16.50
1 ea. Cattle guard—18-foot roadway.....	1,400.00 1,200.00
6,060 lin. ft. Galvanized barbed wire fence.....	.20 .18
2 ea. Gates—Texas type.....	11.50 10.00
16 ea. Bracing.....	11.50 6.00
66 ea. Treated tmb. warn. posts—6-inch diam. (refl.).....	5.75 10.00
10 ea. Right if way markers.....	5.75 7.00
873 lin. ft. Removing & rebuilding fence.....	.14 .15
2,000 lin. ft. Contour ditches.....	.09 .10
8 cu. yd. Grouted rock check dams.....	23.00 15.00
1,148 bbl. Cutback asphalt, Type MC-1.....	6.90 6.80
1,980 bbl. Cutback asphalt, Type MC-3.....	6.70 6.80
6,170 ton Top course surfacing.....	.90 1.03
6,820 ml. Mixing asphalt and aggregate.....	900.00 850.00
582 bbl. 210-250 penetration asphalt.....	7.30 7.50
190 bbl. Cutback asphalt, Type MC-5.....	7.00 7.50
1,008 ton Aggregate for seal coat.....	5.25 4.75
6,017 mi. Blading and Shaping.....	600.00 450.00
BRIDGE ITEMS	
70.72 cu. yd. Concrete for pre-cast bridge units	90.00 90.00
29.77 cu. yd. Class "AE-AR" concrete—substructure.....	80.00 90.00
44.35 cu. yd. Class "AE-AR" concrete piling.....	67.00 60.00
27,152 lb. Reinforcing steel.....	.14 .15
16,606 lb. Structural steel.....	.27 .25
113 cu. yd. Excavation for riprap.....	5.00 4.00
352 cu. yd. Wire enclosed riprap.....	9.50 10.00
6,515 lb. Woven wire fabric.....	.25 .30
130 lin. ft. Steel stakes.....	2.50 3.00
900 lin. ft. Steel pile shells—16-inch diam.....	11 50 9.50

MISCELLANEOUS—Subdivision improvements in California

California—San Mateo County—Trousdale Construction Co. E. T. Haas Co. submitted a low bid of \$236,818 for work consisting of clearing and grubbing, excavating and/or embankment for constructing pavement, curb, gutter and sidewalk; grading and preparing subgrade for constructing pavement, curb, gutter and sidewalk; constructing sanitary sewer system with sewer mains, manholes, cleanouts, laterals; constructing a water distribution system with water mains; constructing a storm sewerage system with storm sewers, catchbasins junction structures, headwalls, and drainage channels; constructing underground power, telephone, fire alarm and electroliner systems with fire alarm boxes, electroliners; installing street name signs and monument boxes. Unit prices were as follows:

(1) E. T. Haas Co.....	\$ 236,818
(2) L. C. Smith Co.....	255,417
Lowrie Paving Co.....	263,123
J. Henry Harris.....	281,109
Associated Pipeline, Inc.....	282,586
George C. Renz Construction Co.....	291,781

1 lot Clear and grub.....	(1) \$3,000.00 (2) \$2,000.00
1,300 cu. yd. Street embankment.....	1.30 .50
300,000 sq. ft. Grading and preparation of subgrade.....	.01 .01
95,300 sq. ft. 6-inch crusher run base.....	.08 .08
98,800 sq. ft. 5-inch crusher run base.....	.07 .07
95,300 sq. ft. 3-inch plant mixed surfacing.....	.10 .11
94,800 sq. ft. 3-inch plant mixed surfacing.....	.07 .08
3,800 lin. ft. 2x8-in. redwood header board.....	.30 .30
130 lin. ft. 2x10-inch do.....	.52 .40
11,500 lin. ft. Portland cement concrete curb and gutter.....	1.20 1.40
43,500 sq. ft. Portland cement concrete sidewalk 4-in. thick.....	.24 .27

17,100 sq. ft. Portland cement concrete driveway approaches 6-in. thick.....	.33 .32
350 lin. ft. 6-in. vit. clay pipe sanitary sewer.....	1.75 1.70
1,760 lin. ft. 8-inch do.....	1.90 2.00
420 lin. ft. 10-inch do.....	3.00 2.20
1,200 lin. ft. 12-inch do.....	3.50 3.50
125 lin. ft. 8-inch cast iron pipe sanitary sewer.....	5.00 4.50
215 lin. ft. 10-inch do.....	6.00 6.00
100 lin. ft. 12-inch do.....	8.00 7.00
70 lin. ft. 8-in. cast iron pipe sanitary sewer, hanger supported.....	8.00 6.00
50 lin. ft. 10-in. cast iron pipe sanitary sewer, with corr. metal pipe jacket—El Camino.....	25.00 30.00
70 lin. ft. 10-inch do—SPRR.....	25.00 30.00
50 lin. ft. 12-inch do—El Camino.....	27.50 35.00
40 lin. ft. 12-in. cast iron pipe sanitary sewer with portland cement concrete jacket.....	12.00 20.00
13 ea. Sanitary sewer manholes.....	185.00 200.00
8 ea. 6x8-inch vit. clay pipe wyes.....	6.00 10.00
1 ea. 6x10-inch do.....	8.00 12.00
2 ea. 6x12-inch do.....	11.00 15.00
11 ea. 6-in. vit. clay pipe ¾ bends.....	3.00 5.00
11 ea. Lateral cleanout.....	16.00 100.00
1 ea. 8x6-in. cast iron pipe with screw plug and 6-in. cast iron pipe riser.....	80.00 130.00
1 ea. 12x6-inch do.....	110.00 150.00
1,810 lin. ft. 6-inch cast iron pipe, water.....	2.95 3.50
3,970 lin. ft. 8-inch do.....	4.00 4.50
620 lin. ft. 12-inch do.....	5.95 7.00
100 lin. ft. Cast iron pipe water with corr. metal pipe jacket—El Camino.....	23.00 35.00
40 lin. ft. 8-in. cast iron pipe with corr. metal pipe jacket—SPRR.....	23.00 37.00
50 lin. ft. 12-inch do—El Camino.....	25.00 40.00
55 lin. ft. 12-inch do—SPRR.....	25.00 45.00
4 ea. 6-inch gate valve with box.....	100.00 100.00
11 ea. 8-inch do.....	130.00 130.00
2 ea. 12-inch do.....	240.00 250.00
9 ea. Fire hydrants with valve and box.....	295.00 590.00
150 lin. ft. 1-inch copper service.....	1.25 1.00
11 ea. 1-inch corporation stop.....	10.00 15.00
11 ea. 1-inch angle meter stop.....	9.00 10.00
11 ea. Concrete meter boxes.....	4.00 15.00
1 lot Connection to exist. water mains California Drive.....	50.00 100.00
1 lot do—Dufferin Ave.....	75.00 100.00
470 lin. ft. 12-inch reinf. conc. pipe.....	3.00 3.00
4 lin. ft. 18-inch do.....	10.00 15.00
740 lin. ft. 39-inch do.....	13.00 18.00
75 lin. ft. 48-inch do.....	22.00 20.00
540 lin. ft. 60-inch do.....	27.00 25.00
510 lin. ft. 72-inch do.....	32.00 35.00
80 lin. ft. 54-inch corr. metal pipe installed by jacking—SPRR.....	75.00 75.00
54 lin. ft. 48-inch reinf. concrete pipe installed by jacking—SPRR.....	70.00 75.00
50 lin. ft. 60-inch do—El Camino.....	70.00 80.00
55 lin. ft. 60-inch do—SPRR.....	70.00 80.00
50 lin. ft. 72-inch do—El Camino.....	90.00 90.00
1 lot Structure No. 1.....	857.00 975.00
1 lot Structure No. 2.....	503.00 800.00
1 lot Structure No. 3.....	50.00 50.00
1 lot Structure No. 4.....	513.00 975.00
1 lot Structure No. 5.....	408.00 525.00
1 lot Structure No. 6.....	526.00 510.00
1 lot Structure No. 7.....	150.00 100.00
1 lot Structure No. 8.....	4,300.00 3,575.00
7 ea. Standard catchbasins.....	180.00 200.00
2 ea. Stand. field inlet catchbasins, do including removal of existing masonry structure.....	160.00 150.00
1 ea. 250.00 300.00	
50 lin. ft. Remove existing 24-inch storm drain.....	2.00 2.00
1 lot Remove portion of existing reinf. concrete headwall.....	200.00 250.00
6 ea. Standard saddle connections.....	100.00 50.00
75 lin. ft. Channel section No. 1.....	10.00 1.50
48 lin. ft. Channel section No. 2.....	10.00 1.50
55 lin. ft. Channel section No. 3.....	10.00 1.50
2,000 lin. ft. 3-in. asbestos cement wire telephone conduit with pull in wire.....	.70 .70
5 ea. Telephone service box No. C-3185.....	65.00 66.00
1 ea. Telephone service box No. K-2862.....	30.00 32.00
2,400 lin. ft. 1½-in. G.S. pipe fire alarm conduit with conductor.....	.60 .60
2 ea. Fire alarm boxes.....	350.00 350.00
2 ea. Master fire alarm boxes.....	425.00 440.00
3 ea. Fire alarm splice boxes.....	30.00 30.00
390 lin. ft. 4-in. iron pipe power conduit with pull in wire.....	2.50 2.55
5,800 lin. ft. 1½-in. G.S. pipe electroliner conduit with conductor.....	.98 1.00
31 ea. 1-arm electroliners.....	335.00 340.00
24 ea. 2-arm electroliners.....	380.00 390.00
4 ea. Pole risers.....	30.00 30.00
6 ea. Street name signs.....	30.00 25.00
13 ea. Monument boxes.....	15.00 25.00

BRIDGE—Build a 188-ft. steel and concrete overpass over railroad tracks in Montana

Montana—Mineral County—State. Union Construction Co. of Missoula was awarded a contract to build a 188-ft. steel and concrete overpass over Northern Pacific railroad tracks along Superior Highway South and East on its low bid of \$48,830. Unit prices were as follows:

(1) Union Construction Co.....	\$ 48,830
(2) W. P. Roscoe Co.....	49,461
Montana Engineering & Construction Co.....	50,410
Clifton & Applegate.....	51,467
Cahill-Mooney Construction Co.....	54,023

(Continued on page 139)

UNIT PRICES ... CONTINUED

F. L. Flynn and Co.....	55,175	
A and B Construction Co.....	55,793	
N. A. Nelson Construction Co.....	58,150	
Glenn Geery, Inc.....	58,821	
J. Merz.....	62,807	
Hansen & Parr.....	66,257	
197.0 cu. yd. Class "A" Concrete.....	(1) \$63.00	(2) \$60.00
245.9 cu. ft. Class "AD" Concrete.....	77.00	82.00
85,248 lb. Reinforcing Steel.....	14	14
372.5 lin. ft. Steel Bridge Rail.....	10.00	9.00
365 cu. yd. Structure Excavation.....	5.30	6.00

HIGHWAY — Road-mixed bituminous surfaced road in Utah

Utah—Cache County—State. L. A. Young Construction Co. submitted a low bid of \$65,473 for construction of 3.1 mi. of 2-in. road-mixed bituminous surfaced road, including grading and drainage, on the Cove-Mountain Home road. Unit prices are as follows:

(1) L. A. Young Construction Co.....	\$ 65,473	
(2) Olof Nelson Construction Co.....	68,969	
LeGrand Johnson.....	69,517	
Fife Construction Co.....	70,117	
Germer, Abbott & Waldron.....	72,111	
Wheelright Construction Co.....	72,504	
Carl E. Nelsen Construction Co., Inc.....	75,575	
Reynolds Construction Co.....	76,985	
J. Vernon Cook.....	77,576	
Wilkinson Construction Co.....	85,076	
56,000 gal. Bituminous Material, Type MC-3.....	(1) .13	(2) .12
14,300 gal. Bituminous Material, Type MC-1 or MC-2.....	.13	.12
9,500 gal. Bituminous Material, Type RC-4.....	.15	.13
100 gal. Bituminous Additive.....	2.00	2.24
460 ton Cover Material, Type "A".....	3.00	3.44
3,095 mi. Scarifying and Mixing.....	500.00	645.00
16,000 ton Gravel Surface, Type "B".....	.62	.64
11,800 cu. yd. Selected Material Base Course.....	.38	.38
26,000 cu. yd. Unclassified Roadway Excavation.....	.30	.35
2,000 cu. yd. Imported Borrow.....	.30	.24
50,000 sta. yd. Class "A" Overhaul.....	.01	.01
6,500 yd. mi. Class "B" Overhaul.....	.15	.13
1,500 1,000 gal. Watering.....	1.50	1.22
220 hr. Rolling, Tamping Roller.....	6.00	9.85
100 hr. Rolling, Pneumatic Tire or Power Roller.....	5.00	5.20

980 lin. ft. 18-inch C. M. Pipe.....	4.00	3.28
231 lin. ft. 24-inch C. M. Pipe.....	5.00	5.07
26 lin. ft. 30-inch C. M. Pipe.....	7.00	6.06
50 lin. ft. 72-inch C. M. Pipe.....	30.00	28.80
38 lin. ft. C. M. Pipe Arches 22"x13".....	5.00	3.50
182 lin. ft. C. M. Pipe Arches 29"x18".....	6.00	5.36
38 lin. ft. 15-inch C. M. Pipe Perforated.....	3.00	3.07
24 lin. ft. 24-inch Reinforced Concrete Pipe.....	7.00	5.70
602 lin. ft. 8-inch Underdrain.....	1.00	.80
377 lin. ft. 10-inch Underdrain.....	1.00	1.00
700 lin. ft. 12-inch Underdrain.....	1.50	1.28
100 lin. ft. Relaying 12-inch C. M. Pipe.....	.50	1.00
100 lin. ft. Relaying 15-inch C. M. Pipe.....	1.00	1.25
100 lin. ft. Relaying 18-inch C. M. Pipe.....	1.00	1.50
14 lin. ft. Relaying 24-inch C. M. Pipe.....	3.00	2.00
3 lin. ft. Relaying 10-inch Concrete Pipe.....	5.00	3.00
20 lin. ft. Relaying 18-inch Concrete Pipe.....	5.00	5.00
18 cu. yd. Concrete Class "AA".....	70.00	74.00
1,775 lb. Reinforcing Steel.....	.20	.15
1,650 lb. Structural Steel.....	.60	.40
1,200 cu. yd. Excavation for Structures.....	1.00	2.50
420 cu. yd. Granular Backfill.....	2.00	4.00
65 hr. Mechanical Tamping.....	4.00	5.00
1,300 cu. yd. Small Ditch Excavation.....	.40	.50
Lump sum Clearing and Grubbing.....	5.00	8.00
20 ea. Moving Mail Boxes.....	30.00	35.00
6 ea. 10-foot Gates.....	40.00	45.00
15 ea. 16-foot Gates.....	.30	.35
12,600 lin. ft. Right of Way Fence, Type "B".....	8.00	7.50
20 ea. Guide Posts.....	10.00	8.00
42 ea. Right of Way Markers.....	30.00	30.00
2 ea. F. A. P. Markers.....	300.00	250.00
Lump Sum Furnishing Water Equipment.....	300.00	400.00
Lump Sum Furnishing Construction Signs.....		

MISCELLANEOUS—Furnish two seven-man survey parties at Hills Creek Reservoir near Oakridge, Oregon

Oregon—Hills Creek Reservoir—C. of E. Adrian W. Vaaler of Eugene submitted a low bid of \$9,810 for furnishing two seven-man survey parties at the site of Hills Creek Reservoir near Oakridge. Lump sum prices were as follows:

(1) Adrian W. Vaaler.....	\$ 9,810
(2) Wall and Tenneson.....	11,784
Pettijohn Engineering Co.....	13,200

Unit prices per day	Two 7-man survey parties, consisting of one party chief, one instrumentman, two rodmen-chainmen, and three axemen, each.....	(1) \$327.00	(2) \$392.80
---------------------	--	--------------	--------------



CHEAP HEAT

... saves time and money for contractors

For less than 17c an hour in fuel, you can dry plaster, fast, even on cold or humid days; pour and cure concrete safely at any temperature and keep men working, inside or out, in freezing weather.

The working hours you save will much more than pay the cost.

The Master Heater rolls into place, starts at the flip of a switch, blows clean, odorless heat right where you want it... instantly. Thermostat and safety controls are fully automatic; combustion so complete you don't need a vent. Burns inexpensive kerosene or fuel oil. Two models—160,000 or 400,000 BTU per hour. For more information mail coupon.

MASTER

Send this coupon for full information about the Master Heater to Master Vibrator Company, 333 Stanley Ave., Dayton 1, Ohio. No obligation.

Name _____ Company _____
Street _____ City _____

News of DISTRIBUTORS

Motorola regional sales mgr.

Donald F. Brickley has been named Region 1 sales manager for Motorola Communications & Electronics, Inc. He will cover Idaho, Montana, Washington, Wyoming, Utah, and eastern Nevada.

Hall-Perry news

Hall-Perry Machinery Co., Butte, Mont., has taken the distribution of Mixermobile Distributors, Inc., products, a complete line of material handling equipment as well as mixers, tractomobiles and dozermobiles.

Additional news is that Hall-Perry is establishing a new branch at Billings, Mont., which will have complete offices, parts, and service departments and warehouse facilities.

Koehring of California changes managers

H. R. Powers has been appointed general manager of Koehring Company of California, Stockton, Calif., replacing W. J. Duecker, who is no longer with the company.

Gard Spaulding heads Central Machinery sales

New sales manager at Central Machinery Co., Great Falls, Mont., is Gard Spaulding. He replaces Dave Vaughn.

Homelite expansion

Homelite Corporation recently moved its Seattle office to Rainier at 22nd, So. Seattle, where it has excellent off-street parking at all hours, and 5,000 sq. ft. of modern plant space. A. D. Sherwood is Pacific Northwest district manager.

Holland takes on new lines

J. T. Holland, Salt Lake City dealer, was recently appointed dealer for Stow Manufacturing Co., handling Stow concrete vibrators and vibrating screeds. Another line recently taken on by Holland is the hoists, cranes, and trolleys of David Round & Sons.

Pat Jones succeeds Hanson at J. I. Case Co.

H. L. Hanson, formerly assistant branch manager of sales for J. I. Case Co. at Oakland, Calif., was recently transferred and promoted to manager

of the Bettendorf sales branch, Bettendorf, Iowa. He has been succeeded at the Oakland branch by Pat Jones, who for the past few years had been territory supervisor in southern, and more recently in central California.

Honnen receives Cat dealership

Honnen Machinery Co., Blythe, Calif., has been named Caterpillar dealer for the Blythe, Parker, and Needles areas, replacing Hartner Machinery Co. Hugh Honnen, president of the new organization, has had almost 35 years of experience with earthmoving and agricultural machinery. Early in his career, he had some little experience in the earth-has been associated with Caterpillar moving business and in later years dealers in Colorado and Utah.

Earle Honnen handles McCoy sales promotion

McCoy Company, Denver, Colo., recently appointed Earle Honnen as sales promotional manager. He has been with the McCoy organization for two years and has had experience



**Earle
Honnen**

in advertising, sales, parts, service, and yard. In his new function, he will be handling advertising promotion, sales training and sales development. At present he is setting up a new sales control method for the company.

Western Machinery Co. handles Hensley equipment

Western Machinery Co., Phoenix, Ariz., recently took on the distribution of the products of Hensley Equipment Co., Oakland, Calif.

New lines for Andrews Machinery Co.

Andrews Machinery Co. of Washington, Seattle, was recently appointed distributor for Mall Tool Co.,

handling Mall gas and electric vibrators and gasoline power trowels. Other accounts recently taken on by Andrews are Gruendler crushing and pulverizing equipment of all types; and Deutz diesel engines.

New home for Thompson Aircraft

Thompson Aircraft Tire Corp. announces the construction of new general and administrative offices in San Francisco. According to company officials, the offices will occupy 3,000 sq. ft. of floor area, and will be constructed on its existing property at 18th & Minnesota Sts. The firm manufactures heavy duty tires for on and off highway use.

Also, recently announced by the company is the appointment of Edward J. Georgia as executive assistant and engineering manager of its San Francisco and Miami plants.

Andrews & Andrews distributes Timken equipment

Andrews & Andrews Machinery Co., Portland, Ore., recently took on the distribution of Timken rock bits for the state of Oregon. Equipment is manufactured by Timken Roller Bearing Co., Canton, Ohio.

Nelson takes on LeTourneau line

New line recently taken on by Nelson Equipment Co., Seattle, is that of R. G. LeTourneau, Inc., covering logging arches, electric hoists, electric motors, tree saws, and land clearing equipment.

Appointments at Braman-Dickerson Co.

Wayne C. Bailey was recently appointed general manager of Braman-Dickerson Co., Inc., Riverside, Calif. Other new appointments in the company are: Archie Casteel, assistant to general manager; James K. Pace, sales manager; Roy L. Bigler, service manager, and Robert Knox, parts manager.

Hudson alters name; takes on accounts

New lines recently taken on by Hudson Equipment Co. (formerly Hudson Corporation), San Diego, Calif., are: Hensley Equipment Co.; A. O. Smith Corporation; Wooldrige Manufacturing Co.; W. A. Riddell Co.; Schramm, Inc.; Kato-light Corporation, and Quaker Rubber Corp. The assets of the Hudson Corporation were sold in March of this year to William Kenton who now heads the reorganized company.

News from McGinnis Company

Neil B. McGinnis Co., Phoenix, Ariz., has appointed two new salesmen: Ken Nelson and "Woody" Woodford. The company has also

taken on the Schield Bantam Co. line of excavators and cranes for the Phoenix territory.

Howard-Cooper of Calif. appointments

F. Crawford is the new branch manager of the newly formed, wholly-owned subsidiary of Howard-Cooper Corp., known as the Howard-Cooper Corporation of California, with headquarters at Eureka. Other personnel appointments are: Bruce Rogers, office manager; W. A. Bona, W. Robertson, and J. Smith, sales engineers. W. Slavens is shop superintendent. The new company, which recently bought out Tony Gosselin's interests will handle International Harvester, J. D. Adams, Unit Shovel, and others in Northern California, along with its other lines represented in Oregon and Washington.

Southwest rep named by LeTourneau-Westinghouse

James T. Barron, who has been with LeTourneau-Westinghouse Co. since early in 1953, has been named district sales representative in a territory covering Western and South-

James T. Barron



western states. He will make his headquarters at Denver, Colo. Distributors with whom he will work are Contractors' Equipment & Supply Co., Albuquerque, New Mex.; Liberty Trucks & Parts, Inc., Denver, Colo.; Rocky Mountain Machinery Co., Salt Lake City, Utah, and Superior Equipment Co., Inc., Phoenix, Ariz. H. W. Murphy, whom Barron replaces, has been transferred to the Texas-Oklahoma territory.

Power Transmission adds and expands

Power Transmission Equipment Co., Billings, Mont., announces the return of A. T. Baugh to its employ, and also announces that it has added the Band-It line. The company is located in larger quarters at 15 North 33rd St., just across the street from its former location.

Personnel changes by Northwest firm

Columbia Equipment Co. recently made some changes among the personnel in its territories. Clint Sweet is presently working out of the Seattle branch covering both contrac-

...For PEAK PERFORMANCE On Every Job CARVER PUMPS

If you want peak performance on every dewatering job depend on CARVER!

CARVER manufactures the complete line of self-priming pumps from 4000 G.P.H. to 250,000 G.P.H. Every one of these pumps has the same simple design, sturdy construction and rugged durability that mean outstanding performance where jobs are really tough.

Your CARVER DISTRIBUTOR can also supply you with Diaphragm Pumps and a full line of high pressure Jetting Pumps. See him today.

CARVER PUMP CO. Muscatine, Iowa

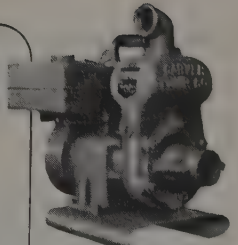
Western Region Warehouse

1530 W. 12th St., Long Beach 13, Calif.

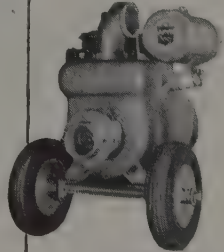


CARVER

the quality name in pumps



1½" SELF-PRIMING
4,000 G.P.H.



3" SELF-PRIMING
20,000 G.P.H.



4" DIAPHRAGM PUMP
6,000 G.P.H.

Announcing



The unit is light in weight, compact, very portable, easy and economical to operate and maintain.

Dens-o-meter

The KEY to accurate field tests for moisture-density of embankment and foundation soils.

Developed after two years research and experiment by Department of Highways, State of Washington. Opens up entirely new possibilities for earthwork engineers and contractors. Engineers can now make accurate moisture-density and compaction tests.

- in all large or small holes
- in all types soils and granular base materials
- in about 3 minutes after hole is dug

Now for the first time, holes of any size from 0.000 cu. ft. to 0.500 cu. ft. can be measured with the same equipment. Holes up to 22 inches in depth can be measured—singly or in successive lifts.

Get full information from

Exclusive Sales Agents

CHARLES R. WATTS & CO.

4121 SIXTH AVENUE NORTHWEST
SEATTLE 7, WASHINGTON

**Engineers, Carpenters,
Concrete Men, Foremen,
Superintendents:**

SOLVE ENGINEERING PROBLEMS ... at a Glance!

There is no time to waste these days on tedious figuring of routine problems! This fine, enlarged edition of **CONSTRUCTION DESIGN CHARTS**, by Consulting Engineer James R. Griffith gives countless engineering short-cuts — and answers preliminary design problems in a flash! There's a whale of value in this enlarged edition for every man engaged in construction today! This is the fourth reprinting of **CONSTRUCTION DESIGN CHARTS**, and greatly enlarged over all previous editions. Contains 100 design charts and 215 pages filled to the brim with valuable information that is a sure-fire hit with construction men. Handsomely bound in sturdy black Fabriroid with gold stamped letters. A special metal binding allows each page to lie flat for easy reference.

YOU GET ALL THIS

How Nomographs
Are Constructed
Concrete Design
Concrete Form Design
Earthwork
Highway Design
Hydraulics
Structural Design
Timber Design
Compressed Air
Transmission
Measurement of
Triangular Areas

PLUS MUCH MORE!

Price

\$5.00

Postpaid

Add 15c Sales
Tax if ordering
from a California
address

MAIL THIS COUPON TODAY!

KING PUBLICATIONS

609 Mission Street
San Francisco 5, California

YES, I want a copy of **CONSTRUCTION DESIGN CHARTS**, for which I enclose \$5.00. (Add 15c if ordering from a California address.) If not completely satisfied, I can return the book in 10 days and get full refund plus postage.

Name.....

Address.....

City.....State.....

Position.....Company.....

tors and Counties and Cities in the northwest counties in Washington. Jack Brady is covering the eastern Washington territory, working out of Spokane. M. W. (Bill) Hackett has been moved to the Portland office from Spokane, working out of that office and assisting in sales work with others of the sales force.

Three new lines for Air-Mac

Air-Mac, Inc., Seattle, Wash., well known distributor of material handling equipment in the Northwest, recently added the Towmotor line of lift trucks and tractors manufactured by the Towmotor Corporation. Other equipment lines taken over recently by Air-Mac are the P & H hoist of the Harnischfeger Corporation, and the Hopto of the Badger Machine Co.

Sales dept. changes at Modern Machinery Co.

W. F. (Bill) Briney was recently appointed sales manager of Modern Machinery Co., Inc., Seattle, Wash. Briney was formerly, for three years, in service work for Cleveland Rock Drill Co., had two years experience with the Anaconda Copper Mining Co. in Butte, Mont., and spent four years in the construction and mining division of the Le Roi Co. Tom Stone and Roland Undi were recently ap-

pointed sales engineers. For the past three years Stone had been Pacific Northwest district representative for Le Roi. Undi was formerly with the A. H. Cox Co. in Seattle.

Gunderson-Taylor news

New officers were recently named for Gunderson Taylor Machinery Co., Denver, Colo. Edward F. Taylor moved up from vice president to president; Edward D. Egan is the new vice president, and Benjamin F. Stapleton, Jr., is secretary.

Recently the company took on the line of the Construction Machinery Co., Waterloo, Iowa, and also is now representing the Industrial Section of the Omaha Standard Trailer Co., Omaha, Neb.

Shop facilities have been expanded to include a complete air tool repair shop with all necessary equipment, as well as a new fabricating facility for the manufacturing of core drilling and deep hole wagon drilling equipment.

A new branch has been opened in Grand Junction, Colo., at 1121 South Fifth St., with Fred Gottbreht in charge, assisted by Bill Gibson. The Gunderson-Taylor full line is distributed, assembled, and manufactured at Grand Junction as well as in Denver.

New lines for Brown-Bevis

Brown-Bevis Industrial Equipment Co., Los Angeles, is now distributing Seaman Pulvi-Mixers in San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, San Diego, Riverside, San Bernardino, Imperial, and Inyo counties in California, as well as Clark County, Nev. Also, recently Brown-Bevis became exclusive distributor for Aeroil Products Co. for all of Southern California and Clark County, Nev., handling Aeroil pressure cleaners, asphalt kettles and specialties for the roofing and sewer contracting trade, as well as for industrial installations.

MANUFACTURERS

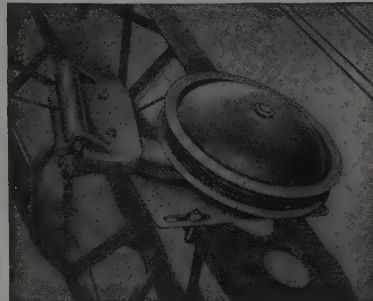
Steel firm starts architectural div.

J. B. Henry, Jr., has been named manager of the newly-created Architectural Division of Allegheny Ludlum Steel Corp. The division was established to satisfy the interest of architects and builders in stainless steel as a building material.

Koehring promotes two

D. W. Marchant has been named vice president and general manager of Koehring Southern Co. at Chattanooga, Tenn. N. J. Decker was appointed assistant to E. A. Brugger,

GREATER BUCKET CONTROL WITH UNIFORM TENSION at any pay-out



WESTFALL CENTER-PULL AUTOMATIC TAGLINE AND MAGNET CONTROL REELS

FAIRLEAD ROLLERS — Save needless line wear.

MOVING PARTS — Ball-bearing mounted.

AMPLE PAY-OUT — Big reserve for all jobs.

SMALL, COMPACT — No bulky projections.

BETTER SIGHT — Does not obstruct operator's vision.

QUICK INSTALLATION — 4 "J" bolts — No drilling.

5 SIZES for any tagline requirement.

WRITE FOR FREE FOLDER!

WESTFALL AUTOMATIC TAGLINE

345 E. Second St. Los Angeles 12, Calif.
Phone MUtual 4894

vice president in charge of manufacturing at Koehring's Milwaukee plant.

New Carboly manufacturing head

Peter J. Jensen has been named manager of manufacturing at Carboly Department of General Electric Co. John A. Muldoon succeeds Jensen as manager of the Michigan sales district.

Le Roi names manager for mixer-loader sales

James R. Harwood has been appointed sales manager of the Transo Division of the Le Roi Company. The division manufactures and sells



**James R.
Harwood**

rubber-tired front end loaders and truck-mounted concrete mixers. Harwood joined the Le Roi Company four years ago and for the past year has been a sales engineer in the Transo Division.

Marion acquires controlling interest in Osgood Co.

Announcement was recently made by John P. Courtright, president of Marion Power Shovel Co., of acceptance of the plan for acquiring the controlling interest in The Osgood Company as well as its subsidiaries, The General Excavator Co. and The Commercial Steel Castings Co. It is expected that all companies involved will retain their separate identities.

CF&I promotes McAllister

John W. McAllister has been appointed administrative assistant to the president of The Colorado Fuel and Iron Corp.

U.S. Steel names two veeps

Austin J. Paddock has been appointed vice president in charge of contracting for American Bridge Division of U.S. Steel Corp. R. Bruce Hunter became vice president in charge of manufacturing operations at the same time.

Clarke heads Leschen sales

Appointment of L. Jack Clarke as general sales manager for the Leschen Wire Rope Division of H. K. Porter Co. was recently announced. Clark has served the Leschen organization in the New Orleans area and as manager of the New York sales district. He will now make his headquarters at the division's main offices in St. Louis.

American Hoist appoints sls. mgr.

Ray J. Dervy succeeds to the position of general sales manager of American Hoist & Derrick Co., a post formerly held by John E. Carroll, now president of the firm. Dervy



**Ray J.
Dervy**

started his industrial career as a production engineer for U. S. Steel Co. He saw five years' service in World War II. In 1945 he joined American Hoist in the industrial equipment division and a year later was promoted to district manager in charge of the Pittsburgh office and territory.

Hyster news

The Hyster Company, manufacturer of materials handling equipment, outlined its overseas marketing program for over 40 representatives at a recent meeting held at Peoria, Ill. Clyde Dean is export sales manager for the company, which last year opened its new European factory at The Netherlands.

POWER HYDRAULICS

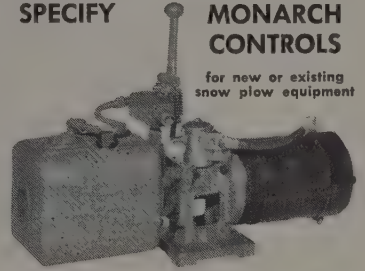
for

Snow Plows

SPECIFY

MONARCH
CONTROLS

for new or existing
snow plow equipment



- Type H.E.P. "Dynamight" Electric Power Control
- Fits All Trucks
- Available for 6 or 12 Volt Systems
- 1000 lbs. Pressure 1 Gal. per Minute
- Fan Belt Driven Models Also Available

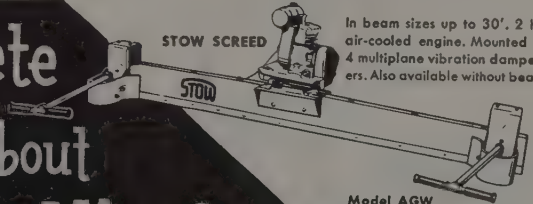
• Write Hydraulic Division



MONARCH ROAD MACH. CO.

1331 Michigan St. N.E.
GRAND RAPIDS, MICHIGAN

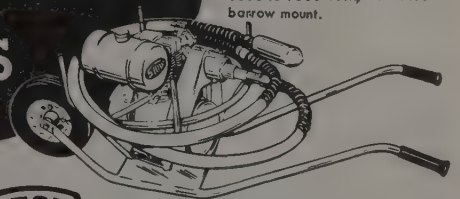
Concrete facts about Concrete Vibrators and Screeds



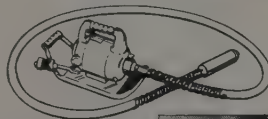
In beam sizes up to 30'. 2 HP air-cooled engine. Mounted on 4 multiplane vibration dampeners. Also available without beam.

Model AGW

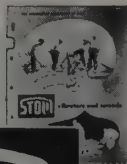
4½ HP 4 cycle air-cooled engine, automatic centrifugal ball bearing clutch, delivers 6000 to 9300 VPM, with wheel barrow mount.



Model BU
2 HP at 9000 VPM
115 V. AC or DC



See your STOW distributor about STOW vibrators and screeds today. Send for free Bulletin 526.



STOW is the name you want!

The high operating speeds of the new STOW line of Concrete Vibrators make possible the use of heavy duty, light weight flexible shafting and lighter, more efficient vibrator heads—which speed operations, cut costs. And, STOW design provides convenient, practical speed control so attachments may be used directly on the vibrator shafts.

STOW SCREEDS—permit placing more than 300 cu. yds. in less than 8 hours; strike off and impact in one operation; leave surfaces true to grade; work up to and around manhole covers and obstructions.

STOW MANUFACTURING COMPANY—
53 Shear Street Binghamton, New York

Space is sold as advertisers' inches. All advertisements in this section are 1/2 in. short of contracted space to allow for borders and composition.

CLASSIFIED

Rates are 8.50 a column inch. Copy should be sent in by the 20th of preceding month if proofs are required; by the 23rd if no proofs are required.

POSITIONS

DESIGNING ENGINEER

Well-established manufacturer needs first-class engineer to design and improve construction machinery.

Excellent salary—Good future.

SALES ENGINEER

Also need two or more experienced sales engineers familiar with heavy construction; one for Midwest and one for Pacific Coast.

Write Box 10-A

Western Construction

FOR SALE

FOR SALE

Barber-Greene 830-840 Mixer and Dryer Hot-Mix Plant, complete with electric shakers, tunnel, boiler, steam-heated tanks, and all necessary equipment; 1/2-yard Quickway truck-crane; TD 18 International Tractor with carry-all; 2 International dump-trucks; AC blade; Motor roller; Howe truck-scales; Various other pieces of small equipment. MUST BE SOLD IMMEDIATELY, AND AT A SACRIFICE. Mid-Valley Corporation, 414 E. Mill St., Porterville, California. Phone 1440.

FOR SALE

FOR SALE

1—Koehring Model 34E, Twin Batch Paver purchased April 1946. Powered by G. M. Diesel. F.O.B. Utica, N. Y. \$5,000.00.

1—Ransome 34E. Dual Drum Paver. Powered by Cummins Diesel. F.O.B. Chelsea, Michigan. \$12,000.00.

1—1/2-yd. Insley dragline, in good shape.

All in good condition and reasonably priced.

RUFFRIDGE-JOHNSON
EQUIPMENT CO., INC.

3024 S.E. 4th St. Minneapolis 14, Minn.
Lincoln 7648 — PRIOR 7147

FOR SALE STEEL SHEET PILING

NEAR BREWSTER, WASHINGTON

Shipped New		Used		Only One Job	
Carnegie	MP-101	MP-102	Tees		
Length	Pcs.	Pcs.	Pcs.		
72-65 ft.	105	100	2		
65-60 ft.	210	50	9		
60-50 ft.	210	5	18		
50-45 ft.	290	2	7		
45-40 ft.	120	1	13		

Also quantity 35 ft. and shorter—Quick Ship—ment Regardless of job, location. Write, Wire or Phone.

MISSISSIPPI VALLEY
EQUIPMENT CO.

511 Locust St., St. Louis 1, Mo., CHestnut 4474

FOR SALE

BARGAINS

New—Used Rotary SWEEPER CORES

WE MAKE THESE

Grace - Hough
Littleford - Meili
Blumberg - Rosco
Lull - Spearswell
Detroit - Harvester
and Other Popular
Makes
All Makes Rebuilt -
Repaired - Refilled

Trade In Your Old Cores
Immediate Service
WIRE, WRITE OR PHONE

VAN BRUSH MFG. CO. INC.

327 S. W. Blvd.

K. C., Mo.



STOP that WATER

With FORMULA No. 640, a clear liquid which penetrates 1" plus in concrete, brick, stucco, plaster, etc. Seals out water, dirt. Holds 20' head. Use outside and in. Preserves all absorbent materials. Sold 14 years. Quick, economical, sure. \$3 in 55's. Free sample. See Sweet's.

HAYNES PRODUCTS CO., OMAHA 3, NEBR.

FOR SALE

NEW
MODEL SA BLAW KNOX
CONCRETE SPREADING MACHINES
WITH CONTINENTAL ENGINES
20' SPREAD

SCHNITZER STEEL PRODUCTS CO.
3300 N. W. Yeon Ave.
Portland, Ore.
Phone Capital 9231

RUBBER TIED EARTH MOVERS

Two used "B" Tournapulls 1947 Models, 30 cu. yds. In excellent condition. Equipped with Tournamatic transmissions and Buda Model DC-1125 engines. Machines are now in use and can be inspected. \$25,000 for both units. F.O.B. job site Minneapolis area.

WM. H. ZIEGLER CO., INC.
2929 University Ave. S. E.
Minneapolis 14, Minnesota

BARGAIN

1947 Ingersoll Rand Diesel Compressor HKA-500 model. Recondition motor and in A-1 shape. Speed 1100 R.P.M. Price \$2500.00

Box 18028 Bridgeport, Wash., c/o Gunther & Shirley Co. and E. V. Lane Corporation.

FOR RENT

SOLD RENTED REPAIRED

Transits • Levels
Steel Tapes • Compasses

Portland Instrument Co.
334 S.W. 5th nr. Stark
PORTLAND 4, ORE., AT 3598



RENT STEEL PILING

Get the exact lengths and sections you need from Foster—all standard makes, delivered on time—and at Foster's standard low rental rates. Also Rental Pile Hammers & Extractors.

LB FOSTER co.
PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
HOUSTON 2 • LOS ANGELES 5

LOW COST INSTALLATION AND OPERATION

CABLEWAYS

IMMEDIATE SHIPMENT

ELECTRIC, STEAM OR DIESEL

CAPACITY: 5 TO 20 TONS

SELL, RENT OR BUY

AMBURSEN DAM CO INC

225 MADISON AVE. NEW YORK

FOR DAMS
BRIDGES
BREAKWATERS
FILTRATION AND
SEWAGE PLANTS

FOR SPEED
ECONOMY
EFFICIENCY
FLOOD SAFETY
LABOR REDUCTION

ADVERTISERS in this issue

A

Adams, J. D., Manufacturing Co... 7
Air Reduction Pacific Company... 6
Allis-Chalmers Manufacturing Co.,
Tractor Division16 & 17
American Pipe and Construction
Co., Northwest Division... Cover 3
American Tractor Equipment
Corp.94 & 95
Austin-Western Company, Div.
Baldwin-Lima-Hamilton Corp... 58

B

Badger Machine Company..... 33
Baldwin-Lima-Hamilton Corpora-
tion, Construction Equip. Div... 45
Barco Manufacturing Co..... 52
Barnes Manufacturing Company 122
Bethlehem Pacific Coast Steel Cor-
poration 40
Blaw-Knox Company
Equipment Division 87
Foote Construction Equip. Div.. 18
Broderick & Bascom Rope Co... 31
Bros, Wm., Boiler & Mfg. Co... 111
Bucyrus-Erie Company39 & 93

C

Carver Pump Co.....141
Caterpillar Tractor Co.....23 & 83
Chain Belt Company..... 44
Chicago Bridge & Iron Company. 56
Chicago Pneumatic Tool
Company8 & 9
Chrysler Corporation, Dodge Truck
Division 24
Cleveland Trencher Co.107
Coffing Hoist Company123
Colorado Fuel & Iron Corporation
Industrial Wire 51
Grader Blades 88
Wickwire Rope 97
Columbia-Geneva Steel Division.
United States Steel Corp...53 & 91
Consolidated Machinery & Supply
Co., Ltd.101
Continental Sales & Service Co...128

D

Dewey & Almy141

E

Eaton Mfg. Co., Axle Division... 47
Euclid Division, General Motors
Corporation 13

F

Fiske Bros. Refining Co.,
Lubriplate Division132
Flexible Steel Lacing Co.....122

G

Gar-Bro. Manufacturing Co.....124
Gilson Screen Company134
Goodrich, B. F., Company, The... 5
Goodyear Tire & Rubber Co., Inc.,
TheCover 4

H

H-S Engine Co.128
Hawthorne-Michaels Co. 37
Horn, A. C., Co., Inc., (Sub. of
Sun Chemical Corporation)... 54
Hunt, Rodney, Machine Co..... 35

I

International Harvester Co.,
Industrial Power10 & 11
Motor Truck Division..... 29

J

Johnston, A. P., Company, Inc...145

K

Keasbey & Mattison Company... 12
Kolman Manufacturing Co. 46

L

Le Roi Co.14 & 15
Leschen Wire Rope Division, Sub.
The H. K. Porter Company, Inc.103
Lincoln Electric Company, The...118
Lubriplate Division,
Fiske Bros. Refining Co.....132

M

Madsen Iron Works, Inc.....136
Marion Power Shovel Company.. 55
Marvel Equipment Corp.....132
Masonite Corporation131
Master Vibrator Co.139
McDonald, B. F., Co.130
McKiernan-Terry Corporation ..127
Moffett Engineering Co. 28
Monarch Road Machinery Co...143
Murphy Diesel Company 38

N

Noble Company, The 42
Northwest Engineering Co..... 3

O

Owen Bucket Company.....109

P

Pacific Telephone and Telegraph
Company135
Permanente Cement Co. 34

R

Richfield Oil Corp. 36
Roebling's, John, Sons Corporation 21

S

Seramm Inc.117
Shawnee Manufacturing Co.....137
Shell Oil Company..... 99
Standard Oil Company
of California 43
Standard Steel Corp.115
Stephens-Adamson Mfg. Company 27
Stow Manufacturing Co.143
Superior Concrete Accessories, Inc. 32
Superior-Lidgerwood-Mundy Corp. 137

T

Texas Company, The..... Cover 2
Thermoid Co. 19
Truck Mixer Manufacturer Bureau 50
Twin Disc Clutch Company..... 22

U

Union Oil Co. 26
Union Wire Rope Corporation... 25
United States Pipe & Foundry Co.. 85
United States Rubber Company,
Mechanical Rubber Goods..... 49
United States Steel Corp...53 & 91
Universal Form Clamp Co.119
Universal Manufacturing Corp...133
Utility Trailer Mfg. Co.105

W

Watts, Charles R.141
Wellman Engineering Company,
The 89
Wellman, S. K., Co. 20
Western Concrete Pipe
Association129
Western Construction142
Westfall Automatic Taglines....142
Wood, Gar, Industries, Inc..... 30

Johnston Stainless Welding Rods

Practical, Down-to-Earth Welding Rods
Alloys as they are supposed to be

Corrosion Resistant—
Clean metal

Strong—
Low in cracking

A. P. JOHNSTON CO., INC.
1845 E. 57th St., Los Angeles 58

BACKFILL, uncompacted

Quest for the dollar sign

We ran an editorial recently called "WANTED: Engineering cost data." What prompted us was the very real need that engineering organizations have for information that will help them make realistic choices among design alternatives. There's an element here of service to the client—public or private. But there's also the plain fact that a mutual understanding of problems, including those with dollar signs, is essential to a good working arrangement between engineer and contractor.

A reader takes off from our editorial theme, wondering if some organization, possibly of contractors, could provide pre-bidding information on a unit price basis. It would be a big service on the engineering side of things—we're sure of that. But we're dubious about the mechanics of it all. In fact, there's the cost of finding the costs!

Our reader, himself an engineer standing to benefit from such a plan, hastens to note that even now engineers aren't exactly setting pins in the wrong alley. He concludes, "This service would probably be useful to some contractors too, judging by the variations in unit prices often seen. The engineer's estimate is not always as far off as some contractors..."

They'll need a wide screen

We got an unusual letter last month. A commercial moving picture firm was prospecting for movie possibilities among construction projects of the Western states. We limited ourselves to just a few paragraphs (just a few jobs!) in our reply, and we asked what was going on. The answer shows that Hollywood is about to take a cue from the sidewalk superintendent. As with almost anything in 1954, television has had something to do with it! Here is what we learned:

"By and large the construction field has been overlooked as a source of excellent material for film use. And this seems strange, for the general public has always had a strong urge to watch men and machines at work. Witness the holes cut in guard fences so passers-by may watch even a small power shovel in a foundation hole..."

"At the moment 12 times more film is being made for TV release than for theater use. Almost all this film is being made on 16 mm, which means that production costs are very low.

"The ideal TV film is one which is made originally on 16 mm. color, so that parts may be adapted to theater short release (blown up to 35 mm.).

Scripts are being written to accommodate 13- and 26-min. takes or sections, and these must be available in a series of some continuity.

"The strangest thing of all is that a great deal of film is being made on subjects which previously might have been regarded as commercial—now

Twenty-five years ago in Western Construction

"Completion of the Stewart Mountain Dam of the Salt River Project, Arizona, is scheduled for March 1930. This dam, to cost \$2,300,000, is of the variable-radius arch type, with a gravity section on the west end and an overflow section on the east end... The overflow length is 1,200 ft.,... the height from bedrock is 180 ft."

* * *

"C. C. Young, governor of California, appointed the three members of the board to administer state registration of civil engineers, as follows: Donald M. Baker, consulting engineer, Los Angeles; Henry J. Brunnier, consulting structural engineer, San Francisco; and Albert Givan, general manager and chief engineer of the Sacramento Municipal Utility District."

* * *

"Robert W. Hunt Co. has been employed by Robinson & Steinman, consulting engineers, to perform mill, shop, and field inspection of all steel and cables for the new St. Johns Bridge in Multnomah County, Oregon."

* * *

"A. H. Read Co. of Cheyenne, Wyoming, has placed over 55,000 cu. yd. earth fill and over 5,000 cu. yd. rock fill, in connection with the contract for constructing North Crow Dam for the city of Cheyenne. The dam is earth and rock, 90 ft. high. Spillway is being excavated, and the tunnel, tunnel plug, piping, and cutoff wall have been finished."

* * *

"On Saturday, October 19, the Pardee Dam banquet and dedication will be held, a special event being planned by the contractor for the event. The banquet follows the policy of Atkinson Construction Co. in celebrating the completion of important projects."

shown for entertainment value. The door is open to any industry to present an interesting picture with enough thread to hold it together...

"Perhaps somewhere along the line we may find the material and the co-operation which will turn into a well-rounded construction feature picture. At least, we are going to look."

The man who originated the little white line

A newspaper clipping tells of the death of Howard Law in Fresno, California, during July. Who was he? According to the *Reno Evening Gazette* "his monument is to be found on nearly every street and road over the country. He is credited with first proposing the white centerline for highways."

Once a convenience, the centerline itself has become a necessity. It has been dotted, dashed, doubled up, raised, corrugated, and even painted yellow! Some states use two colors. And from these variations has sprung an entire art of highway signing and striping. Concludes the *Gazette*, "there may have been others who suggested the highway dividing line, but the Fresno man is generally recognized as the originator, and he is to be considered as one of America's unsung heroes."

Note: After considerable research, B. F. Goodrich Co. in 1939 established E. N. Hines of Detroit as the white line originator in 1911. The idea also occurred independently to many others then and shortly after.

NEXT MONTH

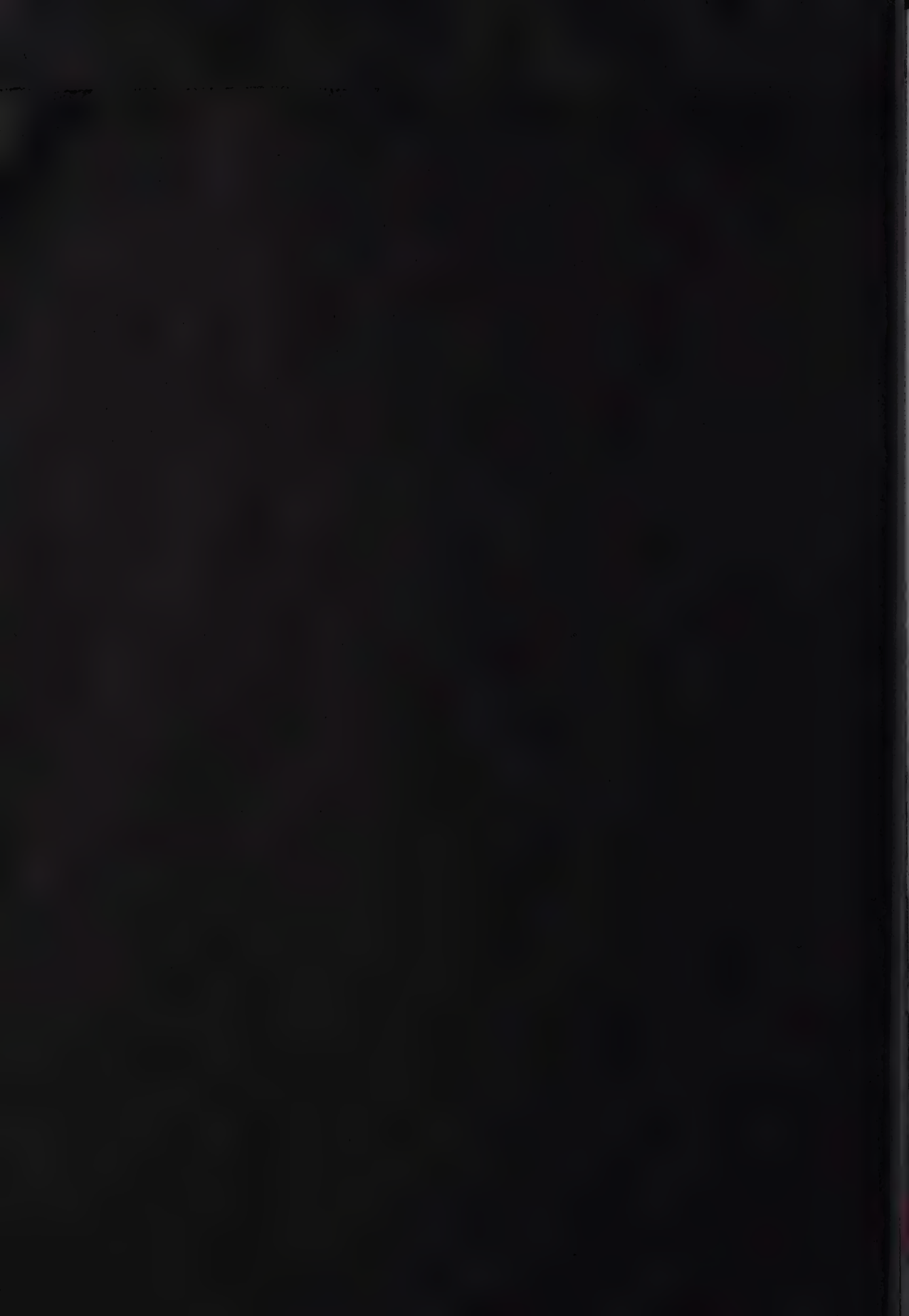
DR. L. I. HEWES AWARD

... The annual Hewes Award presentation was a feature of the annual meeting of the Western Association of State Highway Officials, held last month at Sun Valley. The winner will be introduced next month in a conference report by James I. Ballard, editorial director of *Western Construction*.

CONCRETE AT FOLSOM DAM

... Here is another landmark job in the technology of lean mass concrete as developed by the Corps of Engineers. An article next month will review methods and procedures, the "why" of Folsom concrete specifications, and the "why" of departures from them as the job has progressed.

... The Editors



BRARY INC. COPY
FURNISH BOOK INFORMATION

WESTERN CONSTRUCTION

PORTLAND CEMENT ASSN.
ATT: LIBRARY
33 W. GRAND AVE.
CHICAGO 10, ILL.

LMA
JAF
~~PF~~
GKR
HAH
WH
WCO
JAL
~~E.A.~~
NDB
JSS

STAY FORTY
FEET APART
WHILE ON BRIDGE

DRIVE
TO THE
LEFT

This month . . .

Subdivisions: Big construction in the West

New way for picking FAS routes in Washington

Insulation holds heat in winter concrete

NOVEMBER 1954

COVER see page 4

OVER 15 YEARS OF LOW MAINTENANCE COSTS

reports Isbell Construction Company, Reno, Nevada



TEXACO SIMPLIFIED LUBRICATION PLAN — With not more than six Texaco Lubricants you can handle all your major lubrication. The plan saves time and money, reduces lubricant inventories, eliminates lubrication mistakes. Ask a Texaco Lubrication Engineer all about it.

"WITH TEXACO MARFAK," reports the Isbell Construction Company, "we've enjoyed over 15 years of low maintenance costs and extra long chassis parts life. Our experience has shown that no matter how tough the terrain, *Texaco Marfak* stays in the bearings and really gives them protection against dirt and moisture."

Contractors everywhere get similar results with *Texaco Marfak*. It won't squeeze or jar out, stays in the bearings, effectively guards against wear and rust. It's top assurance of lower maintenance costs, longer bearing life.

In wheel bearings, use *Texaco Marfak Heavy Duty*. Isbell does and finds that it safeguards bearings for extra thousands

To keep its equipment on the job, and maintenance costs low, Isbell Construction Company—highway builder, open pit mining contractor—has been using Texaco Products for years.

of miles between repackings, increases bearing life, assures greater braking safety. No seasonal change required.

**MORE THAN 500 MILLION POUNDS OF
TEXACO MARFAK HAVE BEEN SOLD**

For crawler tracks, *Texaco Track Roll Lubricant* is ideal. It wards off rust and wear—keeps out dirt and moisture.

Let a Texaco Lubrication Engineer help you step up your equipment efficiency, cut down on maintenance costs. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.



TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

TUNE IN . . . TEXACO STAR THEATER starring DONALD O'CONNOR or JIMMY DURANTE on television . . . Saturday nights, NBC.

UPSY-DAISY

ANOTHER ROCK PROBLEM

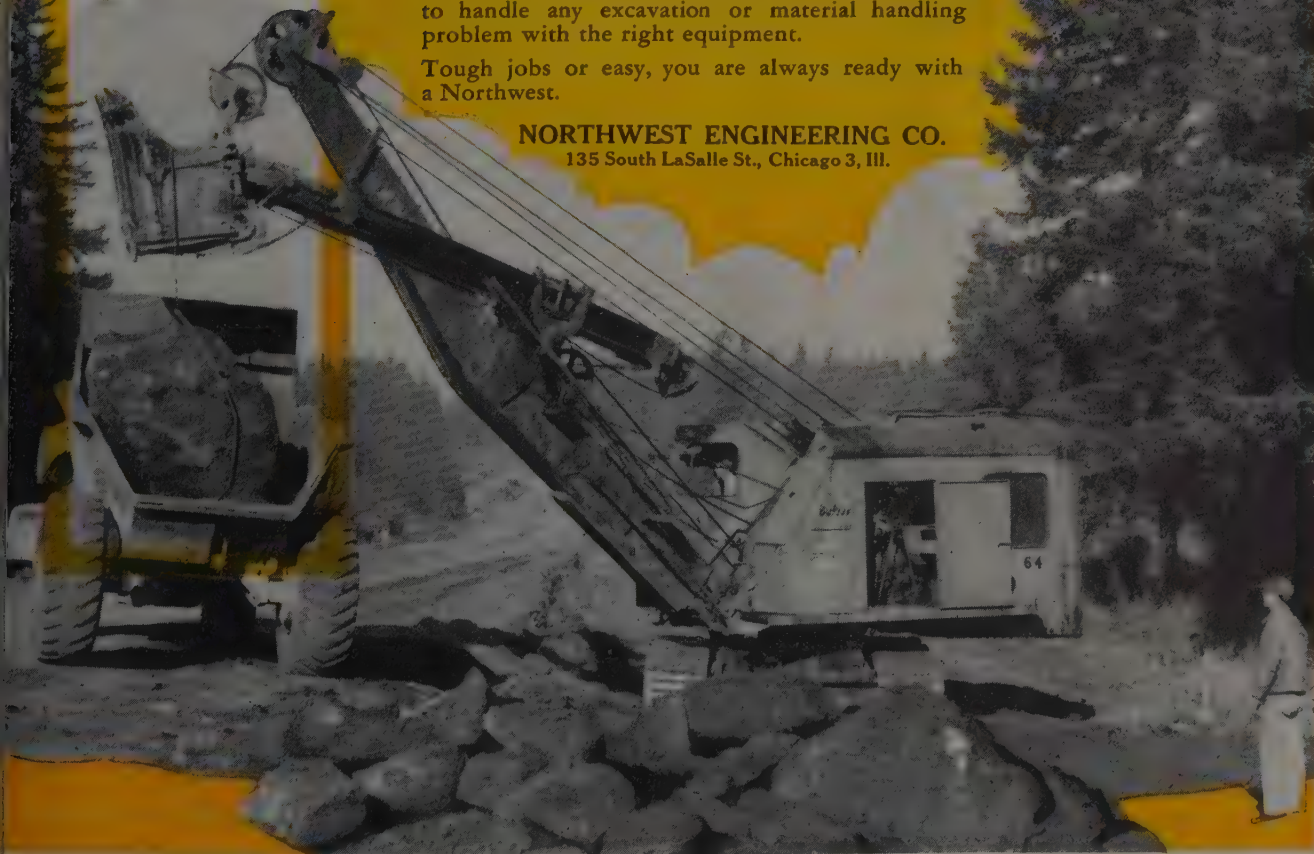
for R. A. Heintz, Portland, Ore.

THIS bit of load lifting is on the Vancouver Expressway and the shovel, of course, is one of the nine Northwests that R. A. Heintz of Portland, Oregon has owned.

But that's the main thing about a Northwest! You're always prepared for the tough ones. You're equipped with the maximum in digging ability even when the jobs look easy—you're ready when the unexpected surprises you because your Northwest is built for the hardest job a Shovel, Crane, Dragline or Pullshovel has to do. Simplicity reduces upkeep and adjustment and cuts "down" time. Ease of operation without delicate mechanical complications is assured by the "Feather-Touch" Clutch Control. Uniform Pressure Swing Clutches take the jerks and grabs out of swinging and make spotting easy. The Cushion Clutch eliminates shock overloads before the shock gets to the machinery. Convertibility from Shovel, to Crane, Dragline or Pullshovel makes it easy to handle any excavation or material handling problem with the right equipment.

Tough jobs or easy, you are always ready with a Northwest.

NORTHWEST ENGINEERING CO.
135 South LaSalle St., Chicago 3, Ill.



Local NORTHWEST sales agents

RENO, NEV., Sierra Machinery Co., Inc.

SPOKANE, WASH., General Machinery Co.

CHEYENNE, WYO., Karem Tractor & Equip. Co.

PORTLAND, ORE., Balzer Machinery Co.

DENVER, COLO., Power Equipment Co.

SALT LAKE CITY, UTAH, Arnold Machinery Co.

MEDFORD, ORE., Cal-Ore Machinery Co., Inc.

PHOENIX, ARIZONA, Superior Equip. Co.

NORTHWEST SALES OFFICES:

SAN FRANCISCO, CALIF.
255 Tenth Street

LOS ANGELES, CALIF.
3707 Santa Fe Ave.

SEATTLE, WASH., 1234
Sixth Ave. South

*Successful
Contractors
Stay Successful
with
Proved Equipment*

ARTICLES

- Subdivisions: Big construction in the West**
Part 1: Clearing 1,000 acres, moving 6,500,000 yd. 49
- New way for picking FAS routes in Washington counties . . . 53**
By Pat Thomson
- Insulation holds heat in winter concrete 56**
By George B. Wallace
- WASHO meets at Sun Valley—a report and three papers . . . 59**
- Low bidder shows how on underpinning 64**
- Steam plant construction is different at Alaska airbase 66**
By George Avery
- Paving on the slope at Garvey Reservoir 68**
By Phillip L. Bailey and Louis R. Hovater

DEPARTMENTS

- Editorial Comment 47
- Reports from the Courts 70
- News 76
- Alaska Newsletter 90
- Engineers on the Move 92
- Supervising the Jobs 96
- Tricks of the Trades 108
- New Literature 114
- New Equipment 118
- Unit Prices 130
- News of Distributors 132
- Classified Advertising 134
- Advertisers in This Issue 135
- Backfill, Uncompacted 136

FRONT COVER

YOU DON'T HAVE to be in England to drive on the left side of the road. The fast moving heavy equipment pictured here is passing over a limited width timber bridge under good control because of this trick. For more tricks for earth-moving production, see page 51.

*For 28 years the construction
and engineering publication
serving the special needs of
ALL the West and Alaska*

EDITORIAL

EDITORIAL DIRECTOR
James L. Ballard

EXECUTIVE EDITOR
Ralph Whitaker, Jr.

MANAGING EDITOR
John J. Timmer

ASSISTANT EDITOR
Kenneth E. Greene

NEWS EDITORS
Robert L. Byrne
May A. Carroll

PRODUCTION MANAGER
Patricia N. Mann

BUSINESS

James I. Ballard President
Franklin B. Lyons Vice President
L. P. Vrettos V. P. & Treasurer

ADVERTISING SALES
Manager—V. C. Dowdle

REPRESENTATIVES
SAN FRANCISCO—V. C. Dowdle, 609 Mission St.
San Francisco 5, Calif. Phone YUkon 2-4343

LOS ANGELES—Jerome E. Badgley, 128 So. Mansfield
Ave., Los Angeles 36, Calif. Phone WEbster 8-8512

PACIFIC NORTHWEST—Arthur J. Urbain, 609 Mission St.
San Francisco 5, Calif. Phone YUkon 2-4343

CHICAGO—A. C. Petersen, 3423 Prairie Ave.
Brookfield, Ill. Phone HUter 5-0532

NEW YORK—Richard J. Murphy, 107-51 - 131st St.
Richmond Hill, N. Y. Phone JAmica 9-2651

Published monthly by

KING PUBLICATIONS

Publication office
416 Wall Street
Los Angeles 13, California

Editorial, advertising & circulation office
609 Mission Street
San Francisco 5, California

CIRCULATION

CIRCULATION MANAGER
E. F. Hubbard

ASST. CIRCULATION MANAGER
R. L. von Thurn

For change of address use prepaid rip-out postcard bound in this issue, or write Circulation Dept., 609 Mission St., San Francisco 5, Calif.

Subscription rate is \$4 per year in the U.S. and countries in the Pan American Postal Union. All other countries, \$5 per year. Single copies 35c.

Entered as Second Class Matter at the Post Office in Los Angeles, California, under the Act of March 3, 1879. Postmaster: Please send Notice 3579 to Western Construction, 609 Mission Street, San Francisco 5, California.

Copyright 1954 by King Publications

\$10,000,000,000 for highways

Elsewhere in this issue a report of the 1954 convention of the Western Association of State Highway Officials touches on the federal administration's proposal for a 10-year, \$50,000,000,000 program of highway construction. Confidence in the positive outcome of the proposal was expressed by a member of the AASHO staff as well as by individual delegates and guests at the WASHO meeting.

Just what does the coming program mean to the West? It means about \$10,000,000,000 in highway construction. The full impact can better be expressed this way:

Say, conservatively, that the program gets off to a gradual start with only \$500,000,000 worth in the West during the first year—when it comes. On the basis of past performance this will mean an additional \$65,000,000 in Washington—145% of current expenditures. Additional! For California the percentage is about the same, the amount running close to \$200,000,000. Colorado will be applying \$29,000,000—over and above a typical current year's figure of about \$20,000,000.

At first glance, it would appear that our highway departments will have a bear by the tail. Actually, they will have widespread support in meeting the challenge. First and foremost will be the construction industry of the West. Not inconsiderable will be the West's entire—and almost universally motoring—population. Their interest is well expressed in the statement of a California highway official, recently quoted at the time of a new freeway opening: no ribbon cutting, but “a man on the construction crew will just pull away the barricades and run for his life”!

What's the life expectancy?

This question may take various forms, because not every engineering problem involves a tangible design to which a life can be assigned. Phrased in a ridiculous manner: An owner wishes to use 35,000 sq. ft. on a 7,000-sq. ft. piece of property! The engineer's reply necessarily takes the minimum form of a five-story structure. But this is not design of a structure for its own sake. It is the solution to a problem of needs.

And there are other constituent needs within the main problem. They comprise a set of limits that further narrow the engineer's choice of solutions. In a metropolitan situation where streets and patterns of land use are well established, life expectancy may not be a primary design criterion. In the West, chances are that lateral force alone will call for stouter design.

But what about the importance of economic life in another important civil engineering field—highways? Here is a fluid situation. The pattern of Western automotive transport is in every respect a changing one.

Vehicles change in weight, dimensions and speed. They change in character, their evolution having now made Western highways into major avenues of commerce. And they have steadily increased in numbers.

The Western community changes, and it is vital to the pattern of automotive transport. For the most part, growth is the rule. But the rate varies from one place to another. Exploitation of a newly discovered resource brings early congestion to every passable road in the area.

The result of this shifting pattern is constant change in Western highway needs—as expressed by design standards and location. Today's highway location, unlike today's 12-story building, cannot realistically be assigned an extended economic life.

Why, then, build so many of our highways and highway structures “hell-for-stout”? Geometric standards and physical standards for carrying capacity can be met with our cheapest construction methods and materials. And a 15- or 20-year expectancy is well within the time limits for full performance of such materials.

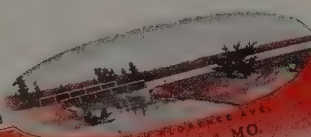
To build for a 50-year life with today's geometric and physical standards is unrealistic on the basis of past experience. In addition, the more durable methods and materials are more expensive.

It is not a case of knowing when the highway will be realigned, or where its new location will be at that distant date. It is enough to know only that there will be change. Otherwise, continuing as at present, this hell-for-stout structure some day will be at best a farmer's access bridge, and at worst the object of some expensive demolition work.

TAKE IT FROM A MAN WHO KNOWS

HERE'S A MISSOURI CONTRACTOR WHO SAYS...

SHOUCE



1145 SOUTH WOODBRIDGE AVE.
SPRINGFIELD 4, MO.

September 23, 1954

Registered Professional Engineer

Austin-Western Company
Aurora, Illinois
Gentlemen:

After using our new Austin-Western hydraulic crane for approximately three months, we would like to express our thoughts to your company as to the maneuverability of this piece of equipment.

Up to date we have laid approximately 11,000 lineal feet of concrete pipe ranging from 48 inches in diameter down to 12 inches in diameter.

The location of this drainage pipe was such that it was impossible for us to use a crane with a long boom attached, on account of the high tension transmission lines and the large lead telephone cables that were approximately 14 feet above the ground. Also this drainage was located in places that were inaccessible with other type of equipment. Our Austin-Western hydraulic crane due to its horizontal and telescopic boom made it possible for us to place all this tile with two workmen. Otherwise, it would have required ten workmen with a flat bed truck to transfer these heavy concrete pipes from the stock pile to the site.

It also replaced another machine that would have been necessary to perform these operations had we not purchased our Austin-Western crane. Generally, we are very pleased with the operation of this equipment as of date and will recommend same to other prospects who wish to contact us for further proof of the maneuverability of this equipment.

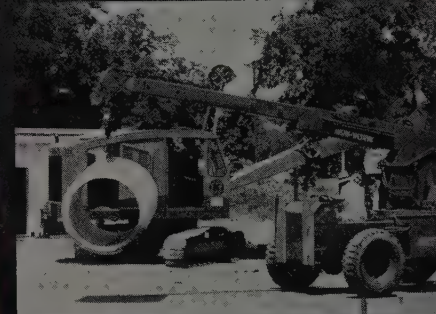
Very truly yours,

R. S. Houce
R. S. HOUCE
P.E.

RSH
jr



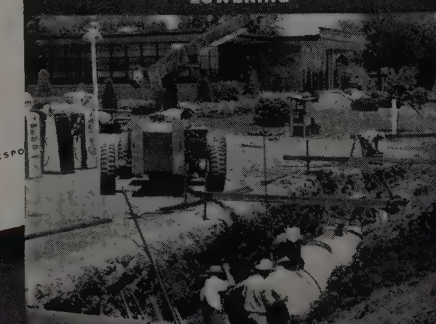
LIFTING



CARRYING



LOWERING



SPOTTING

AUSTIN-WESTERN COMPANY

Construction Equipment Division
Baldwin-Lima-Hamilton Corporation

AURORA, ILLINOIS, U.S.A.

ARIZONA—SHRIVER MACHINERY COMPANY Phoenix
CALIFORNIA—EDWARD E. BACON COMPANY San Francisco 10
CALIFORNIA—SMITH BOOTH USHER COMPANY Los Angeles 54
COLORADO—LIBERTY TRUCKS & PARTS COMPANY Denver 1
IDAHO—ENGINEERING SALES SERVICE, INC. Boise
MONTANA—WESTERN CONSTRUCTION EQUIPMENT CO. Billings
WYOMING—KEREMI TRACTOR AND EQUIPMENT COMPANY Cheyenne

MONTANA—WESTERN CONSTRUCTION EQUIPMENT CO. Missoula
NEVADA—C. D. ROEDER EQUIPMENT COMPANY Reno
NEW MEXICO—N. C. RIBBLE COMPANY Albuquerque
OREGON—COLUMBIA EQUIPMENT COMPANY Portland 14
UTAH—WESTERN MACHINERY COMPANY Salt Lake City 15
WASHINGTON—COLUMBIA EQUIPMENT COMPANY Seattle

NOVEMBER 1954

SUBDIVISIONS: Big construction in the West



PART 1 OF 4

Clearing 1,000 ac., moving 6,500,000 yd.

This year—1954—one out of every three construction dollars in the U. S. is being spent on private residential subdivision development. The size and scope of this work rivals the large public works projects for the amount of men, equipment, and materials involved (\$7.3 billions for the first eight months this year). This article—the first of four—describes initial site development on a typical large Western subdivision now under way.

EXPANSION IS THE WORD. California is busting at the seams from a tremendous population increase. The result has been a big boom in housing, commercial and industrial development.

Typical of this trend is the current undertaking at the old Mills Estate in San Mateo County. The Trousdale Construction Co. of Los Angeles is developing this 1,000 ac. of ground, title of which is vested in Atlantic Life Insurance Co. of Richmond, Virginia. The tract extends from (east to west) sea level to over 600 ft. in elevation. It was bounded on the south by the city of Burlingame and to the north by Millbrae. A north-south railroad and major highway artery dividing the area into three distinct sections posed further problems. Improvements to this ground to ready

it for buildings will be in the order of \$10,000,000. That's big construction!

A great amount of planning and co-operative effort was required between Trousdale and the two neighboring cities before the actual type of development was decided upon. This ate up almost another year's time after the original purchase date early in 1953. As it now stands, about two-thirds of the land will be incorporated into Burlingame and about one-third into Millbrae.

A first step—engineers

Two firms were retained by Trousdale to handle the engineering problems involved. One of these is Wilsey & Ham who have been instrumental in the basic layout development. Determination of the street layout and utility design (water, storm drains,

sewage, electrical) were important. The rolling terrain presented important decisions to be made on the amount of fill required in the low level mud flats and the cut and fill requirements of the higher hills. They act as agents for Trousdale in handling the various contracts for actual construction.

Another firm, Dames & Moore, is handling soil investigations. A complete community presents many foundation requirements where there are to be light industries, commercial buildings, and homes. Likewise, the soil itself, varying from clay to sand, required careful analysis as to what it would provide as foundation material for buildings—as well as for streets and utility use. The preliminary work has now been done and the firm is continuing as consultants



DIRT IS FLYING as each of these Wooldridge Terra Cobras is push-loaded by two Allis-Chalmers HD20's. The rapid loading time is only 15 to 20 sec. in a distance of 100 to 150 ft.

on compaction tests of fill areas and slopes.

Of the original 1,000 ac., about 200 have been set aside for a high school, intermediate school, hospital, and airport and freeway extension. The remaining 800 ac. will be sub-divided as follows:

180 ac.—light industry and manufacturing.

30 ac.—commercial (shopping centers, filling stations).

25 ac.—professional buildings.

20 ac.—garden apartments.

35 ac.—Four grammar schools.

500 ac.—residential homes (about 3 per ac.).

Clearing

A unique clearing operation was started in March 1953. Trousdale called upon the LaFon Bros. Tree Service to remove about 40,000 eucalyptus, pine, fir, cypress and other species. Delayed by late rains, the clearing job encountered further difficulties when the accepted method of clearing by means of a heavy chain dragged between two crawler tractors failed to uproot the tough-rooted eucalyptus trees. These trees would bend, to snap off at the trunk several feet above the ground, leaving a lengthy and expensive stump removal operation. A solution to the problem was found in special equipment designed and built by Peterson Tractor & Equipment Co. of San Leandro, Caterpillar dealer, and American Tractor Equipment Corp. of Oakland.

Peterson equipped a Cat D8 tractor with a special tree dozer on the front, and an ATECO hydraulic rock ripper mounted on the rear. In place of the usual rock ripper standards, ATECO furnished special root cutting knives for the ripper capable of penetrating 30 in. below ground surface and severing roots up to 10 or 12 in. in diameter. Made of alloy steel plate 3 in. thick, the knives are

slightly hook shaped to aid penetration and shearing action. One face of the tapered cutting edge is hard faced, providing a self-sharpening effect. Each knife weighs 860 lb. The tree dozer is carried on a special head frame attached to the standard bulldozer push beams. It rests on top of the regular bulldozer bowl and is bolted to it so the tree dozer can be raised or lowered with the bulldozer power control unit. The long tree dozer push arm carries a head equipped with hard faced teeth to bite into the tree trunk without slipping.

Two San Franciscos . . .

To fully appreciate that subdivision development is big business, here are some facts and figures: "Ninety square miles or 57,619 acres of land in the Bay area were subdivided in the seven year period ending June 30, 1953," a recent study by the San Francisco Bay Area Council revealed.

"As a contrast, San Francisco occupies 45 square miles with a net residential area of approximately 13 square miles. During the seven year period covered by the fiscal years 1947 through 1953, the acreage subdivided in each of the three Bay Area counties, Contra Costa, San Mateo and Santa Clara, exceeded the net residential area in San Francisco.

"The study showed that a total of 2,833 subdivisions in the nine counties had been approved by the California Division of Real Estate during the seven year period. Santa Clara County had the greatest number of subdivisions in the Bay area, 768, while Contra Costa led in the total subdivided acreage, 14,050."

The arm has a reach of 9 ft. 4 in. in front of the bulldozer bowl when in its normal position with the head 12 ft. above ground level.

To fell a tree, the operator lowers the knives into the ground and makes three or four passes close to the trunk to sever the supporting roots. He then rams the tree 12 to 15 ft. up the trunk with the tree dozer, toppling it to the ground. The entire operation requires but 3 to 4 min., even on trees several feet in diameter.

A final step in mechanizing the job came about when LaFon had trouble keeping the green trees burning. This problem was solved by mounting the propeller from a wind machine used for frost protection in citrus orchards on the front frame of an old Cat D4. Belt driven from the former power-take-off, the 4-bladed 7½-ft. propeller provided a steady draft to keep the fires burning.

Earth moving

Four general areas, involving about 6,500,000 cu. yd. of earth moving, are involved. The first area for light industry, calls for 1,750,000 cu. yd. of fill. The second area, commercial, required 200,000 cu. yd. of fill (now completed). The third area of professional buildings and apartments calls for about 650,000 cu. yd. of fill. The fourth and largest area for residences will require 4,000,000 cu. yd. of balanced cut and fill. For the first three areas, or about 2,500,000 cu. yd. of fill, all material—a sandy loam—is being taken from one borrow area near the foothills. Haul lengths for the fill area vary from 2,000 to 10,000 ft. Between February and September, this year, about 550,000 cu. yd. of fill operations had been accomplished.

The contractor handling all of the earth moving is J. A. Thompson & Son of Los Angeles who has in turn a subcontract with the Hindry Construction Co. for this project. Thompson is furnishing all of the earth moving equipment. Work was started in February 1954, on two bridges and their approaches. These were necessary to the fill operations and pass over a busy highway and railroad.

By this September Hindry had 18 Wooldridge Terra Cobras on the job, with 14 of them in operation. This number has been built up over a period of time as they became available from other work in Los Angeles. Most of these Terra Cobras were acquired by Thompson in 1946. The total number will be about 24 at the height of earth moving operations later this year. The need for them is great at present, and they are being sent up immediately from Los Angeles with no major overhauling being done.

Main filling operations are proceeding at present on the industrial area with a haul length of about 1

mi. On this haul, the Terra Cobras are averaging about 6 trips per hr. Each is being loaded at the borrow pit by 2 Allis-Chalmers HD20s. Four pushers in all are kept busy at the pit. Loading time for each unit is 15 to 20 sec. in a distance of 100 to 150 ft. A fast rate of hauling is evident from the 12,000 cu. yd. being handled daily. All roads are kept well watered down and bladed.

New tricks

Here are two new tricks. Because of the relatively narrow haul road over the bridges and approaches, which is approximately 32 ft. out-to-out with 12½-ft. lanes, the drivers are driving on the left side of the road. Better able to see the edge of the road and bridges, the drivers are rolling along at full speed with no fear of collision. Also, the drivers are strapped into their seats with safety belts; this is in case a bowl should drop or if they run off the bridges or approaches. Such a precaution has already saved one man's life.

Marvin McCoy, superintendent for Hindry, is doing an excellent job to obtain the maximum efficiency from his Terra Cobras. He has one man whose full time job it is to keep time records on this equipment. This procedure helps to measure the performance of the drivers (which varies considerably) as well as the equipment.

With regard to lubrication and preventive maintenance, McCoy has two shifts on his one grease truck. The major portion of the routine greasing is done on night shift when the equipment is lined up.

Bridges

An economical and interesting solution to the problem of earth moving over the highway and railroad was found. Timber Structures, Inc., contracted for the design, fabrication, and erection of two bridges that will have better than a 50% salvage value when this project is through. The girders can be used for other timber bridges or for formwork beams in concrete bridge construction.

In both bridges, 6 girders are used parallel to the road haul, giving a 32-ft. out-to-out width. One span of 37 ft. 6 in. over the railroad requires 11x32½-in. girders and another over the highway of 60 ft., requires 12½x45½-in. girders. Minor approach spans of 15 and 20 ft. use 12x19½-in. girders and 11x24¾-in. girders respectively.

The decking is solid 2 x 12 No. 2 Douglas Fir planking on edge with 2 in. of blacktop wearing course on top of this. Terrific vibration, set up by the extremely heavy moving equipment, requires that the bolted connections of the bridges be tightened about once monthly. If all goes well, about 3 yr. more will be required to complete layout and construction of the improvements. Two more



TWO LAMINATED WOOD BRIDGES with spans up to 60 ft. were manufactured by Timber Structures, Inc., to solve the problem of earthmoving over a four-lane highway and over railroad tracks. All timber parts will have excellent salvage value.



FULL 1,000 AC. OF DEVELOPMENT can be seen here. Trees have been cleared from the hills in the foreground with burning still in the process. Borrow pit is located at left center of photo with material being hauled to the flat area in far background.

years after that should see a major portion of the various buildings completed.

Key personnel

Trousdale Construction Co. is maintaining a Northern California office at Millbrae. For this company, Paul W. Trousdale is president; L. E. Weisenburg, vice-president and

civil engineer in charge of this development; John G. Vasos, superintendent; William Irwin, supervision of house planning. Legal matters are handled by Charles H. Church, attorney of Los Angeles, while accounting and fiscal matters are supervised by Louis M. Clark, C.P.A. of the accounting firm of Parker & Parker, also of Los Angeles.

For the engineering firm of Wilsey & Ham, with headquarters in Burlingame, general plans were prepared under the direct supervision of Charles Blair and his assistants Herbert Hall and William Fitch. Construction plans were prepared under the direction of Jack Van Zant. William Wright is head of the survey section and field supervision is under Albert Brown.

For Hindry Construction Co. Marvin McCoy is general superintendent, R. E. Price is office engineer, Robert R. Moodie is master mechanic, and Hal Von Scoy, Henry C. Jones and Lyle McCann are foremen.

Equipment List

- 18—Wooldridge Terra Cobras
- 8—Allis-Chalmers HD20 tractors
- 2—Caterpillar D8 tractors
- 2—Southwest sheepfoot tampers
- 2—Caterpillar No. 12 blades
- 1—Ferguson pneumatic roller hauled by a Euclid tractor
- 3—Wooldridge 25-cu. yd. scrapers
- 4—Shopbuilt 1,800-gal. water wagons with International bodies, 4-in. pumps added for quicker front or rear delivery
- 1—GMC grease truck with Alemite unit
- 1—Welders truck with 3-ton boom

New look at salt water barriers

Measurements being taken to determine practicability of salt water control in the delta opening on San Francisco Bay—Noted Dutch engineer compares problems to those successfully handled in Holland—Feasibility of master levees and barriers key to growing economic water problems.

PURSUANT TO A REQUEST from the Board of Consultants on the San Francisco Bay Salinity Control Barrier Investigation, State Engineer A. D. Edmonston has assigned 40 highly trained technicians of the Division of Water Resources and Water Project Authority to conduct studies at Pittsburg below the confluence of the Sacramento and San Joaquin Rivers to measure the quantity and quality of fresh water in the Delta region, something that has never before been determined.

Edmonston said that it is hoped these studies will provide the answers to problems involved in the operation of Central Valley Project and construction of the Feather River Project as well as the proposed salt water barriers.

Nature of measurements

A new and unique method will be followed to definitely ascertain the direction and quantity of flow during the tidal oscillation of the water in the vicinity of Pittsburg and how much fresh water is being lost out of the Delta each day. This method consists, basically, of moving a current meter through the water by a moving boat over a measured distance parallel to the thread of the stream.

The engineers and technicians of the Division of Water Resources and Authority will work for 15 days in three 8-hr. shifts. They will report their findings to the Board of Consultants, Edmonston said:

"The early estimated figure of 3,300 sec.-ft. of fresh water outflow needed to control sea-water intrusion has never been verified by any direct or indirect measurement process. Whether the actual flow is 3,000 or 6,000 sec.-ft. is a question which must be answered before the water supply of the Central Valley can be firmly established, and before the economic and financial feasibility of the proposed Bay Barrier Project can be firmly ascertained.

"A 1,000 sec.-ft. variation in this assumed salinity control demand will spell a substantial difference in the economic feasibility of any project designed to divert water from the channels of the Delta. If we find an extra 1,000 sec.-ft., it may have a \$20,000,000 capital value. The wide amplitude of tidal flows at the confluence of the Sacramento and San Joaquin Rivers and the large volume of

flow oscillating up- and down-stream past that confluence have defeated earlier attempts to directly measure the flows with the hydrographic equipment available."

The Board of Consultants comprises Raymond A. Hill, Los Angeles; Hans Kramer, Brig. General, Ret., San Francisco; Malcolm Pirnie, New York; Philip C. Rutledge, New York; and Charles E. Deleuw, Chicago. Ir C. Biemond, noted Dutch engineer, collaborated in the preparation of the Third Progress Report, and concurred in its findings and recommendations. Biemond spent two months in California making studies of possible salt water barriers at several locations in the San Francisco Bay Area. He returned to The Netherlands on August 28. The Board has scheduled its next meeting in Sacramento for the week of December 6 to 10, 1954, inclusive.

The report of the Board of Consultants made to the Water Project Authority and released September 14 recommends that in the finalization of the investigations in progress, precedence be given to determination of the quality of the water that would be available for use if a barrier or barriers were constructed. The report further recommends that the principles utilized in the protection of reclaimed lands in The Netherlands be applied to correct adverse conditions in the Sacramento-San Joaquin Delta with reference to floods and water quality. The final report of the Division of Water Resources will include studies based on these suggestions, Edmonston stated.

Dutch comparisons

All members of the Board were greatly impressed by Biemond's description of what had been done in The Netherlands to protect reclaimed lands from floods and with his views on the applicability of such principles to correction of present adverse conditions in the Delta. Application of these would involve the following:

1. Restriction of flood flows in Sacramento River, San Joaquin River and Mokelumne River to defined channels confined by master levees.

2. Closure of all connections, except for small locks, between these primary flood channels and the interior Delta channels and maintenance of water levels in these interior channels at lower elevations.

3. Construction of an independent canal for the conveyance of Sacramento River water across the Delta to the pumping plants used and planned for the delivery of surplus water to regions of shortage.

4. Provision of diversion works for the delivery of water out of the cross-Delta canal into the interior channels for irrigation of lands within the Delta.

5. Provision of pumping plants for the discharge of return and drainage waters into the primary flood channels.

6. Works to prevent the encroachment of saline waters up to the point of diversion from Sacramento River, if such works be found necessary.

Scope of investigations

The investigations must cover means of delivery of water to areas adjacent to the San Francisco Bay in urgent need of an adequate supply of fresh water for domestic and industrial uses, because such needs cannot be satisfied until the water is brought to the point of use. If it should be found from further and more detailed investigation that the lakes created by a barrier or barriers may not be relied upon as a permanent source of potable water for the San Francisco Bay region, then alternative means for the delivery of water of good quality into that area must be considered. Should this not be done as part of the current investigation, the solution of the basic problem of providing additional water to offset present shortages and potential needs will remain unsolved.

The Water Project Authority, through the Division of Water Resources, is conducting the bay barrier investigations with an appropriation of \$250,000 voted by the legislature when it adopted the Abshire-Kelly Salinity Control Barrier Act of 1953. The Water Project Authority shall report to the legislature the result of its studies not later than March 30, 1955.

Save time and money—electric stud welding

STUD WELDING HELPED Soule Steel Co. of San Francisco save upwards of \$5,000 on the installation of sash in the concourse building at the city's new municipal airport. Charles Hoss, erection superintendent for Soule, subcontractor to Carl N. Swenson Co., general contractor, reported that about 12,000 5/16x3/4-in. AF threaded studs were fastened to the exterior of the steel columns with a Nelson stud welding gun. This work was completed in half the time it would have required if through bolts had been used.

New way for picking Federal Aid

Secondary route in Washington counties

If enough money were available, every cowpath could be paved. The amount that is available just won't stretch that far. It's a matter of determining—by some sound and easy-to-apply method—what secondary road should have priority ahead of another within the county. The author tells you from his own experience of a new method that can be easily applied to help solve the problem.

By **PAT THOMSON**

County Engineer
Douglas County, Washington

UNDER THE FEDERAL AID highways acts all of the forty-eight states as well as Hawaii, the District of Columbia, and Puerto Rico, receive annual allocations of Federal Aid Secondary (FAS) funds. The extent of the financial aid given is shown by the Department of Commerce announcement of the amount for the 1956 fiscal year, which begins July 1, 1955. The annual federal aid authorization for highways is \$875,000,000. Of this \$315,000,000 is for primary highways, \$210,000,000 for secondary roads, \$175,000,000 for urban primaries, and \$175,000,000 for the national interstate system. Almost \$65,000,000 will be spent in the Pacific Northwest.

Who gets FAS funds

The Acts require all states, except those directly responsible for all road mileage within the state, to share the secondary funds with county road departments. In Washington, all counties but one have actively participated in the program. Federal regulations governing expenditures of FAS funds contemplate 50% shall be expended on county routes and the balance on state routes of the FAS system. Eligibility is somewhat loosely defined though, for original regulations say, "Roads selected shall be roads not included in the Federal Aid highway system and shall be exclusively within the rural areas."

Federal aid secondary routes in any county are required to form an integrated system of rural roads. By federal interpretation, a route is considered integrated if one end of that route ties in directly with another road on either the federal aid primary system or secondary system.

Actually, there is no statutory limit to the mileage a county may have on its federal aid system. Common sense analysis governs this mileage, however, to that amount a county can maintain, construct, and

reconstruct on its total estimated matched federal aid funds.

The initial mileage selected in Washington State counties was limited in extent, selected from what seemed the most important routes in the county. However, most of these routes have been constructed, or economic conditions have been changed drastically, so that counties are requesting additional mileage.

The FAS program was established contemplating a cooperative construction program on a pre-selected system of the most important routes in the county. Previous county-wide studies for system selection tried in this state have not proved satisfactory. Consequently selection has degenerated to a "add a route a year" policy.

Fred Dixon, district engineer for the Bureau of Public Roads in this state, was highly concerned because the principles of the Highway Acts were not being adhered to and very definitely felt that a program of system overhaul was in order. The annoying question was how to do it at a reasonable cost and within a rea-

sonable length of time. He reasoned that if means could be devised that (a) would make it possible to evaluate the importance of the county mileage not included in the approved system, (b) would not be excessively time-consuming, and (c) could be done by the local officials themselves with assistance from the state and bureau—then those counties in need of program latitude should be willing to cooperate by making such a study. These specifications suggested a rating system based on evaluating the various elements that make importance on a relative basis rather than on the basis of a mass of statistics. Thus, the time involved in gathering the statistics and most of the cost would be eliminated. To do this and still come up with a study of value would require that the relative rating be done by those best informed in the study area. This immediately suggested the county commissioners and county engineer.

Dixon method

The Dixon method, used successfully in one county prior to the Douglas County study, is based on rating a set of elements for each route, or section of a route, included in the study. This is on a 1-10 scale and computed for each route or section. From these ratings, an index is derived to arrange the route or sections by order of importance and permit selection of routes for system expansion in a descending order of economic value.

Dixon hopes the counties in this state that are in need of system expansion will take advantage of this



LOOKING OVER THE RESULTS of the Douglas County road survey are (left to right) Roy Nelson, P. C. Thomsen, and Morris Sachs. All are members of the county board of commissioners.

RATING SHEET

County Douglas Road Armstrong Study Section No. 3

	IMPORTANCE										Rating	Weight	Adjusted Rating
	1	2	3	4	5	6	7	8	9	10			
ECONOMY											<u>3.8</u>	<u>10</u>	<u>38</u>
Agriculture											<u>10/14</u>		
Stock													
Dairy													
Poultry													
Forest Products													
Mining													
Commercial Fishing													
SERVICE ROUTE											<u>3.8</u>	<u>10</u>	<u>38</u>
School											<u>10/14</u>		
Mail & Newspaper													
Milk													
Egg													
Commercial Bus.													
Commercial Haul.													
Logs - Lumber													
Commutor													
RELIGIOUS & SOCIAL											<u>1</u>	<u>5</u>	<u>5</u>
Church											<u>3/5</u>		
Grange or Lodge													
School													
RECREATION											<u>2.2</u>	<u>3</u>	<u>7</u>
Hunting											<u>11/5</u>		
Boating & Fishing													
Stream Fishing													
Summer Homes													
Camping													
Skiing													
TRAFFIC VOLUME											<u>7</u>	<u>10</u>	<u>70</u>
ACCIDENT RECORD											<u>2</u>	<u>1</u>	<u>2</u>
Total Adjusted Rating <u>160</u>													
Speedometer Length <u>6.3</u> Miles													

FIGURE 1

study method to support the addition of a sufficient mileage to their system. This should provide programming latitude for about 10 years and get this cooperative construction program back on a long-range basis.

How to start in

Douglas County began its system survey, the second in the state, by outlining on a map the mileage to be studied. This included all mileage not on the approved system—except those local roads that provide so little service they need not be considered in a study of this kind. The map was given to the state aid engineers of the local state highway district, who broke each route into appropriate, numbered study sections. This was done so that the entire route was not condemned if certain sections did not meet approval.

Rating sheets, one for each official for each study section, were provided. In Washington, school and mail routes are a matter of public record. State aid officials placed these

on the service elements, calculating each portion of the route as a percentage of the total route that was school or mail route.

Each study section had to be traveled with the rating done at the end of the section. Thus, the field trip was outlined to cover the mileage with a minimum of driving. Two cars were used with two county officials in each car. One car was driven by James Gray, state aid engineer, who came as an interested observer and to become acquainted with the study method so that it can be carried out in the remainder of the district. The other car was driven by Don Manning, Washington district planning engineer, Bureau of Public Roads.

After traveling each study section, mileage was recorded for that section and the rating sheet marked by each individual. Each road was rated in relationship to the total mileage to be studied under the following points:

ECONOMY: In Douglas County, where the economy is primarily

wheat, the routes or the route most important to agriculture was rated 10. All other routes rated in direct ratio. The other economy elements (Fig. 1) were rated below this in accordance with a direct percentage of land use.

SERVICE: Each function was rated as a percentage of the mileage on that section in accordance with the following table:

0-14%—1	55- 64%— 6
15-24%—2	65- 74%— 7
25-34%—3	75- 84%— 8
35-44%—4	85- 94%— 9
44-54%—5	95-100%—10

RELIGIOUS AND SOCIAL: Only two ratings were considered here. If the route served directly a gathering place for the element concerned or if any of the elements were on the route, it was rated 10, otherwise 1.

RECREATION: The route serving the greatest direct recreational functions was marked 10 with the other graded routes down in direct proportion.

TRAFFIC VOLUME: A one-day traffic count brought the traffic volumes up-to-date. The highest volume was rated 10 and the others in direct descending ratio.

ACCIDENT RECORD: Only those routes having a series of recurring accidents were considered. This indicated that something should be done for public interest and benefit.

Composite rating sheet

All four sheets were transferred to a composite sheet in the office. To get an average factor rating, the score of each element of the factor was totaled and divided by the number of elements. It is entirely conceivable that every factor could have a rating of 10. Therefore, for differentiation purposes, each factor was given a weight. These were determined by all four county officials who reached agreement on the degree of importance of each major grouping.

In Douglas County, we felt that economy was of primary importance. For the agricultural economy determined the extensiveness of our total mileage and governed somewhat the character of road to be built.

Traffic volume was considered equally important since the character, type, and extent of traffic determined the design standards of construction.

Service routes were also considered of high importance. For the amount of school and mail route determines to a large extent the areas of heavy maintenance required on the total road system. All other categories were graded descendingly in importance.

On the composite sheet, Fig. 1, each dot represents an individual rating, and the cross the average of all four ratings for the particular ele-

ment of the group. The total averages, as designated by the crosses, were computed for each group and divided by the number of persons marking rating sheets. This gave a rating for each group, which multiplied by the weight factor, gave the adjusted group rating. The total of the adjusted group ratings gives the final qualification number or total adjusted rating for each study section. Table 1 lists all routes in descending order of importance as determined by total adjusted rating.

Break point

More routes were surveyed than was feasible for the county to construct in the 1-yr. period with the funds available. Two curves were plotted to see if a natural cutoff point existed. One chart was plotted with adjusted ratings over study section number. Another chart was plotted with adjusted ratings over accumulated mileage. Both curves indicated a natural break at an adjusted rating of 139. All routes above this figure were deemed system possibilities while roads rating 139 and below were rejected as too low for further consideration.

To determine if all of the mileage with rating above 139 should be included in the proposed system increment, the estimated cost of final stage construction for the 92.8 mi. was computed. Allowances were \$7,900 per mile average cost for sub-grade and ballast, \$5,000 per mile for light bituminous surface treatment (LBST), and \$1,500 per mile for seal coating. These computations (Table 2) produced an amount of \$1,156,850 needed for construction of present and proposed increment. Inspection of yearly construction expenditure reveals a possible \$1,515,570 available for the 10-yr. construction plus an additional amount of \$250,000 federal aid allocation.

Sound 10-yr. program

Since county policy sets aside from the top of construction funds an amount equal to the FAS allocation, about \$500,000 will be spent exclusively on FAS route construction. All of the routes shown feasible for programming also exist on the county primary system 10-yr. program selected in 1950. Therefore, it is safe to assume that the county will carry out a certain amount of construction on them and the program is feasible.

Douglas County feels the study method substantiates the previously determined 10-yr. county construction program. If counties would expand the study system to cover all county mileages, each road in the county system would be rated in economic importance to every other road. Such a system could easily support individual construction programs and be used to resist pressure groups in vetoing haphazard area construction. These computations produced an amount of \$497,500.00.

Total Adjusted Rating	Section Number	Section Name	Section Mileage	Accumulated Mileage
241	22	Douglas-Withrow	14.3	14.3
239	1	Waterville-Alstown	6.8	21.1
239	16	Crane Orchard	2.4	23.5
225	21	Beebe Orchard South	3.9	27.4
221	11	St. Andrews-P.S.H. No. 10	7.6	35.0
214	9	Palisades-Three Devils	7.6	42.6
206	13	St. Andrews-P.S.H. No. 2	5.5	48.1
199	7	North Whitehall Road	5.2	53.3
183	15	Leahy North	6.5	59.8
181	19	Logan Road	13.7	73.5
169	14	Leahy South	13.0	86.5
160	3	Armstrong Road	6.3	92.8
139	4	Titchenal Canyon	8.2	101.0
137	10	Jameson Lake	6.7	107.7
135	8	Highland School	9.3	117.0
131	12	St. Andrews North	6.9	123.9
129	20	McNeil Canyon	8.2	132.1
128	18	Dyer South	9.1	141.2
127	5	Rock Island Grade & North	11.8	153.0
113	6	South Whitehall Road	6.2	159.2
111	2	Alstown East	10.5	169.7
105	17	Dyer-Central Ferry	9.9	179.6

Study Sec.	No.	Type of Improvement Needed	Length	Cost
	22	Ballast & LBST	14.3	\$114,400.00
	1	Ballast & LBST	6.8	54,400.00
	16	Non-Skid Seal	2.4	3,600.00
	21	Grade & Surface	3.9	30,810.00
	11	Grade, Surface & LBST	7.6	114,000.00
	9	Grade & Surface	7.6	60,040.00
	13	Grade, Surface & LBST	5.5	82,500.00
	7	Surface	5.2	20,800.00
	15	Ballast & LBST	6.5	52,000.00
	19	Grade, Surface & LBST	13.7	205,500.00
	14	Grade & Surface	13.0	102,700.00
	3	Ballast & LBST	6.3	50,400.00
	5	Surface	11.8	47,200.00
		SUBTOTAL FOR PROPOSED INCREMENT	104.6	\$938,350.00
Approved FAS Route No.		Type of Improvement Needed	Length	Cost
	491	Ballast & LBST	2.0	\$ 16,000.00
		Ballast & LBST	3.0	24,000.00
	439	Grade, Surface & LBST	6.0	90,000.00
		Non-Skid Seal	4.0	6,000.00
	584	Non-Skid Seal	5.0	7,500.00
	1022	LBST	7.0	35,000.00
		2 Steel Bridges	45 ft. each	40,000.00
		SUBTOTAL FOR APPROVED ROUTES	27.0	\$218,500.00
		GRAND TOTAL	131.6	\$1,156,850.00

Since the total amount available for federal aid construction was estimated to be \$500,000 we felt the monetary check substantiated this mileage.

Final evaluation

The findings of this study will be used to support a request for the addition of 92.8 mi. (roads rating above 139) to our federal aid system and if approved by the Bureau of Public Roads, Douglas County will be in a position to program the federal aid construction where need is most urgent for a reasonable period of time. We feel that the routes included in the increment were chosen by a logical system of elimination, leaving

only the most important routes in the county's economy. It is a system the county can construct readily and reasonably and maintain satisfactorily. It is a system that has been properly evaluated.

The Dixon method of evaluating the importance of potential federal aid routes for counties should be considered by other counties having difficulty with program latitude for it is a survey method that is logical, economical, and easily prepared. It will permit the continuance of FAS construction as contemplated under the Highway Acts. Fred Dixon is to be highly commended for his forthright solution to what has been a difficult problem.

Insulation for heat in winter concrete

Success on Bureau of Reclamation jobs has proven insulation to be effective and economical in protecting winter concreting operations. The new method utilizes insulated forms and insulated surface blankets to seal in the heat and moisture and the heat developed by hydration of the cement.

Laboratory investigations and analytical studies begun in the Bureau's Denver offices in 1951 showed the soundness of protecting fresh concrete by insulation. Field trials in the Missouri River Basin have confirmed the

laboratory studies and proved the practicality and economy of the method.

Many of the difficulties and costs of protecting winter concreting by using heated enclosures may be avoided by using proper insulation. When a dry heat is used there is danger of overheating the concrete surfaces nearest the source of heat. Fire danger is also prevalent. Enclosed steam heating provides excellent curing conditions, but is expensive and must be watched constantly to maintain desired uniform curing temperatures.

By **GEORGE B. WALLACE**

Engineer, Design Division
Bureau of Reclamation
Denver, Colorado

EXTENSIVE LABORATORY TESTS and field observations have determined the amount of warmth and moisture required to develop adequate strength and resistance to freezing and thawing. Walls, floors, barrels, boxes, beams, columns, and similar sections constructed with air-entrained concrete containing 1% calcium chloride require a minimum of 3 days of moist curing at 50 deg. F. As further precaution in severe weather, Bureau specifications, unless approved insulation is used, require an additional 3 days' moist curing above freezing. As a general practice, massive blocks in dams, piers, and similar sections require the same length of protection and moisture curing at a minimum temperature of 40 deg. F. If the above protection is provided, the engineer need not be concerned that freezing will cause latent defects in the concrete to appear after construction is completed, provided that the specified 3 days' protection is obtained.

The heat of fresh concrete is utilized during the first few hours of curing before hydration has progressed sufficiently to sustain the desired concrete temperature. In many parts of the United States the temperature of fresh concrete can be produced at 50 deg. F. or above by heating only the mix water. In the mixer the temperature of the concrete should be above 50 deg. F., and a few simple precautions should be taken to preserve its heat during mixing, transporting, and placing so that the desired temperature is maintained when protection is applied. A shelter for the mixer and a tarp over the concrete during transportation will help. However, it is most important to have a sufficient number of vibrator and access openings to place and consolidate the concrete quickly; before

it loses an objectionable amount of heat. As soon as a concrete surface is brought to grade and finished, protection should be started.

For many years, pavements and other slabs cast against the ground have been protected from freezing by cover of straw, hay, damp sand, or earth. These blankets are effective in retaining the moisture and heat of the concrete, but are laborious to apply, move, and reuse. Commercial insulation blankets and bats of rock wool, fiber glass, balsam wool, and Sisalkraft paper have been produced which offer excellent protection. These products are, to varying degrees, weather resistant and easily moved and relaid on flat work. They may also be fastened to the forms or laid as blankets on unformed concrete surfaces.

Good temperature control is thus obtained for a wide variety of concrete structures built during cold-weather months. Current estimates indicate that such insulation practices can be utilized during construc-

tion under severe winter conditions for approximately one-half the cost of installing heated enclosures.

The following describes the application of several types of insulators at four of the Bureau's construction undertakings—Trenton Dam and Courtland Canal in Nebraska, Kirwin Dam in Kansas, all of the Missouri River Basin Project, and Flatiron Afterbay Dam on the Colorado-Big Thompson Project in Colorado. The Missouri River Basin structures exemplify the effectiveness of cold-weather insulation, as extreme winter conditions usually prevail in Kansas and Nebraska.

Description of insulators

Fiber glass blankets were used by the contractor to protect concrete during construction of Kirwin Dam and appurtenant structures during the extremely cold winter of 1953-54. The blankets, obtained in rolls, were 10 ft. wide, 25 ft. long, 1 in. thick, and weighed 60 lb. per blanket. The light weight of the rolls made them partic-



ROCK WOOL INSULATION blankets were placed directly on the exterior concrete surface of Courtland Canal siphon barrels. Metal slip forms were covered for 12 hr. prior to stripping while the concrete hardened.

ularly suitable for construction; one workman could carry a roll to a concrete placement and cover the top as placing operations proceeded. The blankets consisted of a 1-in. layer of fiber glass, encased between durable, weather resistant reinforced Sisal-kraft paper.

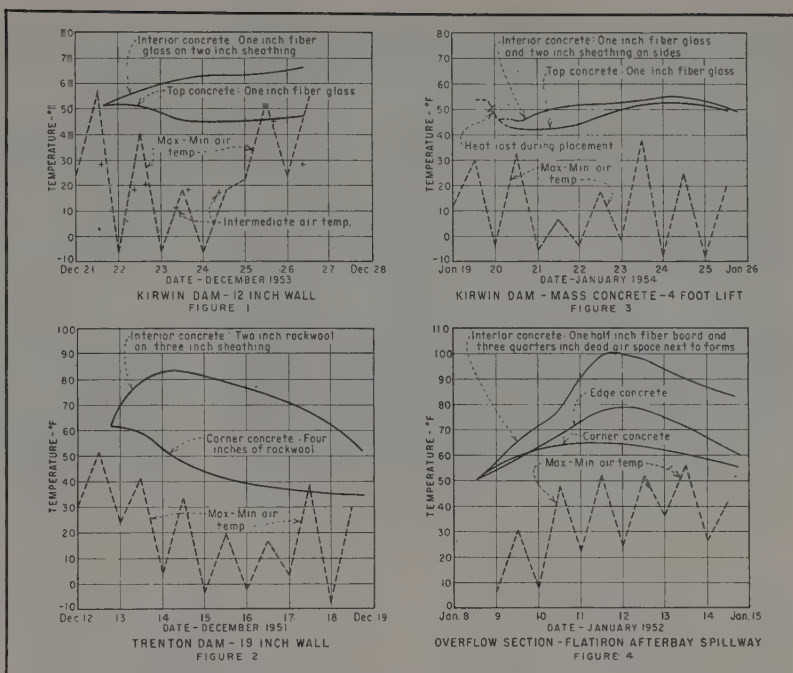
Applied to walls, the blankets were cut to stud spacing and secured between the studs outside the sheathing by 1x2-in. wood strips placed along the edges of the insulation and nailed to the forms. For unformed surfaces, the blankets were placed in direct contact with the concrete to avoid flow of air beneath the blankets which would lower their effectiveness to retain heat and moisture. The blankets were easily cut to special shapes and fitted snugly around reinforcing steel protruding through concrete surfaces.

To protect newly placed concrete in the spillway wall at Trenton Dam during the winter months of 1951-52, rock wool bats, factory made, were used. The bats, 2 in. thick and having black building paper encasements, were placed between the studs and fastened to the outside form sheathing with battens along the edges. The top of walls were protected by two blankets each composed of 2 in. of rock wool held together with burlap covering. The extra blankets were required to provide sufficient protection for corners and edges.

Use of blankets

Rock wool blankets, job made, were applied during the winter of 1952-53 to protect the concrete in siphon barrels for the Courtland Canal near Superior, Nebraska. These blankets originally consisted of a 2-in. layer of rock wool mopped with hot tar onto canvas on one side and burlap on the other. However, soon after construction the blankets consolidated to slightly less than 1 in. thickness. The resulting blankets, 12 ft. wide and 16 ft. long, protected the concrete before and after forms were stripped, as well as the sub-grade for future placements. During extremely cold weather small butane heaters inside the siphon barrel provided supplementary heat prior to stripping the forms, and were also occasionally used underneath insulation protecting subgrades. After the forms were stripped the blankets were placed in direct contact with outside concrete surfaces of the siphon barrels to prevent circulation of air underneath the blankets. The blankets were moved forward with backfilling operations or when the required protection period was completed.

For the Flatiron Afterbay Dam, fiber board was used in January 1952 to protect formed surfaces of the overflow section of the dam. Panels $\frac{1}{2}$ in. thick were fitted between form studding, separated from the sheathing by 1-in. furring strips thus forming a $\frac{3}{4}$ -in. dead air space.



THE GRAPHS show that the temperature of concrete protected with nominal thicknesses of fiber glass, rock wool, and fiber board can be maintained well above freezing even when the work is exposed to sub-zero temperatures.

Earth blankets were used to protect concrete in floors and the gate structure at Trenton Dam. As portions of a structure were completed, canvas shelters provided protection until all of the horizontal surface could be covered with sand. Silt was also used in place of the sand as the protective agent for a surface which was backfilled with impervious soil.

Performance of insulators

The effectiveness of these insulators may be evaluated by comparison of the concrete temperature observed during the protection period with the maximum and minimum daily air temperature to which the insulators were exposed. Interior concrete temperatures were measured in form tie holes or special holes located at the center of each formed surface and penetrating into the concrete 3 to 6 in. The holes were sealed with insulation material and readings were obtained after the temperature became stabilized. Surface temperature of concrete was measured by placing a thermometer in direct contact with the concrete, covering the thermometer with insulation and reading after the temperature became stabilized.

Fig. 1 and 2 show that for concrete walls both 1-in. fiber glass attached to 2-in. sheathing and 2 in. rock wool attached to 3-in. sheathing satisfactorily retained heat in the concrete even under prolonged subzero temperature. However, the 1 in. of fiber glass insulation on the unformed tops of walls did not continually maintain the top surface temperature at 50 deg. F. This deficiency could probably be

avoided by increasing the thickness of the top cover from 1 to 2 in. The figures also show that 4 in. of rock wool did not maintain the temperature of concrete in corners at 50 deg. F., although the temperature was well above freezing and the concrete was not damaged in any way. It is of interest to note that the corner temperature dropped as much as 30 deg. F. below the main body of concrete.

Corners, edges, and tops of walls have extensive surface per unit of volume and therefore require extra insulation to sustain the desired temperature. The temperature of concrete in one wall protected with 2-in. rock wool on 3-in. sheathing reached 98 deg. F. at 2-day age. Since higher temperature would be conducive to cracking the concrete upon subsequent cooling, the forms were loosened and the temperature dropped 14 deg. F. in the next 14 hours. In placing following units the initial temperature of concrete was materially reduced.

Temperatures uniform

Temperature measurements were made of concrete in the Courtland Canal siphon barrels after 72 hr. of protection by the job-made rock wool blankets. The temperature was measured near both inside and outside surfaces by inserting a thermometer in form tie holes. Outside temperatures averaged 2 to 3 deg. F. lower than inside temperatures. The measurements showed that these rock wool blankets maintained comparatively uniform concrete temperatures well above freezing in the barrels. Approximately 96% of concrete tem-



FIBER GLASS insulation blankets were cut to stud spacing and fastened to outside of sheathing by 1x2-in. wood strips nailed to the forms. The form shown here had been used 7 times previously.



SPECIAL SHAPES such as this sluice pier at Kirwin Dam can be covered with little difficulty. Reinforcing steel bars will fit snugly in holes punched through the blankets.

perature measurements made near the inside of barrels and 82% of those made near the outside of barrels were 50 deg. F. or above. Only one temperature of 40 deg. F. was observed and the next lowest was 46 deg. F. No difficulty was experienced in stripping the forms in 12 hr. after placement. However, several barrels were damaged when steel forms were reset against the concrete near ends of the barrel in preparation for adjacent placements. The damage was avoided by waiting 24 hr. before resetting the forms.

From these results it appears that insulating blankets were satisfactory in protecting the siphon barrels from freezing temperatures. The fact that siphons are usually constructed below surrounding ground level, which naturally protects them from winds, makes them especially suited for this type of protection. It is doubtful that 1-in. thick rock wool blankets would provide adequate protection for similar structures exposed to Nebraska winter winds.

At Trenton Dam, temperature measurements were taken for the concrete in floor slabs protected by a blanket of sand. These measurements indicated that the sand blanket maintained the concrete temperature above freezing but permitted a rapid drop of temperature when it was exposed to melting snow and strong winds. A mass concrete foundation was similarly protected except that 10 in. of silt was used. Silt produced better protection and was unaffected by snow or ice. A durable mat of fiber glass would probably be superior to earth blankets for ease of handling, and could be placed much sooner without marring fresh concrete surfaces.

As shown in Fig. 3, the temperature of mass concrete at Kirwin Dam protected by 1-in. fiber glass was strikingly uniform despite wide variations in air temperature. Here the temperature of top surface concrete

dropped as low as 42 deg. F. during exposure to subzero air temperatures. Although 40 deg. F. is considered by many to be an adequate curing temperature for mass concrete, Bureau specifications usually specify a minimum curing temperature of 50 deg. F; this could doubtless be reduced safely when uniformity of protection is assured. The lower range of curing temperatures shown in Figure 3 is an asset in that the concrete will have a lesser tendency to crack when subjected to low temperature some time after protection is removed.

As indicated in Fig. 4, 1/2-in. fiber board with a 3/4-in. dead air space was more than adequate protection for formed surfaces of mass concrete exposed to comparatively mild air temperatures. The high concrete temperatures shown in the figure may be avoided by loosening the forms. The figure indicates also that the temperature of concrete near corners and edges was considerably less than that of interior face concrete.

Moist curing insulated concrete

Concrete surfaces to be cured by painting with a sealing compound offered no particular problem with the use of insulation. When insulated forms were stripped immediately at the end of the required protection

period the concrete surfaces appeared damp, indicating that adequate moisture for curing had been maintained during the protection period. After the forms were stripped the concrete surfaces were immediately painted with white pigmented curing compound. Unformed surfaces were sprayed with curing compound prior to covering, if weather conditions permitted. During severe freezing weather the concrete was covered immediately following placement and curing compound was applied later. The Sisalkraft paper encasement of fiber glass blankets in contact with the concrete kept evaporation of surface moisture to a minimum.

Spraying of concrete

Continuous application of water to concrete surfaces protected by insulation blankets proved difficult. On the first large mass placement for the Kirwin Dam spillway, water was pumped underneath the fiber glass blankets. This procedure soon damaged the blankets and caused ice and water to build up in adjacent areas. The most satisfactory method was to roll the insulation back in panels and spray the concrete with water and

(Continued on page 74)

TABLE I
COLD WEATHER CLIMATIC DATA FOR SELECTED CITIES*

Location	El. (ft.)	Temperature (deg. F.)		Mean no. of days per		Mean yearly snowfall (in.)
		Daily maximum	Daily minimum	year min. temp. is 32 deg. F. and below	and below	
Yakima, Washington	1,061	35.7	19.7	128	3	21.7
Pocatello, Idaho	4,444	30.9	13.0	162	10	38.4
Red Bluff, California	341	52.4	34.6	26	0	3.1
Flagstaff, Arizona	6,895	...	...	198	9	...
Reno, Nevada	4,397	43.0	20.3	157	3	28.9
Salt Lake City, Utah	4,260	36.5	21.8	106	1	55.3
Roswell, New Mexico	3,612	54.7	24.8	98	1	10.3
Helena, Montana	3,893	28.4	11.4	157	23	54.6
Lander, Wyoming	5,563	31.6	5.6	191	28	72.0
Denver, Colorado	5,292	42.6	18.5	139	8	56.1

* Data for this table based on records of the U.S. Weather Bureau through 1952.

Sun Valley spotlight on federal plan for \$50 billion on nation's highways

Attendance over 300 as engineers plan how to handle \$10 billion added Western highway construction—Hewes Award recognizes work on highway maintenance radio network—New conference sessions tackle contractor-engineer relations.

WITH THE LARGEST ATTENDANCE in more than a decade and stimulated by President Eisenhower's proposal for an important expansion in the federal highway program, the 33rd annual conference of the Western Association of State Highway Officials held at Sun Valley September 16-18 was a meeting of unusual significance to highway development in the West. Under the general direction of E. V. Miller, State Highway Engineer of Idaho and President of WASHO, aided by the members of his organization, those attending were offered a strong program of general meetings and important technical sessions combined with social events and entertainment.

At the close of the conference the following officers were elected for the coming year: President, C. O. Erwin, Chief Engineer, New Mexico Highway Dept.; Vice President, J. R. Bromley, Superintendent, Wyoming Highway Dept.; Secretary, H. B. Glaisyer, Secretary, Oregon Highway Commission. Other members of the executive committee will be E. V. Miller of Idaho, W. A. Bugge of Washington, and Scott Hart of Montana. The 1955 conference will probably be held in Wyoming.

Financing more highways

Among the resolutions passed at the concluding session of the conference, probably the most important related to the proposal of President Eisenhower for the expenditure of \$50,000,000,000 on Interstate and other Federal-Aid Highways. This resolution presents the following definite suggestion for the financing of this plan:

"The Western Association of State Highway Officials recommends to the Governor's committee that a plan be formulated wherein the Federal Government will use the present federal 2c gasoline tax to service the issuance of government securities to pay for the building of the interstate system totaling \$20,000,000,000 in a ten year pe-

riod, as a 100% federal obligation, because of the importance of the interstate system to the national defense and to pay for 50% of the cost of the other federal aid systems totaling \$30,000,000,000 in a ten year period, provided the states match the federal funds on all Federal Aid systems except the interstate system; the apportionment to be made in accord with the existing law, or modification made by the Congress, state matching requirements to be under the present sliding scale provision with reference to the public land states; and the roads to be constructed and maintained by, and subject to the police power of the several states . . ."

Another resolution recommended that no federal aid highway funds be made available for toll road facilities. Several resolutions, as in former years, urged the federal government to advance the road building program

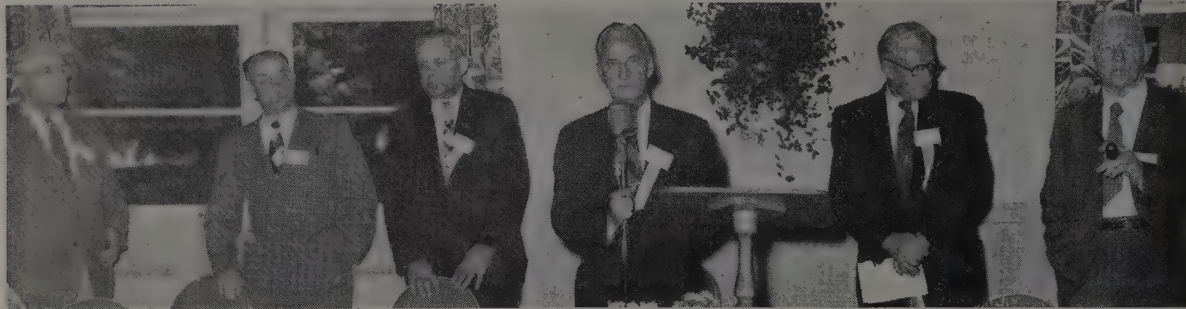
in the national forests, not only making up the present deficiency in appropriations which have been authorized but also to carry out a forest road program which would parallel the new proposed federal aid plan.

At the concluding luncheon session the annual presentation of the "Dr. L. I. Hewes Award" was made. This annual award of \$500 is financed by Western Construction and made in the name of WASHO to the engineer of the West who made the most significant contribution to highway development during the preceding year. Nominations for the award are made by the various state highway departments and final selection is by the executive committee of WASHO. The award this year was presented to Arnold H. Carver, Departmental Communications Engineer of the California Division of Highways for "Outstanding Work in Developing a State Wide Radio Communications System for Highway Maintenance."

For the first time the conference program included a separate session on contractor-engineer relations. This group included members of state highway engineering staffs most directly concerned with construction



ARNOLD CARVER, left, is the 1954 Hewes Award winner. Here he receives the award certificate and a handshake from James I. Ballard, president and editorial director of Western Construction.



problems and about an equal number of contractors and chapter officials of the AGC. Active discussion covered such subjects as the problems of pre-qualification of contractors, the handling of damages resulting from overruns in contract time, the various advantages of setting contract completion by either a fixed terminal date or by the number of working days, and the perennial question of whether specifications should be stated in terms of results to be accomplished or the methods contractors should use.

Another feature of the conference was the usual early morning breakfast session sponsored by the AGC where AGC chapter officials, under the general direction of A. H. Carter, head of the Highway Division, met with highway administrators in the discussion of common problems.

Of particular significance was a paper presented by R. H. Baldock, State Highway Engineer of Oregon, on "Hauling of Overloads of Natural Resource Roads." In essence this veteran authority on the subject of highway loading and taxation found no reason to compromise on a matter of loads which exceed the legal limits as established by state highway officials and state laws. At the conclusion of his remarks vigorous discussion was offered by three mem-

NEW OFFICERS of the WASHO are shown above immediately after their election during the final luncheon. Left to right are H. B. Glaisyer, Secretary - Treasurer, Secretary to Oregon Highway Commission; Vice President J. Ray Bromley, Chief Superintendent and Engineer of Highways, Wyoming; Executive Board Member W. A. Bugge, Director of Highways, Washington; President C. O. "Pete" Erwin, Chief Highway Engineer, New Mexico; Executive Board Member and Retiring President Earle V. Miller, Idaho, State Highway Engineer; Executive Board Member Scott P. Hart, State Highway Engineer, Montana.

bers of the California Legislature who were particularly interested in having exceptions made for the haulers of logs operating in areas where lumbering is the essential industry. To this plea, Mr. Baldock replied that: (1) Overloading would eventually result in the breaking down of the highways which are essential to the success of the industry and (2) any exceptions made for one industry could not be denied another, which could only lead to the widespread extension of overloading with obvious results. His position on this matter remained unchanged during the extended discussion.

In his opening address to the conference, President Miller urged the establishment of a highway research laboratory at the national level with

corresponding long range field testing. He pointed to the WASHO test road program as an illustration of joint research effort among several state highway departments but indicated that the results from these occasional and unrelated tests were not adequate.

Hal Hale, Executive Secretary of the American Association of State Highway Officials, spoke at one of the general sessions reviewing for WASHO the work of the last Congress in connection with federal and state highway programs. He indicated the assurance that the proposal of President Eisenhower for a \$50,000,000,000 highway development program to be planned for the coming 10 years is more than a casual suggestion and is now being actively considered as to financing problems by the Administration. He predicted that at the convening of the next Congress, bills would be introduced, including one probably sponsored by the Administration, which would provide for implementing such a highway program, including many variations of the general proposal. From these numerous legislative bills a decision would ultimately be reached which would provide for the biggest decade of highway construction and improvement in the history of the country.

Should specs point to methods or results?

By **SAM C. GUESS**

Executive Secretary
Spokane Chapter, AGC

THIS SUBJECT IS ONE on which I have held a very definite opinion for a number of years. I propose to support the view that to write specifications requiring the contractor to meet the end results will cost the owner less in the long run.

Progressive, successful contractors spend their lifetime organizing and equipping to do construction as economically as possible, using methods

of their own devising. Today we find that contractors have largely specialized, or that they use specialty subcontractors in order to attain the highest efficiency and to perfect methods which will make them competitive. Specifications in which methods are prescribed prevent their using this knowledge.

For the contractor who hasn't this experience and knowledge there are a number of trade journals which disseminate recent improvements in the methods of practically all construction. The forward looking con-

tractor can and does visit jobs in progress to learn new methods. He also hires experienced personnel with construction "know how" to supplement his own.

From personal experience and from the testimony of others within the industry, it is known that the technical writers who are charged with the preparation of specifications lack field experience. Since the specification writer is by nature, temperament, and environment an "in-the-office-man," it is difficult for him to specify the construction method which uses

the most economical approach to the problem. Neither can he take the gamble of specifying a new method until it is thoroughly proven. This is a gamble that the contractor takes. To specify methods penalizes the contractor who has worked out economical methods, and thus the owner spends more in the long run for his construction.

Recently in discussing this matter with one of the contractors in my area, he said, "It is sometimes mighty nice to be able to follow a specification to the letter, step by step, and to know how they expect you to do a job. But it is a bitter experience to find out somewhere along the line one of your steps was inadvertently wrong and that the whole job has to be torn out. When we get a job with this type of specification we try to see that the inspector gives approval to the work when one step is completed and before the next is begun. Very often, however, we find that the inspector will refuse to approve on the step basis and it is this added gamble that we must include in our cost estimate."

The contractor is a true individualist. It is part of his nature that makes him think there is no job he cannot build or learn to build. It is also this characteristic which causes the owner rightfully to erect barriers

in the bidding procedure to protect himself. The owner who takes the steps to pre-qualify all persons before giving them a chance to bid is wise.

Qualifications assure methods

What does pre-qualification do for the owner? I would definitely say that it saves him money, gives him a better job at less cost and results in a better climate in which future construction can be done. Too often bids submitted by incompetent contractors are abnormally low as the result of a lack of knowledge of the type of construction and a lack of judgment. Costly delays, disputes, claims, and disagreeable situations lie in wait for the owner who takes the bid of the incompetent. Abnormally low bids result in a disruption to the rest of the industry within the area and create a question in the mind of the contractor bidding future work with that owner.

Since accepting the invitation to appear before you, I have had an experience which I would like to recount. For a sizable bridge job in our area the successful contractor was some \$100,000 lower than the next bidder, and the difference was principally on one item, pile driving. The specifications called for the use of a composite pile made up of a wooden pile driven to below lake bottom capped by a steel pile which was to be

filled with concrete after driven. The crux of the cost was the method of connection between the two component parts of the pile. The drawings showed three methods possible of use and the specifications stated that the contractor might propose a further alternate.

In an interview with the contractor's representative on the job shortly after work commenced, I learned that the method of connection being used was one the contractor had devised some three years ago, and that he had been waiting for the right bridge to come along. Did the owner profit by specifying the end results? In this instance, and in many, many others, the answer is yes.

One of my favorite specifications states that the road shall be rolled lightly with a 10-ton roller and that a fast shot of water shall be applied to lay the dust. When you encounter such terms in specifications they give you a laugh; but in other instances where the specifications spell out construction methods which hamper the contractor in his operations it is no laughing matter.

When the owner lets a contract he is, in effect, buying the contractor's ingenuity. To specify methods is to limit that ingenuity. Therefore, for the owner's sake, specify the end results.

Uniform measurement and payment specs

By HENRY C. HELLAND

Planning Survey Engineer,
Montana Highway Commission

EACH STATE HAS its own special problems which must be treated on an individual basis, but there is a great area in which all states could profit by adopting uniform specifications. No single facet of the relations between highway departments and contractors is cause for more argument and dissention than that of measurements of and payment for contract items.

An average specification is a volume of 300 to 700 pages, usually containing about 500 pages of fine print. Of the 60 to 100 construction items covered, there is a wide divergence of opinion not only in how they should be measured and paid for but also whether the item is worthy of such consideration. Most specifications give several methods of payment for certain items. As an example, Clearing and Grubbing may be paid for as acres of clearing, acres of grubbing, acres of clearing and grubbing or as a lump sum item for the job. In most

cases the provision for a lump sum bid will result in a higher price for the item, and this is especially true if it is a quick money item.

The purpose of specifications is to outline clearly the finished product which the contractor must produce and the quality of the materials which he must use. The contract lists the items on which he establishes his price for doing the job. There may be dozens of ways to measure items for payment but there must be one which would be advantageous or at least satisfactory for adoption by most states.

In selecting seven specifications at random, it is interesting to note the treatment of the item of Overhaul.

Specification 1 called for 600 ft. free haul and payment by cu. yd.-station to 1,200 ft. from origin and by 1,000-cu. yd. stations beyond that limit.

Specification 2 listed a free haul of 500 ft., payment by cu. yd.-station to 1,000 ft. and cu. yd.-mile for transporting material in excess of 1,000 ft.

Specification 3 had 500 ft. free haul, 1,600-ft. station-yd. haul limit and

yd.-mile overhaul beyond that distance.

Specification 4 provided that when the proposal shows an item for Overhaul the free haul distance shall be 3,000 ft. and when there was no overhaul item, all hauling shall be considered free haul.

Specification 5 called for 600 ft. free haul, short overhaul to 1,200 ft. by the yd.-station, and beyond 1,200 ft. long overhaul by the hundred-yd.-station. Also provided is truck haul by the yd.-mile.

Specification 6 provided for 500 ft. free haul and payment for further haul by the station-yd. or mi.-yd.

Specification 7 provided an entirely different concept of measurement and payment, and lest I confuse you by my interpretation, the specification is quoted herewith. (See next page.)

From these examples, you can see that not only is there quite a difference of opinion but also, it's a little confusing. And, when specifications are confusing, you don't save money. Whenever there is a doubt in the mind of the contractor, he makes allowance to cover the possible in-

Is this your specification for overhaul?

METHOD OF MEASUREMENT

The work of hauling a cubic yard of excavated material from the balance division of its origin into any other balance division, whether or not the balance division of deposit is adjacent to or beyond the balance division of its point of origin, will be computed as a cubic yard of "Overhaul."

If it is required that excavated material be hauled completely through a balance division or divisions intervening between its origin and place of use, then a unit of "Added Haul" will be computed for each cubic yard of excavated material for each intervening balance division through which such excavated material is hauled between its origin and place of use.

On road contracts, the following will apply to the determination of balance points for overhaul and added haul:

1. Where a grading exception, or a separate contract structure exception has a length of 1,000 ft. or less, a balance point shall be considered as located at the center of the grading exception or at the center of the separate contract structure, as the case may be, instead of a balance

point located at each end of the grading exception or structure exception as shown on the plans;

2. Where a grading exception, or a separate contract structure exception has a length of more than 1,000 ft., but does not exceed a length of 2,000 ft., the balance points shall be considered as located at each end of the exception, irrespective of the kind of exception;

3. Where a grading exception, or a separate contract structure exception has a length more than 2,000 ft., the balance points shall be considered as located at intervals of 2,000 ft., such intervals to be measured from the beginning of the grading exception or separate contract structure exception, as the case may be. Any remaining fraction of 2,000-ft. intervals which exceed 500 ft. will be considered as a balance division in determining overhaul, and any remaining fraction of 2,000-ft. intervals which is 500 ft. or less will not be considered as a balance division in determining overhaul;

4. Where the plans show an exception within a balance division, the exception shall be

considered as a part of the balance division, irrespective of the kind of exception;

5. Regardless of the foregoing statements, overhaul payment will not be allowed when the overhaul involved is that required for construction of approach ramps at the beginning or end of any exception, such individual ramp not exceeding a length of 500 ft.

BASIS OF PAYMENT

Overhaul, and added haul if any, will be paid for at the contract unit price per cubic yard for "Overhaul," and per unit of "Added Haul," which payment shall be full compensation for hauling and placing the material, and for all labor, equipment, tools, and incidentals necessary to complete the work specified.

If the proposal does not contain an item of "Overhaul" and if such is required to complete the work, it will be paid for at a rate of 7 cents per unit of "Added Haul."

If the proposal does not contain an item of "Added Haul," and if such is required to complete the work, it will be paid for at a rate of 5 cents per unit of "Added Haul."

creased cost. At least, those who stay in business do.

A study of construction specifications with a view to securing greater uniformity will either lead to improvement of the specifications or, at least, provide an opportunity to reaffirm the conviction that your method of handling the subject is right.

Should we include the asphalt in the price per ton for plant mix or measure it separately for greater flexibility?

Should compaction of embankment be included in the excavation price or should each needed operation, such

as watering and rolling, be included separately? While the latter method has the advantage of protecting the contractor and stabilizing prices, it also freezes progress in the development of better methods of compaction.

The tendency to establish separate bid items for various phases of a contract operational unit seems to be increasing. This procedure makes the life of the project engineer an easier one and eliminates much of the grounds for argument. It also eliminates the incentive on the part of the contractor to develop new and better methods of operation. Measurement

of and payment for a completed item requires closer field inspection, and diligence must also be exercised to see that the contractor is not put to needless effort and expense where specified requirements are practically unattainable.

The desirability of more uniform construction specifications is not open to question. The area of measurement and payment appears a most fertile one on which to begin the task. It is recommended that the Western Association of State Highway Officials initiate action on a study of construction specifications in order to develop the desired uniformity.

Overweight trucks on natural resource roads

By R. H. BALDOCK

Oregon State Highway Engineer

THERE IS A TENDENCY all over the United States to increase the sizes and weights of motor vehicles engaged in hauling commodities over so-called natural resource roads. In the timbered areas this ap-

plies to the movement of log trucks, and in the mining areas to the movement of ore or coal. Throughout the West there have been attempts by both of these interests to obtain special privileges.

About the time some of the logging concerns started to build private roads, in order to haul greater pay-

loads, the U. S. Forest Service and the U. S. Bureau of Land Management permitted the movement of oversize and overweight vehicles over roads controlled by these agencies and which were tributary to these private logging roads. The question as to whether these roads through federal lands are public

roads under the jurisdiction of state laws has never been settled, but, insofar as Oregon is concerned, laws were enacted to permit such practice. Obviously, advocates for special oversize and overweight privileges are gaining ground.

This gain is further evidenced by the formulation of agreements between the logging companies and some of the counties in Oregon to utilize, first, short sections of county roads and, then, much longer sections under a contract plan wherein the loggers agree to build the roads stronger and to maintain them, provided they are permitted to haul loads in excess of the statute limitations. There is no question that the counties do not have the power to legislate. Finally the legislature legalized their action under certain conditions. For the most part, these conditions have been disregarded and the practice is still being carried on in an unlawful manner in Oregon.

Highway loads higher

A study of the contracts executed by those counties operating within the new law revealed that the maximum weights varied from 120,000 to 200,000 lb. and the tandem-axle weights from 50,000 to 95,000 lb. These weights appear to be substantially heavier than those carried by log trucks operating over private roads in Oregon, where maximum loads vary from 90,000 to 180,000 lb. and tandem-axle loads from 48,000 to 90,000 lb.

The states are obviously sanctioning a dangerous economic practice when they allow a specialized group to use a public highway with loads which exceed the limitations established for the general public. Furthermore, the general trucker will soon demand the same consideration—and why not? It must be remembered that the finished product is even more important than the raw material. If logs are allowed to be transported as a privileged load, perhaps lumber is entitled to the same consideration.

In this connection, it might be mentioned that the actual saving to the industry, by permitting heavier truck loads of logs, is probably quite small. I question whether proper consideration has been given to the economies of the situation. Perhaps the apparent savings in truck operation are not founded upon fact.

Recently there appeared a report entitled "Comparative Results of Trucking Logs by Various Size Vehicles," compiled for the Washington State Council for Highway Research by the Institute of Forest Products. The report indicates that the most economical size vehicle varies with

the length of haul—the longer the haul the greater the size for the most economical operation. The report shows that the 84,000-lb. gross weight class is the most economical up to a 16-mi. haul, that the 100,000-lb. gross weight class is the most economical between a 17- and 28-mi. haul, and that the 115,000-lb. gross weight class is best for hauls over 28 mi. The report shows the cost per Mfbm. per mile for the different weight classes on different haul distances.

For hauls in excess of 15 mi., it is interesting to find that while apparently there is a saving of from six to eight cents per thousand per mile in hauling, when a 100,000-lb. gross load is compared to a 68,000-lb. gross load on comparable type surfaces, the apparent savings are appreciably reduced despite the increase in loads when the large loads are hauled over a gravel surface and the smaller loads are hauled over a paved surface.

Expressed in another way, the savings that they are apparently making are partially consumed by the additional cost of operating over graveled roads and, conversely, if the hauling roads were paved, the cost of building and maintaining such pavements would probably consume a large part of the savings that are made by hauling the heavier loads. State highways are, in general, paved and the cost of building pavements strong enough to stand such heavy loads is material. When the pavement ruts under the load, it cannot be bladed smooth again as is done with a gravel surface.

No justification

Engineers can build heavier pavements and bridges to sustain greater sizes and weights with reasonable maintenance costs, but the costs requisite to sustain gross weights up to 200,000 lb. and tandem-axle weights of 95,000 lb. are so great that in all probability they may never be justified on state highway systems. It seems doubtful that the recipients of the benefits for such increases could afford to pay their share of the increased cost occasioned by such special usage and operate at costs competitive with other means of transportation.

Any discussion about increasing the dimensions and weights of trucks, based upon the building of new highways with commensurate geometric and structural design, is rather pointless because of the limitations of time and money. In fact, the repetition of legal axle weights, due to the phenomenal increase in heavy trucks, is causing fatigue in pavements and bridges built on present design standards which is rather alarming.

There appears little question but that the granting of special permits

and the changing of the statutes for selected groups, such as those in the mining and logging industries, which permit the movement of oversize and overweight vehicles over certain types of roads, will result in pressure from other groups to gain the same privileges on more and more highways.

Recommendations

On October 1, 1953, a committee was appointed by Charles M. Ziegler, President of AASHO, to make an investigation on the current practice of operating overweight logging trucks on private roads, special agreement county roads, and on national forest roads and land-use roads controlled by governmental agencies. In conclusion, this Committee recommended:

(1) That governmental agencies do not expend public funds to construct highways and thereafter permit the movement of vehicles over such highways within a state in excess of statute limitations with respect to gross weights and dimensions.

(2) That special privileges should not be granted, either by statute or permit, to selected industries, thus permitting the movement of vehicles of gross weights and dimensions in excess of those allowed to other industries.

(3) That no increases in vehicle size and weights be made over present standards of the AASHO until the loading tests now under way or proposed are completed and the economic studies in connection therewith are made and published.

Plastic pipe to be used in steam plant

FIBRE-GLASS reinforced plastic pipe will be used by the City of Los Angeles for condensate make-up lines in its \$71,000,000 Valley Steam Generating Plant, now under construction. City engineers selected the Reflin pipe because its smooth interior minimizes the mineral and biological deposits usually found in steel-lined pipelines.

Plastic pipe is lighter than steel pipe, allowing cheaper handling and installation. Using standard fittings and simple tools, two men can lay Reflin pipe under average conditions. According to Reflin officials, the pipe is resistant to rust, chemical attack, electrolytic action, and other factors causing deterioration of steel pipe. Its high impact strength, light weight, and rigidity enable ordinarily difficult installations to be made easily. It is adaptable to all standard auxiliary equipment, including valves, pumps, and tanks.



Difficult underpinning problem gave large bid spread, but Low bidder shows how with Gradall

How to excavate 800 seven-foot deep holes located practically beneath two-story barracks was solved with this versatile piece of equipment. Old timber piling had rotted away and were replaced with concrete piles.

WHEN THE BIDS RANGE from \$108,000 to \$384,900 (12 bids), you know that an unusual job is involved. This was certainly the case at Mare Island Naval Shipyard in California where new underpinning was required on nine buildings supported on pile foundations.

These buildings, one- and two-story wood frame structures, are supported on a total of 1,283 piles. The average ground level is but 5 or 6 ft. above mean sea level. The piles concerned were driven in 1942. They project about 1 to 3 ft. above the ground to support 12x12 timber girders, that in turn support floor joists. During the years, dry rot has taken its toll on that portion of the piling above the water table.

Many solutions offered

The problem submitted to bidders was to excavate around the piles, cut them off below the water table, and to form and pour a 14 in. diameter concrete pile on top of them. A composite pile is the final result. An exception is made in the case of concrete foundation walls and concrete stairs that rest on piling. Here the exterior rotted wood of the piling is removed to leave a sound wood core.

Each of them is wrapped with wire reinforcement and gunited.

A breakdown of the total of 1,283 piles shows that about 220 of them will be gunited, and the remainder cut off and replaced with concrete. Also, one-third of the total are inner piling—that is, under the building and difficult to get at. The other two-thirds are located near the outside of the buildings and are relatively easier to get at. Pile centering averages about 16 ft. both ways.

Methods intended to be used by different contractors varied greatly. From jacking the building off the foundations and temporarily moving them aside (some measure 118 x 168 ft.) to major excavation for access to the piling were some of the schemes that might have been used. But here is how the Baldwin Contracting Co., Inc., is doing the job in a very efficient manner.

Gradall usage

Considering any one building, excavation averaging about 7 ft. deep is made at every other exterior pile with a Gradall. This versatile crane is equipped with a 24-in. wide bucket that enables it literally to reach under the buildings several feet. Unlike a backhoe, shovel, or any other piece

of equipment, the Gradall operates with the same precision that you would use with a spoon or fork in eating. The telescopic boom can be extended, retracted, and also rotated. It is a fact that the bucket's movement can be controlled within a quarter-inch tolerance. Its use here held hand excavation to a minimum. Often operating in small restricted areas, no damage has yet been done to any of the buildings.

Each girder is shored up at its midpoint where it spans between piles. This is done for an entire building before any excavation is started. Mentioned earlier, added advantages of working on alternate piles is twofold: (a) the danger of lateral swaying of the building is eliminated with one-half of the original piles still in place; (b) room is available for the excavated material next to the piles not being worked on.

With the small clearance to work in beneath the buildings, efficient hand labor methods are being used to excavate on the interior piles. It has been found that the upper 4 ft. of fill material and the underlying blue mud will stand with vertical cuts. Laborers equipped with Thor air-operated hand spades dig a hole with a 2-ft. clearance around the piles. Here, too, every other pile is worked on and excavated material thrown toward the remaining piles. Twelve laborers using six hand spades have been able to make an excellent rate of progress.

When excavation has been carried down below the water-table at a pile,



FOLLOWING EXCAVATION AND CUTOFF of timber piles to 7-ft. depth, two circular metal forms are placed in position for the new concrete

pile. Ready-mix concrete is delivered to pressure tank and then blown at 90 psi. through 2-in. diameter air hose to the forms.

two saw cuts are made with an 18-in. Homelite chain saw. One cut, the higher one, completely cuts the pile in two. The lower cut, 18 in. below the upper, is made only 3 to 4 in. deep around the perimeter. Using axes, the wood between the upper and lower cuts is removed, leaving a 7-in. diameter tenon 18 in. long. This acts as a dowel in the concrete to be poured around it.

Blowing concrete

Ready for the concreting operation, a cage of reinforcing steel is placed over the tenon consisting of six verticle $\frac{1}{2}$ -in. diameter bars spirally wrapped with $\frac{3}{4}$ -in. diameter wire. Two semi-circular sheet metal forms 8 ft. long are then bolted together around the base of the pile and they extend up to the girders. The forms are for a 14-in. diameter concrete pile. With the upper end against a 12-in. wide girder, there is a 2-in. crack through which to pour the concrete. The concrete mix is designed to attain a strength of 2,500 psi. in 28 days. Batch proportions for 1 cu. yd., for an 8-in. slump are 9 sacks of cement, 2,450 lb. of sand, 7 oz. of Darex air entraining agent, and about 45 gal. of water. Delivery of concrete to the job is by transit-mix trucks.

From the truck to the forms, a method is being used to pour concrete that Pete Andersen, superintendent, first saw used 18 years ago. A 7-cu. ft. sand blasting tank has

been mounted on concrete buggy wheels. A 6-in. diameter hole in the top, plugged by a rubber-covered steel ball, is opened to allow a charge of concrete to enter directly from the transit-mix truck. A valve is opened and air pressure at 90 psi. is supplied to the tank from a Jaeger compressor. The concrete charge is blown from the tank through 75 ft. of 2-in. air hose, through a flattened out metal nozzle, and into the pile form. Each pile requires about 7 cu. ft. of concrete.

Clogging of the delivery line is routinely prevented by two precautions. A $\frac{1}{2}$ -in. mesh screen over the tank charge opening prevents entry of oversized material—eliminating one possible source of trouble. And then the delivery hose is lubricated first with water before any concrete is blown. The delivery end of the hose is diverted from the forms until the concrete first appears.

The metal forms are stripped from the fresh concrete after 24 hours and Hunt Process applied for further curing. Exterior pile excavation holes are then backfilled, using a $\frac{3}{4}$ -

cu. yd. Hough Payloader. Interior excavation holes depend on good, old hand labor for backfilling. At this point, with one-half the total piles concreted, work is begun on the remaining one-half.

This project was begun on July 12 and will be finished by November 12. Most of the composite concrete piles are now completed. The 220 piles requiring guniting are to be done last. The latter require an entirely different process from that described earlier for the composite pile. The only similarity is from the excavation standpoint.

What might have been a muddy situation turned out otherwise when water seepage into excavated holes remained a small quantity. Three $1\frac{1}{2}$ -in. Homelite pumps are used each morning to dewater all the holes. This brief pumping is all that is required until the next morning.

Personnel

Key personnel on this smooth running project for Baldwin Contracting Co., Inc., are Donald K. Jorgenson, manager of general construction for Baldwin; Peter J. Andersen, general superintendent; Hugh Erwin, general foreman; Elton Henley, labor foreman.

For the U. S. Navy, Capt. G. K. Brodie is 12th Naval District officer in charge of construction; Cdr. C. E. Spellman is resident officer in charge of construction at Mare Island; E. E. Van Emon is inspector on the job.

EQUIPMENT LIST

- 1—Warner & Swasey Gradall
- 1—Hough Payloader, $\frac{3}{4}$ cu. yd.
- 1—Schramm 315 air compressor
- 1—Jaeger 105 air compressor
- 4—Thor Model 16 & 19 hand spades
- 2—Homelite chain saws
- 3—Homelite $1\frac{1}{2}$ -in. pumps

Special problems in construction of steam plant for Alaska air base

Thawing sheds for coal cars, insulation of steam lines and the structure, and the varied steam usages all combine to make this plant and its construction unusual.

By **GEORGE AVERY**

Construction Engineer
U. S. Army, Corps of Engineers
Alaska District

KILOWATTS AND STEAM B.T.U.'s are playing big vital roles in providing fighter cover over the top of the continent, a strong bombing arm to strike over the Pole if necessary, and ground troops to protect this northern anchor of our Pacific perimeter.

The World War II major forts and air bases had one small central heating and power plant, supplemented by a few scattered portable diesel plants for additional kilowatts and hand-fired, coal-burning hot air heating systems at each barracks. Today, these emergency utility units have been replaced by large modern heating and power plants. At each major base, at least one new plant has been built to meet the greatly increased heating and power load, and to modernize the utility systems. Additions to three of these new suppliers are already under way.

At Elmendorf Air Force Base, near Anchorage, Alaska, a new heating and power plant is being constructed.

In April 1953, Patti-MacDonald and Associates were awarded the contract by the Corps of Engineers at a low bid was \$11,514,007.

Unusual features

Alaskan design for heating and power plants in the Anchorage area calls for several features that are not usually incorporated in Stateside plants. Coal is plentiful all along the Alaska Railroad, north of Anchorage. The coal is purchased by the military from privately owned mines. In the winter, the loaded coal cars are solid blocks of black ice. A thawing shed, using heating coils under the tracks and steam lances, is necessary to thaw the cold mass of fuel. Indoor storage is then needed to stockpile the dried-out coal. Coal delivery to the coal building, direct from the mines, high up in the mountain valleys, is achieved by both railroad cars and huge 28-ton trucks. Naturally, the plants are designed with a steam output far greater than what is needed for power generation, as steam heat is really more important to the bases than electricity. If there is a power failure, you can see by candlelight as the sourdoughs did

during the old gold rush days. But life can become unbearable if the heat is turned off at 40 deg. below zero.

Steam usages

This project includes six large-for-Alaska water-wall boilers to run the plant, furnish steam heat to various new base installations through underground conduit, and generate electrical power. Three turbine-generator units with the condensing plants will be installed to provide the vital power. Steam will be supplied to the turbines at a pressure of 400 p.s.i.g.—750 FTT at the stop valve inlet. When operating straight condensing at 100 p.s.i.g. extraction pressure, the steam consumption of the units will not exceed 10.1 lb. per kw hr at the rated load of 7,500 kw.

Thus, when placed in operation, the plant will supply 900,000 lb. of steam for plant internal use, electrical generation, and base heating and 22,500 kw. of power. The 400-lb. installation will have pressure-reducing stations to feed 100 lb. of steam for ordinary consumption and 200 lb. to the laundry.

Quantities include: building excavation—48,000 cu. yd.; reinforcing steel—807 tons; concrete—11,530 cu. yd.; structural steel—1,807 tons; boiler structural steel—280 tons; boiler tubing—402 tons; steel roof decking—56,360 sq. ft.; insulated metal siding—88,160 sq. ft.; electrical conduit and duct—62,000 lin. ft.; electrical wire—290,000 lin. ft.; duct insulation—23,500 sq. ft.; railroads—5,325 lin. ft.

Of course, this is a small plant by comparison with the super PG&E giant at Pittsburg, California, now under construction. But in Alaska, it stands out like a colossus above the pigmy plants of the past.

Connecting utilities

A dam and weir will back up nearby Ship Creek to supply condenser cooling water. It will flow by gravity from a 250x750-ft. cooling pond to a pumphouse. From there it will be pumped up to the plant on the bluff. The job also includes railroad tracks to bring in the coal, outside steam distribution lines and power tie lines to connect to feed existing base systems. Z-crete with its Vermiculite insulation is being used on the underground steam conduits.

The boilers are manufactured by Erie City; the turbine-generators, switchgear, load centers by Westinghouse; the structural steel by Isaacson Iron Works; coal-handling equipment by Fairfield; roof decking and siding by Robertson; ash



WINTER TEMPERATURES of 30 deg. below zero make insulated metal siding a necessity. Federal Roofing is placing over 88,000 sq. ft. Welder to the right is tack-welding siding to girt.



Z-CRETE with its vermiculite insulation is being pumped into forms to encase underground steam lines. In background, ready-mix concrete is being poured on a concrete pad for expansion loop.



CARPENTERS INSTALL template prior to installation of reinforcing steel for concrete bin in power plant's coal storage building. In background, backfill is sluiced for consolidation.

handling equipment by United Conveyor; control instruments by Bailey Meter; deaerators and degasifier by Cochrane; soot blowers by Bayer; valves by Crane; air-preheaters by Buffalo Forge; pumps by Fairbanks-Morse, Peerless, and Warren; vacuum cleaning systems and stokers by Hoffman; coal scales by Richardson; cinder collector by Western Blower.

Seasonal construction

Starting in the spring of 1953, the main plant substructure was poured up to ground level; the cooling pond was excavated; the concrete pump-house was built; the 36-in. cooling water lines from the pumphouse to the cooling pond were installed; and some outside water, sewer, and steam distribution lines were completed. When the temperature started tumbling down to zero late in November, the job shut down for the winter.

After the spring thaw this year, the project came alive in April, "red iron" erection began, boiler drums were being hoisted into place, and fans and ductwork were soon sitting in place on the fan floor. Coal hoppers were being bolted into place with impact wrenches. The job was rolling in July. Roofing and siding operations were in full swing. Operating floors were filling the forms. The coal building structural steel was being riveted into place after the main building red iron was completed. Coal-handling flight conveyors were going up. The project was as busy as a brown bear in a blueberry patch along the Kuskokwim.

Since ground was broken for this coal-burning steam plant on April 29, 1953, work on this essential installation has highballed ahead of schedule every month. At the end of July, the project was 7% ahead of estimated progress, and 50% complete.

In August, the job hit a crescendo of construction. All of the trades were on the payrolls, with an average



ANOTHER METHOD for insulating steam lines is the use of utilidoras as in the foreground. Utilidor walls are reinforced concrete and the lids precast. In the center background is the heat and power plant proper with coal storage building to the right.

of 225 men employed. This total will increase in the fall when piping installation starts full blast. It is anticipated that the building will be enclosed by winter, and that, with temporary heating units, the work will be pushed no matter what the thermometer reads on the outside. The contract completion date is April 1956, but high hopes are held that the plant will be turned over to the using agency, the U. S. Air Force, for their operation by November 1955.

Rapid progress

Several factors have had a helping hand in the progress accomplished thus far: good foundation subgrade with no unwatering required; the versatile use of an efficient guy der-

rick and top-hand erection gang to set the structural steel and most of the mechanical equipment; efficient expediting of materials and mechanical equipment from Stateside; the use of precast slabs for the indoor-storage concrete coal bunkers; and the valuable experience Patti-MacDonald gained in constructing a similar heading and power plant at neighboring Fort Richardson from 1951 to 1953.

This military installation was designed by the Bechtel Corp. of San Francisco, working as architect-engineer for the Alaska District. For a listing of the lead personnel for the contractors and for the government, see the Supervising section of this issue.



OVER 96,000 SQ. YD. of 3-in. thick asphaltic concrete was placed on these 3:1 slopes with conventional paving equipment. With an average

placement of 600 tons per day, this job came out months ahead of schedule. Reservoir is 2,000x1,000 ft. by 60 ft. deep.

First use of mechanical spreader for paving on 3:1 reservoir slope

By **PHILLIP L. BAILEY**
District Engineer
and

LOUIS R. HOVATER
Area Engineer
The Asphalt Institute

EXCAVATED OUT OF THE rolling hills at Monterey Park near downtown Los Angeles is Garvey Reservoir, a part of the long-range water plan by the Metropolitan Water District. With the rapid growth of Southern California areas, district engineers foresaw the need for a new reservoir and additional distribution system. Investigations of possible reservoir sites revealed that the Monterey Park Hills offered the last remaining close-in location to downtown Los Angeles. This site also provided sufficient elevation to insure an adequate hydraulic gradient for the proposed new distribution system. However, the location selected was no natural site and the great oval bowl with inside slopes of 3:1 had to be shaped by excavation and compacted embankments. Total

excavation amounted to 3,400,000 cu. yd., while compacted fill for embankments approximated 3,100,000 cu. yd.

The reservoir has a 3-in. pervious asphaltic concrete surface lining and an underlying impervious blanket of select material varying from a thickness of 10 ft. on the bottom to 3 ft. at the top of the slopes. This type of reservoir construction required over-excavation and under-fill to provide for the impervious blanket. To insure accurate grading for paving, the select material on the slopes was over-filled $1\frac{1}{2}$ ft., compacted and removed; thus also providing an easy method for supplying all the select material needed for the blanket of the reservoir bottom. By selecting the best materials on the job site to be used for the impervious blanket, and because of the method of compaction, a percolation rate was achieved better than the prescribed maximum of 0.06 cu. ft. per year per foot of head.

For compaction of the impervious blanket, especially designed small-diameter, heavy-weight rollers were

used. Each roller unit weighed 30,000 lb.; 3,000 lb. per linear foot of drum. It was figured that the small diameter, heavy rollers put 25,000 ft.-lb. of compactive effort into the soil in 16 passes of the roller. Also, 16 roller passes did the desired compaction job on the particular soils encountered. The actual compactive effort obtained averaged 30,000 ft.-lb.

High quality of work

A new technique in constructing the 3-in. asphaltic concrete lining over the impervious blanket was one of the reasons for the reservoir being completed months ahead of the contract schedule. The technique was developed by paving contractor, W. E. Hall Co., and made possible the use of a mechanical spreader on the steep 3:1 reservoir side slopes. The mechanical spreader insured an even spread of the asphaltic concrete and provided partial compaction before the surfacing was finished with a roller. Not only was the quality of work higher than can be attained by use of the conventional spreader-



THREE PIECES of equipment—truck, mechanical spreader, and 4½-ton roller—are held individually on the slope by cables attached to two tractors and a crane located at the crest.



SPECIAL RAMP attached to tractor allowed spreader to complete its run to the top of the slope. The ramp then tilted clear of the ground and was moved forward 12 ft. ready for a new pass.

box, but the quantity of asphaltic concrete lining placed on the slopes averaged 600 tons a day.

Tilting ramp at crest

Representatives of Hall conceived the idea of building a ramp at the crest that would enable the mechanical spreader to be pulled above the crestline. To do this, a ramp was attached directly to a tractor on the crest which was used as a hoist for the spreader. This enabled the hoisting equipment, the ramp, and the spreader to be moved simultaneously into a new position merely by moving the tractor along the crest. The rockers were so designed that the ramp tracks would tilt forward as soon as the rear of the spreader passed the crestline of the reservoir, lifting the ramp and the machine sufficiently to permit the tractor hoist with its attached ramp to be easily moved into a new position. Once set for the next course of asphaltic concrete placement, backing of the spreader down the ramp would tilt the rockers backward and the spreader again would be on the reservoir slope. Paving of the slopes required the use of three hoists on the reservoir crest—one on the trucks feeding the spreader, one pulling the spreader up the slopes, and one for the 4½-ton roller supplying the final compaction.

The reservoir lining, which covers 974,000 sq. ft. on the reservoir floor and 865,000 sq. ft. on the side slopes, was placed with sufficient material deposited to provide a compacted 3-in. thickness. Each course laid down was 12 ft. wide on the straight sides of the reservoir and on the bottom. On the curving sides a 5-ft. lap of joints at the bottom permitted the spreader to be hauled up the slopes in a straight line, laying down a course that came out 12 ft. wide at the reservoir crest.

The asphaltic concrete mix for the work was chosen to provide a porous lining. After the reservoir is filled, this porous lining will prevent any back pressures from developing and causing an upheaval of the pavement on drawdowns. Water in the bank storage will be allowed to seep back into the reservoir.

The mix for the asphaltic concrete lining is similar to that used by the Los Angeles Department of Water and Power at Stone Canyon reservoir. The gradation is as follows:

SIEVE SIZE	PERCENT PASSING
¾	95-100
½	85-95
No. 4	44-58
No. 10	28-38
No. 40	10-18
No. 80	4-10
No. 200	1-4

A 60-70 penetration paving asphalt was used in the amount of 5 to 6% by weight. A penetration type emulsion RS-1 was used as a tack coat at the joints. The lining was laid at a temperature of 260 to 285 deg.F. The material was hauled from a plant 12 mi. away by a fleet of trucks that averaged six loads a day each.

Breakdown and final rolling

The final rolling of the asphaltic concrete lining was accomplished by the use of various types of rollers. On the slopes, a 4½-ton steel wheel roller was used. For areas on the slopes inaccessible to the mechanical spreader and the 4½-ton roller, the material was spread by hand and compacted by a small hand roller. The 4½-ton steel wheel roller was also used for the breakdown rolling on the reservoir bottom. However, final compaction was obtained by using an 8-ton steel wheel roller.

For access roads and parking areas, a 60-70 penetration paving asphalt was used as the bituminous

binder in an asphaltic concrete mix having the following gradation:

SIEVE SIZE	PERCENT PASSING
¾	98-100
½	86-92
¾	72-78
No. 4	44-50
No. 8	29-35
No. 30	18-24
No. 100	8-14
No. 200	5-7

The 3-in. thick pavement contained 4.8% asphalt, by weight. Asphalt paving 1½ in. thick for drainage ditches conformed to Los Angeles County Road Department Specifications using an SC-6 asphalt binder. The mix conformed to the following gradation:

SIEVE SIZE	PERCENT PASSING
¾	100
¾	95-100
No. 4	40-60
No. 8	24-30
No. 30	9-15
No. 100	5-8
No. 200	1-2

The mix contained 4.5% asphalt, by weight. In connection with the drainage ditches, a prime coat and seal coat consisting of an RS-1 penetration type emulsion were used in the amount of 0.25 and 0.20 gal. per square yard, respectively.

Reservoir storage will be 1,500 ac. ft. with a water surface of 37 ac.

The Morrison-Knudsen Co., Inc., and R. A. Westbrook were joint venturers for the \$3,143,695 construction project. Key personnel in the Metropolitan Water District's planning, engineering, and construction supervision of the Garvey Reservoir project include: Robert B. Diemer, district general manager and chief engineer; R. A. Skinner, in charge of design; Henry J. Mills, construction engineer; W. S. Merrithew, resident engineer; Dexter L. Cleveland, chief inspector.

REPORTS from the COURTS

By HOWARD S. BURNSIDE, Attorney and Registered Engineer

Oral promise to pay for lumber enforced

IF MR. A PROMISES to pay Mr. B's debt, the promise must be in writing if the creditor wants to collect from A. Certain contracts must be in writing to be enforced, otherwise it would be easy to defraud others by "proving" oral agreements that never existed. Such contracts are said to be within the Statute of Frauds. But there are qualifications and exceptions as demonstrated in the case at hand.¹

Owner Makos promised to pay contractor Bean's outstanding lumber bill as well as materials to be shipped. Fairview Lumber Company had told Bean no further credit would be extended but they delivered more lumber based on Makos' oral promise. Thereafter Makos paid for the lumber shipped after the promise but refused to pay the outstanding bill. The lumber company sued and obtained a judgment.

Makos was the owner for whom the lumber was used, and for this reason his promise to pay Bean's debt did not have to be a written agreement. The underlying principle is that the lumber was used mainly for the promisor's (Makos) pecuniary or business advantage.² If Bean used the lumber for his own building or some other person, Makos' oral contract (his promise to pay) could not be enforced by the lumber company.

1. *Fairview Lumber Co. v. Makos* (Wash.) 265 P. 2d 837.

2. *Restatement Contracts*, Para. 184.

Fraudulent misrepresentation by salesman

IN AN ACTION by a furnace installer for recovery of the contract price judgment was entered in favor of the owner upon the defense of fraudulent misrepresentation by the furnace salesman. The following principles relating to sales of operating equipment are applicable to countless situations of equipment installation.

"A statement that (an) article will satisfactorily meet the buyer's requirements will be regarded as an expression of opinion about something to take place in the future. Actionable

fraud cannot be predicated upon such a statement."

"But where the salesman does assert such special and peculiar knowledge (of the article or of the condition under which it was to be used) a statement that the article is appropriate for, and will satisfactorily meet, the buyer's requirements will be regarded as a representation of fact.

"In his negotiations . . . Wing represented himself to be an expert in the design and sale of furnace installations . . . with the intent that respondent would rely thereon and 'with the knowledge the respondent was inexperienced in such matters'."

The one who speaks must have knowledge of the falsity of the representation of a fact or be ignorant of the truth if he is to be held responsible in a fraud action. It is no excuse to show that one did not know his representations were false or that he believed them to be true. Thus ignorance of the truth of matter is no excuse if a representation is made as to the fact of the matter.

Holland Furnace Co. v. Korth (Wash.) 262 P. 2d 772.

Retrospective effect of building code

UNLESS the building code specifically excepts existing buildings, a requirement that all building stairways have handrails includes buildings constructed prior to the adoption of the code. The code is given retrospective application. Thus if an existing building is not properly equipped with a stairway handrail, it is a proper question for the jury whether the failure to erect a handrail was negligence by which a person would be responsible in damages to one who fell upon the stairway. This ruling was made in *Fay v. Allied Stores Corp.*¹ and is in accord with decisions in other states on this point.²

1. *Fay v. Allied Stores Corp.* 269 P. 2d 189.

2. *Finnegan v. Royal Realty Co.* 35 C. 2d 409.

Municipal corporation retains connection charge

THE SALT RIVER PROJECT Agricultural Improvement and Power District, a corporation, charged the Rubenstein Construction Company \$25 per unit to connect electricity to

500 dwellings built in 1951-52 at Williams Air Force Base.

An Arizona statute reads in part that "No charge shall be made by any public service corporation for making connection for water, gas, electricity, or telephones."¹

The contractor sued to recover its payments for the connection charges. The power company claimed itself to be a political subdivision and municipal corporation of the State and thereby entitled to all the privileges and immunities granted such political subdivisions.

The issue then is whether this power district is a public service corporation or a municipal corporation. The answer to this question has broad application because it can conceivably affect contractual relations of persons dealing with the district, liability to others for negligence, taxes, etc.

In a brief opinion,² the Supreme Court of Arizona affirms that the District is a municipal corporation and does not lose this status (or the immunities available) while engaging in an activity ordinarily identified with public service corporations.

1. Sect. 76-109, A.C.A. 1939.

2. *Rubenstein Const. Co. v. S. R. Proj. Agr. Imp. & Power* 265 P. 2d 455.

Notes on legal procedure

FOR A BETTER understanding of the Reports some of the terms used from time to time and legal procedure are described.

The person who commences a law suit is the plaintiff. He must state a "cause of action" against a defendant or several such causes. This document is the "complaint." A copy of the complaint together with a summons is "served" on the defendant who is required to file his "answer" within a prescribed time—usually 10 days.

If the defendant feels that he is entitled to some relief or damages which arise out of the same matter, he will file a cross-complaint stating a cause of action. The defendant is then also a cross-complainant. The cross-complaint is served on the plaintiff who becomes also a cross-defendant and must file his answer.

The matter, if it goes to trial (more cases are settled than tried) may be tried before a judge which is a "trial before the court" or it may be tried before a jury. Either party has the right to demand a jury trial. (In some few situations a jury is not a matter of right.)

The person who demands the jury must deposit fees which vary in different places. Sixty dollars a day jury fees are required in Superior Court in San Francisco. Whoever wins is entitled to be repaid jury fees by the loser.

The jury renders a "verdict." The court renders "judgment."



By early 1955, you'll be able to drive from New York City to Buffalo—without a single traffic light or stop sign. That's the fabulous New York Thruway, a dream that I-R Air Power is helping to carve out of rugged terrain where many sections are solid rock.

One hundred seventeen GYRO-FLO rotary compressors, with a combined capacity of 61,265 cubic feet of air per minute, are speeding the job to completion—driving Ingersoll-Rand rock drills and other pneumatic equipment on this high-speed construction project.

Here, where sustained drilling speed and uninterrupted production are of particular urgency, the simplicity and dependability of the GYRO-FLO

design really pay off. The GYRO-FLO rotary sliding vane compressor has no valves, pistons, rings, rods or clutches to wear out, adjust or replace. It delivers an abundant supply of oil-free air at temperatures that never go above 200 F. And pressure is automatically controlled closely and smoothly all the way from 0 to 100% capacity.

Available in 125, 210, 315 and 600 cfm, GYRO FLO offers the only complete line of rotary portables—each size proven by years of heavy duty in the field. Get the complete GYRO-FLO story from your nearest Ingersoll-Rand distributor or branch office. It will save you money now and for many years to come.

2-94

**CONTRACTORS'
COMBINATION**

Ingersoll-Rand
11 Broadway, New York 4, N. Y.

COMPRESSORS

• ROCK DRILLS

• AIR TOOLS

• CARSET JACKBITS

• PUMPS

Short Story—Valuable Reading!

Here's a contractor who saved plenty on a big job, using Universal's Ezebilt Scaffolding. He needed just 832 Braces (1648 connections) in this scaffold run—*single braces*, instead of cross-braces in 70% to 85% (six out of every seven) of the spans. He saved at least 60 seconds on each cross-brace he would have had to use with ordinary scaffolding. Ezebilt's fast-connecting 'Gravity-Lock' mechanism also saved him 20 seconds on each brace-connection. Small Talk?—Not when you multiply seconds by hundreds and thousands! This man, by using Universal Ezebilt Scaffolding, *saved many hours on this single job*. In dollars and cents—it made sense to use the *one* scaffolding that allows such savings.

UNIVERSAL Ezebilt SCAFFOLDING



California—BURLINGAME

EZEBILT SCAFFOLDING COMPANY

1313 ROLLINS ROAD

PHONE: DIamond 4-5661

California—LOS ANGELES

AMERICAN-UNIVERSAL OF CALIFORNIA, INC.

3146 RIVERSIDE DRIVE

PHONE: NOrmandy 4-6425

Colorado—DENVER 8

THE UNIVERSAL COMPANY

1426 ULSTER STREET

PHONE: DUdley 8-1624

Utah—SALT LAKE CITY

CONTRACTORS EQUIPMENT & SUPPLY CO.

650 SOUTH 6th WEST STREET

PHONE: 22-0501

Washington—SEATTLE 2

UNIVERSAL EQUIPMENT COMPANY

1549 EASTLAKE AVENUE

PHONE: CApitol 2136

WINTER CONCRETING

... continued from page 58

then replace the insulation. Usually one wetting a day would keep the unformed surfaces damp. This procedure was continued until just prior to placing the next lift or until the required water curing period was completed.

Durability of insulators

Sisalkraft encasement around fiber glass insulation made it more durable and resistant to weather than plain fiber board or rock wool bats having black building paper. The building paper covering on the rock wool bats deteriorated quite rapidly when exposed to wet weather and project engineers recommended covering the bats with chicken wire or water resistant paper. Approximately 80% of all fiber glass insulation purchased for the Kirwin job was in usable condition at the end of the construction season.

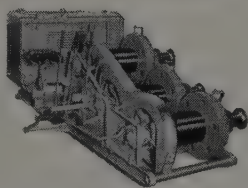
The job-made rock wool blankets were durable, and with proper care in handling they could be used continuously throughout two winter seasons.

Summary information

The performance records of the insulators described in this article indicate that in locations having winter climates similar to that of southern Nebraska or northern Kansas, 1 in. of fiber glass on 2-in. sheathing or its equivalent will usually be adequate for protecting formed surfaces of walls 12 in. or more in thickness; 2 in. of fiber glass blanket or its equivalent will usually be adequate for tops of walls or floor slabs; and 1 in. of fiber glass blanket or its equivalent will usually be adequate to protect unformed surfaces of mass concrete. If weather conditions are such that these thicknesses are inadequate, they probably will seriously limit performance of workmen.

The large number of continually changing conditions that affect generation and retention of heat in concrete make it advisable to check the temperature of the concrete twice daily throughout the first 3 days. If this is done it is not likely that the concrete temperature will drop to a critical point without ample time to provide additional protection.

The number of days having mean daily air temperatures below 32 deg. and 0 deg. F. at selected cities within the Bureau of Reclamation construction area in the 17 Western states are shown in Table 1. It is interesting to note how many days have air temperatures below 32 deg. F. but how few days are below 0 deg. F. throughout much of this great area. A comparison of the temperatures in this table with the exposure temperatures in Fig. 1 through 4 indicates that in much of the Bureau work area winter concrete can be protected by insulation throughout the entire winter season.



A new building system, plus modern, high-speed American equipment, have pared 10 months off construction time at the University Hospital of Portland, Oregon. Originally scheduled for completion late in 1955, the building's 1,200-ton structural steel framework is already completed.

The contractor followed the "Cofar" building system in which metal decking is welded to the steel frame and covered with lightweight concrete. Helping to speed the rate of construction and keep costs down is the highly-efficient American Model 75-B 3-drum Hoist.

With anti-friction bearings throughout, American Hoists not only speed the job by delivering more capacity loads per day, but they withstand longer, tougher usage. Years of experience are behind these famous hoists, built to satisfy the most exacting requirements of owner and operator alike.

American Hoists outsell all others simply because they do more work, with less maintenance, for a longer life span. Ask your distributor for details on the complete American Hoist line, *the line that leads the field!*

American Hoist

AMERICAN HOIST & DERRICK CO.

St. Paul 1,

Minnesota

MANUFACTURERS OF

Crawler & Truck Cranes • Steel Derricks • Crosby Blocks • Wire Rope Sheaves • Locomotive Cranes • Hoists • Portable Material Elevators • Genuine Crosby Clips • Revolver Cranes
• Utility Hoists •

ARIZONA

PHOENIX BUILDING BOOM—

Two building projects totaling \$6,000,000 will have begun in Phoenix by the time this appears. Rubenstein Construction Co. is handling a 523-apartment project with shopping center for Rental Development Corp. of America. Del E. Webb Construction Co. has the Uptown Plaza, a commercial development of shops and offices. The apartments project recently gained an FHA mortgage insurance approval in the amount of \$3,749,900. Actually, with the investment in land and other improvements, the overall cost will be over \$4,000,000. Plans for the 34 brick wall buildings were drawn by Ralph Haver, architect. Construction of the Uptown Plaza will cost at least \$2,000,000. The buildings planned will form an "L" along two sides of the square 10-acre site,

with a separate two or three story building at the opposite corner. Architect was H. H. Green.

RECENT MAJOR CONTRACT AWARDS

and low bids in Arizona include a low bid of \$211,869 submitted by **Bentson Contracting Co.** of Phoenix for construction of bridges and structures on US 60 & 70 near Superior. **Copper State Construction Co.** of Mesa submitted a low bid of \$300,555 for 11.3 mi. of grading and draining on an alignment paralleling SR 86 northeast of Willcox. **Lyle Price** of Flagstaff submitted a low bid of \$484,889 for 8 mi. of grading and draining on a new alignment of US 89 near Ashfork Junction. **Western Constructors, Inc.**, of Phoenix submitted a low bid of \$342,992 for 15.2 mi. of grading, surfacing, and construction of a steel girder bridge 16 mi. northwest of Tucson. **L. M. White** of Tucson submitted a low bid of \$431,264 for 12.7 mi. of widening and surfacing on US 60 & 70 near Aguila.

CALIFORNIA

\$150,000,000 TOWN—Development has begun on a \$150,000,000 community, Warren Park, to be built on an 1,876-acre site near Danville. It will be a model garbage-free community consisting of a 100-acre regional shopping center, schools, parks, recreational facilities, and churches. There will be more than 9,000 single-family residences. Experts in many phases of municipal development are being brought into the program, including Don Groom, Bay Area developer and builder. It is estimated that the project will take two years to complete.

OAKLAND SHOPPING CENTER

—Demolition of the Oakland Speedway to make room for a \$25,000,000 shopping center is under way. This marks the first phase of construction for the 48-acre regional shopping center, named Bayfair. Architect Victor Gruen's design calls for 80 stores, dominated by a \$6,000,000 department store. The project is under the direction of Capital Co., Beckett & Federighi, and Macy's of San Francisco.

ROUND BUILDING—Plans have been approved for what is believed to be the world's first round office building. The unique structure is located in Hollywood and is being built for Capitol Records, Inc. Overall height of the structure will be 13 stories totaling 150 ft., the limit for the Los Angeles area. The building will be composed of a reinforced concrete cylinder 12 stories high and 90 ft. in diameter, rising above a rectangular, one-story base. Designed by Welton Becket and Associates, the building will cost close to \$2,000,000 and will be completed in January 1956.

CONGRESS HAS APPROVED the joint water conservation and flood control project in Santa Barbara County. It is anticipated that expenditures will total \$17,000,000. The project includes a dam at the Vaquero site on the Cuyama River with levees along the Santa Maria River and a tributary stream.



PIT 4 HOLES THROUGH

Crewmen of Walsh Construction Co. show their jubilation at the final holing through of the 21,500-ft. Pit 4 tunnel (Western Construction—Sept. 1954, pp. 64-67; Sept. 1953, pp. 82-84). Fragmented lava rock made it necessary to timber closely all the way. The job was started in October 1952.

ANNOUNCING

Faster, more powerful
bucket lift

1. For maximum
carrying capacity
in loose materials

2. For maximum
digging, positive
dumping of
sticky materials

NEW TWO-POSITION 2¼-YD. BUCKET

NEW, FASTER-WORKING

NO. 6 SHOVEL

at no increase in price

NEW POWER—the CAT* Diesel Engine now gives you 100 HP, an increase of approximately 25 per cent—and you get it with Caterpillar ruggedness and economy.

NEW 2¼-yd. BUCKET gives you 12½ per cent more capacity, gets heaping loads, dumps cleanly. Exclusive two-position feature gives maximum use of bucket capacity in *any* material: rear position for clean, fast dumping of sticky materials; forward position for carrying heaping loads of loose materials.

GREATER LIFTING POWER and speed with new hydraulic pump: its pressure is stepped up more than 40 per cent for fast, positive lifting action under *all* load conditions.

These extra values cost you no more in price!

These useful attachments increase your job range: skeleton rock bucket, quarry bucket, heavy-duty narrow bucket and bulldozer blade.

**Versatile new No. 6 Shovel is built to do
more work at less cost**

Weight distribution, engine horsepower and bucket capacity are carefully balanced so that the tracks *stay* on the ground for maximum stability.

Your Caterpillar Dealer will be glad to demonstrate the new No. 6 Shovel *on the job*. See him today. And count on him for fast service and genuine factory parts.

Caterpillar Tractor Co., San Leandro, Calif.;
Peoria, Ill., U. S. A.



CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

**NAME THE DATE...
YOUR DEALER
WILL DEMONSTRATE**

CONSTRUCTION of a \$7,100,000 low dam in the Colorado River to serve the Palo Verde Irrigation District has been authorized by Congress. The new dam will replace a rock structure which has been gradually giving way as a result of changes in the flow of the Colorado River. The problem has been developing since the operation of Hoover Dam.

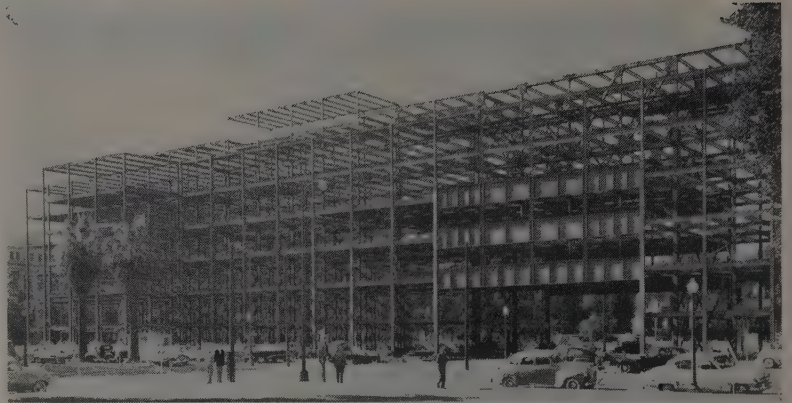
PROGRESS AT TECOLOTE — Drilling in 6½-mi. Tecolote Tunnel is moving at 100 ft. per week since excavating crews passed an area of severe water seepage. Progress had been slowed to a few feet per day by incoming water which reached a peak of 7,800 gal. per minute. The forward heading area is now in dry rock, however, and is moving out of the trouble zone. The project has been under way since January 1950, and is scheduled for completion in September 1955. Close to 3,000 ft. remain to be bored.

AIRPORT OF THE FUTURE — Oakland's new airport, designed for jets, helicopters, and seaplanes, as well as the more traditional type of aircraft, has received the go-ahead signal from the Board of Port Commissioners and the Civil Aeronautics Administration. Plans for the project were included in a comprehensive report by the New York consulting firm of Knappen-Tippetts-Abbett-McCarthy. It is expected that the \$11,500,000 airport will be in use by 1957.

PACIFIC GAS & ELECTRIC CO.'S \$37,000,000 Poe hydroelectric project on the north fork of the Feather River has entered into the construction phase with preliminary work on an access road. Test drilling and prospecting of foundation conditions at the powerhouse site is also being done. Company officials stated the project will require three to four years and that at the peak of the work, two years hence, between 1,000 and 1,500 men will be employed. The initial contract on the access road is held by H. Earl Parker Co.

NEW PHONE BUILDING — A \$3,-000,000 office building for the General Telephone Co. of California is under construction in Santa Monica. The structure will be earthquake resistant and will provide 200,000 sq. ft. of floor space. The plans, drawn by Albert C. Martin & Associates, provide for eventual doubling the size of the building.

REGENTS O.K. PLAN — The University of California regents have approved a capital improvements program calling for an expenditure of \$18,239,500 at eight campuses for the 1955-56 school year. Included is a \$1,500,000 offstreet parking structure in San Francisco and a \$1,800,000 arts building in Santa Barbara.



490,000 SQ. FT. OF FLOOR SPACE IN OFFICE BUILDING

Slightly over half of the \$7,000,000 office building being built in Sacramento is shown in this picture. The three plate girders which span 8th St., are 73 ft. long and 13 tons each. General contractor George A. Fuller Co. plans completion by December 1955.

RECENT MAJOR CONTRACT AWARDS and low bids in California include a low bid of \$1,498,951 by the A.B.C. Construction Co. of Norwalk for installation of a pipeline between Corona and San Juan tunnel for the Metropolitan Water District. Guy F. Atkinson Co. of South San Francisco submitted a low bid of \$610,151 for 3.2 mi. of paving in Tulare County. James I. Barnes submitted a low bid of \$3,560,000 for construction of six schools in Bakersfield. Cox Bros. Construction Co. of Stanton submitted a low bid of \$265,535 for 14 mi. of widening and surfacing on the Pacific Coast Highway near Newport Beach. Granite Construction Co. of Watsonville submitted a low bid of \$635,014 for 1.8 mi. of grading, surfacing, and widening of an existing steel bridge in Stanislaus County.

Healy Tibbits Construction Co. of San Francisco submitted a low bid of \$1,234,100 for installation of an outfall sewer for Los Angeles County Sanitation District at Torrance. Huntington Bros. of Napa submitted a low bid of \$170,000 for 2.2 mi. of grading and surfacing in Sonoma County. Vern R. Huck of Los Angeles is to develop a \$1,066,000 subdivision in Palmdale. W. F. Maxwell Co. of Los Angeles submitted low bid of \$497,782 for 12 mi. grading and surfacing and construction of two bridges in San Bernardino County. K. E. Parker of San Francisco received a \$1,381,000 award for construction of the San Mateo County Courthouse.

George W. Peterson and Jack W. Baker, Jr., submitted a low bid of \$722,657 for construction of bridges, ramps, and frontage roads on SR 158 in Los Angeles. Stoite Inc. of Oakland received a \$1,346,221 award for construction of a 4-story courthouse in Sacramento. B. J. Ukropina, T. P. Polich, Steve Kral & John R. Ukropina of San Gabriel submitted a low bid of \$1,061,539 for 4 mi. of grading and surfacing and construction of

two bridges in Orange County, and another low bid of \$1,923,764 for 4.1 mi. of grading, surfacing, and construction of six bridges in Santa Barbara County. P. J. Walker Co. of Los Angeles received a \$1,581,846 award for construction of hydrodynamics test facilities at Edwards Air Force Base.

COLORADO

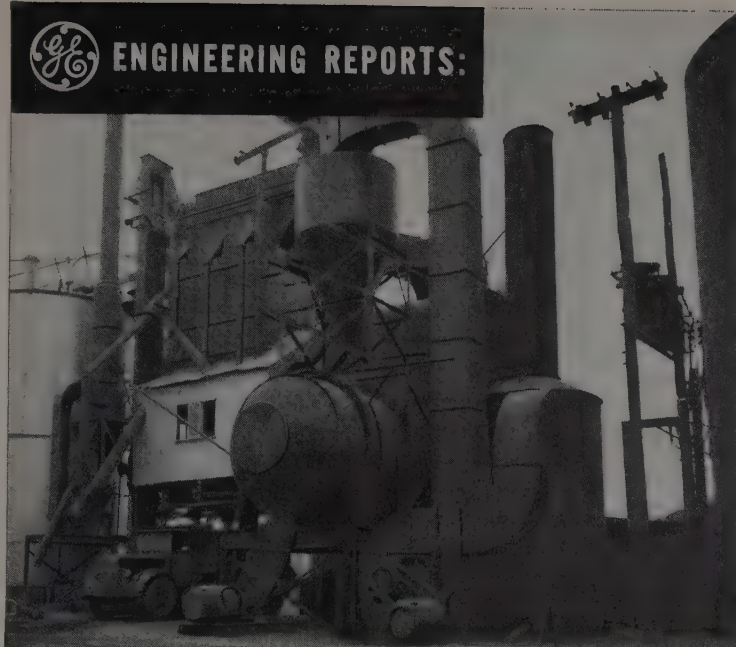
BOULDER GETS HOTEL — A \$4,-500,000 hotel apartment and shopping center is to be built at Boulder. Site of development is the present 40-acre Mountain View golf course which was recently bought by the Murchison brothers of Dallas, Texas. Construction will begin in a few weeks, according to a Murchison representative. Architectural plans are being drawn by Raymond Harry Ervin. Liberal use will be made of Boulder flagstone, as used in many buildings on the University of Colorado campus a few blocks away. The contract is held by Mead & Mount Construction Co.

MORE HOMES FOR DENVER — Morrison & Morrison, Inc., has purchased 125 acres at the edge of east Denver as a site for 500 new homes. The overall cost of the project will be in excess of \$5,000,000. Since the location is outside the city limits, annexation is being studied. Only two weeks previously Morrison announced plans for construction of 300 homes in the same general area, also at an estimated cost of \$5,000,000.

RECENT MAJOR CONTRACT AWARDS and low bids in Colorado include a \$3,500,000 award to the Stearns-Roger Manufacturing Co. of Denver for the design and construction of a steam power plant for the Southern Colorado Power Co. at Canon City.



ENGINEERING REPORTS:



G-E SERVICE is quickly available to any Simplicity-built plant. An asphalt plant must be dependable above all—no G-E motor has failed in this Triboro Asphalt Co., Flushing, N. Y., installation since its construction in 1949.



ECONOMICAL OPERATION is one advantage of using General Electric drives. This 100-hp G-E motor operates main dust blower at Triboro.

Large asphalt-plant builder standardizes on General Electric equipment for dependability

G-E motors and controls help maintain continuous high output at Simplicity-built plants

The Simplicity System Co. of Chattanooga, Tenn., has used General Electric motors and controls since they first electrified this type of asphalt plant. W. C. West, Simplicity general manager, says "We not only feel G-E apparatus is the most dependable of any available, but for years we've been highly pleased with G-E service."

Reliable, flexible motors are required for these applications. Simplicity-built plants are often remotely located at the end of utility lines or where power availability is low. Drive motors are subjected to very high starting torques. Even a one-hour shutdown can cost more than a thousand dollars in lost production alone. Because of these conditions, G-E motors designed to operate under high starting torques and low starting currents were selected after Simplicity ran a series of tests for various applications, in co-operation with G-E engineers.

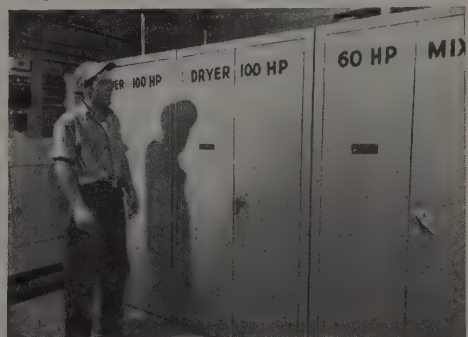
Your construction equipment will gain in dependability and efficiency too, when you electrify with G-E drives and power distribution equipment. They're backed by G-E engineering help in application, installation and service, available through any G-E Apparatus Sales Office, or by writing General Electric Co., Section 664-33, Schenectady, N. Y.

WESTERN SALES OFFICES: Albuquerque, Bakersfield, Butte, Denver, Eugene, Fresno, Los Angeles, Medford, Oakland, Pasco, Phoenix, Portland, Riverside, Sacramento, Salt Lake City, San Diego, San Francisco, San Jose, Seattle, Spokane, Stockton, Tacoma.

GENERAL  **ELECTRIC**



DEPENDABILITY is built into this 25-hp G-E motor, which operates the burner controlling the temperature and consistency of asphalt mixture.



CENTRALIZED G-E CONTROL PANELS are factory assembled and system-wired; they provide safer control for all motors in a Simplicity plant.



Commercial Steel Tunnel Liners Speed Construction... Traffic Maintained

Traffic on the main line of The Central Railroad of New Jersey had to be maintained while a 97" pipe was laid in soft ground. With only 14 feet of cover above the pipe, the problem of adequate tunnel support was extremely important.

"Commercial" engineers were asked to design a structural tunnel lining to carry all loads that would develop until the pipe could be laid and properly back packed. Ground conditions were such that only small sections of the tunnel face could be mined and left unsupported—and then for a very short time. So the lining had to be one that could be erected quickly and in sections that one man could position until secured in place.

Agreement as to design and method was reached and "Com-

mercial" was told to produce and deliver the steel tunnel lining to meet the schedule. Solid corner "Commercial" Liner Plates curved to exact radii were set into position as the mucking was done, then quickly bolted together into a continuous lining. Closely behind, "Commercial" Steel Ribs, bent to proper contour and completely fabricated ready for field erection, were set inside the liner plates and bolted together.

From the field we are now told, "Everyone concerned is satisfied with this type of construction... the tunnel liners offered no particular difficulty during the installation."

Can we be of assistance to you in your tunnel job? There is no obligation.

THE COMMERCIAL SHEARING AND STAMPING COMPANY
YOUNGSTOWN 1, OHIO • CHICAGO, ILLINOIS • SALT LAKE CITY, UTAH

"COMMERCIAL"

"PRODUCTS PREFERRED
BY CUSTOMER ACCEPTANCE"

"Commercial" engineers will gladly assist you;
they have the experience and know how.

LINER PLATES • RIBS • SETS • LAGGING

IDAHO

TWO CLEARWATER DAMS—Preliminary investigations have started on dams to be built at Bruce Eddy and Penny Cliffs on the Clearwater River in north Idaho. Four companies have organized the Pacific Northwest Power Co. to handle the projects. It is estimated that the dams will generate 535,000 kilowatts and will cost \$300,000,000.

THE WASHO ROAD test is ended. After the application of 238,000 heavy axle loads to each of the test pavements, the Highway Research Board, which conducted the test for the Western Association of State Highway Officials, announced that traffic was at an end. Engineers have now begun detailed studies of the condition of the pavement down to the subsoil. The final report, which may have the answers to some of the questions concerning heavy use of pavements, will be published in the Spring of 1955.

RECENT MAJOR CONTRACT AWARDS and low bids in Idaho include a low bid of \$165,331 submitted by Aslett Construction Co. of Twin Falls for roadwork on the Ketchum-Clayton highway in Custer County. Frank J. Baulne of Yardley received a \$485,416 award for the construction of 4.9 mi. of US 95 between Fenn and Cottonwood in Idaho County. Kiely Construction Co. of Butte submitted a low bid of \$433,321 for roadwork on the Ketchum-Clayton highway. Morrison-Knudsen Co., Inc., of Boise received a \$232,493 award for grading and surfacing near Nampa. Carl E. Nelson of Logan submitted a low bid of \$237,075 for grading and surfacing in Jerome County.

MONTANA

EMPLOYMENT reached new highs in September at the Anaconda Aluminum plant two miles east of Columbia Falls. Over 1,500 were on the payroll with more than half working overtime building the new aluminum reduction works. This meant a flow of close to \$175,000 a week in construction payrolls into the Flathead valley. The contract is held by Foley Constructors, with Donovan Construction Co. the principal subcontractor.

BLASTS RIP PLANT—Three explosions damaged the Rainbow Dam power plant near Great Falls recently. The blasts resulted in a power

LA-11

Split seconds count...



In manual batching operations, it may be only a split second between the time the operator looks at the dial and pushes the lever . . . but in a day's run, that time lapse can add up to a batch or two lost!

Automatic batching is as positive in its operational sequence as the sun. The plant works every split second of the cycle . . . and automatically insures the accuracy so essential for today's exacting specifications.

BLAW-KNOX BATCHING PLANTS WITH *Automatic* EQUIPMENT make every second count toward profit



- Push-button operation speeds each phase of cycle.
- Batch is predetermined by a turn of the selector knob.
- Interlocks, either electrical or mechanical, eliminate the possibility of human error.
- Fully automatic batchers include automatic filling, automatic cut-off and automatic power-operated discharge. Operated by remote control from a panel control board with all weighing scales in view.
- Indicator lights keep operator informed of each phase of the cycle.
- Weighing hoppers are steep sloped and perfectly smooth inside, with rounded corners to insure quick, clean discharge.

Whether your job requires the speed and accuracy of automatic batching, or whether manual or semi-automatic operation is satisfactory, Blaw-Knox bins and batchers for both aggregate and cement are available in the size and type you need.

ASK YOUR BLAW-KNOX DISTRIBUTOR
about the one-source advantages of
the Blaw-Knox "Complete Paving Package"

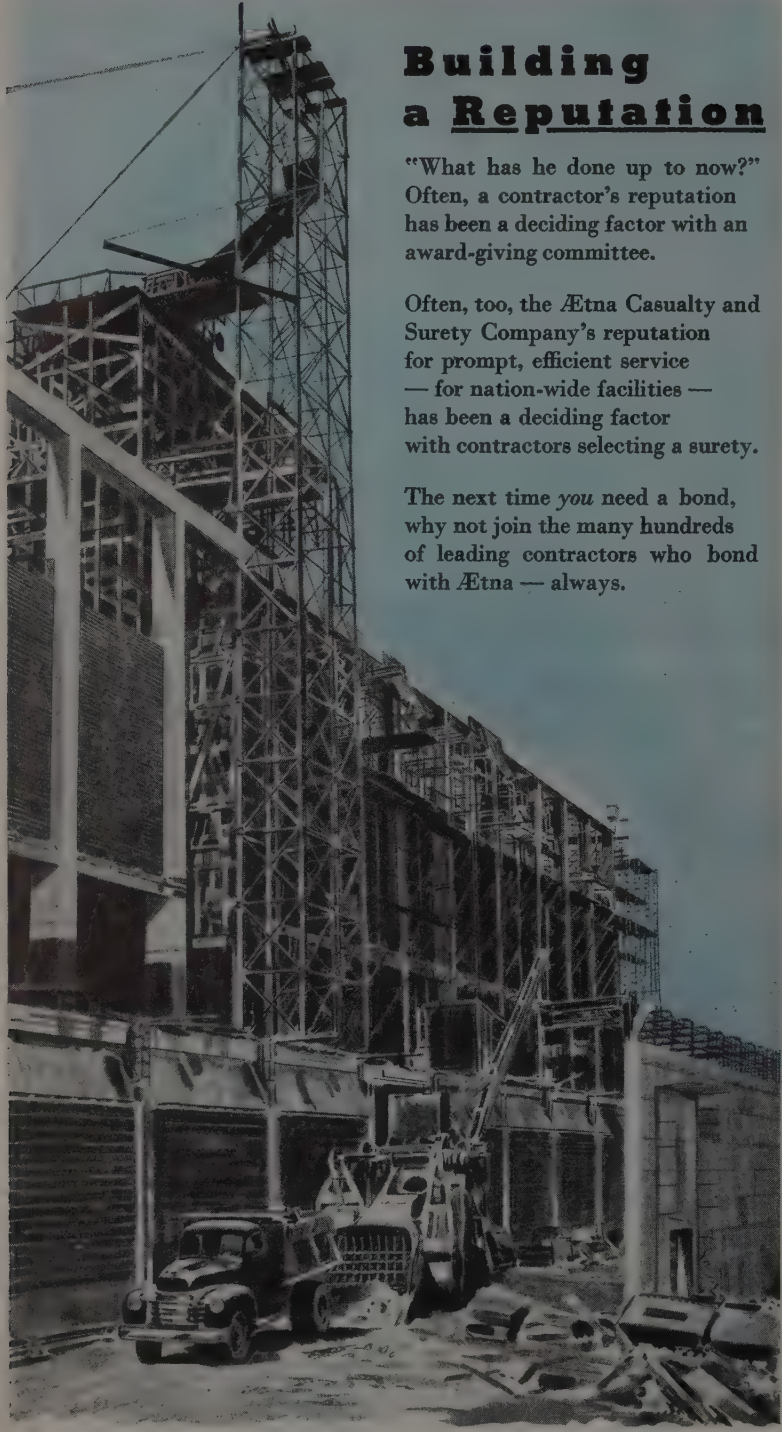
BLAW-KNOX COMPANY
BLAW-KNOX EQUIPMENT DIVISION
PITTSBURGH 38, PA.
Offices in Principal Cities



BLAW-KNOX PACIFIC COAST BRANCH

818 Monadnock Bldg., 681 Market St., San Francisco 5, Calif.

CONTRACTORS EQUIPMENT CORPORATION, 2727 S. E. Union Avenue, Portland 2, Oregon; FOULGER EQUIPMENT CO., P.O. Box 87, 1361 S. Second W., Salt Lake City 8, Utah; THE O. S. STAPLEY CO., P.O. Box 960, 723 Grand Avenue, Phoenix, Arizona; C. H. GRANT CO., 2515 Willow Street, Oakland 7, Calif.; COLORADO BUILDERS' SUPPLY CO., Box 4280, S. Denver Sta., Denver 9, Colorado; LIVELY EQUIPMENT CO., 2601 No. Fourth Street, Albuquerque, New Mexico—P.O. Box 1436 1423 E. Missouri Street, El Paso, Texas; INDUSTRIAL EQUIPMENT CO., 415 N. 27th Street, Billings, Montana; NORMONT EQUIPMENT CO., 420 Third Ave. So., Great Falls, Montana; STAR MACHINERY CO., 241 Lander St., Seattle, Wash.; E. 415 Sprague Ave., Spokane, Wash.; SHAW SALES AND SERVICE COMPANY, 5100 Telegraph Road, Los Angeles 22, Calif. —Branch: 2175 Newton St., San Diego, Calif.



Building a Reputation

"What has he done up to now?"
Often, a contractor's reputation
has been a deciding factor with an
award-giving committee.

Often, too, the Aetna Casualty and
Surety Company's reputation
for prompt, efficient service
— for nation-wide facilities —
has been a deciding factor
with contractors selecting a surety.

The next time you need a bond,
why not join the many hundreds
of leading contractors who bond
with Aetna — always.

No job too big--no job too small

AETNA CASUALTY AND SURETY COMPANY

AFFILIATED COMPANIES: AETNA LIFE INSURANCE COMPANY

AUTOMOBILE INSURANCE COMPANY • STANDARD FIRE INSURANCE COMPANY

HARTFORD 13, CONNECTICUT



cut-off for 45 min. in large areas of Montana. The plant controls the operation of four dams on the Missouri River. Officials of the Montana Power Co., which owns the plant, blamed the explosions on a failure in the transformer causing a concentration of power in the line, so that the generator bus "blew up." Damage to the building and equipment was estimated at \$200,000.

THE LARGEST SINGLE GRADING project in Montana Highway Dept. history was awarded September 29 to England & Roth Construction Co. Their bid was \$680,304. The road is located in Fergus County and will involve over 2,000,000 cu. yd. of excavation.

RECENT MAJOR CONTRACT AWARDS and low bids in Montana include an award of \$218,969 to Stanley H. Arkwright of Billings for 7.5 mi. of grading and surfacing on the Livingston-Big Timber highway. Clifton & Applegate of Yardley received two awards: one of \$189,894 for 0.4 mi. grading, surfacing, and construction of an overpass in Mineral County and one of \$193,759 for 1.5 mi. grading and surfacing in Flathead County. England & Roth Construction Co. of Rapid City received a \$680,303 award for 3.9 mi. grading and draining on the Grassrange-Malta highway in Fergus County. Albert Lalonde Co. of Sidney received a \$516,351 award for 14 mi. grading and surfacing in Teton County.

NEVADA

EARTHQUAKE—Nevada's second earthquake in two months centered between Lovelock and Fallon and caused considerable damage, particularly to irrigation facilities. Cost of repairs was expected to reach \$200,000, as much as the bill for the first 'quake, which occurred in July. The Rogers diversion dam two miles northeast of Lovelock was reported to be a complete loss. The \$10,000 structure went out during the 'quake but there was no flooding of farm land. It was pointed out by City Engineer Lloyd Whalen that had not repairs taken place immediately after the July earthquake tremendous damage would have resulted, since the second tremor would have been the last straw for many walls.

RECENT MAJOR CONTRACT AWARDS and low bids in Nevada include a \$1,242,539 award to the Thorn Construction Co. Inc. of Springville for roadwork in Clark County.



PELADOW GIVES CONCRETE FASTER SET, GREATER WORKABILITY, HIGH STRENGTH

Peladow, new high-test Dow calcium chloride, in concrete mix adds strength, permits faster, better work . . . speeds construction schedules . . . cuts costs

Modern construction methods won't permit long, wasteful periods of waiting for cement to gain working strength. For this reason, Dow's new high-test (94-97%) Peladow® calcium chloride in buckshot-size pellets should be used in the mix to accelerate the hydration action and speed up setting time.

Peladow, engineered especially for construction use, can be used in smaller quantities than ordinary calcium chloride, because *four bags of Peladow do the work of five bags of flake-type calcium chloride*. This advantage of compactness offers substantial economies through reduced transportation, storage and handling costs.

When your job requires pouring into forms, a Peladow admixture assures an even flow and a *complete* fill. It eliminates the greater part of voids in corners and on

surfaces where adhesion to forms causes pockets in ordinary mixes. When the forms are removed, you will find a smoother, better appearing, more uniform surface that requires a minimum of pointing up. In addition, the greater workability of the mix, induced by Peladow, makes it possible to decrease the amount of water which would otherwise be necessary to make the concrete flow. This reduction in gauging water reduces shrinkage and surface crazing and provides a denser, more waterproof concrete.

Assure yourself of the increased efficiency and productivity by taking advantage of the many benefits Peladow provides. Peladow is shipped in 100-lb. moisture-proof bags and covered bulk hopper cars. Write for detailed information to THE DOW CHEMICAL COMPANY, San Francisco, Los Angeles, Seattle, Dept. IN —991L-1

you can depend on **DOW CHEMICALS**

DOW

NEW MEXICO

A DAMAGE SUIT amounting to \$532,000 has been filed by Southwest Engineers against the city of Albuquerque. Southwest Engineers, a partnership, formerly were consulting engineers to the city on sewer and other utility expansion projects. The firm was fired by the city for alleged inadequate supervision and it filed suit for alleged breach of contract.

RECENT MAJOR CONTRACT AWARDS and low bids in New Mexico include an award of \$130,444 to **Jack Adams** of Los Alamos for 5.6 mi. of grading and surfacing SR 75 in Taos County. **Boswell Construction Co.** of Albuquerque submitted a low bid of \$127,989 for earthwork, clearing and structures for rehabilitation of drains on the Middle Rio Grande Project. **Haake Construction Co.** of Albuquerque received a \$127,472 award for 5 mi. grading and surfacing in Chaves County. **D. D. Skousen & Son** of Albuquerque submitted a low bid of \$273,510 for earthwork on the Middle Rio Grande Project. **Saul & Gilbert & Foster Construction Co.** of Santa Fe received a \$153,948 award for 5.5 mi. of grading and surfacing in Socorro County. **Skousen-Hise Contracting Co.** of Albuquerque received a \$1,042,659 award for 5.1 mi. of grading and surfacing on US 66 in Valencia County. **Wylie Paving Co.** of Albuquerque received a \$175,639 award for 7.7 mi. of grading and paving near Albuquerque. **Wylie Bros. Contracting Co.** of Albuquerque received a \$332,868 award for 31.8 mi. grading and surfacing in Lea County.

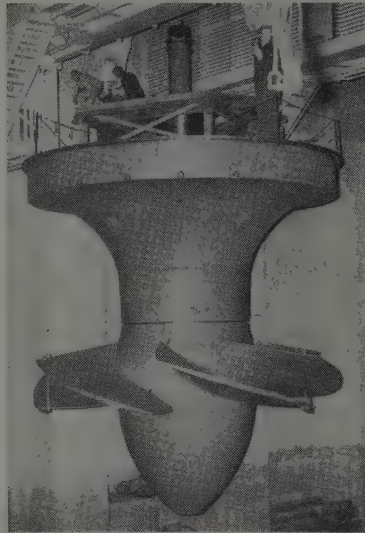
OREGON

CONGRESS has appropriated \$4,133,000 for construction of a major air force base at Klamath Falls. The original schedule called for a possible start of runway work this fall but weather may delay the beginning until spring. Preliminary engineering on the site has been completed.

BRIDGE NEAR McNARY—Erection of the steel superstructure for a new highway bridge across the Columbia River connecting Umatilla, Ore., and Plymouth, Wash., is moving ahead on schedule after a delayed start due to high water. The 3,400-ft. toll bridge will contain 3,500 tons of structural steel and will connect U.S. Highway Route 730 and Washington State Highway Route 8, presently joined by ferry boat service. The construction design of the new crossing is a double cantilever with two 600-ft. center spans, with girder type approach spans. Consulting engineer on the project is Tudor Engineering Co.

McNary rotors—largest ever

THE HYDRO-GENERATORS at McNary Dam, like the one shown here, are the largest pieces of rotating electrical equipment in physical size ever made. Each is 52 ft. in diameter and weighs 1,200 tons. The



70,000-kw. units were designed by General Electric Co. to specifications prepared by the Corps of Engineers. The thrust bearing will carry over 4,000,000 lb. This represents a 33% increase over the bearings at Bonneville Dam, previously the largest in the world.

Each of the McNary generators will revolve at a speed of 85.7 rpm., a comparatively slow speed made necessary by the large quantities of water available to turn the turbines, and the low head. By 1956 12 of the generators will be producing power.

Construction on the dam was started in 1947 and completed last winter when the 61-mi. long reservoir was filled. Overall cost was \$286,000,000. Fish passages alone cost \$22,491,000.

RECENT MAJOR CONTRACT AWARDS and low bids in Oregon include a \$157,410 award to **Hamilton & Thoms** of Eugene for construction of four viaducts over the Portland-Salem Expressway in Marion County. **Lee Hoffman** of Beaverton received a \$172,921 award for construction of a bridge and approaches north of Portland. **Roy L. Houck & Son** of Salem received a \$341,441 award for grading and paving near Salem. **R. A. Heintz Construction Co.** of Portland submitted a low bid of \$849,861 for construction of 6 mi. of Union Pacific RR and 5.4 mi. of US 30 at The Dalles Dam Project in Sherman County. **Kuckenberg Construction Co.** of Portland received a \$620,567 award for 2.3 mi. of grading and

oiling on the Pacific highway north from Myrtle Creek in Douglas County.

Tom Lillebo of Reedsport received a \$153,472 award for construction of six reinforced concrete structures on a new alignment of Pacific highway in Lane County. **J. Ira McNutt** submitted a low bid of \$432,000 for producing and stockpiling railroad ballast material for construction of the relocated Union Pacific RR near The Dalles. **Warren Northwest, Inc.**, of Portland received a \$208,205 award for 14 mi. of paving in Klamath County. **Porter W. Yett** of Portland received a \$294,286 award for 2.9 mi. grading and paving in Washington County.

UTAH

NEW PLANT FOR PROVO—Consolidated Western Steel Division of United States Steel Corp. announced it will construct a steel pipe manufacturing plant near Provo. The new mill, which is expected to have an employment roll of more than 200 when production begins next spring, will have about five acres under roof. The steel frame and corrugated sheet building will be fabricated and erected by Consolidated Western.

WORK ON WIDENING the Beck Street section of U.S. 89 and 91 between the Victory Road intersection and Beck's Hot Springs, a 1.7-mi. project, is nearing completion. The present four-lane road is being widened to six, with a buttressed neutral zone. Workmen have started to lay the 6-in. concrete base, after which they will pour an additional 3 in. of cover. **Gibbons & Reed Co.** has the \$365,000 contract.

CANAL SAFETY DEVICE—A new escape device to be used in the Gateway Canal of the Weber reclamation project in Utah is expected to make it one of the nation's safest large canals. At each of the canal's 7 siphons will be broad, low steps beginning below the water surface and extending the full width of the canal. If men or animals fall into the 8-ft. deep, 35-ft. wide canal and float for only a few minutes on the fast-moving water, they will be washed to safety on the concrete, open steps. This safety innovation is in addition to the usual fencing and escape ladders. **Morrison-Knudson Co.** holds the \$1,948,822 contract for construction of the canal, wasteway, and power plant headworks.

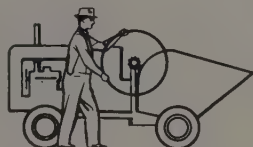
RECENT MAJOR CONTRACT AWARDS and low bids in Utah include a low bid of \$2,360,370 submitted by **Jacobson Construction Co.** of Salt Lake City for construction of a hangar and related utilities. **Morrison-Knudsen Co., Inc.**, of Boise submitted a low bid of \$1,948,812 for

where
CONCRETE

must be
**HIGH in
STRENGTH**

**LOW in
WEIGHT**

Specify



BASALITE **Expanded Shale Aggregate**

BASALITE "rounded particle" surface sealed Expanded Shale Aggregate is being used in the manufacture of lightweight concrete for the "10-inch pour" floor of the Richmond-San Rafael Bridge, San Francisco Bay.

On this job—as on all other jobs requiring lightweight concrete—**BASALITE Aggregate** will make possible concrete weighing 40 to 50 pounds less PCF than conventional concrete of comparable strength. Less structural and reinforcing steel and cement will be required to obtain a high-strength mix. Curing shrinkage will be held to a minimum because **BASALITE Aggregate** is chemically inert, with low absorption . . . resultant low volume change. Placement characteristics will prove excellent because of the Aggregate's spherical shape and lack of voids that permit full utilization of cement paste.

Design "lightweight strength" into all structural concrete construction with BASALITE Expanded Shale Aggregate

● Construction scene on partially completed Richmond-San Rafael Bay Bridge, San Francisco Bay. **BASALITE Expanded Shale Aggregate** was specified to provide lightweight, high strength "10-inch pour" concrete roadbed.



ROUNDED EXPANDED
SHALE AGGREGATE

Specify New **BASALITE** *Throughout*

BASALT ROCK COMPANY, INC.
Wapa, California

Write for all the facts. Today!

LIGHTER • STRONGER • BETTER

Top notch efficiency in *DEEP DOWN SPOT DIGGING...*



Tangible, valuable features contribute to the exceptional trench excavating of

OWEN BUCKETS

Basic features include: *correctly designed shells* for easy penetration and

discharge—removable counterweights to help force the shell into material and the block and tackle principle of multiplying closing power.

Others are *low headroom* that makes handling easy—*low center of gravity* that aids in placing the bucket when below the line of vision and *side cutters* which cut clearance for the bucket and aid in maintaining parallel trench walls.



"A mouthful at every bite"

**BUCKETS
AND
GRAPPLES**
Write for Catalog

THE OWEN BUCKET CO.

6060 Breakwater Avenue • Cleveland, Ohio

Branches: New York, Philadelphia, Chicago, Berkeley, Calif., Fort Lauderdale, Fla.

earthwork, concrete lining, and structures on Gateway Canal of the Weber Basin Project.

WASHINGTON

COWLITZ BONDS APPROVED

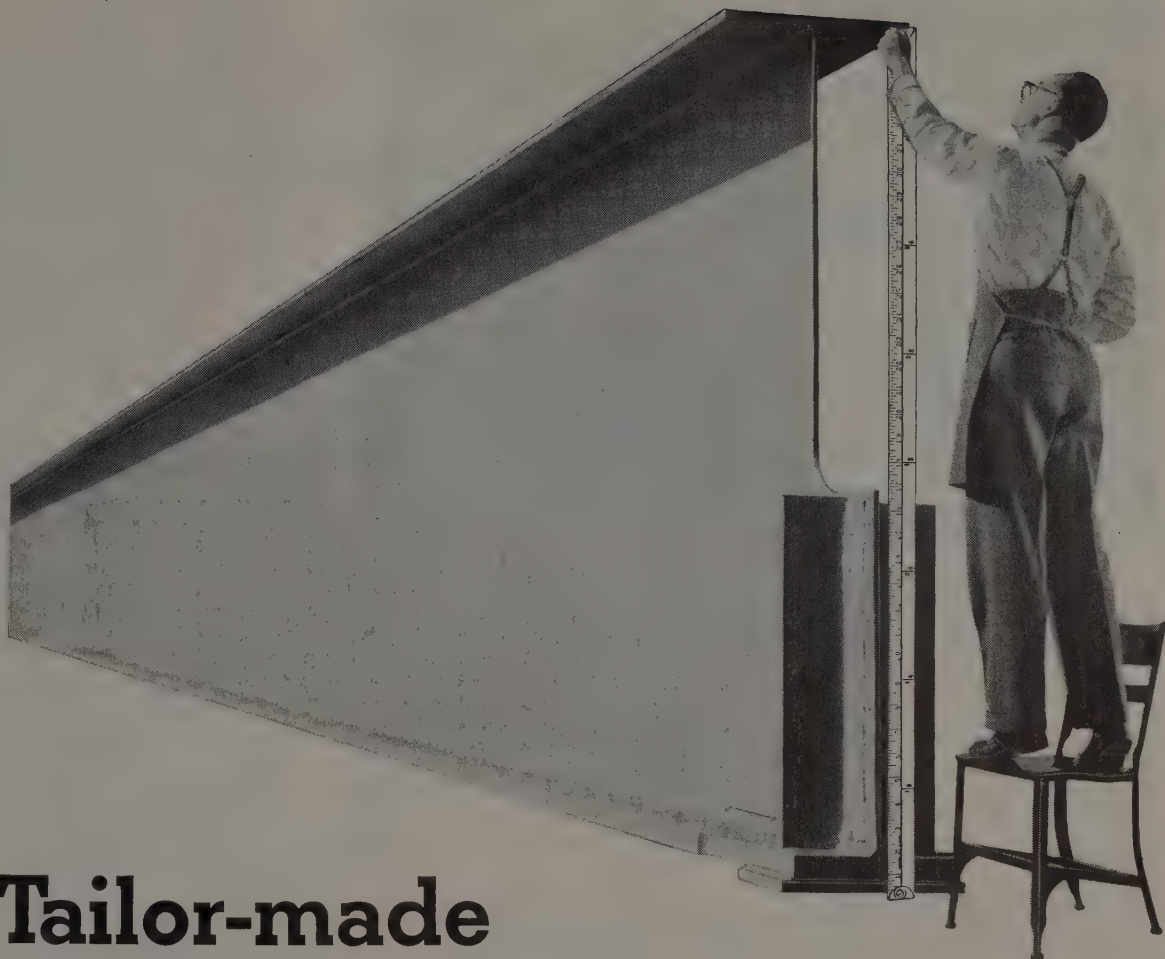
—The Tacoma City Council passed three ordinances providing for a \$146,000,000 bond issue to cover construction of two dams on the Cowlitz River for Tacoma City Light. Combined output of the powerhouses will be 474,000 hp. with provisions for a future installation of an additional 158,000 hp.

SPOKANE SPAN—The proposed Maple St. toll bridge in Spokane could be constructed for \$4,610,000 with 3,367,000 vehicles using the span during its first year of operation. That was the estimate included in a report presented to the city council by Tudor Engineering Co. The quoted cost includes right-of-way, engineering administration, legal expenses and other contingencies, but no financing costs. A period of nine months to a year would be required to prepare contract plans and specifications and the awarding of contracts. Construction would not exceed two years.

HYDRO PERMIT—The power commission granted a three-year preliminary permit to public utility district No. 1 of Douglas County for a proposed hydro-electric development at the Wells site on the Columbia River. The project would include a concrete dam and a powerhouse with an initial capacity of 392,000 kilowatts. A preliminary permit is issued for the sole purpose of authorizing priority. It does not authorize construction.

BIG HOUSING PROJECT—The first project under the new defense department program to improve conditions at military installations will be a \$10,000,000, 800-family housing unit at Fort Lewis. The Seattle firm of Durham, Anderson & Friede has been chosen architect-engineer for the planning and design of the project. It will take an estimated 18 months to build the 800 units. The Seattle district of the Army Corps of Engineers will advertise for bids about December 30.

CHIEF JOSEPH NEAR END—Mass placement of concrete in Chief Joseph dam is now in the home-stretch with less than 40,000 cu. yd. remaining to go into the 981,000 cu. yd. structure. The last seven crest gates atop the dam were scheduled to go into place in early November. The final concrete pour is slated for mid-December.



Tailor-made

Today, Kaiser Steel plates are being welded together to form structural beams—*tailor-made* to fit exacting designs.

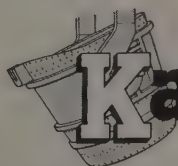
This is a dramatic advance over the old method of tailoring the designs to fit the size ranges of ordinary structural steel.

This new method means: 1) up to 20% less structural weight; 2) substantial dollar savings.

In the West . . . more and more girders built up from

Kaiser Steel plates are being used where larger-than-average structurals can improve construction, including major units of the multi-million dollar construction program currently underway through the California Department of Public Works.

Because of our nearby location, western builders are assured of fast delivery. Also, close at hand, our experienced technical and metallurgical staffs are always ready to give personal attention to your problems.



Kaiser Steel

built to serve the West

PROMPT, DEPENDABLE DELIVERY AT COMPETITIVE PRICES • plates • continuous weld pipe • electric weld pipe • tinplate • hot rolled strip • hot rolled sheet alloy bars • carbon bars • structural shapes • cold rolled strip • special bar sections • semi-finished steels • pig iron • ingot molds • coke oven by-products
For details and specifications, write: KAISER STEEL CORPORATION, LOS ANGELES, OAKLAND, SEATTLE, PORTLAND, DENVER, TULSA, NEW YORK



SPOKANE COLISEUM NEARS COMPLETION

Roof girders like this one in Spokane's \$2,500,000 coliseum span 125 ft. Plans for the structure, largest civic auditorium in the Pacific Northwest, specified 470 tons of concrete reinforcing steel. Public opening is slated for this month.

HYDRO STUDY ROLLING —

Minneapolis Aerial Mapping Co. has begun aerial studies of the three dam sites in the proposed 145,000 kilowatt Wenatchee River-Chiwawa project. Stone & Webster are busy on cost estimates, water flow calculations and load studies for the development, which involves storing water on the Wenatchee and Chiwawa rivers and running the flow into the Chumstick through a 6-mi. tunnel. Power would be produced at all three locations. The investigations are for the purpose of determining the feasibility of the project.

BUGGE SETS TARGET —

State Highway Director William A. Bugge named 1955 as the target date for completion of the \$56,250,000 reconstruction job on U.S. Highway 99. He also said that the \$8,250,000 improvement project on Snoqualmie Pass would be finished in 1955. Wet weather had been an obstacle to construction this year, particularly on Highway 99, where in some sections 1/3 to 1/2 of construction time was lost because of adverse weather.

RECENT MAJOR CONTRACT

AWARDS and low bids in Washington include an award of \$5,514,000 to Drake & Fuller of Portland for construction of B-52 structures at Mose Lake. Peter Kiewit Sons' Co. of Longview received a \$1,328,367 award for construction of the Skagit River Bridge north of Mt. Vernon in Skagit County. Materne Bros. of Spokane received a \$165,487 award for 15.6 mi. of surfacing in Chelan National Forest. J. A. Terteling & Sons

of Auburn received a \$554,406 award for 18 mi. of surfacing on the Stevens Canyon Highway in Mt. Rainier National Park. C. E. Youngdahl & Co. of Portland received a \$1,478,000 award for construction of school buildings in Vancouver.

WYOMING

CITIES SEEK DAM HEAD-QUARTERS —

Three southeast Wyoming towns, Douglas, Torrington, and Guernsey, have shown interest in obtaining the headquarters for workers on the \$50,000,000 Glendoe dam. More than 300 families would move into the selected area for a period of six years while the project is under construction. Work is to begin in December.

RECENT MAJOR CONTRACT

AWARDS and low bids in Wyoming include a low bid of \$243,785 submitted by Sharrock & Pursel of Casper for construction of earthwork and structures on the Eden Project.

ALASKA

SCHOOLS LEAD ALLOTMENTS

Schools lead in importance in allotment of Federal funds from the 1955 budget with 11 projects to cost \$5,768,300, including a \$2,000,000 high school building in Juneau. Public utilities are next with \$2,831,250. All public bodies concerned with the

projects will reimburse the government for 50% of the cost.

RECENT MAJOR CONTRACT

AWARDS and low bids in Alaska include an award of \$1,161,930 to S. S. Mullen, Inc., of Seattle for construction of barracks and messhalls at Ladd AFB. Pacific Alaska Contractors, Inc., of Tacoma received a \$969,519 award for construction of roads, streets and ammo storage facilities at Whittier and another award of \$696,517 for grading and paving for family quarters near Anchorage. Stock & Grove, Inc., of Anchorage received an award of \$244,680 for 2.4 mi. of roadwork on the Mitkof Highway.

Here and There

MEMBERS OF ASSOCIATED

General Contractors feel that universal use of their new subcontract form will greatly reduce bid peddling practices that have hurt the profession. The one page form is largely the result of requests for Congressional action to further regulate contractors' operations. The following code of ethics is printed on the back of each form:

"The operations of the contractor are made possible through the functioning of those agencies which furnish him with service or products, and in contracting with them he is rightfully obligated by the same principles of honor and fair dealing that he desires should govern the actions toward himself of architects, engineers, and client owners.

"Ethical conduct with respect to sub-contractors and those who supply materials requires that:

1. Proposals should not be invited from anyone who is known to be unqualified to perform the proposed work or to render the proper service.

2. The figures of one competitor should not be made known to another before the award of the subcontract, nor should they be used by the contractor to secure a lower proposal from another bidder.

3. The contract should preferably be awarded to the lowest bidder if he is qualified to perform the contract, but if the award is made to another bidder it should be at the amount of the latter's bid.

4. In no case should the low bidder be led to believe that a lower bid than his has been received.

5. When the contractor has been paid by a client owner for work or material, he should make payment promptly, and in just proportion, to subcontractors and others."

Forms can be obtained at the AGC office, 217 Benjamin Franklin Hotel, Seattle 1, Washington.

Hardfacing

Check the
**COMPLETE
VICTOR
LINE**

VICTOR hardfacing
alloys save you time and
money with faster
application,
smoother deposits,
longer wear!

See your
VICTOR dealer now
... get the facts,
and you'll get VICTOR!

VICTOR
for welding

Profitable dealerships
open; inquire now!

VICTOR EQUIPMENT COMPANY
ALLOY ROD AND METAL DIVISION
11440 So. Alameda St. • Los Angeles 59

For Manual Application

THIS HARD- FACING ROD	FOR THESE CONDITIONS	FOR THIS EQUIPMENT	APPLI- CATION
VICTORTUBE	Severe abrasion	Scarifier teeth, dredge cutter blades, posthole augers, oil field tools, ditcher teeth	Acety. AC-DC Elec.
VICTORTUBE "SPECIAL"	Abrasion, severe impact	Oilfield bits, rock bits	Acety. only
VICTOR TUNGSMOOTH	Thin cutting edges	Coal cutters, brick augers, pug mill knives, screw conveyors, farm tools	Acety. AC-DC Elec.
VICTORITE	Earth abrasion or sliding friction	Plowshares, cultivators, steel mill guides, cement chutes, shaft bearings, rolling mill guides	Acety. AC-DC Elec.
TUBE VICTORITE	Abrasion, impact	Plow points and farm tools	Acety. AC-DC Elec.
VICTORITE 1	Corrosion, heat, abrasion	Saw teeth, carbon scrapers, wire guides, rocker arms, steel mill applications	Acety. AC-DC Elec.
VICTORITE 6	Red heat, impact, corrosion and abrasion	Blanking, forming and trimming dies, cams, hot punches, pump shafts	Acety. AC-DC Elec.
VICTORITE 12	Heat, abrasion, impact	Saw blade inserts and other critical applications	Acety. AC-DC Elec.
VICTORITE CARBON ARC	High abrasion, thin deposit	Plowshares, lister shares, sweeps	Carb. arc Acety.
VICTORALLOY	Abrasion, severe impact	Tractor rollers, dredge pump impellers, bucket lips and teeth, rock crushers, steel mill wobblers, roll crushers	Acety. AC-DC Elec.
VICTORALLOY #1	High abrasion, medium impact	Bucket lips, rock crushers, Muller tires, gyratories	Acety. AC-DC Elec.
VICTORALLOY "A"	Angular shock, extreme impact, build-up	Clutch parts, gears, crusher plates, gyratory mantles, build-up for hardfacing	AC-DC Elec. only
VICTORALLOY "B"	Heavy impact, moderate abrasion	Tractor rollers and sprockets, shovel pads, plates, idlers, etc.	AC-DC Elec. only
VICTORALLOY "C"	High abrasion, moderate shock and impact	Tractor grousers, pressure rolls, crusher segments, roll crusher teeth	AC-DC Elec. only

Also VICTOR Bulk Metals, VICTORITE Plow Point Bars, and VICTOR Super-Titan Blasting Nozzles

For Automatic Application

THIS TYPE	FOR THESE CONDITIONS	ON THIS KIND OF EQUIPMENT
VA #1	Abrasion, medium impact	Crusher rolls, crushers, gyratory crushers
VA #2	Abrasion, impact, Multi-pass application	Steel mill applications
VA #3	Abrasion, light impact	Mill guides, crushers, dredge bushings
VA #4	Multiple layer build-up	Tractor rails, crane wheels, general build-up
VA #5	Heavy impact, abrasion	Tractor rollers, idlers, mine car wheels, sheave wheels
VA #6	Medium abrasion, high impact	Crane wheels, drums, roll necks
VA #7	Abrasion, high impact	Build-up for hardfacing
VA #8	Abrasion, medium impact	Dozer bits, roll crushers, scraper blades
VT #60	Extreme abrasion	Tool joints, grader blades, scraper blades, augers

(Also Mfrs. of welding & cutting equipment, blasting nozzles)
844 Folsom St., San Francisco 7 3821 Santa Fe Ave., Los Angeles 58

H-11

ALASKA Newsletter

By CLIFFORD S. CERNICK, Anchorage

BIG FREEZE-UP LOOMS—Alaska's construction season has by now virtually reached its close for 1954. The few projects still at peak construction are being rushed to that stage of production which will allow workers to proceed with inside duties. As the first breath of winter is felt in northern construction camps there is a general slowing down in the tempo of activity. Contractors in the Anchorage area report that, although most of their jobs still are proceeding, there have been some layoffs because of the onset of winter weather. It will be only a little more than a month before sub-zero temperatures, bitterly cold winds, and supply difficulties bring most outside construction activities to a complete standstill. Construction workers, like Alaskan geese, are making the southward pilgrimage. Airlines report southbound planes are jammed and northward planes all but empty. The months ahead in Alaska, until next spring comes to the northland, will be again, as far as the construction industry is concerned, months of planning and preparation rather than months of large scale progress on actual construction.

DREAM DAM—The dream of a huge dam on the Copper river seems a step nearer reality with the announcement that the Portland, Oregon, firm of Ivan Bloch and Associates is making a study of the site for the dam at Wood Canyon. The Federal Power Commission recently issued a temporary permit to the Harvey Aluminum Co. of Torrance, California, in connection with that site. The industrial consultant firm is making arrangements for stream gauging, silt investigations, and core drilling on the proposed dam site which is located 85 mi. up-river from Cordova. The proposed 560-ft. dam would, according to preliminary estimates, produce 1,475,000 hp. of energy for electro-chemical and electro-metallurgical plants at Cordova or Valdez.

FIFTY MILLION DOLLAR POSSIBILITY—A suggestion that the Territory of Alaska launch a fifty million dollar public works program of its own has been made by an Anchorage business leader. Jack White, a real estate executive and city councilman, believes that Alaska should embark on a large-scale program of road development, school construction, and hydro-electric power development. He envisioned that this development program would take place

on a 30-yr. basis and would be financed by means of bonds issued by the territory. The suggestion is an outgrowth of a mounting feeling among Alaskan leaders that too much reliance has been placed in the past on government appropriations for construction work and too little on ways in which Alaskans could finance projects they urgently need.

CONSTRUCTION CASUALTIES

—An example of the unexpected kind of delays some types of construction encounter in Alaska is the earthquake which rocked the Anchorage area early in October. While this quake did not cause a great deal of damage, it nevertheless put completed construction to a rigid test of stability. For example, two 14-story buildings in the Anchorage area were severely jolted by the quake but there was no damage beyond a few cracks in the outer walls. The ability of these structures to withstand earthquakes was laid to sound engineering. However, Mother Nature was not so kind to one section of the Alaska Railroad. The earth heaved violently, then dropped from under about 140 ft. of railroad track, leaving the rails suspended over a crater between 15 and 20 ft. deep. Five bulldozers were sent in to fill the area with heavy rocks and earth and within 20 hr. service was restored.

WILDERNESS PAVING PROJECT

—In the shadow of some of Alaska's most spectacular glaciers at the army port of Whittier, a contractor will soon be paving roads, streets, and walks only a stone's throw from rugged wilderness where bears roam and wolves howl. The contract was recently awarded by the Alaska District Engineer to Pacific Alaska Contractors, Inc. of Tacoma, Washington. That organization, working under a \$969,519 contract, is providing paving to serve Alaska's unique wilderness skyscrapers, the multi-story housing projects constructed by the military at Whittier where level land is at a premium. Work on the housing portion of the Whittier project is now well under way. Deadline on the paving project is October 1, 1955. This will require stepped-up construction from the first spring breakup throughout next spring and summer.

ALASKAN INNOVATION—Alaska's first prestressed concrete bridge, and the first bridge to be completed on the new Copper River Highway,

has been turned over to the Bureau of Public Roads by the contractor, M. P. Munter Co. of Seattle. The 255-ft. bridge is composed of one 45-ft. span and seven 36-ft. spans. Its approaches are 2,000 ft. long and made up of two 14-ft. traffic lanes. According to Richard Ellis, Bureau of Public Roads engineer, this type of construction is ideal for Alaska, cutting costs, simplifying construction, and making a more durable structure.

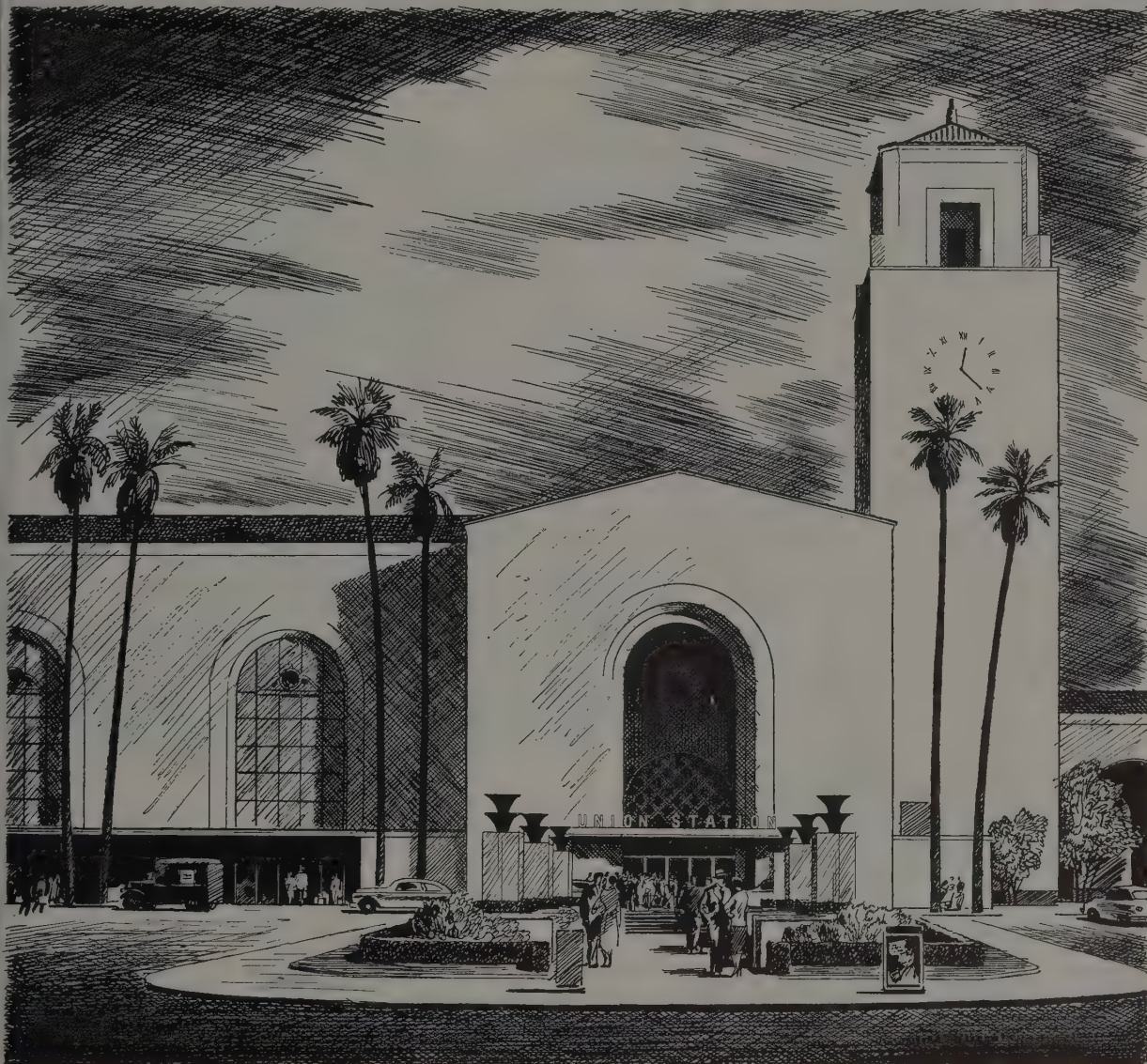
ROAD INSPECTION—The Territory's Highway Engineer, Irving Reed, recently completed a seven week's inspection trip of the entire Alaska Road Commission's work. He reported that the biggest road project under way is a secondary highway on the Seward Peninsula out of the historic gold mining town of Nome. This road eventually will connect with the main Alaska Highway System. Reed also checked progress on roads in the Anchorage, Cordova, Nenana, Seldovia and Fairbanks areas.

END OF HOUSING SHORTAGE

—Convincing proof that the housing shortage in the Anchorage area has been whipped, at least for the time being, is contained in the announcement by the government that seven public housing projects in the Anchorage area will be sold by Uncle Sam. The projects, comprising more than 200 units, were built during a period of severe shortage of living quarters during the post-war years. That shortage has by now been alleviated by construction of thousands of new home units by private contractors. Uncle Sam has given the situation the once-over and decided to unload all of his housing holdings. The reason the government gives for disposing of its low rental housing projects is a significant one for housing contractors. That reason is: there is no further need at this time for government subsidized housing and the pinch is over.

BIG MUD DAM—Refrigerated mud may be used to build many of Alaska's future dams. According to Oliver C. Riggs of Chugiak Electric Association, Alaskan construction men are beginning to study the idea seriously. Several mud dams exist in the Territory now, the largest of which is located near a large nickel mine at Livengood. Riggs believes these dams can be built to save money and the cost of importing materials. He added that when the temperature rises too high, mud dams could be equipped with a series of set coils constituting a regular refrigeration cycle. For this process ammonia would be boiled out of the tubes, pulled into special compartments and reduced to liquid form to start the cycle again.

UNITED STATES STEEL AT WORK IN THE WEST—the distinctive Los Angeles Union Passenger Terminal



TEEMING TERMINAL . . . with a framework of steel!

Sixty-eight trains a day begin or end a journey here, carrying more than one million passengers every year.

Completed in 1939, the Los Angeles Union Passenger Terminal combines both beauty of design and the ultimate in operating efficiency. Structural steel, rails, and reinforcing bars went into its construction . . . and a major share came from the mills of United States Steel.

Yesterday, Today, and Tomorrow—Columbia-Geneva has for years helped to fill the steel needs of the West. We hope that when you need steel, you'll continue to look first to Columbia-Geneva, Western producing member of the industrial family that serves the nation—United States Steel.

West's Largest Steel Producer

United States Steel Corporation • Columbia-Geneva Steel Division

SAN FRANCISCO • LOS ANGELES • PORTLAND • SEATTLE • SALT LAKE CITY • DENVER



UNITED STATES STEEL

ENGINEERS

on the move

Col. H. George Gerdes (USA, Ret.) has been appointed power engineer for Kaiser Engineers, assigned to the company's hydroelectric development program. With more than 20 years' experience as a civil and military engineer, Colonel Gerdes during the 1930s was engineer in charge of design on the Bonneville Dam.

* * *

Recently chosen to serve on President Eisenhower's five-man advisory committee for his fifty billion dollar, 10-year national highway plan are **Stephen D. Bechtel**, president of the Bechtel Corporation, engineers-constructors of San Francisco, and **William A. Roberts**, president of Allis-Chalmers Manufacturing Co., a past vice president of the American Road Builders' Association.

* * *

George E. Lang has been appointed state highway engineer for Arizona, succeeding **R. D. Canfield**, who died in an automobile crash in early August, less than a month after he was chosen to succeed **R. C. Perkins**, deceased. **Angus L. Chadwick** was named district engineer of District 1, Lang's former post.

* * *

Robert F. Herdman has retired from the Bureau of Reclamation service at Denver, Colo., but intends to remain active in his profession, probably at an overseas location. Herdman served the Bureau for 24 years, the last two on an assignment



Ralph F. Herdman

in Lebanon. At one time he was office engineer for construction of Black Canyon Dam in Idaho, and resident engineer on Bartlett Dam in Arizona.

* * *

Howard C. Elmore, assistant Northwest area manager in Wenatchee, Wash., for the Bonneville Power Administration, recently resigned to accept a post as engineer for the Chelan County Public Utility District. He will handle all elements

relating to the Rock Island generation plant operation in connection with the Northwest power pool, inter-company pool, and Puget Sound Power & Light Co.

* * *

New national president of the American Society of Civil Engineers is **William R. Glidden** of Richmond, Va. Among the six new directors chosen is **Lawrence A. Elsener**, vice president of the Chicago Bridge & Iron Co., San Francisco.

* * *

Robert H. Griffin, formerly an engineer with the Federal Power Commission, who made his home in Oakland, Calif., has moved to Massena, N. Y., where he is on the staff of the St. Lawrence River Joint Board of Engineers.

* * *

George M. Williams, Bureau of Public Roads, is located in Washington, D. C., where he is assistant to the deputy commissioner. His post as division engineer in Denver is filled by **Karl Chamberlain**, as recently announced in these columns.

* * *

Ralph A. Hoffman, a member of the Arizona Highway Department for nearly 35 years, recently left the department. Since 1923, he had been bridge engineer, in charge of planning and construction supervision of all bridges and dams built by the state. Hoffman has joined with **Lloyd Miller**, another former member of the bridge engineering division, to engage in private engineering practice. Offices of the new engineering firm are in the New Post Office Building, 13th St. and McDowell Rd., Phoenix.

* * *

Personnel of Tudor Engineering Co. on erection of a bridge over the Columbia River at Umatilla, Ore., just below McNary Dam, are **Oral Conyers**, resident engineer; **Clyde Barrett**, chief inspector; and **Wally Simms**, "Hank" Callaway and **Ray Conyers**, inspectors. American Bridge Division of U. S. Steel received the contract for the construction from Umatilla County. **C. O. (Slim) Edmonds**, is superintending and **D. G. Engelhorn** is field engineer, under the general direction of **E. E. McKeen**, erecting manager in the San Francisco office of American Bridge.

* * *

Boyd Walter recently transferred from the Palisades project to take over supervision of the new office be-

ing set up at American Falls, Idaho, by the Bureau of Reclamation, in connection with planning and preparation of design for Michaud Flats project in southeastern Idaho. Construction of the Michaud project will provide irrigation water for some 11,035 ac. of land.

* * *

Walter de Berard, senior engineering aide, with more than 25 years of service with the county of San Diego (Calif.) and the Harbor Engineering Department, recently retired.

* * *

E. J. White, district engineer for the Alaska Road Commission at Anchorage, Alaska, has been replaced by **B. D. Stewart, Jr.**, of Juneau.

* * *

Dave Sontag is resident engineer for the Long Beach (Calif.) harbor department on the Ninth St. bridge under contract to the Macco Construction Co.

* * *

L. R. Richards, project engineer, is field engineer on a contract recently awarded by the New Mexico State Highway Department on a low bid of \$1,042,659 from Skousen-Hise Contracting Co. for a grading and draining job on US 66. This 5.16-mi. stretch, besides grading and drainage, includes four concrete and steel bridges, one 21.5-lin. ft. culvert, hot plant surfacing and miscellaneous construction. Assistant construction engineer for the state in that area is **J. J. Plese**, Albuquerque.

R. E. Miller is construction engineer for New Mexico and is in overall charge of this project as well as others in the state. **N. R. Sack**, assistant construction engineer for the entire state on structures, will probably be prominently identified with this contract since it has many major structures.

Charles A. McMahon, construction superintendent and engineer, is teaching a special six-week course in Management, Organization, and Supervision of Construction Projects at the University of California at Los Angeles. The course includes lectures on advantages of different types of contracts, estimating, budgets, financing, practical labor relations, specifications, job scheduling, records, organization, subcontractors, jobsite plant set-up, supervision and final inspection. The fee for the 15-hour course is \$12.00.

McMahon has supervised over \$150,000,000 worth of construction, including such projects as the new Anheuser-Busch Brewery, the underground Pershing Square Garage, and the Parklambra Tower apartment buildings in Los Angeles.

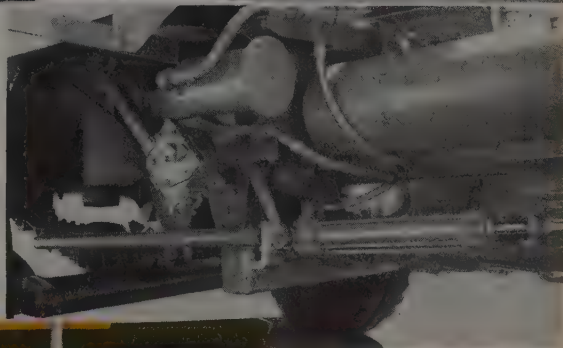
ON THE JOB **ALL** WAYS!



MANEUVERABILITY Tight turning radius, wide-axle track and power steering assure Kenworth 801 owners easier handling, greater safety, less driver fatigue.

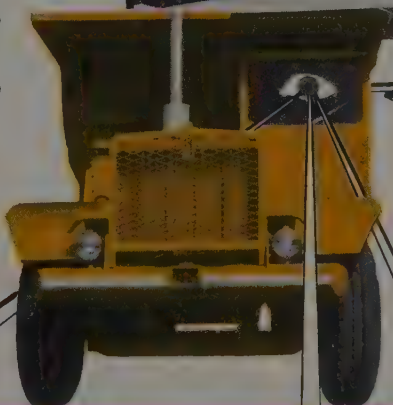
CAPACITY Pay load is 36,000 lbs. Body capacity struck measure is 12 cu. yds. Heaped load is 14 yds. (3 to 1).

DEPENDABILITY The Kenworth 801 is built strong where the strain comes, with variable section frame and all-welded steel body braced with longitudinal reinforcements. Spring mounted, this heavy-duty dump truck is engineered throughout for over capacity.



801

**HEAVY-DUTY
END-DUMP**



Power steering means control of the Kenworth 801 is sure and easy—loaded or unloaded—on any terrain. Ends road shock. Also, note rugged 25,000-pound capacity front axle—really big

Unique chassis design of the Kenworth 801 give driver unequalled vision fore and aft, and on both sides. Safer to operate



KENWORTH

TRUCKS ★ BUSES

REDUCE BLADE WEAR AND BREAKAGE ON TOUGH, ROCKY JOBS...



Like all ESCO blades, this sectional ESCO Dozer Blade is cast of special work-hardening manganese steel.

ESCO Cast Blades Often Outlast 5 or More Rolled Steel Blades

The shock and pounding of rough work develops an extremely hard wear-resistant surface on ESCO Blades —because they are *cast* of special *work-hardening* manganese steel.

Working an ESCO blade on dozers, graders or scrapers actually makes the surface more wear resistant. Yet the blade core retains high impact toughness regardless of age or usage. That's why on tough, rocky jobs ESCO Cast Blades reduce blade breakage—regardless of work speed—and give far longer life than any rolled steel blade. ESCO Cast Blades often outlast five or more rolled steel blades. Result: Less downtime for repair, lower blade replacement cost—a definite increase in productive hours per dollar invested.

ESCO Blades fit all popular makes of dozers, angle-dozers, graders and scrapers. If you want to cut *your* operating costs, use ESCO Work-Hardening Cast Manganese Blades on your toughest jobs. For details, see your nearest ESCO dealer, or write direct.

ESCO

ELECTRIC STEEL FOUNDRY CO.

2144 N. W. 25th AVENUE, PORTLAND 10, OREGON

712 PORTER ST., DANVILLE, ILL.

Offices and Warehouses: Honolulu, Hawaii; Houston, Texas; New York, New York; Los Angeles, San Francisco, California; Seattle, Spokane, Washington; Centralia, Pennsylvania; Eugene, Oregon; Salt Lake City, Utah. In Canada: Vancouver, British Columbia, and Toronto, Ontario.

DEATHS

Earle C. Earle, 66, chief engineer of the Los Angeles Harbor Department, died Sept. 30 at Santa Barbara, Calif., after an illness of several months. He was a member of the department since 1926 and under his direction more than \$50,000,000 of harbor development work was accomplished.

* * *

Howard E. Robbins, 58, a regional director of the Bureau of Reclamation, died Sept. 12. He had been with the Bureau, chiefly as a construction engineer, for the past 35 years, and had been director of Region 5, with headquarters at Amarillo, Tex., since 1947.

* * *

J. Hamp Morgan, assistant construction engineer, with the New Mexico State Highway Department for over 15 years, was killed in Deming in an automobile accident.

* * *

Arthur Ruettggers, 65, former head of the Bureau of Reclamation's Denver laboratories and known for his pioneering work in concrete control techniques, died in Denver Aug. 8 after a long illness. He directed the Denver laboratories through the period of study for such famous structures as Hoover and Grand Coulee dams.

* * *

Denman K. Gemunder, 64, engineer of Salem, Ore., died recently. He had conducted his own engineering business for 20 years, prior to which he was with the Bureau of Public Roads and with the Bureau of Rivers and Harbors.

* * *

Floyd L. Owens died in a Reno, Nev., hospital recently. He owned and operated a contracting business at Sparks for many years.

* * *

Arthur T. Green, foreman of the Nevada State Highway Department, died at his home in Lovelock recently.

CALENDAR

Nov. 4-6—Associated Equipment Distributors, joint-meeting of Regions 11, 12 and 14, Broadmoor Hotel, Colorado Springs, Colorado.
Nov. 9-11—American Association of State Highway Officials, annual meeting, Olympic Hotel, Seattle, Washington.
Jan. 10-13—American Road Builders' Association, annual meeting at Roosevelt Hotel, New Orleans, La.
Jan. 23-28—Associated Equipment Distributors, annual meeting, Conrad Hilton Hotel, Chicago.
Feb. 7-9—Association of Asphalt Paving Technologists, annual meeting, Jung Hotel, New Orleans.

NEW CASE "50" Powerloader

**with 65 h.p.
Diesel Engine
Power Steering**

FAST BUCKET ACTION!



Here's a big new loader that moves more yards per day, trims time on every job. It's powered by the completely new 65 h.p. Case diesel engine. Has big tires front and rear for traction and flotation. Double-acting lift and bucket-control rams combine with a unique toggle action that provides automatic crowd. The result is heaping buckets, filled fast . . . and less spillage.

The "50" Powerloader carries a one yd. bucket that raises to clear 10½ feet in just 10 seconds. Bucket dumps in 3½ seconds . . . lowers in 4 . . . has a digging depth of 6 inches. Platform is roomy, safe, free of linkage and power lines. Seat adjusts fully for day-long comfort . . . and it's located in convenient reach of all controls. Visibility is exceptionally good. Hydraulic power steering makes handling exceptionally easy. J. I. Case Co., Racine, Wis.

Superior Equipment Co.	Phoenix, Ariz.
Reynolds Equipment Co.	Fresno, Calif.
Equipment Sales & Service	Sacramento, Calif.
Contractors Machinery Co.	San Francisco, Calif.
Electric Tool & Supply Co.	Los Angeles & San Bernardino, Calif.
Equipment Sales & Service	Stockton, Calif.
Hassard Equipment Co.	Chula Vista, Calif.
Liberty Truck & Parts Co.	Denver, Colo.
Starline Equipment Co.	Boise, Idaho
Jenkins & Albright	Reno, Nevada
Foulger Equipment Co.	Salt Lake City, Utah
Montana Powder & Equipment Co.	Helena and Billings, Mont.
Columbia Equipment Co.	Portland, Oregon
Star Machinery Co.	Seattle and Spokane, Wash.
Wortham Machinery Co.	Cheyenne, Casper, Rock Springs and Sheridan, Wyoming

SUPERVISING the jobs

Joseph Corrales is supervising the construction of an elementary school at Sunnyvale, Calif., a \$278,000 job recently awarded to George Bianci, contractor. Bill Pollard is assisting as carpenter foreman. Work is scheduled for completion by the end of the year. Bert L. Smith is representing the school department as inspector.

* * *

E. S. Roberson, superintendent, and Phil Mirenda and Frank Burroughs, carpenter foremen, are on a state highway job on Freeway 5, Los Gatos, Calif., a \$360,000 project recently awarded to Carl N. Swensen Co., Inc. "Bud" Pond is civil engineer, and Bob Colley is resident engineer for the State.

* * *

Walt Small is general superintendent for J. C. Pomeroy Co. on the construction of an addition to the American Can Co. building at San Francisco, to cost about \$2,500,000. Carpenter foremen are Oscar Bramblett and Harold Bulhman. Willis Green is labor foreman, and Marvin Lokkesmoe is detailer. The job office is in charge of Bob Lane. Construction is expected to be finished the middle of 1955.

* * *

A. G. Johnson, general superintendent, assisted by L. E. Olson, head the construction crew completing work on Macy's Department Store at Hillsdale, Calif., for Haas & Haynie, contractor. Working under J. Stone, carpenter superintendent, are

the following foremen: Peter Rudometkin, Joe Reyes, R. W. DeLucchi and Jack Sprague. C. A. McDonald, Ora McKeehan and S. M. Thomas are labor foremen, and Louis Marino is cement finisher foreman. Mike Sigretto is equipment superintendent. Timekeepers are Ralph Siler and Earl Runion. Ross Handy is field engineer.

* * *

Webster F. Mello is superintending a contract for Williams & Burrows, Inc., and Carl N. Swenson, Inc., a joint venture, building a residence hall at a cost of about \$2,000,000 at Santa Barbara for the University of California. Other key men on this work comprise T. R. Estrada, foreman; Joe Froelich, labor foreman; Dave Hunter, engineer, and O. Rudolph, superintendent on sewers. Job will probably end in mid-1955.

* * *

James Wilson, general superintendent; Henry Edwards, structural superintendent, and his assistant Ken Ormsberg, are among the top men supervising a \$2,500,000 highway job between Ventura and Santa Barbara, Calif., for McCammon-Wunderlich Co., which recently received the contract from the State. Other important men on the work are Ralph McCall, carpenter foreman, and Henry Edwards, master mechanic. Joseph Voyer is office manager, and Don Haney, timekeeper. George Dickey is resident engineer representing the highway department.

W. T. Miller, assistant project manager, and Ellis Bunn, crusher superintendent, are two top men for Morrison-Knudsen-J. A. Terteling & Sons on this joint venture firm's contract at Mountain Home AFB in Montana.

* * *

J. Perry Parker, project manager, and Albert C. Parker, general superintendent, head the construction crew working for H. Earl Parker on this contractor's \$644,340 award for 10 mi. of levee work on the west bank of the Feather River in Butte County, Calif. Other contractor men in key positions are: Lincoln F. Moffitt, master mechanic; and superintendents R. W. Higgins (structures); R. E. Mayfield (day); Clifton W. Cotter (night); and Sydney Murray (Tournapull). Job will soon be completed.

* * *

Marvin McCoy is general superintendent and R. E. Price is office engineer for Hindry Construction Co., contractor on a major earth moving job of 6,500,000 cu. yd. at the old



Price

McCoy

Mills Estate in San Mateo County, Calif. The combination of these two men brings together many years of experience to make it a smooth running operation.

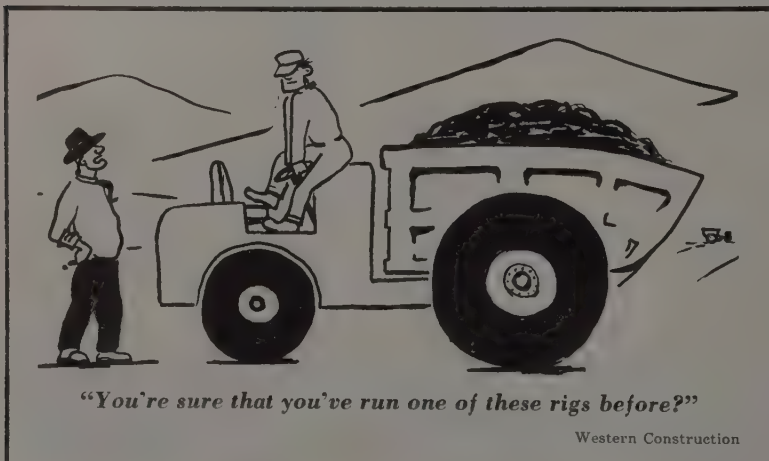
* * *

Ray Anderson, superintendent, and his assistants Harry Hall and Vic Apted; John Hart, project engineer; and J. B. Allen, purchasing agent, are among the top personnel of James I. Barnes Construction Co. which is building the \$3,560,000 Kern County High School and Junior College at Bakersfield, Calif. Job is just starting and is expected to take 500 days. The \$1,500,000 addition to the Bakersfield Mercy Hospital also is under construction at this time by the Barnes company.

* * *

Blaine P. Clyde is supervising the construction of a highway relocation job at Wanship Dam in Utah, for W. W. Clyde & Co., which is doing the work at a cost of \$683,743. Other men in key positions are: Ray Corless, Frank Rigtrup, Frank Jensen and Jack Frances, grade foremen; W. O. Graham, bridge foreman; Vern Allen, powder foreman; and John Smith and Sam Fratto, master mechanics.

Down-time By Domagalski



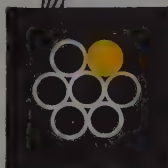
"You're sure that you've run one of these rigs before?"

Western Construction

TOUGH DIRT MOVES FAST ON RAIL SPUR CONTRACT



L. J. "Louie" DIETZ



Wet clay that balled up into 2-foot clumps is the material encountered by Swords and Dietz on their contract for grading a new railroad spur. The new spur will serve a newspaper publishing center to be built on the outskirts of Peoria, Illinois. The gently-rolling terrain was covered with a deep layer of topsoil, beneath which was the sticky yellow clay that had to be moved to make way for drainage culverts. Louie Dietz, of the Swords and Dietz company, brought in dozers and scrapers for the job and the tough dirt was on the move in a hurry.

The Peoria contracting firm has handled every type of earthmoving — from leveling for homes to stripping for gravel. Louie Dietz has been in the business for many years — and for many years his choice of wire rope has been Broderick & Bascom Yellow Strand!

Dietz reports, "We've never found a better rope than Yellow Strand. It gives us outstanding service. It has just the right flexibility for easy handling, yet has a strong body. We always keep extra reels on hand and we get Speedi-Service from our B & B distributor."

You, too, can get outstanding service from Yellow Strand on your equipment. Call your nearby Broderick & Bascom distributor for a sample of Speedi-Service and for longer-lasting Yellow Strand Wire Rope!

BRODERICK & BASCOM ROPE CO.
4203 Union Blvd., St. Louis 15, Mo.
655 Edmunds St., Seattle 8, Wash.

SPECIFY

Yellow Strand

FOR SAVINGS . . . SAFETY . . . SPEEDI-SERVICE



Big scrapers — equipped with quality-built Preformed Yellow Strand Wire Rope — are taking off the deep topsoil, exposing the tough, wet yellow clay below. The new rail spur will be about $\frac{1}{2}$ mile long.

A Swords and Dietz dozer brings a blade full of wet clay out of a hole. This dozer has a B & B Dozereel — a mounting device that can save as much as \$60 on each reel. Blueprints for the bracket can be obtained without charge from your B & B distributor or from Broderick & Bascom Rope Co.

Donald D. Whaley is supervising the office and hangar construction for North American Air Lines, Inc., at San Francisco International Airport, a \$1,200,000 project in the hands of George A. Fuller Co., contractor. Desmond B. Epidendio is carpenter foreman. The reinforced concrete and brick office construction and the steel hangar in all cover 31,000 sq. ft. James A. Brent represents the architect, Quenton Engineers.

* * *

Paul C. Helmick, owner, has the assistance of W. H. Ryan, general superintendent, and Earl K. Brown, superintendent, in carrying out the construction contract recently awarded Paul C. Helmick Co. to clear

1,433 ac. behind Timothy Meadows Dam in Clackamas County, Ore., a \$1,146,000 undertaking.

* * *

Clyde Hawken, superintendent; Everett Casper, engineer; and Paul Kendall, job office manager, head up a \$1,276,096 contract recently awarded to Lytle & Green and S. Birch & Sons for 63 mi. of paving on the Glenn Highway, Big Timber to Porcupine, Alaska. Job is scheduled to run till September 1955.

* * *

Bob Long and Don F. Needham, partners, are holding down the jobs of superintendent and office manager, respectively, on their firm's recent award for construction of a \$1,109,200

addition to St. Agnes Hospital, Fresno, Calif. E. C. Dawson is carpenter foreman. This is a 3-story concrete construction, requiring 480 days.

* * *

Bill Mackey, superintendent, with the aid of Don Crego, labor foreman, and Carl Reeves, maintenance foreman, is supervising a \$194,612 contract for 5.5 mi. of miscellaneous work on the Burgess Junction-Lovelock road in Sheridan County, Wyo. C. A. Reeves is the contractor.

* * *

The Baldwin Contracting Co. of Marysville has a good superintendent in the person of Peter J. Andersen

A MILE OF LINER PLATE helps this sewer under roads and rails



Two-man crew on platform installs Armco Liner Plates at tunnel head. Mucking machine follows, to remove lower part of core.

How to install a million dollar sewer job on the West Coast? Open trenching would have disrupted traffic on busy streets and on more than 20 railroad tracks. But by tunneling with the aid of Armco Liner Plates the contractor was able to keep the work underground and out of traffic's way.

The Liner Plates also filled a second need. They were left in place to provide the outside form for the concrete lining.

Armco Liner Plates are 18-inch wide curved plates, flanged along two sides, with the corrugations extending through the longitudinal joints. They

have a high strength-to-weight ratio. Individual plates are light enough for one or two men to carry, hold and bolt in place.

Use Armco Liner Plates for speed and safety on your next tunneling job. They are available in a wide range of sizes and gauges. Write for details.

**ARMCO
LINER
PLATES**



ARMCO DRAINAGE & METAL PRODUCTS, INC.

Berkeley • Los Angeles • Seattle • Spokane
Portland • Salt Lake City • Denver



Andersen

He is currently handling the underground pinning job at Mare Island Naval Shipyard described on page 64.

* * *

Dennis N. Dillon, project manager; Leo Jones, field superintendent; and Ralph Carlton, general foreman, are top personnel on a \$1,323,367 job recently awarded Peter Knutson & Sons Co. for grading and surfacing on Highway 1, Skagit River Bridge, north of Mount Vernon, Skagit County, Wash.

* * *

J. E. Ricker, general superintendent, and L. N. Spencer, project engineer; G. S. Van Landingham, master mechanic; W. C. Burns, structural foreman; and Cy Johnson, office manager, are the principal personnel on earthwork construction, concrete lining and structures, Wellton-Mohawk Division, Gila Project, Arizona for Morrison-Knudsen Co., Inc. which was awarded this contract of bid of \$1,168,977.

* * *

Roy Marker is project manager and Herb Hendershot is superintendent for A. B. C. Construction Co., which has a pipe line contract of \$1,498,951 between Corona and San Juan Tunnel for Lower Feather, Los Angeles County, Calif. Other key men on the work are Bert Healey, job engineer; J. Hunt, supervising the equipment, and W. Violette, a key man on pipe.

* * *

Albert A. Dunn is project manager, and William F. Haechler is superintendent for Louis C. Dunn Inc., contractor on the over-\$1,000,000

STEEL BRIDGES

for today's
highways

PITTSBURGH • DES MOINES

Modern highways demand modern bridges wherever roads must "take to the air." For half-a-century, bridge fabrication and erection have been a vital part of our activities, with every advance in design and method reflected in the dependable structures we build. • The project pictured is the Fleming Park Bridge at Neville Island, Pittsburgh. With an overall length of 804 feet, the bridge has a through-truss channel span of 360 feet, and will accommodate four lanes of traffic, relieving a serious bottleneck in a heavily-travelled area. • Let us consult on your bridge requirements, and submit a quotation.

PITTSBURGH • DES MOINES STEEL CO.

Plants at PITTSBURGH, DES MOINES and SANTA CLARA

Sales Offices at:

PITTSBURGH (25),.....3420 Neville Island
NEWARK (2),.....219 Industrial Office Bldg.
CHICAGO (3), 1224 First National Bank Bldg.
LOS ANGELES (48),.....6399 Wilshire Blvd.

DES MOINES (8),.....921 Tuttle Street
DALLAS (1),.....1225 Praetorian Building
SEATTLE,.....528 Lane Street
SANTA CLARA, CAL.,.....627 Alviso Road





SHOWN ABOVE working for the Hitz Construction Co. are, left to right: first row—Chet Comstock, project manager; Harry Knodel, job superintendent; second row—"Swede" Melander, labor foreman; Leonard Keller, Leonard Young and Pat O'Mara, carpenter foremen. The job is a \$2,000,000 contract for erection of the Midland Bank Building at Billings, Mont. Job started in June this year and is expected to finish June 1955. For Holman Erection Co., which is doing the reinforcing steel, Ralph Holman is superintending for his firm. Cletus Holman is superintending for S. L. Espy who has the masonry subcontract.

000 High School construction at Upland, Calif. Labor foreman is Raymond H. Esparza. James C. Cox is in charge of purchasing.

J. D. Blanton, president; J. Raymond Jones, vice president; and Paul Ullman, chief engineer of the Tower Contracting Co., Inc. of Texas, are

directing the execution of a \$291,218 contract recently awarded their company for work at the Middle Rio Grande Project, New Mex. R. E. McLaughlin and A. R. Monroe are superintending the work, which started the middle of September and is expected to take 825 days for completion.

* * *

Clarence Glans, superintendent, and Boyd Beagles, general foreman, are top supervisors for L. H. Hansen & Sons who have a 500-day job of erecting a gymnasium at the site of the new high school and junior college in Bakersfield, Calif.

* * *

William Miller is superintendent for H. K. Ferguson Co. on construction of a building for North American Aviation Co. in Downey, Calif. Virgil Sahl is carpenter foreman and "Chuc" Romans is labor foreman. N. W. Erwin is office manager. Representing North American as resident engineer is John J. Flowsy.

* * *

Charles A. Langlais, president; Walter Caldwell, vice president and general superintendent; Charles Terrill, superintendent, and William A. Langlais, vice president, are in overall charge of the work of installing a traffic control system on the lower deck of the San Francisco-Oakland Bay Bridge, a \$505,570 contract re-



Model HSF as shown for Caterpillar D4-U \$476.00
f.o.b. Billings, Montana

A hydraulic power control unit offered with 18 to 55 GPM of 1000 psi hydraulic power for bulldozers, loaders or drawn equipment. Front-mount pump is steel-tube manifolded to the reservoir-valve unit. The control valve features a lock-in float position. Proven by many years of satisfactory service.

Available for all current track-type tractors.
Dealer and distributor inquiries invited.

H-S ENGINE CO.

N. P. Industrial Site

Billings, Montana

H
Y
D
R
A
U
N
I
T

FOR YOUR CONVENIENCE . . .

. . . new style rip-out post cards appear for the first time this month on pages 103 and 104. Just fill in your change of address or subscription order, drop in "outgoing mail" and we'll do all the rest.

MASTER DISTRIBUTORS

for

**CONTINENTAL — WISCONSIN ENGINES
ROCKFORD CLUTCHES**

ENGINES — CLUTCHES — PARTS AND SERVICE

for

**TRANSPORTATION — INDUSTRIAL
AGRICULTURAL PURPOSES
ENGINE REBUILDING AND OVERHAUL**

Courteous reliable service at reasonable cost

CONTINENTAL SALES & SERVICE CO.

POWER SPECIALISTS

3817 Santa Fe Avenue, Los Angeles 58

LOgan 5-6381

cently going to the Charles A. Langlais Co. About 225 working days are required for the job. Western Switchboard Co. is furnishing the controls.

* * *

C. V. McBride is foreman for Jack Adams who has a contract for 5.6 mi. of grading and surfacing on Highway SR-75, Penasco-Dixon road in Taos County, New Mex. Adams got the award on a bid of \$130,444.

* * *

Here is a listing of the personnel on the Alaskan \$11,514,007 Elmendorf AFB heating and power plant described in this issue.

The lead personnel for the prime contractor, Patti of Kansas City, MacDonald of St. Louis, Wyatt and Kipper of Seattle, and Thorgard of Seattle, are as follows: **Gayle Lefler**, project manager; **Harold Gall**, general superintendent; **John Williams**, project superintendent; **"Skipper" Smith**, former super, who has been transferred to Patti-Mac's huge Whittier contracts; **Bill Barker**, pinch-hitting project superintendent and carpenter superintendent; **Ken Tierney**, piping manager; **Phil Bell**, piping superintendent; **Jack Foster**, concrete; **Earl Fox**, boilers; **Bill Latrace**, conveyors; **Bill Wickstrom** and **Bill Anderson**, reinforcing steel; **Roy Payne**, labor foreman.

For the subcontractors, the work has been supervised as follows: Federal Roofing—**Roy Hull** on metal roof decking and siding, and **"Slim" Gant** on built-up roofing; City Electric—**Gene Kayton** on electrical; Isaacson Iron Works—"Dutch" and **"Skinney" Jenne** and **Johnny Kelley** on structural steel; Oaks—**Dale Hale**, **"Red" Olson**, and **Jim Beal** on earthwork; Sundberg—**Mickelson** on painting; Vermiculite Constructors—**Bill Culver** on insulation of the underground steam conduits. Two subcontractors have not come in on the job yet—**Armstrong Cork** on the piping insulation and **Virginia Metal** on the inside metal partitions.

This power and heating project is being built for the U. S. Air Force, under the administration and inspection of the U. S. Corps of Engineers, Alaska District, with headquarters at Anchorage. Government personnel include **Col. Carl Y. Farrell**, district engineer; **Lt. Col. R. E. Hisle**, resident engineer; **Capt. Horace E. Combs**, project engineer for Elmendorf AFB; **John Maciag**, zone engineer; **George Avery**, chief inspector. Other inspectors—**Dick Inglima**, concrete; **Joe Hurley**, structural steel; **Earl Henning**, boilers; **Bob McCreedy**, piping; **Frank Green**, electrical; **Art Derby**, office engineer; and student-aides working in Alaska for the summer—**Raymond Benson** of Harvard and **Charles Stoy** of University of Washington. **Buck Boykin** is chief inspector on the outside utilities, assisted by **Art Peters**.

Bechtel now has the following personnel assigned to the job: **Ib Ibsen**, supervising mechanical engineer, and



ROCK RIPPER



Rips materials you never could rip before

Fast penetration in hardest materials

Hydraulic down pressure puts full weight of tractor on standards for fast, full penetration. Rips many materials that formerly required shooting.

Really shatters rock for easy loading

Curved standards provide natural draft to keep points down, produce underground quivering action that seeks out cracks and weak spots. Shatters rock and hard materials to easy-loading condition... you get bigger loads faster, with less scraper wear and damage.

8,800 lbs.* of rugged strength

Takes full power of largest track-type tractors and either rips rock or stalls tractor. ATECO drawbar takes the pull—no strain on tractor case.

* with three standards; 7,500 lbs. with two.

Available for Caterpillar D7 and D8, Allis-Chalmers HD20, and International TD24 tractors. Sold exclusively through your Caterpillar distributor. See for yourself how an ATECO ripper boosts yardage and saves equipment. Call your "Cat" dealer for a demonstration NOW.

#27

AMERICAN TRACTOR EQUIPMENT CORPORATION

Designers and manufacturers
since 1920

Mack Woodruff
PRESIDENT

9131 San Leandro Blvd.
Oakland 3, California

BULLDOZERS • ROADBUILDERS • RIPPERS • SCRAPERS • LOADERS



LOWE CONSTRUCTION CO. has a \$1,000,000 contract to erect a bank building for Security Trust & Savings Bank at Billings, Mont. Shown above, left to right, are: **James O. Kimble**, job superintendent; **Leonard Koski**, carpenter foreman; **Vern Hendershot**, labor foreman; **Bob Senitte**, carpenter foreman. Not shown are **Bill Green**, general superintendent, and **Claude Wiesener**, steel foreman.

Bill Beckhorn, electrical inspector. **Dudley Ott** handles the job for Bechtel in San Francisco as project engineer for the power division.

* * *

John J. Morton, project manager; **Joe McNabb**, project engineer, and **Guy Heimsoth**, assistant project manager, key men for **Guy F. Atkinson Co.** and **Ostrander Construction**

Co., are directing the construction of a navigation lock at The Dalles Dam Project on the Columbia River, Washington and Oregon. This is Atkinson's third out of the five major contracts already awarded on this project, and was won by Atkinson on a low bid of \$12,708,180.

* * *

Robert Rouse, project superintendent,

ent, and **Leroy R. Reynolds**, office manager, are two top men for **Grove, Shepherd, Wilson & Krue, Inc.**, on this contractor's \$1,581,592 contract for construction of a 160,000-sq. ft. warehouse of reinforced and concrete masonry, a railroad spur, and outside utilities at Fort Richardson, Alaska. Work got under way the last half of September and is expected to run till November 1955.

* * *

W. W. White, job superintendent; **B. F. Lockwood, Jr.**, job engineer; **J. D. Brown**, master mechanic; and **J. G. Fuller**, office manager, comprise the top supervisory personnel of **Peter Kiewit Sons' Co.** which holds a \$5,960,241 contract for 3.9 mi. of grading, surfacing and separation structures on **Ramona Freeway** between **Rosemead** and the **San Gabriel River** in **Los Angeles County, Calif.**

* * *

Dave Brosnell, superintendent, assisted by **Charlie Gardner**, is directing for **Boswell Construction Co.** a \$127,898 contract for earthwork, clearing and structures for rehabilitation of drains, **Middle Rio Grande Project**, **New Mex.** Job started the middle of September and is expected to finish in 440 days.

* * *

Truman Hart, superintendent, and **H. B. Raun**, engineer, are top personnel for **W. F. Maxwell Co.** which is doing 12 mi. of grading and surfacing work, besides some bridge work,

IF YOUR BLASTING HOOK UPS DEMAND:

- Maximum Safety—
- Freedom From Electrical Hazards—
- Electrical Storms
- Simplicity of Hook Up—
- Assurance Every Hole is Fired—
- Lowest Overall Costs—

You'll find **PRIMACORD*** will fit your operations to a "T." Investigate and seal

*Four Types Available
PLAIN, REINFORCED
WIREBOUND, PLASTIC.



COAST MANUFACTURING & SUPPLY CO.
LIVERMORE, CALIFORNIA

You SET THE SPECIFICATIONS



Special 4 x 6 Steam Fixed
Drum Winch. Duty single line
pull 4,300 lbs. at 90 FPM.

Superior-Lidgerwood-Mundy has the facilities and experience to meet them . . . either from an all-inclusive line of standard hoisting equipment or with equipment engineered to your specific requirements.

WRITE FOR BULLETINS AND CATALOGS

SUPERIOR-LIDGERWOOD-MUNDY CORPORATION

Main Office and Works: **SUPERIOR, WISCONSIN, U.S.A.**
New York Office, 7 Day Street, New York 7, N. Y.

lighting and sign installation at Archibald Ave. and Etiwand Ave. in San Bernardino County, Calif., a \$497,782 undertaking.

* * *

Robert C. Reif, superintendent for Cox Brothers Construction Co., is heading a \$265,535 contract for widening and surfacing 14 mi. of Pacific Coast Highway in Newport Beach, Orange County, Calif.

* * *

Paul Cross, superintendent, is supervising a \$145,386 contract for 2.1 mi. of grading and surfacing on US 85, Santa Fe city limits to Airport Junction, New Mex., for Henry Thygesen & Co.

* * *

Ralph A. Blankenbaker, general superintendent, has been working on the 3,000,000-gal. reservoir and pumping station construction for the city



Blankenbaker

Eastlick

of Billings, Mont., about a \$300,000 contract awarded to Hitz Construction Co. Carpenter foreman is **H. D. Eastlick**. Job is just about finishing.

* * *

E. W. Temple is superintending a state highway job at Sheridan, Wyo., involving grading, paving, sewers, curbs, and gutters, contract for which is handled by Peter Kiewit Sons' Co. Other key personnel on this \$500,000 project are **Kermit Galbreath**, hot plant foreman; **Irvin Freil**, street foreman; **C. M. Montgomery**, carpenter foreman; and **Stanley Woinoski**, master mechanic. **Ray Robertson** is in charge of the office.

* * *

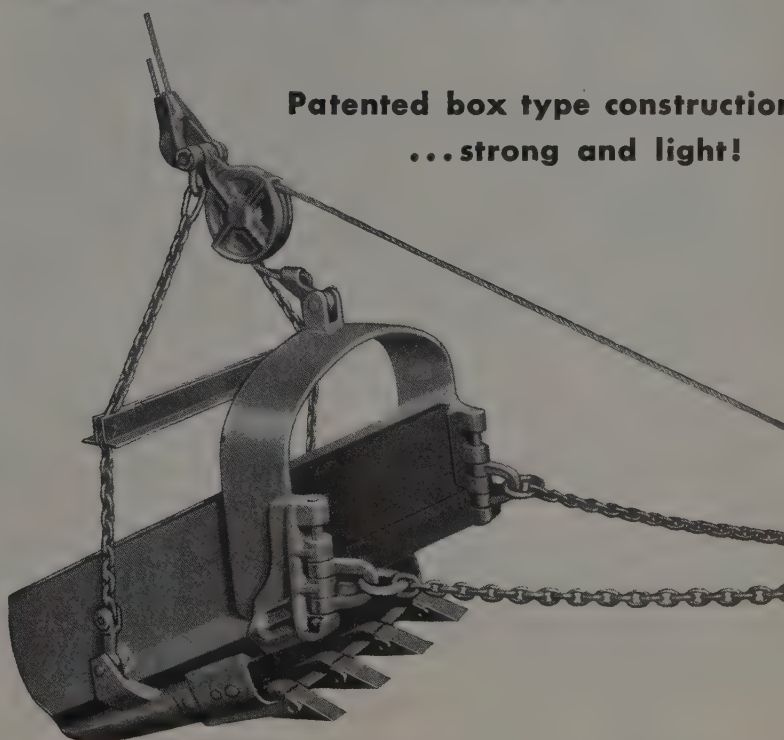
W. S. Kimble is supervising a \$189,802 contract recently awarded to John Delphia, under which 1.5 mi. of road in the heart of Sequoia National Park, Calif., is to be cleared, graded, using crushed rock base, and plant-mix surfacing placed before the coming winter weather. "**Woody**" **LeCount** is engineer, and **Herman Rosse** is foreman.

* * *

Carl M. Harris, project superintendent for Stolte, Inc., heads the job personnel working on a sanitary sewage collection system at Morro Bay, Calif., costing \$875,791. **Ray Bateman** is office engineer. **Slavo Rigrisich** and **Vic MacFarland** are spread foremen, and **John Wright** is carpenter foreman.

Make more profits with

WELLMAN-WILLIAMS DRAGLINE BUCKETS



**Patented box type construction
...strong and light!**

THE Wellman-Williams Dragline Bucket is perfectly balanced, light in weight, has a wide digging radius and hitch connections for fast adjustment of digging depths. Alloy steels provide maximum strength with minimum dead weight. Teeth are made of manganese steel and are reversible. Perforated type dragline buckets also available.

It's a WELLMAN—built to dig and last while digging.

THE WELLMAN ENGINEERING CO.

CLEVELAND 4, OHIO

*Mail
coupon
for free
bulletin*

The Wellman Engineering Company
7026 Central Avenue, Cleveland 4, Ohio

Please send me a free copy of bulletin on:

- | | |
|--|--------------------------------------|
| ☐ Clamshell Buckets | ☐ Stone Grabs |
| ☐ Dragline Buckets | ☐ Log Grabs |

Your Name _____

Address _____

City _____ State _____

Position _____ Company _____



Left to right in the above pictures are, UPPER LEFT—Bruner, Weaver, Reinsch. UPPER RIGHT—Coblentz, Dailey, Copeland. LOWER LEFT—Truitt, Cleary, Misener. LOWER RIGHT—Brown, Clark.

Headed by Dwight K. Bruner, project superintendent; Harry Reinsch, field superintendent (mechanical); and George Weaver, field superintendent (structural); the men listed below are employed in key positions by the Bechtel Corporation on the building of a steam power plant at Castle Gate, Utah. This project is being built for the Utah Power & Light Co. at a cost of about \$11,000,000, and is expected to be finished by the end of this year.

Pipefitter foremen — Lee Mortensen and Lou Penrod (general); Vernon Taylor, Blair Snow, Lynn Houser, Marvil Flom, Ares Gammell, Robert Taylor, Joseph Paystrup, Ober Turner, Don Castleberry and Max Field. Operating engineer foremen—William M. Nellis and Andrew Christiansen. Cement finisher foreman—Spencer Bowles. Warehousing—Jim Monroe, chief material man, assisted by Al Oscar, Bob Bardsley, Lloyd Perigo, (tool room); also Glen Truscott.

Electrical foremen—Glen Palmer, Clifton Adams and Robert Johnson (general); Raymond Stevenson, Edward O'Donnell, Kenneth McEwan, Kenneth Baum, Graham Shaw, Arnold Bochard and Roy Hoover. Millwright foremen—Tom Spencer (general); Walter Wyler and Walden Hurst. Boilermaker foreman—Jack Peer. Ironworker foremen — Dean Reasor (general); Charles Lay (riggers); Robert Ballou, Leslie Robinson and Raymond Sadler (structural). Carpenter foremen — Jesse Brown (general); J. R. Clark (sawyer). Labor foremen—Clyde Truitt (general); Frank Misener, Tom Cleary, Jim Wilcox, and August Wilstead.

Office — Bob Bogan, office manager; Dick Moseley, chief timekeeper, assisted by Heinz Sonnekens, Joe Dudler, Charles Virden, Evan James and Joe Xiras; Ralph Pederson and Earl Peterson, accountants; and the following office assistants: Noel Melvin, Malcolm Beck, Robert Booth, Pete Flemetis and Joe Maglicco.

Chief engineering men in the field are: Charles Copeland, senior civil engineer, assisted by Art Taylor, subcontracts; Austin Mitchell, surveys; Rudolph Larcher, structural; Earl Skillicorn and Jack Braithwaite, field engineers; and Neil Magann, plans. Sam Coblentz, senior mechanical engineer, assisted by Ken Neuschwander and Bob Powell, field engineers; and Don Johnson, piping details, Dan Dailey, senior electrical engineer, assisted by Edw. Gravdahl, test engineer; Silvio Guisti and Ira Smith, field engineers; and Irving Ojala, cost engineer.

SAFETY

Job accidents take their toll

THESE were the accidents that resulted in death or serious injury on the West's construction jobs during the last reported month.

Elmer Bolelli, 32, Vallejo, Calif., driver for a contracting company, was recently killed. He was working alone when a tread on his tractor broke. It is thought that he jumped from the driver's seat and tripped a lever, releasing the loading shovel, and was crushed to death by the heavy scoop.

Rudolph Whitley, 30, was hospitalized and several other workers received treatment for injuries sustained when a 25 x 47-ft. section of the Riviera Hotel under construction at Las Vegas, Nev., collapsed when a steel brace buckled.

Wiley Powell, 59, Midland, Tex., was killed Sept. 13 at San Manuel,

Ariz. A steel worker, Powell was riding a beam being hoisted in the construction of a crusher building. The beam twisted throwing him 35 ft. to the concrete floor.

William LeMoigne, 64, Chico, Calif., was killed in early September while repairing a tractor. Apparently he had attached a guy line from a tree limb to the tractor in inspecting the vehicle's treads; the tree snapped and the wire struck him on the head.

STATEMENT REQUIRED BY THE ACT OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946 (Title 39, United States Code, Section 233) SHOWING THE OWNERSHIP, MANAGEMENT, AND CIRCULATION OF WESTERN CONSTRUCTION, PUBLISHED MONTHLY AT LOS ANGELES, CALIFORNIA, FOR OCTOBER 1, 1954.

1. The names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher: James I. Ballard, 609 Mission St., San Francisco, Calif.

Editor: Ralph W. Whitaker, Jr., 609 Mission St., San Francisco, Calif.

Managing Editor: John J. Timmer, Jr., 609 Mission St., San Francisco, Calif.

Business Manager: Luther P. Vrettos, 609 Mission St., San Francisco, Calif.

2. The owner is: (If owned by a corporation, its name and address must be stated and also

immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual member, must be given.)

Arthur F. King, 609 Mission St., San Francisco, Calif.

Louise B. King, 609 Mission St., San Francisco, Calif.

M. K. Lyons, 609 Mission St., San Francisco, Calif.

M. K. Vogel, 609 Mission St., San Francisco, Calif.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required from daily, weekly, semiweekly, and triweekly newspapers only.)

JAMES I. BALLARD
(Signature of publisher)

Sworn to and subscribed before me this 24th day of September, 1954.

(Seal) (Signed) RUTH POWELL POOL
(My commission expires Sept. 11, 1958)

"They're working rings around the bigger trucks"

—says Ed Kimball, owner of Boylston Construction Co., Boylston, Mass., in telling how Hydra-Matic* GMC's are getting his jobs done quicker—and cutting costs to boot.

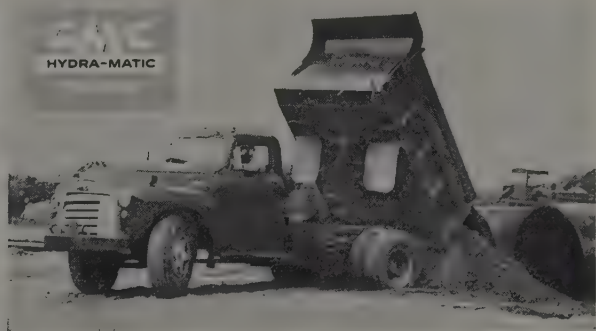


EXCAVATING AND MOVING 80,000 YARDS OF BANK GRAVEL IN SEVEN WEEKS calls for a team of eleven trucks and two shovels. Boylston Construction's two new 145 h.p. GMC M470's—equipped with 4-yard dump bodies and sideboards that hike their capacity

to 8 yards—are working with nine trucks of other makes. All nine have greater horsepower—three of them are ten-wheelers. "Those GMC's are hustling more gravel each day than any other rigs on the job," Kimball says.



CLIMBING A STEEP UNPAVED GRADE—without room for a running start—is the only way out of the nearly completed excavation. Recently—when heavy rains made the grade slick and muddy, it proved too tough a pull for the big ten-wheelers when fully loaded. But the GMC's—their Hydra-Matic-controlled flow of power applied through single rear axles—made it every trip with loads heaped to 8 yards—just one less than the other trucks. "We never even had them going all out," driver Jack Whalen boasts.



GMC HYDRA-MATIC FUEL ECONOMIES really add up on the steady diet of one-mile hauls from pit to dumping point. The M470's (22,000 GVW) are each using 17 gallons of gas a day as compared with 27 gallons burned by a comparatively powered truck on the same job. "And I'm looking forward to wiping all clutch-repair costs off my books," Kimball says. "My previous trucks wore out three clutches apiece every two years. To date, the GMC's haven't cost me a dime for any kind of repairs."

*Hydra-Matic standard on many models; optional at extra cost on others.

GMC Truck & Coach—A General Motors Division

TRICKS of the TRADES



P & H truck cranes team up for fast heavy girder lift

IN ONE OF THE HEAVIEST LIFTING jobs ever attempted by truck cranes, four bridge girders weighing 125 tons each were loaded and then erected in a matter of hours. The four girders, each 128 ft. long and 13 ft. 6 in. high, are being used on a portion of the Harbor Freeway in Los Angeles, Calif. Heisler & Woods, subcontractors to Webb and White, arranged for the heavy lifting assignment. The first task was to load the girders onto trucks for moving some 30 mi. to the job site. Lee Wood arranged for the four 35-ton truck cranes to take on this job. They were all P&H Model 555 truck cranes with 40-ft. booms. When the actual loading time came, two cranes took their places at each end of the girders and actually "walked" the structures into position for truck loading.

At the erection site, the same truck cranes raised the girders. Working in harmony, the four machines placed the girders in a record short time. Ten feet more of boom had been added to each crane for the lift at the job site. At this location the cranes again had

to walk their heavy loads, demonstrating the coordination possible with modern truck cranes of this type. Had the girders been lifted by jacking, or by the use of stiff legged derricks, a minimum time of three or four days would have been required.

Safety Council issues statistical year book

THE 1954 EDITION of the National Safety Council's statistical year book, "Accident Facts," is now off the press. Twenty pages of the 96-page book are devoted exclusively to occupational accidents and provide the factual background necessary to give direction to an industrial safety program. Most common accidents of an industry, part of the body most frequently injured, off-the-job accident problems, unsafe acts, and unsafe conditions contributing to permanent impairment and death, and other topics are included. "Accident Facts" is priced at 75c a single copy and less

for quantities. Inquiries should be sent to the National Safety Council, 425 No. Michigan Avenue, Chicago 11, Ill.

CORRECTION

IN OUR SHORT ARTICLE on "Keep the Drills Going" in the September issue, a correction is due. Fred Stuller had been described as responsible for the design of special jigs for bit sharpening that handled both the cross and square type of bit pattern. This should be corrected to read that Gino Brusatori, machinist, and Giliam Stuart, "keeper of the bits," worked in collaboration on this project.

Booklet on asphalt

THE ASPHALT INSTITUTE ANNOUNCES an up-to-date booklet entitled Construction Specifications for Asphalt Protective Coatings for Pipelines. Full specifications are included for the four main types of protective coatings—thin and thick coat wrapped systems, mastic systems, and coatings for interior surfaces. The booklet is available for 50c from the Asphalt Institute, Russ Building, San Francisco 4, California.

Portable storage unit

SAFE STORAGE of explosives, blasting caps, and other construction materials and equipment on utility company projects is the purpose of this portable welded steel container used by the Idaho Power Co. of Boise. The 275-cu. ft. capacity Transportainer, developed by Dravo Corporation, Pittsburgh, is weatherproof and serves both as a storage facility on job sites as well as a shipping container. J. F. Servis, supervisor of mobile line crews, reports the Transportainer is loaded aboard a flatbed truck for transportation between job locations. When not in field use, it is





WHEN PIPELINES CROSS WATER explosives research pays off

The tremendous power of dynamite, skillfully and ingeniously handled, made it economically possible to cross the wide, deep Tennessee River (inset above) with two parallel pipelines, 50 feet apart. Trenches blasted underwater through hard red clay in the shallows, and lime rock in the 40-foot-deep channel, opened the way for speedy dredging operations . . . another example of the efficiency of modern explosives and blasting methods.

Hercules' research in the pioneering and development of explosives and our extensive service facilities are available to help you in solving blasting problems on construction jobs or in mining and quarrying operations.

Explosives Department

HERCULES POWDER COMPANY
INCORPORATED

973 Market St., Wilmington 99, Del.



Birmingham, Ala.; Chicago, Ill.; Duluth, Minn.; Hazleton, Pa.; Joplin, Mo.; Los Angeles, Cal.; New York, N. Y.; Pittsburgh, Pa.; Salt Lake City, Utah; San Francisco, Cal.

KRS4-

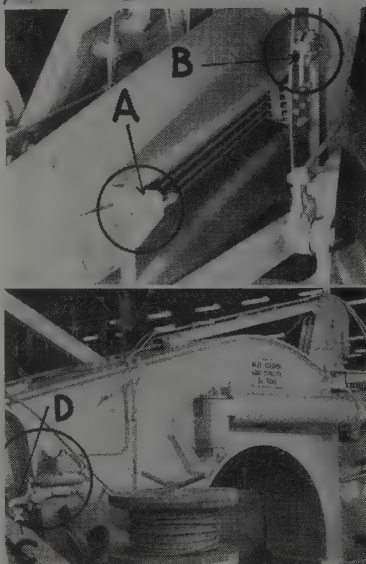
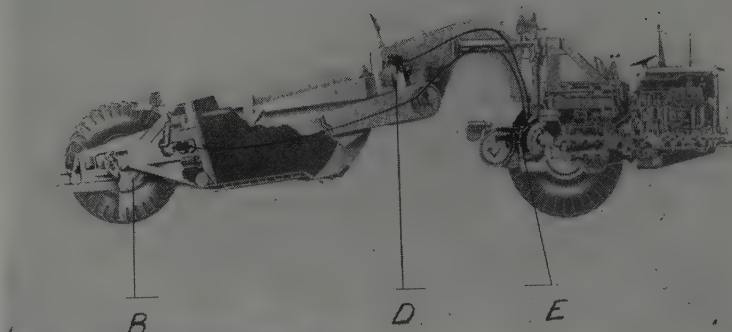
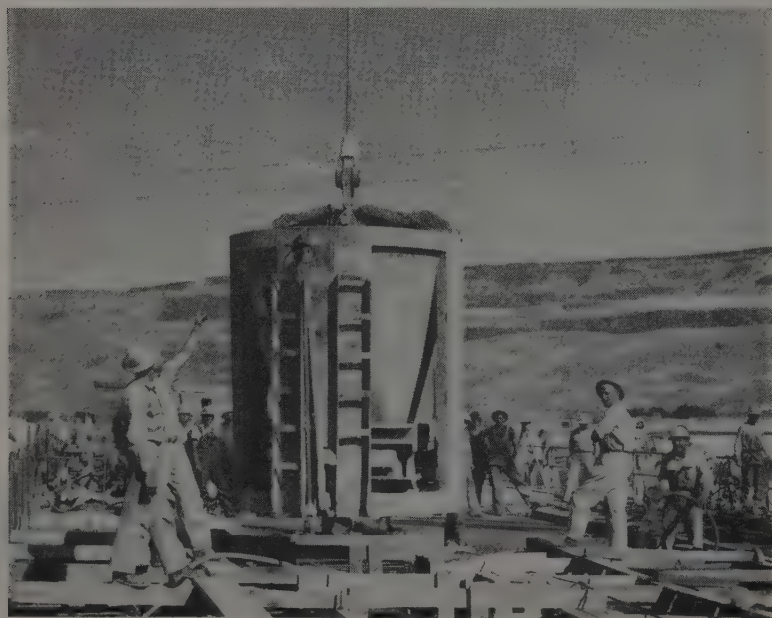
stored at one of the company's substations. In addition to its convenience, the unit protects valuable tools and materials against theft. Outside dimensions of the unit are 7 ft. 9 in. long, 6 ft. 5 in. wide and 6 ft. 10 in. high. It weighs 1,700 lb.

Wire rope won't rotate at Chief Joseph Dam

A SPECIAL WIRE ROPE manufactured for Columbia River Constructors for use at Chief Joseph Dam has established an exceptional service record there. Bethlehem Steel Co. made 800 ft. of 134-in. diameter non-rotating rope for use in from 8- to 12-ft. lengths on a huge Bucyrus 450 special Monighan crane at the dam. Using regular lay wire rope of the same diameter, only two to six weeks of use could be made of each section. Bill McGee, rigging superintendent for Columbia River Constructors, reports that the first section of the special Bethlehem rope that was installed on the Monighan was in use for more than 7½ months. Investigation of the rope at the end of this time showed that a loss in breaking strength of less than 1% had occurred. The remaining strength was still well above the catalog rated minimum strength of 228,000 lb. for unused rope.

During the 7½ months-life of the first section of rope, the Monighan handled 136,000 cu. yd. or 270,000 tons of concrete, plus 200,000 tons of forms, steel, clean-up, and other materials.

DESCRIBED ABOVE AND SHOWN BELOW is a special wire rope designed for use at Chief Joseph Dam. The non-rotating rope was manufactured by Bethlehem Steel Co. to be used in lengths up to 12 ft. on Bucyrus 450 Special Monighan crane.



Hydraulic devices cut cable trouble

FEW OPERATORS of cable operated scrapers can say that they haven't had to perform the undesirable task of changing cable at one time or another. A frequent cause of cable breakage is raising the bowl or bringing the ejector forward until the stops meet and then keeping the cable control clutch engaged, making a sharp turn, or hitting a bump or dip.

Operators of Caterpillar DW20 and DW21 tractors with No. 20 and No. 21 scrapers are not troubled with this cable breakage problem. In order to relieve the operator from having to watch the ejector or bowl stops and to prevent the operator from unintentionally allowing the stops to meet, Caterpillar equips these tractor-scraper combinations with a hydraulic cable saver.

This cable saver consists of two hydraulic cylinders (B or D) that are actuated by the bowl stop (C) or by an adjustable screw set out from the ejector stop (A), and two slave cylinders (E) that automatically return the cable control lever to the disengaged position when actuated by a master cylinder. As the ejector or bowl approaches the stops, the adjustable screw or bowlstop hits a lever on the master cylinder causing it to hydraulically actuate the slave cylinder. The slave cylinder, thus actuated, pushes on an arm that is connected by mechanical linkage to the cable control lever. This returns the lever to the disengaged position before the stops can meet, thus preventing cable breakage.

The master cylinder for the ejector cable (B) is located at the forward end of the ejector track. The master cylinder for the bowl lift cable (D) is located on the gooseneck near the upper nest of bowl lift sheaves. Both slave cylinders (E) are located on top of the cable control housing.



This Sanford, Maine gravel pit equipped with an Austin-Western 201 Plant is making three products simultaneously . . . $\frac{3}{4}$ " to $1\frac{1}{2}$ " (at right), minus $\frac{3}{4}$ " (at center) and minus $\frac{1}{2}$ " (scalping screen).

Across the country **AW** owners agree:
If you **COMPARE** before buying . . .
you'll choose an **AUSTIN-WESTERN** plant!

You know from experience that there are a lot of differences in crushing and screening plants. That's why you should compare carefully the leading makes of portable plants, looking particularly for the things which are needed for trouble-free operation and low-cost output.

A thorough comparison will convince you that Austin-Western's plant is the one for you. You will like its rugged construction, superior jaw and roll crusher and ready portability.

Here's proof that it will pay *you*, to *compare* crushing and screening plants before you buy. Study the chart in this ad and you'll see how much more you'll get with an Austin-Western crushing and screening plant. Call your A-W distributor or write us right away for further facts. Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

Why it will pay you to **COMPARE** before you buy

COMPARE . . .	A-W	Make "X"	Make "Y"	Make "Z"
Welded Steel Plate crusher frame for high strength without weight of cast steel frame	Yes	No	Yes	No
Machined steel toggle plate for absolute protection instead of cast iron	Yes	No	No	No
Inclined positive-throw type vibrating screen	Yes	Yes	No	Yes
Dustproof and watertight brakes on outside of wheels	Yes	No	Yes	No
All bearings of anti-friction type	Yes	Yes	Yes	Yes
Single source for wide range of complete stationary or portable plants, crushers, matching screens, elevators, conveyors and bins	Yes	Yes	No	No
Total	100%	50%	50%	33 $\frac{1}{3}$ %

AUSTIN-WESTERN DISTRIBUTORS

Edward R. Bacon Company, San Francisco, California
Columbia Equipment Company, Portland, Oregon;
Seattle, Washington; Boise, Idaho
Liberty Trucks and Parts Company, Denver, Colorado
N. C. Ribble Company, Albuquerque, New Mexico
C. D. Roeder Equipment Company, Reno, Nevada

Shriver Machinery Company, Phoenix, Arizona
Smith Booth Usher Company, Los Angeles, California
Western Construction Equipment Company, Great Falls, Montana;
Billings, Montana; Missoula, Montana
Wilson Equipment & Supply Company, Cheyenne and Casper, Wyoming
Western Machinery Company, Salt Lake City 15, Utah

Austin-Western

**CRUSHING, SCREENING
and WASHING EQUIPMENT**



BALDWIN-LIMA-HAMILTON CORPORATION

**Construction Equipment Division
LIMA, OHIO, U.S.A.**

Construction Equipment Division

TOOLS of the TRADES

Use the coupon on page 117 for free information on any of these items

1

A HARD FACING COMPARISON CHART has been made available by the **Mir-O-Col Alloy Co.** The chart lists the various rods and electrodes produced by 29 different manufacturers. It is set up to provide a quick review of any one particular type of hard-facing rod or electrode. Abrasion and impact qualities of each type rod as well as many of its applications are listed. Another feature of the chart is its listing of individual hardness ratings, both as deposited and work-hardened, or heat treated as the case may be.

2

PORTABLE NAIL DRIVER—**Morgan Machine Co., Inc.**, has announced a portable nail driver with an automatic hopper feed which sinks each nail completely with a single stroke. It operates by compressed air requiring 14.7 cfm. at 80 to 90 psi. Operating speed is 40 to 50 nails per min. The complete driver includes a feeding unit weighing 65 lb., a driving unit weighing 8½ lb., and a length of plastic hose.

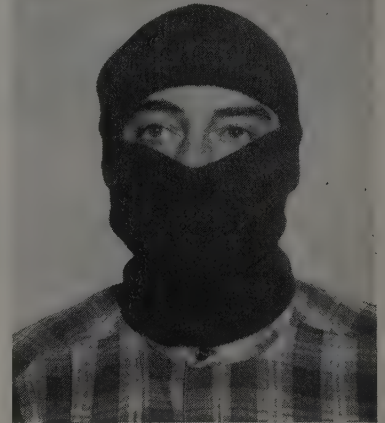
3

A NEW WIRE ROPE ENDING has been marketed by **Electric Steel Foundry Co.** It was designed specifically for the logger handling light or medium sized logs, or using ½-in. and

jagger to slow down handling. Two wedge type choker sockets and a sling hook will make a complete choker at a rigging cost of \$7.75 and weight of less than 7¼ lb.

4

A NEW WINTERLINER has been added to the **E. D. Bullard Co.** line of cold weather head protection. Called the Arctic, this wool-knit liner protects the head, neck and face. The front portion



is constructed so that it slips down over the mouth easily when not needed to protect nose and cheeks from freezing weather. This company also makes six other styles of winterliners, constructed to be worn with all makes and models of safety hats or helmets. They may be worn in combination or individually, depending on the amount of cold weather protection needed. The fabric type are rugged, wind resistant, and water repellent with a fleece or wool interior. Complete literature is available.

5

COOLING SYSTEM CARE—**Cummins Engine Co., Inc.**, has published a bulletin entitled "Give the Cooling System a Chance." This bulletin contains many practical suggestions on the best way to care for an engine's cooling system. The information is not only for Cummins engines, but may also be applied to all internal combustion engines. Cartoon illustrations enliven the 14-page handbook. Included is a convenient check sheet for proper cooling system maintenance.

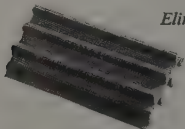
6

OIL FILTERING RISKS—Filtering of lubricating oil is the subject of a new booklet published by **Caterpillar Tractor Co.** The 8-page illustrated booklet discusses the risks in "short cuts" in lubricating oil filter systems and the importance of using a filter made for an engine. A step by step discussion of what a filter must accomplish and a description of how a full-flow filtering system serves the engine are included.



NOW!
LABYRINTH
WATERSTOPS
...the standard
water seal on
outstanding
construction jobs

• Quickly accepted by the nation's leading engineers and contractors, Labyrinth Waterstops—the first really satisfactory water seals—are now being used on all types of jobs...hydro electric plants, atomic energy plants, industrial plants, water and sewage plants, water reservoirs, underground and surface parking lots, swimming pools plus a host of lesser projects. (Names, and details furnished on request.) Why not get additional information on this time and money saving water seal? Just mail coupon below.



*Eliminates seepage
problems.
Simplifies
form work.*

Made in Canada for J. E. Goodman Sales Ltd.
Toronto, Ontario



¾-in. chokers. It will eliminate eye splicing. Called a wedge type choker socket, it grips the wire rope by wedging it. The socket is cast of manganese steel, and can be attached to the choker in just three minutes, as no special tools are required. The choker is cut to the desired length and the end is threaded to the socket and out again forming a loop. The wedge is then dropped and pulled tight. Only 6 to 8 in. of rope are required to attach the socket. There is no eye splice to pull closed, or no wire

WATER SEALS, INC.

9 South Clinton Street Dept. (6)
Chicago 6, Illinois

Please send complete information on Labyrinth Waterstops.

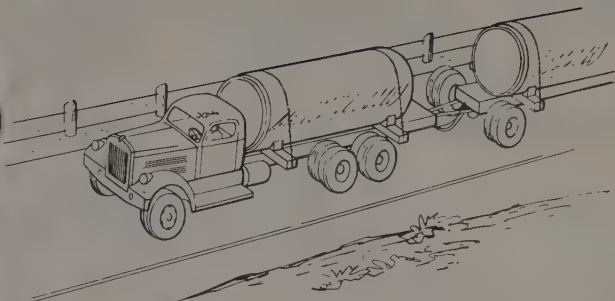
Name _____

Company _____

Address _____

City _____ Zone _____ State _____

White



"Get-up and go"

Whites, each hauling two 11 ton steel-and-concrete pipes, helped Keith Williams complete his section of the San Diego Aqueduct far ahead of the original estimate. Pipe was hauled from Fontana, over highways and cross-country, directly to the point of joining. Williams' all White fleet was on the job 18 hours a day, six days a week.



DOES THE JOB RIGHT

Whether it's over-the-road or rugged off-highway hauling, you can depend on White for cost-saving performance beyond the abilities of ordinary motor trucks. It will pay you to investigate White's many advantages — as they fit your particular requirements. Plan to call your Local White Representative today.

THE WHITE MOTOR COMPANY
CLEVELAND 1, OHIO
Factory Branches, Distributors & Dealers Everywhere



FOR MORE THAN 50 YEARS THE GREATEST NAME IN TRUCKS

NEW LITERATURE

Free copies of any of the items in this section may be obtained by using coupon on page 117.

7

Backfill soil compaction

Gunderson-Taylor Machinery Co. has announced the publication of an informational booklet entitled "Compaction Handbook." It is a concise compilation of material on soil compaction formerly available only through a great deal of research. Beginning with the principle and evolution of soil compaction and the development of compaction equipment, the handbook includes a background on various types of soils, their identification, classifications, and engineering characteristics. Along with these phases of information is a graphic engineering chart. One chapter deals entirely with soil compaction tests, including formulas and expected results. Another chapter is devoted to the procedure for sound backfill compaction, explaining the need and use of laboratory reports, compaction energy and moisture, and proper control of compaction for successful results. The handbook concludes with a description of the manufacturer's Triplex backfill tamper.

8

Steel shoring equipment

Three types of steel shoring equipment designed to efficiently handle any concrete shoring job are described in a new bulletin, "Modern Shoring for Concrete Construction," available from Patent Scaffolding Co. Engineering drawings show how a planned prefabricated shoring can cut costs. Given are flow charts and photos of typical installations. Also described is a shoring used to advantage on high jobs and a single post shore that can be carried and installed by one man.

9

International Harvester line

International Harvester Co. has published a 48-page handbook describing its line of industrial equipment. Extensive specifications are given covering all types of tractors, scrapers and blades, loaders and shovels, and power units. The handbook is in two colors and is fully illustrated.

10

Drill bit pamphlet

Brunner & Lay has issued an 8-page pamphlet describing its line of Rok-Bits. The 17 standard size gauges and the 15 thread types are fully illustrated and described and recommendations are made for their best use. Included is a check list for proper use and care of carbide rock drill bits.

11

Euclid catalog

Euclid Division of General Motors Corp. has issued a 50-page catalog describing its line of equipment for moving earth, rock, coal, and ore. Complete specifications, dimensions, the four types of Euclid equipment, rear-dumps, bottom-dumps, loaders, and scrapers, and these machines are shown in various on-the-job applications. Typical performance charts are given along with cutaways and schematic drawings of certain parts of the machines.

12

Small mover

S-10 Moto-Bug is described in a specification sheet issued by Kwik-Mix Co. The S-10 is a utility mover with 10-cu. ft. capacity hopper. Complete specifications, dimensions and a performance chart are given.

13

Tunneling drill

A double boom drill is described in a folder issued by Thor Power Tool Co. The machine is pictured along with closeups of its important parts. A specification table is given along with a brief description of the company's other products.

14

High speed tractor

LeTourneau - Westinghouse Co. has published a 16-page booklet describing its product, the Tournatractor. Many photos show the piece of equipment in numerous on-the-job uses. Exploded and diagrammatic sketches cover the interior of the machine along with a cutaway drawing of the torque converter. Various accessories are also shown.

15

Combined winch and tackle

Tirfor, a combined winch and tackle, is described in a folder pub-

lished by Griphoist, Inc. The portable lifting and pulling unit is shown in 16 on-the-job pictures. Brief details of its construction are described as well as a list of principal features and important uses. The folder includes a specification table and a brief discussion on proper operation and maintenance.

16

35-ton rear dump

LeTourneau-Westinghouse has issued a folder describing its new 35-ton rear dump. The machine is illustrated with numbered keys to additional closeup and cutaway views. A complete specification table is given.

17

Heavy equipment catalog

Brown-Bevis Industrial Equipment Co. announces publication and release of a new 256-page catalog covering heavy construction equipment and supplies manufactured by over 50 leaders in their field. The catalog, in addition to the illustrations and descriptions, contains a number of pages of useful information. Copies will be supplied without charge to purchasing agents, engineers, contractors, or other interested parties.

18

General construction equipment

A new construction equipment bulletin published by Blaw-Knox Co. is now available. It contains information on the manufacturer's equipment necessary for construction of roads, highways, and airports, or for the production of ready-mixed concrete. Items listed are base pavers, wideners, batching and mixing plants, clamshell buckets, concrete buckets, concrete finishers and spreaders, steel forms, sub-graders, truck mixers, and parts and services. Ask for Bulletin 2463.

19

Bethlehem Steel catalog

Bethlehem Pacific Coast Steel Corp. has announced publication of a new edition of its catalog, entitled "Bethlehem Pacific Rolled Products," which lists all the steel sections that can be rolled on seven roll-

Don't throw away material!

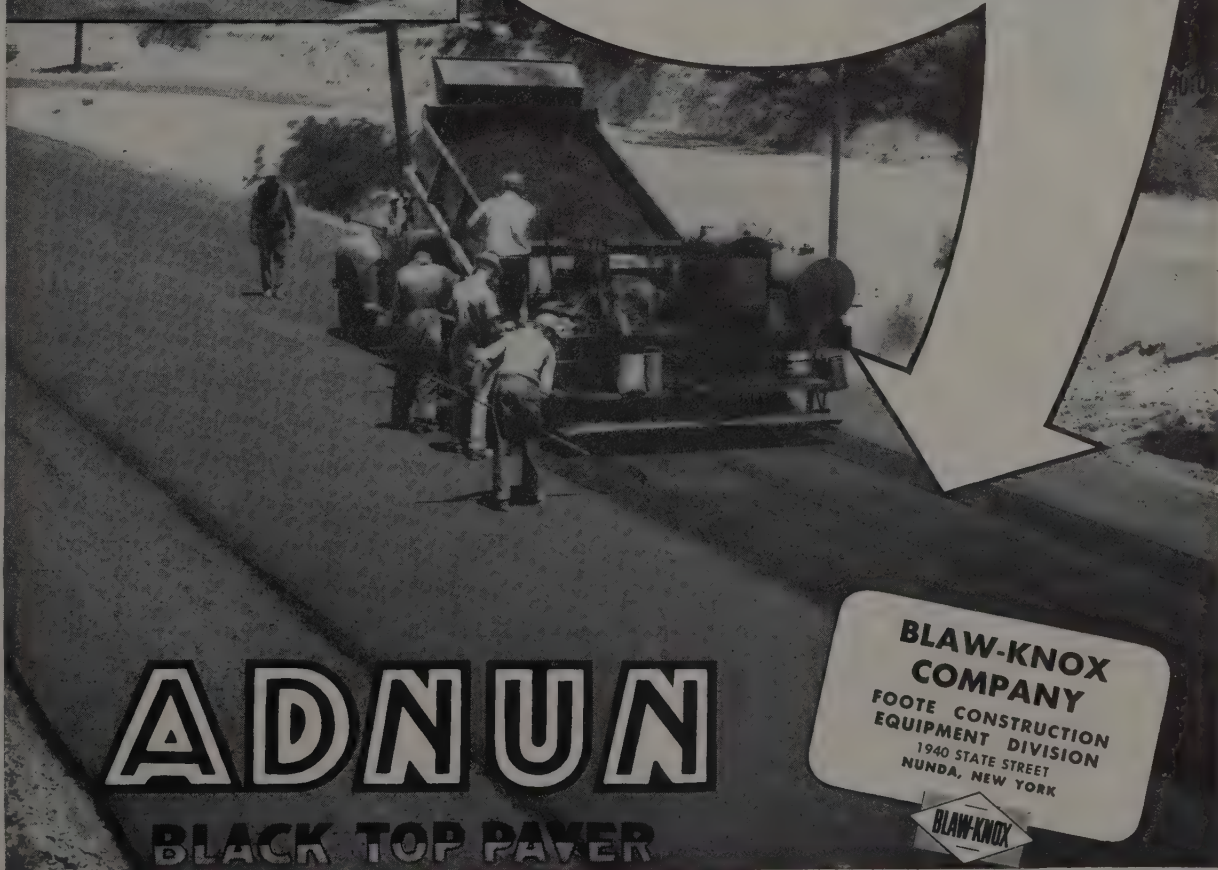
YOU would agree that minus $\frac{1}{2}$ in. deviation on a 9 in. thickness of material would be pretty good accuracy. That's holding to within 5% of grade but even that accuracy means over 175 cu. yds. of *extra* material in every mile of road. Even holding that close to grade can cost you upwards of \$500.00 a mile.

Ask about the Adnun Jr. Model 8. Here's a tow-type rig of advanced design that can handle all non-specification work, patch ahead of your big rig and finish off drive-ways and intersections at low cost.

Don't throw dollars into the Hollows! With the Adnun Fluid Level you supplement the amazing accuracy of the Adnun Continuous Course Correction with gauge control so positive that you can take out the dips that won't show under a straight edge. Continuous Course Correction takes out the short hollows and the Fluid Level makes possible the results ordinarily associated with long wheel base design.

The Fluid Level gives you full control from subgrade to finish course. It makes possible the laying of the road to practically an absolute plane with better density, longer road life and less waste of materials.

Don't throw away material. You can figure more closely with the Adnun and the Fluid Level.



ADNUN

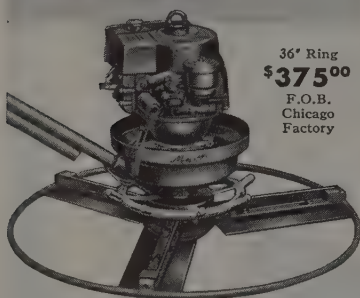
BLACK TOP PAVER

**BLAW-KNOX
COMPANY**
FOOTE CONSTRUCTION
EQUIPMENT DIVISION
1940 STATE STREET
NUNDA, NEW YORK



NEW! Mall POW'R TROW'L

Exclusive
Features New to
Power Troweling



36" Ring
\$375.00
F.O.B.
Chicago
Factory

MALL—the first power trowel that delivers 97% of engine power to the trowel blades. New direct "in-line" transmission does it...no belts or pulleys to steal valuable power.

MALL—the first power trowel with interchangeable ring sizes...36" or 45" rings, with corresponding floating shoes, finishing blades and a 24" disc for dry tamp floors, can be used with one power unit.

MALL—the first power trowel that employs a new, extra sturdy trowel ring and arm design that will not sag. These, plus many other new, exclusive features, make the new MALL POW'R TROW'L the finest performing, easiest to handle gasoline driven troweling machine you have ever experienced. GET DETAILS NOW.

MALL Nation-Wide Factory-Owned Service
Warehouses Assure Fast, Dependable Service.

MALL TOOL COMPANY 7706 S. Chicago Ave.
Chicago 19, Illinois

Send me full details and prices on the NEW
MALL POW'R TROW'L.

Name _____

Firm _____

Address _____

CU-112

ing mills at its Western plants. The 44-page catalog is bound in cardboard covers and contains complete tabulations of the properties of the various sections. In addition are photographs of its Western plants.

20

Bucyrus-Erie products catalog

A new edition of Bucyrus-Erie's catalog, fully describing the company's complete line of excavating, drilling, and material handling equipment has been released. The 70-page, 2-color catalog features copy, condensed specifications, and over 100 photographs of machines on specific jobs. Several recent additions to the company's line are included in sections entitled: Quarry and Mine Shovels; Stripping Shovels; Walking Draglines; and Railway Cranes (including a 250-ton diesel electric crane). Other sections describe small general purpose machines.

21

Hydrocrane pamphlet

A pocket-size pamphlet entitled "Those Who Use It Choose It Again" describes Bucyrus-Erie's truck-mounted, all-hydraulic Hydrocrane from the repeat order angle. The 16-page, 2-color booklet is designed for quick reading and is illustrated with on-the-job photographs. The text points to such practical features as hydraulic control, telescoping boom, self-powered crane, and methods for quick conversion to other attachments for profit-making jobs.

22

Tractor-mounted drilling rig

A drilling rig front-mounted on a crawler tractor is described in Bulletin M-214 published by Joy Mfg. Co. Blasthole and pipeline drilling are the primary uses for this piece of equipment as described in the bulletin. The machine, called Trac-Drill, is given a general description at the beginning of the bulletin followed by pictures of six field situations. The drill can be mounted on the side as well as the front of the tractor and the drilling radii are shown in a series of side and overhead drawings. A series of factory photos show the installation of the drilling unit on a Caterpillar D8.

23

Wagon for Caterpillar tractors

C & D Mfg. Co. has issued a 4-page folder describing its Sierra Movall wagon for use with Caterpillar DW20 and DW21 tractors. The folder includes 7 on-the-job photographs with accompanying text, a price list, and a table of condensed specifications.

24

Industrial products catalog

American Brake Shoe Co. has published its first complete catalog, with emphasis on industrial products. The 48-page, two-color catalog illustrates representative parts produced by eleven divisions of the company and details physical properties or characteristics where pertinent. Breakdown is by type of product, and the catalog contains sections on ferrous castings, non-ferrous castings, bearing materials, sintered metals, steel forgings, welding products, air compressors, industrial pumps, dredge pumps, and railroad products.

25

Cummins fuel pump

Cummins Engine Co., Inc., has issued a full-color folder describing its PT fuel pump. The pump is described in six cutaway views with accompanying text along with a description of the fuel injector. The folder includes a schematic fuel flow diagram showing a pressure regular, throttle, and governor in operating position.

26

General Electric wiring manual

A completely revised, up-to-date edition of General Electric's remote-control wiring manual has been announced. The manual includes the new components recently added to the remote-control line, such as the relay gang boxes, motor-driven master switch; new locking switches; and color-coded remote-control wire. The manual contains complete technical and installation data on this modern low-voltage system of wiring, and is intended for use by architects, electrical engineers and contractors, and for building developers. Wiring diagrams, wiring layout, suggested specifications, and much other useful information is included.

27

Packings and gaskets

"Chempac Packing & Gaskets" is the title of a new 6-page illustrated folder issued by Johns-Manville. The materials are specially designed for chemical and process equipment. The folder gives pertinent information on each of the several types. These include packings in coil, spiral and ring forms which are offered in four styles; a general purpose gasket offered in two styles; a folded gasket for glass lined equipment offered in two styles; and a flange gasket for high pressure service.

gaskets for glass lined equipment offered in two styles; and a flange gasket for high pressure service.

28

Centrifugal thrower unit

Stephens-Adamson Mfg. Co. offers a new bulletin covering their line of fixed and portable "Swiveloaders" for loading or storing bulk materials. The 8-page bulletin shows the unit in correct operation for filling box cars or making unconfined piles. Typical installations are pictured and several detailed drawings are given.

29

Valve bulletin

A 16-page bulletin covering a complete line of standard 4-way hand, foot, power, and solenoid operated valves has just been released by Ledeen Mfg. Co. The bulletin also shows a new line of pilot valves. Dimensions and weights, application diagrams, circuit diagrams, parts list and accessories are included. Ask for Bulletin 1010.

30

Data on manifold design

National Welding Equipment Co. has just issued a series of 9 sheets illustrating and explaining its new compound pressure cylinder manifold design. The sheets are fully il-

lustrated and discuss the problems encountered when designing the pressure cylinder, the difficulties in constructing it and the usefulness of the finished product. Information is given on the proper use of regulators and master control valves.

31

New engineering steel

United States Steel Corp. has published a 46-page brochure describing its new Carilloy T-1 steel. The booklet begins with a discussion of the development of this steel followed by a page of questions and answers concerning it. Tables of mechanical properties, chemical compositions and recommended applications are given. Large photographs and attached copy describe the uses of the new product in construction, industrial equipment, and mining and earthmoving. The book concludes with 6 pages of technical data.

32

Catalog on motor grader

Galion Iron Works & Mfg. Co. has issued a 28-page catalog featur-

ing the operating and construction details of its new heavy-duty grader. Many cutaway drawings and photographs serve to describe the machine's operation and its numerous accessories and attachments. A full page of general specifications is included.

Literature briefs . . .

33

THE USE OF ELECTRIC generating plants in mobile service is described in a pocket size, 2-color, 20-page booklet issued by D. W. Onan & Sons, Inc.

34

A MASONRY SAW and a Jetcrete, a pump for pneumatically applied concrete, are described in literature which has been made available by Construction Machinery Sales Co.

35

A GRAPHICALLY illustrated specification sheet, Bulletin 1241-S2, describing a plaster-mortar mixer, is now being offered by Worthington Corp.

36

TWIN DISC Model PO air-actuated clutch is described in bulletin 304, published by Twin Disc Clutch Co.

CLIP AND MAIL THIS COUPON

▶▶ for your free copies of

NEW LITERATURE

▶▶ or for more information on

NEW EQUIPMENT

described in the following pages.

WESTERN

CONSTRUCTION

READER SERVICE
609 Mission Street
San Francisco 5
California

Send me free booklets and information indicated by numbers circled:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

Send complete information about products advertised on:

Page.....by.....

Page.....by.....

Page.....by.....

Name.....

Address.....

Position..... COUPON FOR

Organization..... NOVEMBER 1954 ISSUE

NEW EQUIPMENT

More information on any of the items in this section may be obtained by using coupon on page 117.

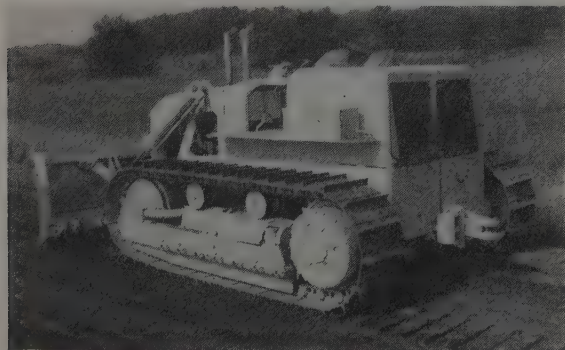
New Euclid line features twin-engine crawler

37

Aimed at a tractor market which has increased 67% in the last five years, Euclid Division of General Motors has introduced a new 53,000-lb. crawler tractor powered by two 190-hp. diesel engines. Use of twin power plants is nothing new in Euclid earth-moving equipment but this principle in a crawler tractor is definitely a new development. The pairing of two engines for locomotive or tractive effort is uncommon and the new tractor, Model TC-12, is the first factory-built crawler with power for each track supplied by a separate engine.

The new model did not require a complete redesigning, however, since the two GM diesel engines and their power trains are the same as used individually in over 750 various kinds of equipment. So no new difficulties were introduced into the interchangeability or accessibility of parts. As a matter of fact, ease of maintenance was of prime consideration throughout the development of the TC-12. It can be dismantled and reassembled with ordinary servicemen's tools. The engines are mounted side-by-side, and drive through universal joints and drive shafts to a torque converter, which is located below and to the rear of the operator location. The converter, transmission reduction gearing, and steering brake form one complete removable assembly. Almost complete dismantling can be carried out without removal of the roller frames. This is a unique feature and permits easy access to all final drive parts.

Euclid designed the TC-12 to provide higher power-to-weight ratios. Drawbar pull, equal to or better than current production crawlers, but at higher ground speeds, will give ability for faster pusher loading or rubber-tired scrapers. Tests indicate that the TC-12 develops about twice the drawbar pull at $2\frac{1}{2}$ mph. (scraper loading speed) as present "big tractors." This speed matches the first gear speed of rubber tired scrapers for more efficient scraper loading.



RADIATORS for the two 6-cylinder diesel engines are mounted in the rear, freeing operator from fan blast. Despite 53,000-lb. weight, maneuvering is easy with separate power on each track.

There are two transmissions each with an integrally mounted torque converter. The crawler tractor transmission, made by Allison, provides three speed ranges forward and three in reverse. All shifting is accomplished under full power. There is no master clutch. The tractor can be shifted from one speed range to the other, without loss of motion, and can be shifted into reverse while still going in the forward direction. The transmission provides

adequate speed selection for all operating conditions. Top speed is 8 mph.

Two independent motors permit a fast, flexible steering system, which increases workability. Normally, when the tractor is operating with light loads, steering can be accomplished in three ways: (1) by applying the brake to either track; (2) by reducing the throttle and applying the brake on either track; and (3) by reducing the throttle to either engine. Under full loads the recommended procedure is the use of the forward and reverse direction selector control on either track.



DOZING LOADS like this seems light work for Euclid's new TC-12. Twin engines totaling 380 hp. make it tops in speed and strength.

All of these steering methods can be utilized in low, intermediate, and high gear operation of the tractor. And fingertip control selection of these gear ranges can be done without interruption of power flow during steering maneuvers.

Even though the TC-12 is very efficient for loading rubber-tired scrapers, it is by no means limited to that one capacity. It can also be used for pushing scrapers, bulldozing and spreading earth, hauling compaction equipment, logging, hauling scraper units of large capacity, and the myriad of smaller uses that arise on every job.

The track gage can be widened without disturbing any precision fits. This is useful in side boom crane mounting for pipe line work. The operator will find himself more comfortable with the rear radiator mounting. This frees him from the blast of forward mounted radiator fans. Rear mounting also makes the radiator much less vulnerable to plugging and damage by dirt and trash from the dozer blade.

Two-section design permits separation where weight or width restrictions are encountered. A free movement of 7 in. is limited by stops welded to each frame half. For applications where oscillation is not desirable, some of the tractors will be field tested with rigid mounting on the cross-shaft.

Although the twin-engine crawler dominates Euclid's new line of products, their engineers also have been busy on other equipment. Three new scrapers, all of the overhung engine type, are now being manufactured: the S-7, 7-cu. yd. capacity; the S-18, 18-cu. yd. capacity; and the TS-18, a further utilization of twin-engine design.

Euclid, which merged with General Motors in 1953 seems to be maintaining the production pace which has seen their plant facilities quadruple in size in the last eight years.

GUARANTEED !

**TO
PUMP
MORE
WATER**



GORMAN-RUPP
125 M PUMP

and doing it on-the-job EVERY DAY!

**NO OTHER PUMP, SIZE FOR SIZE,
CAN EQUAL ITS PERFORMANCE**

Our distributors are authorized to put a Gorman-Rupp Contractors' Pump on any pumping job, any time, anywhere, alongside any other make pump, size for size. The Gorman-Rupp pump is guaranteed to pump more dirty water more hours, using less gasoline and to prime quicker than any other self-priming pump. If it isn't the best all-around pump, our distributor will accept the return of the Gorman-Rupp pump and pay the user any installation expense incurred.

Only the utmost confidence in the product could justify this guarantee.

We can furnish you with any size of self-priming centrifugal pump ranging in capacity from 1½ in., 5,500 G.P.H. to the powerful 10 inch, pumping 240,000 G.P.H.

Ask for Contractors' Pump Bulletin No. 4—CP-11



**SOLVE
YOUR
PUMPING
PROBLEMS**

DISTRIBUTED BY

PACIFIC HOIST & DERRICK CO.	Seattle, Washington
HARRON, RICKARD & McCONE CO. OF SO. CALIFORNIA.	Los Angeles, California
NEIL B. McGINNIS CO.	Phoenix, Arizona
BAY CITIES EQUIPMENT CO., INC.	Oakland, California
NEVADA EQUIPMENT SERVICE INC.	Reno, Nevada
MOORE EQUIPMENT CO.	Stockton, California
STUDER TRACTOR & EQUIPMENT CO.	Casper, Wyoming
ANDREWS EQUIPMENT SERVICE OF WASHINGTON, INC.	Spokane, Washington
GENE FLAHERTY	Pocatello, Idaho
NORTHERN COMMERCIAL COMPANY (Alaska & Yukon Terr.)	Seattle, Washington
TED HENRY COMPANY.	Portland, Oregon

THE GORMAN-RUPP COMPANY
MANSFIELD, OHIO

Advertisement

PUMP EXPERTS STUDY CONTRACTORS' PROBLEMS

Contractors who have ever had a pump fail on the job realize the importance of choosing the proper pump.

A pump failure may hold up the job, cause men to be idle, tie up other equipment, or even prevent finishing the contract on time. The best insurance is to have a pump that has proved itself on many tough assignments.

The Gorman-Rupp Company of Mansfield, Ohio claims that their pumps will out-perform any pump of comparable size and type on the market. So states their guarantee. The greater capacity of these pumps when working against high heads is very important to the contractor. They are the simplest of pumps and practically trouble-free. They never quit on the job.

Years of study and research by engineers in the field and the laboratory have made possible these claims and the guarantee.



FIELD NOTES on the BEST

DIAPHRAGM PUMP EVER BUILT!

With mud, sludge and water seeping into a 28 foot pit for an industrial sewer installation, W. W. Purdy Construction Company of Mansfield, Ohio put this Gorman-Rupp 3" diaphragm pump 3D-8R6, on this job at the Empire Steel Corporation factory at Mansfield.

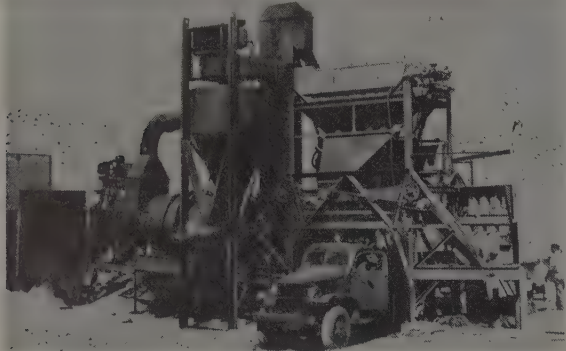
A junction of several six-foot storm sewer tiles was necessary. Rapidly rising water in the 12 x 22 foot pit flooded out workmen and 18 inches of mud and slime accumulated in the pit. The Gorman-Rupp diaphragm pump cleaned out the pit and had the workmen back on the job in 30 minutes. This job involved an 18 foot suction lift, 8 foot discharge elevation and about 35 feet of horizontal 3" hose discharge line into an open manhole. No attention was necessary except fuel supply and starting or stopping when required. The unit is self-priming. It was necessary to operate the unit several minutes every hour.

THE GORMAN-RUPP COMPANY
MANSFIELD, OHIO

Standard Steel's mobile asphalt batch plant can be assembled in one day

Now in production at Standard Steel Corporation is the new Model TM portable asphalt plant. Designed for use in areas where larger plants cannot be erected and operated profitably, and where portability is an important factor, the plant has its welded steel framework heavily braced to withstand stress in transit. The entire unit is mounted on pneumatic tires. Air connections permit the plant to be moved with a semi-type truck tractor.

Ease of erection is an important feature of the Model TM. Equipped with its own self-erecting device, the entire cage, consisting of vibrating screen, mixing unit,



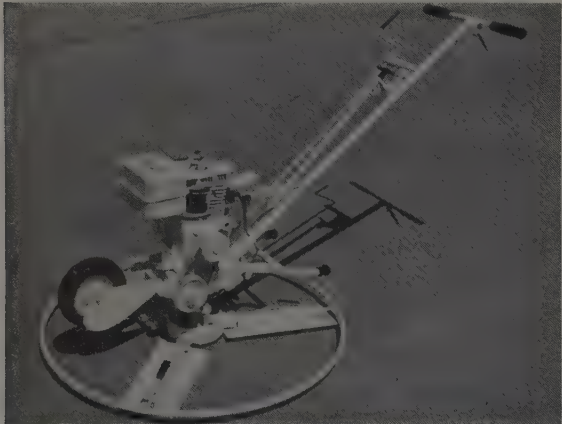
aggregate weight hopper and asphalt bucket, is raised into position by pushing a button. Total time for this operation is 30 min. The hot elevator, a vertical chain and bucket type, is hinged for easy erection by means of a block and tackle. The cold elevator is telescoped for traveling and is simply lowered into position from the trailer. It can be completely removed if a shorter trailer length is desired. Under normal working conditions the complete plant, including all accessories, can be erected in less than one day.

The mixer is in one piece with removable cast alloy liners, which can be replaced without removing the jacket. The dryer, which can be operated with gasoline, electric or diesel power, averages 40 to 50 tons of aggregate per hour. All controls are located on the operating deck enabling one man, in most cases, to run the entire plant from a central location.

39

Power troweler has retractable wheel

White Manufacturing Co. has announced a new Model T-1 concrete finishing machine with a built-in wheel. The rubber tired wheel makes this a one-man troweler, as the machine is fully portable after finishing a concrete floor or slab. Operator moves troweler to side of work,



drops wheel, and thus requires no assistant to help in moving it. With the wheel down, blades and ring are raised about 2 in. above the floor. This permits their easy removal for washing or for changing from float to finishing. The ring can be quickly removed in order to wheel the machine through a doorway. The entire unit, including the steering column, can be disassembled in a few minutes enabling it to be carried in the trunk of an automobile.

The pitch of the blades is controllable during operation by a lever at the top of the steering column. The throttle control is such that if the operator releases the handle, the engine slows down to idling and the troweler does not revolve. Power is supplied by a Briggs & Stratton 2-hp. gasoline engine with automatic clutch. The ring is 36 in. in diameter. Total weight is 130 lb.

40

Dart offers 45-ton crane carrier

Dart Truck Co. is manufacturing a 45-ton crane carrier—one of the largest ever built. Powered by a 240-hp. gasoline engine, the new unit utilizes a 10-speed transmission and 100,000-lb. rear tandem axle. Tires are 14:00 x 24.00, single front and dual rear. The frame is of box



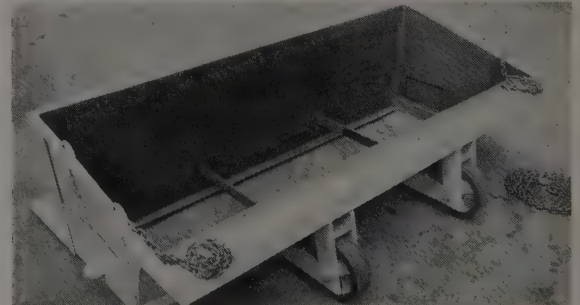
girder design, with single box outriggers and boxed beams extendible to 15½ ft. A one-man cab gives the operator good visibility, and hydraulic steering makes the unit easy to maneuver.

Overall length is 29 ft., width is 10 ft. 6 in., and the gross weight without upperworks is 50,000 lb. An optional wheelbase is provided to meet manufacturers' specifications.

41

New series of asphalt spreader boxes

Rola Paver is the name of a new line of asphalt spreading equipment made by Creative Metals Corp. Illustrated



is the standard unit, available in 8- and 9-ft. widths, with adjustable side gates and cutoff plates. With a capacity of 50 tons per hr., the unit handles controlled thicknesses from 1 in. to 1 ft., and will lay base courses up to 1½ in.

The trench paver is adjustable for any width between 1 ft. and 4 ft. It is designed to lay from 3- to 6-in. depth without compaction, a finishing 2-in. pass with compaction. Trench paver capacity is claimed to be as much as 4,000 ft. per day. Overall dimensions of the new boxes are: width—8 or 9 ft.; length—5½ ft.; height—2 ft. 4 in. Weight is 1,500 lb.

Convenient Controls Speed Production with KOLMAN Conveyor-Screen Plant

KOLMAN Model 101
Portable Conveyor
with Vibrating Screen



Motor-to-ground controls extend throttle control forward to discharge end of conveyor and clutch down to ground level.

Fast, dependable operation is yours with the big-production features and heavy-duty construction of the KOLMAN Model 101 Conveyor-Screen Plant pictured here. These features include:

Head Pulley Clutch

Located at the discharge end of the conveyor, this clutch allows the operator to stop conveyor belt as soon as trucks are loaded and start again as soon as the next truck is in position. Screen continues to operate, clearing screen cloth of lodged rocks and remaining in motion for greatest screening efficiency as soon as belt is started again.

Motor-to-ground Controls

The power unit throttle and clutch controls are extended to a point easily accessible to the operator on the ground. He can throttle back the motor whenever he stops the belt without wasting time going to and from the motor. If he desires to throw out the motor clutch, he can easily do so from the ground.

Gravel Trap for Dozer Loading (With Plate Feeder Installed)

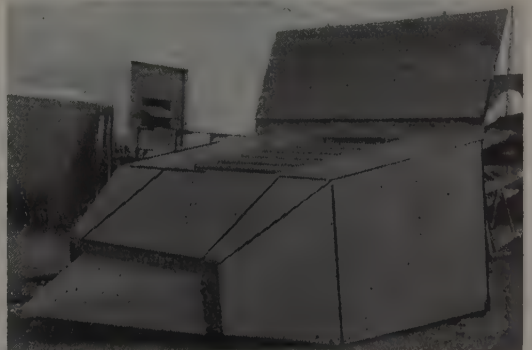
The heavy steel KOLMAN Gravel Trap becomes an integral part of the portable unit, easily moved with the conveyor. It's always ready to move to new locations by simply dozing away material piled around it. Trap has grizzly bars spaced over a wide opening, and a removable door at the rear for easy access to conveyor tail section. Ample room on both sides within the trap allows a man to enter easily to make adjustments. The trap is also available with a plate feeder installed.

Built to Size You Want

Model 101 KOLMAN Portable or Stationary Belt Conveyors are available in 18" to 36" belt widths and in various lengths as desired. KOLMAN Vibrating Screens are designed to be easily attached to any size or make conveyor, and are also available in single, double and triple deck models for many other types of applications.



Heavy production with KOLMAN Conveyor-Screen plant.



KOLMAN Gravel Trap with grizzly bars and removable door at rear.

Write for Conveyor Bulletin 101 or Screen Bulletin 112 Today!

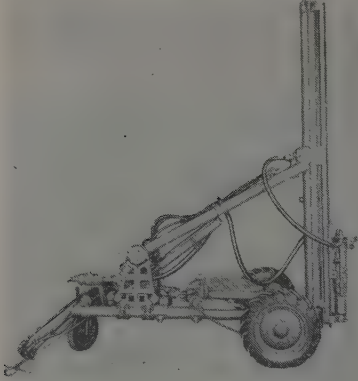
KOLMAN MANUFACTURING CO.

5670 West 12th St.

Sioux Falls, S.D.

Cleveland wagon drill improved

The Cleveland Rock Drill Division of Le Roi Co. has announced the addition of an air motor and special axle to its DR-30 wagon drill, making this



unit self-propelled. This development is intended to meet the demand for more flexibility in deep-hole drilling power, and to save set-up time, according to company officials. A similar air motor is also used for raising and lowering the wagon-drill boom and further speeds the drilling operation. Power is transmitted from motor to wheels by a chain drive. This is shown in the illustration. Actually, the chain drive is fully enclosed.

The air feed has an 8-ft. travel for 6-ft. steel changes. It is claimed that this not only makes drilling faster with both steel and carbide bits, but also increases the footage drilled per bit.

43

New digger for stiff clay

A new clay digger is now in production at Davey Compressor Co. Designated as Model DD-30, it was designed for excavating stiff clay and hardpan as well as concrete and shale. Its latch-type chuck retainer permits a quick change of working steels such as clay spades, flat picks, moil points, chisels, asphalt cutters, frost wedges, dirt tampers and others. The tool's chrome-plated cylinder bore is said to more than double effective working life. The manufacturer emphasizes that many of the parts used in DD-30 are the same as used in other Davey tools, resulting in a minimum of spare parts inventory.

A built-in lubricator gives pressure lubrication to all moving parts. Light starting and running are accomplished through use of a metered throttle valve. The DD-30 weighs 31 lb., is 23 in. long, 7 in. wide, and 4½ in. in depth.

44

New line of hard-facing electrodes

Moly-Mang, a new line of electrodes, has been placed on the market

by Mir-O-Col Alloy Co., Inc. Good for build-up work on manganese castings, Moly-Mang produces a high tensile strength, making it desirable for many applications including frogs and switches. Hardness of deposit is from 5 to 10 Rockwell C and will harden to 50 Rockwell C when subjected to peening or impact. Application is by AC-DC electric arc with reverse polarity.

The new line is available in a full range of sizes and is packaged in hermetically sealed metal containers to prevent moisture pick-up and rod scuffing. Descriptive literature and free samples are available upon request.

45

Wain-Roy markets hydraulic back hoe

Wain-Roy Corp. has announced a new back hoe, designed specifically for the Hough Payloader. The boom design and bucket action permit digging vertical bell holes, vertical side walls, square corners, and



*Trying to "smoke out"
local dealers?*



The answer's in the YELLOW PAGES!



Ever hear of a dealer without a telephone? Of course not. And to increase his telephone orders he advertises in the "Classified" telephone directory. After all, that's where 9 out of 10 people look when they want to find the folks who sell or serve them locally. The Yellow Pages will help you find the product or service you need and the dealer nearest you.

You'll find it fast in the YELLOW PAGES!

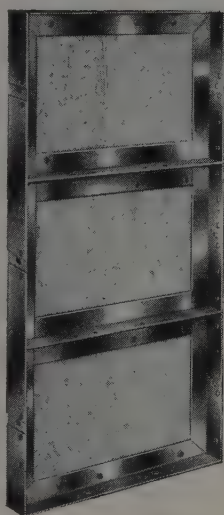


Pacific Telephone

Simplified Concrete Forming System

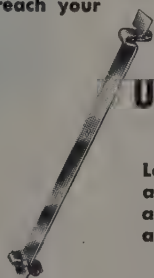
for Lowest all around Form Costs!

3 BASIC ELEMENTS



UNI-FORM Panels

Prefabricated . . .
ready to use when
they reach your
job.



UNI-FORM

Tie

Locks, spreads
and ties . . .
absolutely
accurate.

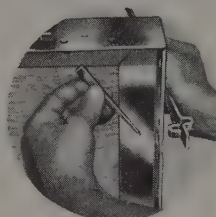


UNI-FORM

Tie Key

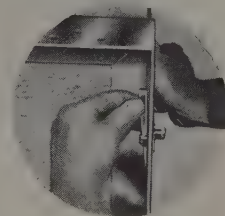
Wedge-Shaped for
fast, easy inser-
tion.

3 SIMPLE OPERATIONS



1

Place the Uni-Form Tie Loop
into the Tie Hole.



2

Set the Tie Key into the Tie
Loop. Panel and Tie are then
locked into one integral unit.



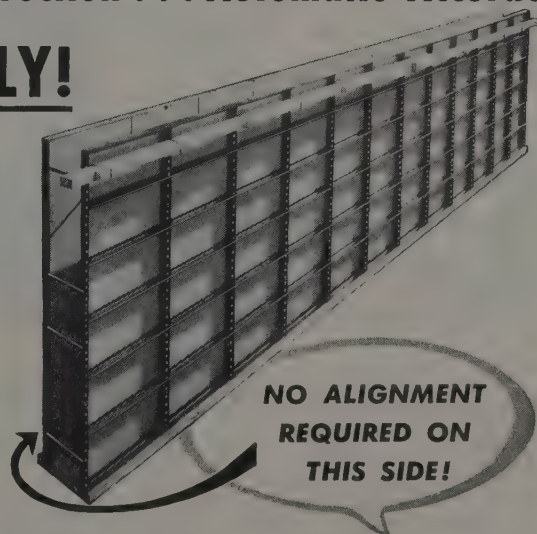
3

Bring the next UNI-FORM
Panel into position . . . in-
sert the Tie Key. The as-
sembly is now completed.

UNI-FORM® Panels Assure Faster Erection . . . Automatic Accuracy
ALIGNMENT ON 1 SIDE ONLY!

FREE Engineering Service!

Complete job analysis . . . forming recommendations,
bills of material supplied by our staff of experienced
engineers...**PLUS**...Field Service...anywhere...any-
time to insure proper starts and maximum economy on
your job. Send us a set of plans for **FREE** estimate.
No obligation.



**NO ALIGNMENT
REQUIRED ON
THIS SIDE!**

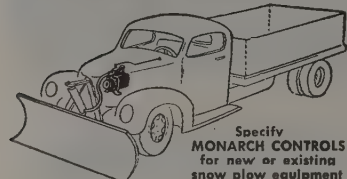
See Your **UNIVERSAL FORM CLAMP Co. Distributor**

K-C CONSTRUCTION SUPPLY CO. Denver, Colo.
BOW LAKE EQUIPMENT CO. Seattle, Wash.
UNIVERSAL FORM CLAMP CO. Los Angeles, Calif.
UNIVERSAL FORM CLAMP CO. San Leandro, Calif.
General Offices and Factory • 1258 NORTH KOSTNER AVENUE • CHICAGO 51, ILL.

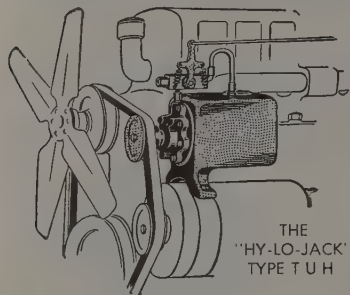


Copyright 1953 by UNIVERSAL FORM CLAMP CO., Chicago 51, Ill.

POWER HYDRAULICS for Snow Plows



Specify
MONARCH CONTROLS
for new or existing
snow plow equipment



THE
"HY-JACK"
TYPE T U H

- Clutch operated models
- Thousands in use—
- 1000 lbs. Pressure, 1 gal. per minute
- Fit all trucks
- Fan belt driven
- Electric Models (6 or 12 Volt) also available

• Write Hydraulic Division
MONARCH ROAD MACH. CO.
324 North Front Ave.
GRAND RAPIDS 4, MICHIGAN

trenches with level grades at the bottom. It provides an effective digging depth of 12 ft. 6 in. below grade. Trenches can be dug and spoil dumped at any radius up to 190 deg. The hoe itself does not interfere with normal functions such as backfilling, excavating, etc. The hoe can be removed in one-half hour and attached in less than an hour.

46

New swivel saves head room

General Machine & Welding Works, Inc., has added a new Wedge fitting to its Miller swivel line. It is incorporated in the body of the swivel, saving up to 8 in. of head room.

47

Concrete reinforcing bar

U. S. Steel Corp. has announced a concrete reinforcing bar designed to reduce costs in the construction of large concrete jobs. Identified as 2½ in. Round USS Di-Lok, the bar reduces appreciably the concrete yardage requirements in heavy structures. Concrete columns can be designed to carry the same loads with substantial reduction in size. This results in less concrete, lower form costs, and frequently, more usable space in the completed structure. Diamond lock deformations in the steel give maximum bond with minimum loss of area.

48

Back hoe has many uses

Recently introduced by American Tractor Corp. is a hydraulically operated Pippin back hoe developed specifically for use on TerraTrac crawler tractors. With an over-all width of only 5 ft., and height of less than 5 ft., the digger can be operated in close quarters inaccessible to cranes and rubber-tired equipment. Its reach of 16 ft. makes it possible to dig vertical-walled trenches 10 ft. below grade. It has a 9-ft. dumping height for piling dirt or loading



trucks. Bucket widths, 12 to 40 in.

A swivel seat enables the operator to face in either direction to move the tractor as needed or to operate front or rear attachments. The front mounted loader or dozer blade permits backfilling of trenches dug with the same machine. It is possible to force the dozer blade into the ground to securely anchor the digger, making it possible to take bigger bites with each pass of the bucket.

49

More hp. for Galion Model 303 grader

The IHC UD-264 diesel engine with 4-in. bore and 5¼-in. stroke on Model 303 medium-duty motor grader is now rated at 55 hp. at 1,800 rpm, according to the manufacturer, The Galion Iron Works and Manufacturing Co.

50

Improved paving joint filler

Grem's Manufacturing Co. has developed a line of low cost rubbery joint filling materials called the Polyloid JFR compounds. They have a greatly increased resistance to the destructive solvent action of jet airplane fuels and gasoline, and are not affected by most acids, salts, alkalies, or corrosive chemicals. The new compounds are waterproof and meet all federal specifications for jet fuel-resistant joint fillers.

Polyloid JFR can be heated in regular kettles and melts at 250 deg. F. The compounds are made for hot-melt pouring, cold-pour placement, coating by brush, trowel, or spray.

51

Small battery charger in production

Universal Motor Co. has designed a 1,000-watt, 32-volt, battery charger called the Model 21-MS. It measures 18 3/16 in. in length, 15 5/8 in. in width,

WISCONSIN-POWERED



KWIK-STEAM GENERATORS Provide Versatile Construction Service



Producing steam as needed, quickly and efficiently, for use on land or on barges; . . . for speeding up pile driving and cutting labor costs; . . . for heating aggregate and water in concrete mixing; for these and many other purposes Littleford Kwik-Steam Vapor generators give good accounts of themselves.

And for the successful, efficient operation of these versatile steam generators, Wisconsin Heavy-Duty Air-Cooled Engines are used as power components for driving blower, fuel pump and water pump.

Littleford Bros., Inc., Cincinnati, Ohio, as the builders of Kwik-Steam Generators, recognize the outstanding dependability and low maintenance cost of Wisconsin Air-Cooled Engines . . . just as many other builders of construction equipment do.

For your money — you can't do better than specify "Wisconsin Power" for your equipment. There is a Wisconsin Engine to meet every power need from 3 to 36 hp.



WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 40, WISCONSIN

A 8096-1/2-A

and 14 $\frac{1}{8}$ in. in height. Weight is 95 lb. The new charging set is powered by a single-cylinder, air-cooled, 4-cycle gasoline engine directly coupled to the generator. Mounted in a control box above the generator are the push-button starter switch, reverse current relay, and ammeter for indicating charging rate. There is an adjustable rheostat for regulating the battery-charging current from 15 to 30 amp. This model is priced at \$265.00. Complete information is given in bulletin DME-1.

52

Oil-burning heater has limited height

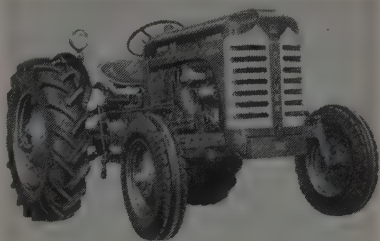
An oil burning heater known as the BJR Model Salamander, designed for use where headroom is limited, has been introduced by Scheu Products Co. It has a shorter stack and larger diffusion hood than Scheu's regular line. The new BJR Model measures 55 $\frac{3}{4}$ in. in height. A return gas stack brings consumed gases back to the bowl, producing better combustion and reducing the amount of cleaning required.

The heater uses less than one gallon of any good grade fuel oil, and will produce from 70,000 to 140,000 BTU. It lights with a match and burns from 10 to 20 hr. on one filling. There are no wicks, valves, or jets. It comes equipped with a damper for extinguishing, and carrying clamp handles.

53

New wheel tractor

An all-purpose wheel tractor has been announced by Oliver Corp. Known as the Super 55, it is designed for both industrial and farm service. It is a four-wheel, adjustable tread



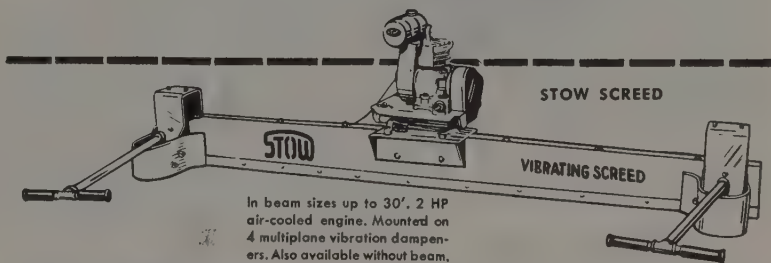
type with low profile and short wheel base. A choice of diesel or gasoline power is offered. Tractor without attachments weighs about 3,000 lb. The Super 55 has six forward speeds, hydraulic control for the three-point hitch, double-disc brakes, and independently controlled power take-off. Literature is available.

54

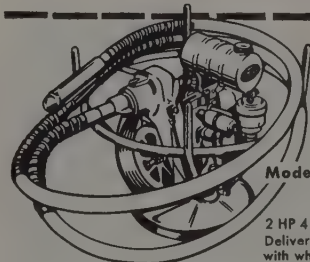
Heavy-duty off-highway truck

A new six-wheel truck, Model RF-230, designed for off-highway service, has been placed in production by International Harvester Co. The vehicle weighs 60,000 lb. and is powered

Concrete facts about Concrete Vibrators and Screeds

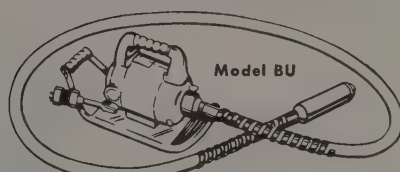


In beam sizes up to 30'. 2 HP air-cooled engine. Mounted on 4 multiplane vibration dampeners. Also available without beam.



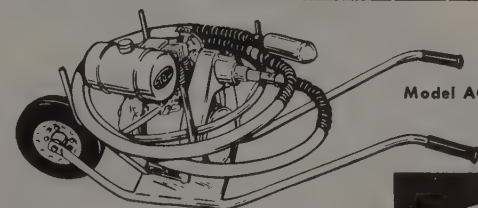
Model BG

2 HP 4 cycle air-cooled engine. Delivers 6000 to 9300 Available with wheelbarrow mount.



Model BU

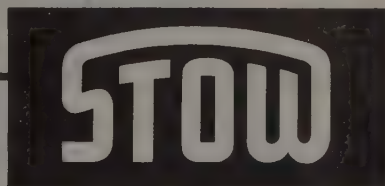
2 HP at 9000 VPM 115 V. AC or DC



Model AGW

4 $\frac{1}{2}$ HP 4 cycle air-cooled engine. Mounted on wheelbarrow for easy maneuverability. Delivers 6000-9300. Available without wheelbarrow.

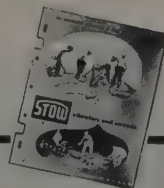
Here is the name you want!



The high operating speeds of the new STOW line of Concrete Vibrators make possible the use of heavy duty, light weight flexible shafting and lighter, more efficient vibrator heads—which speed operations, cut costs. And, STOW design provides convenient, practical speed control so attachments may be used directly on the vibrator shafts.

STOW SCREEDS—permit placing more than 300 cu. yds. in less than 8 hours; strike off and impact in one operation; leave surfaces true to grade; work up to and around man-hole covers and obstructions.

See your STOW distributor about STOW vibrators and screeds today. Send for free Bulletin 526.



STOW MANUFACTURING COMPANY
56 Shear Street Binghamton, New York

PREVENT DELAYS

ON-
THE-
JOB

with
fast, sure

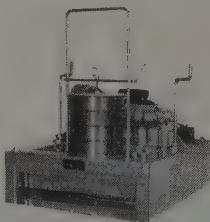
GILSON Screen Testing

Failure to meet sizing specifications costs time and money.

The GILSON Mechanical Testing Screen cuts out error and guesswork in meeting sizing specifications for crushed stone, gravel, slag, coal, ores, and similar materials.

A GILSON Test Report is the standard of industry. It is your guarantee that every carload, every truck-load is as-ordered. And GILSON does the job *fast*—five minutes or less per complete test.

A Sand Attachment for handling 8-inch sieves is optional equipment.



Here's Why You Want GILSON —

No more guesswork on sizing
No more tedious screening by hand

1. Makes tests quickly and accurately
2. Two to seven separations simultaneously
3. Screen trays independently removable
4. Trays balanced to same tare weight
5. Visible separation to refusal
6. Few moving parts
7. Sturdy construction
8. Size range 4" to 200-mesh

Write now for additional information.

GILSON SCREEN CO.
MALINTA, OHIO

by a 201-hp. engine which delivers 430 pt.-lb. of torque at 1,600 rpm. RF-230 is built to withstand shock loads and is suited for use with 8- or 9-yd. concrete mixers, for service in stripping operations, highway and dam construction, earth moving operations, and quarry work.

Standard equipment includes hydraulic, full-power steering; air brakes; 12-volt electrical system, 60-gal. fuel tank, 15-in. clutch, and 175-in. wheelbase. Optional equipment includes high-altitude fittings and tinted safety glass all around.

55

Small scraper easy to service

Euclid Division of General Motors has marketed a 7-cu. yd. scraper, the S-7, which features accessibility of all drive components. Lever type hydraulic operations eliminate all but 11½ ft. of cable. The four cutting blades are reversible and interchangeable, offering maximum digging ability for each type of soil. Complete specifications are given in form No. 503.

56

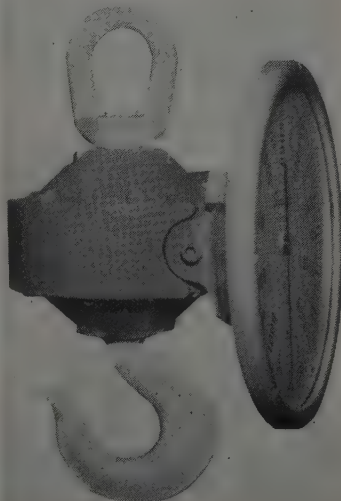
New line of speed tools

Flexible Steel Lacing Co. has announced a new line of speed tools. In this new line are a power tool wrench which speeds up nut tightening, a power tool boring punch for bolt holes, a double purpose templet which assures correct spacing of holes, a wide belt cutter, and a cross arm tool with a pivoted knob for nut tightening. Specifications and list prices are given in bulletin F-110.

57

Hook scale works without friction

A hydraulically operated hook scale, SU-20 Sensater, is being manufactured by Martin-Decker Corp. The scale has a guaranteed accuracy of ¼ of 1% of capacity at any point

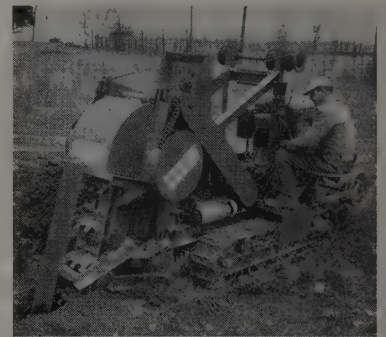


on the dial. The scale uses a new type of mobile diaphragm that develops a piston-like stroke. This transmits an accurate signal to the gage. The Sensater is available in four capacities: 2,500, 5,000, 10,000 and 20,000 lb. The unit weighs 73 lb. and has an ultimate strength of more than 5 times its rated capacity. Full 360-deg. calibration gives larger increments in smaller diameter. The 12-in. scale which has a 25% tare adjustment has bold lines for distant reading and fine lines for close reading.

58

Utility ditcher announced

Gar Wood Industries is producing a crawler-mounted ditcher suitable for house foundation and service line construction for basementless ranch type houses. The new machine, model 403, is a small ladder-type ditcher easily transported from job to job. Its capacity is 5 ft. deep for 8-, 10-, and 12-in. widths of cut and 4 ft. deep for



14- and 16-in. widths of cut. The low ground bearing pressure won't damage lawns or walkways.

The digger has eight speeds forward and digs a straight-sided trench that requires no hand forming. All units are easily accessible and removable for conversion or maintenance without disturbing other components. The discharge chute is self-adjusting, the excavator boom is hydraulically controlled, and conveyor speeds can be varied.

59

Engine has high power rating

Horsepower in the range of 252 to 290 is provided in the new Minneapolis-Moline 1600-12A industrial power unit. The unit operates with 12 volts on either natural or LP gas. Dual 6-cylinder engines of the new engine mounted in parallel are geared to a single power take-off shaft. Displacement is 1,600 cu. in. Horsepower ratings are: 290 at 1,300 rpm.; and 273 at 1,200 rpm. on LP gas; 262 at 1,300 rpm.; and 252 at 1,200 rpm. on natural gas.

The new unit is designed for use with irrigation pumps and other large volume pumping applications, saw mills and cotton gins, generator sets, oil field equipment, and crushers.

Aluminum pistons and counterbalanced crank shaft improve intermittent high-speed performance and give fast acceleration. Counterclockwise rotation of the power take-off shafts is standard in the 1954 production of these units, with clockwise rotation planned for later production. Front power take-off is available. Basing engine speed at 1,200 rpm. and selecting the appropriate gears, power shaft speeds are possible at 600, 800, 1,200 and 1,800 rpm. Twin 14-in. double-disc clutches, oil pressure and water temperature cut-outs are included in this new power unit.

60

Model 35 added to truck mixer line

Concrete Transport Mixer Co. announces the addition of the Model 35, 3½-cu. yd. Rocket truck mixer to



its line of drum-type mixers. This revolving drum mixer features hydraulically-operated chute control, with a permanently attached movable chute and an aluminum detachable extension chute. The new unit has the flexibility of a chain drive and a standard electrically-operated revolution counter.

61

Low cost sandblaster

The Cyclone JR sandblaster manufactured by Safetee Products Co. is a low cost sandblaster which does not need a high powered air compressor for operation. The Cyclone JR re-



moves carbon from cylinder heads, valves, pistons, manifolds and ports. It can be used to clean tire re-cap molds, remove rust, paint or mill scale. It can also be applied to frosting and designing glass or wood. It is available in two models: as a sandblaster only (Model JR) or in kit form. The Model B-50 blast cleaning kit (pictured) gives the user a tool for sandblast cleaning, liquid blast cleaning, or airblast cleaning. Dealer inquiry is invited.

Best way to achieve SPECIFIED DENSITY in

ROCK, SLAG, SOIL-BOUND MACADAM, GRAVEL and SAND BASE COURSES

use...

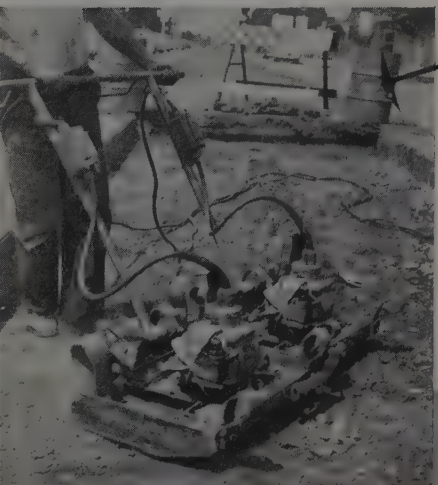
JACKSON

VIBRATORY COMPACTORS!



On jobs such as this, soil-bound macadam—5 inches thick, the JACKSON MULTIPLE COMPACTOR, now more powerful than ever, achieves specified density in JUST ONE PASS. It is equally efficient on rock, or slag base and all other granular soils.

Quickly adaptable to widening, the JACKSON MULTIPLE COMPACTOR is shown here consolidating slag macadam base course 36 inches wide and 9 inches thick. Using three of the machine's powerful compactor units in tandem, it readily obtains specified density in ONE PASS.



Twin hook-up of manually guided JACKSON COMPACTORS consolidating gravel base for a large pavement repair area. These machines, used singly or in tandem, or side-by-side twin hook-ups, are exceedingly efficient for all types of granular soil base and fill compaction; also for bituminous patching and driveway construction. Operated from a trailer-mounted JACKSON POWER PLANT which may also be used for other power tools and lights.

See your Jackson Distributor or write to us for complete information on these machines.

JACKSON VIBRATORS, INC. LUDINGTON, MICH., U.S.A.

FOR SALE 8" & 12" PIPE

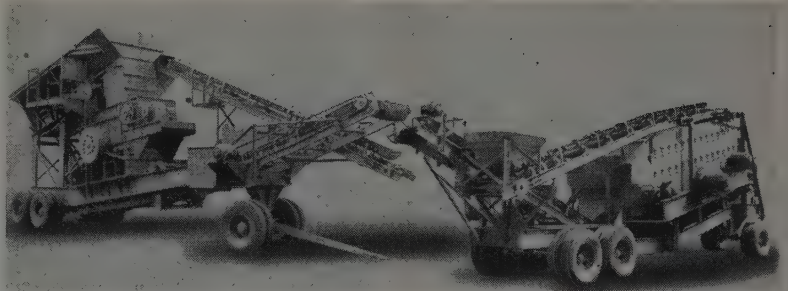
FOR MEDIUM PRESSURE
PIPE LINE SERVICE—
ROAD CROSSINGS—
PILING AND STRUCTURAL
PURPOSES

200,000' 8 5/8" O.D. .322 Wall
28.55# Lapweld
100,000' 12 3/4" O.D. .375 Wall
49.56# Lapweld

All machine cleaned, commercially straight, 20' single random lengths, ends beveled, used good conditions. Priced low, prompt shipment, Welda, Kansas, Grandview and Carrollton, Mo.

Write, Wire, Phone
Humboldt - Chicago
PIPELINE PROJECT

125 W. 3rd St. Tulsa, Okla.
Phones 2-9128 — 54-1229



62

Crushing plant designed for wet materials

A new two-unit hammermill crushing, screening and loading plant designed for operation in wet, sticky materials and in quarries contaminated by clay balls and mud pockets, has been introduced by **Universal Engineering Corp.** The combination hammermill and screening unit will produce aglime and road rock, aglime and chips, or all aglime as desired.

The hammermill is equipped with a moving breaker plate which prevents build-up of material in the breaking chamber, and a moving cleaning bar which keeps the discharge free at all times.

The unit consists of a 5 x 14-ft. double deck inclined gyrating screen with 70 sq. ft. of screening area in each deck and a ball tray deck under the second deck. It is electrically driven with a convenient control panel located on the operator's platform.

63

All-weather cab for tractor shovels

An all-weather molded steel cab is now available for all models of the Michigan tractor shovel built by the **Clark Equipment Co.** Designed for easy field installation, the heavy duty

cab has good vision through safety glass windows set in rubber molding. The rear section, which has sliding windows, rolls freely on track and can be removed in 5 min. The glass in the overhead window is tinted to elim-

Get this helpful booklet

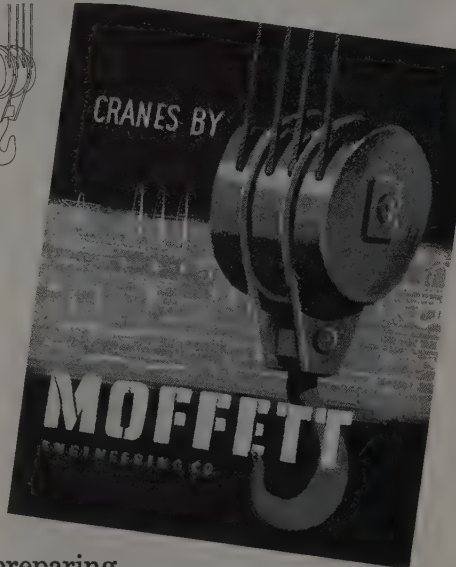


32 pages. Describes
MOFFETT crane types.

Pictures 110

"plant individualized"
installations. Includes

Crane Inquiry form for preparing
specifications. Write for your free copy NOW.



inate the sun's glare. The movable rear section of the cab will lock open or closed in any position. A quick release mechanism frees the lock when the cab is pulled back to open. The cab, which weighs about 275 lb., is sprayed with insulating compound on the inside to deaden noise. A windshield wiper is standard equipment with an optional heater and defrosting unit.

64

Lightweight concrete vibrator

A new lightweight high-speed concrete vibrator is being produced by **Stow Manufacturing Co.** Mounted on a lightweight base the JB vibrator can be easily carried around on the job. This machine has a 2-hp., 4-cycle, air-cooled engine. It has a ball bearing eccentric belt tensioner and a special spring lock for fastening the flexible shaft to the countershaft.

Different combinations of 7-ft., 14-ft. or 21-ft. flexible shafts can be fur-

Traveling Cranes · Hoists



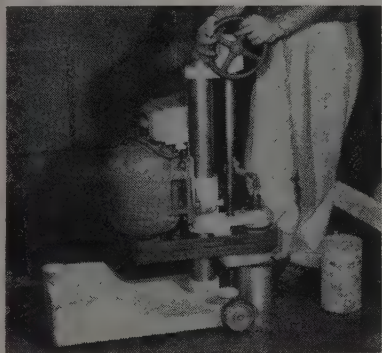
579 Cleveland Ave., Albany, Calif. • Landscape 5-4916
3930 N. Mission Rd., Los Angeles 31 • Capital 2-7161
15 Park Row, New York 38

nished to give total lengths up to 35 ft. The vibrator head can be removed and attachments screwed on for either wet or dry grinding of concrete.

65

Masonry drill can cut reinforcing

Molco Drilling Machines, Inc., is manufacturing the portable drilling machine, the Mechanized Mole, which can cut through hard aggregate and steel reinforcing bars without loss of drilling speed. The new drill will cut a 1- to 6-in. diameter hole in one foot of concrete in less than 2 min. and will drill a 1/2- to 6-in.



diameter hole 18 in. deep in one operation. Deeper holes may be drilled by placing extension shafts on the bit. Vertical or horizontal holes can be drilled through reinforced concrete or any ceramic material. The machine uses self-sharpening diamond drill bits. It can be used for cutting holes for service lines, test cores, and anchoring machinery. It is available in two models, 1 hp., and 2 hp. Weight is about 275 lb.

66

Light-weight paving breaker

Model DB-35, a light-weight paving breaker, is being produced by Davey Compressor Co. It is said to be efficient for light excavation and demolition work on floors, walls, and masonry construction. Because of its lightness, it can be used for horizontal trimming and similar jobs that require breaking to a dimensioned line. The air inlet has a filter screen, and the throttle valve bushing can be replaced without having to repair the handle. The tool weighs 37 lb., and is 23 3/4 in. long.

67

Air filter for backfill tamper

Gunderson-Taylor Machinery Co. is manufacturing a new air filter for its Triplex backfill tamper. The filter is a 48-sq. in. cylinder which needs infrequent cleaning. When cleaning is necessary it is done by removing the plug and turning on the air. Only in extreme cases is it necessary to remove the filter and wash it. The manufacturer emphasizes that the filter can be used only on the Triplex tamper.

Here's how much more you get when you buy— ONAN Electric Plants

HIGHER CAPACITY per pound of weight. A 10KW Onan weighs only half as much as other comparable units.

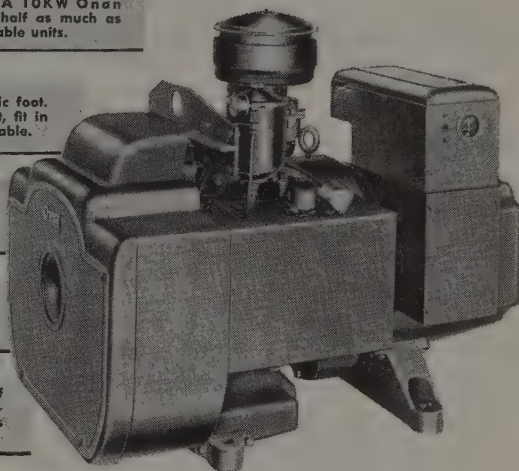
MORE OUTPUT per cubic foot. Onan units are compact, fit in small space, easily movable.

UNIT-BUILT CONSTRUCTION Onan-built plants are direct-connected for permanent alignment, long life.

SPECIAL ELECTRIC PLANT ENGINES. Onan-built engines have massive bearings and other parts to assure durability.

VERSATILITY. A wide variety of accessories such as skids, dollies, trailers, adapt Onan units to more jobs.

48-HOUR SERVICE. Repair parts and factory experts are close to any part of the U.S. Many foreign parts depots.



MODEL 5CW—5,000 watts A.C. two-cylinder, air-cooled, gasoline powered.

... yet kilowatt for kilowatt, an ONAN costs you less than any other electric plant!

ONAN gives you many advances in electric plant design, plus proved dependability on the job! You pay no premium for these Onan features . . . in fact all the electric plants shown here are priced lower than other plants of similar capacity.

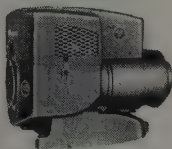
The Onan line is complete, with scores of different sizes and a great variety of optional equipment, making it easy to pick just the right electric plant for particular jobs *with savings in weight, space and operating expense.*

For any job requiring an independent source of electric power, Onan gives you greater all-around service and unequalled value too . . . measured either by first cost or in the long run.

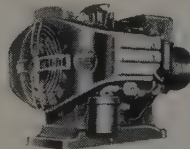
... Gasoline or Diesel-powered Air or water-cooled

GASOLINE: Air-cooled—400 to 10,000 watts. Water-cooled—10,000 to 50,000 watts.

DIESEL: Air-cooled—3,000 and 5,000 watts. Water-cooled—15,000 to 55,000 watts.



MODEL 305CK—3 1/2 KW A.C. 2-cyl. air-cooled, gasoline engine.



MODEL 5DRP—5KW A.C. Diesel two-cylinder air-cooled.



MODEL 3D5P—3KW A.C. Diesel one-cylinder air-cooled.

Write for specifications and descriptive folder!

AUTHORIZED DISTRIBUTORS:

ETS-HOKIN & GALVAN

FREMONT ELECTRIC COMPANY

551 Mission St., San Francisco, Calif. 744 North 34th, Seattle, Washington
218 N. Avalon Blvd., Wilmington, Calif.

SPARKS-WILLS COMPANY

1624 S.E. Grand Ave., Portland, Ore.



UNIT PRICES

Selected abstracts for Western projects

IRRIGATION—Supply canal rehabilitation and enlargement in Colorado

Colorado—Bur. of Recl. Emerson S. Ellett, Inc., submitted low bids of \$100,665 and \$124,029 on both Schedules No. 1 and 2 for rehabilitation and enlargement on the Erie section of the South Platte supply canal of the Colorado-Big Thompson project. Unit prices are as follows:

	Schedule No. 1	Schedule No. 2	Total
(1) Emerson S. Ellett, Inc.....	\$100,665	\$124,029	\$224,693
(2) A. S. Horner Construction Co.....	127,181	169,329	296,510
John H. Keller Construction Co.....	161,995	207,700	369,695

SCHEDULE NO. 1

	(1)	(2)
Lump Sum Clearing right-of-way and reconstructing canal, Station 10.30 to Station 68.00.....	\$12,930.00	\$15,000.00
Lump Sum Clearing right-of-way and reconstructing canal, Station 68.00 to Station 142.50.....	19,540.00	15,000.00
Lump Sum Clearing right-of-way and reconstructing canal, Station 142.50 to Station 172.00.....	8,110.00	15,000.00
500 cu. yd. Excavation for drainage channels and ditches.....	.50	1.00
2,350 cu. yd. Excavation for compacted perimeter.....	.20	.50
2,800 cu. yd. Placing compacted perimeter material.....	.30	.90
3,000 cu. yd. Excavating for structures.....	1.50	1.50
1,450 cu. yd. Backfill about structures.....	.50	1.00
980 cu. yd. Compacting backfill about structures.....	4.00	3.70
1 Detour Constructing and removing roadway detour.....	200.00	700.00
353 cu. yd. Furnishing and placing dry riprap.....	8.00	15.00
120 cu. yd. Furnishing and placing grouted riprap.....	15.00	20.00
14 cu. yd. Furnishing and placing roadway gravel.....	2.50	2.50
5 acre Furnishing and planting grass seed.....	50.00	300.00
410 bbl. Furnishing and handling cement	6.50	6.50
23,300 lb. reinforcement bars.....	.16	.20
260 cu. yd. Concrete in structures.....	85.00	120.00
1,940 lb. Furnishing and installing metal pipe for flumes.....	.90	.80
70 lin. ft. Furnishing and laying 12-inch diameter corrugated-metal pipe.....	3.50	4.60
28 lin. ft. Furnishing and laying 15-inch diameter corrugated-metal pipe.....	4.00	6.00
64 lin. ft. Furnishing and laying 18-inch diameter corrugated-metal pipe.....	5.00	6.50
42 lin. ft. Furnishing and laying 24-inch diameter corrugated-metal pipe.....	6.25	9.00
9.5 M.b.m. Furnishing and erecting untreated timber in road bridges.....	325.00	370.00
3.7 M.b.m. Furnishing and erecting treated timber in road bridges.....	350.00	430.00
1.7 M.b.m. Furnishing and erecting untreated timber in foot bridges.....	325.00	390.00
2 post Furnishing and erecting guard posts.....	10.00	8.00
50 lin. ft. Furnishing and erecting beam-type guardrail.....	6.00	7.50
0.2 mi. Removing fences.....	500.00	300.00
1.4 mi. Removing and rebuilding fences.....	1,000.00	1,150.00
0.1 mi. Furnishing and erecting new fence.....	2,000.00	1,500.00
90 post Replacement and additional posts for rebuilding fence.....	1.50	4.00
144 lin. ft. Furnishing and laying 12-inch precast-concrete pipe with type B joints.....	3.00	4.00
20 lin. ft. Furnishing and laying 30-inch precast-concrete pipe with type B joints.....	10.00	13.50
50 lin. ft. Furnishing and laying HC50, 72-inch precast-concrete pipe with type R2 joint.....	50.00	60.00
700 lb. Furnishing and installing metal slide gates.....	.70	.90
40 lb. Furnishing and installing metal flap gate.....	.70	1.60
3,120 lb. Furnishing and installing miscellaneous metalwork.....	.70	1.30
26 lin. ft. Furnishing and laying 4-inch diameter cement-asbestos pipe.....	2.00	3.00
Lump Sum Furnishing and installing one (1) 4-inch gate valve with valve box and cover.....	100.00	75.00

SCHEDULE NO. 2

	(1)	(2)
Lump Sum Clearing right-of-way and reconstructing canal, Station 172.00 to Station 221.00.....	\$14,680.00	\$15,000.00
Lump Sum Clearing right-of-way and reconstructing canal, Station 221.00 to Station 286.40.....	16,140.00	15,000.00
Lump Sum Clearing right-of-way and reconstructing canal, Station 289.05.4 to Station 315.00.....	6,450.00	22,000.00
900 cu. yd. Excavation for drainage channels and ditches.....	.50	1.00
4,900 cu. yd. Excavation for compacted perimeter.....	.20	.50
5,900 cu. yd. Placing compacted perimeter material.....	.30	.90
5,050 cu. yd. Excavation for structures.....	1.50	1.50
2,530 cu. yd. Backfill about structures.....	.50	1.00
1,200 cu. yd. Compacting backfill about structures.....	4.00	3.70
3 Detour Constructing and removing roadway detours.....	350.00	700.00
460 cu. yd. Furnishing and placing dry riprap.....	8.00	15.00
150 cu. yd. Furnishing and placing roadway gravel.....	2.50	2.50
6 acre Furnishing and planting grass seed.....	50.00	300.00
430 bbl. Furnishing and handling cement	6.50	6.50
25,000 lb. reinforcement bars.....	.16	.20
285 cu. yd. Concrete in structures.....	85.00	120.00
85 sq. ft. Furnishing and placing elastic filler material in joints.....	2.00	5.00
3,100 lb. Furnishing and installing metal pipe for flumes.....	.90	.80
40 lin. ft. Furnishing and laying 12-inch diameter corrugated-metal pipe.....	3.50	4.60
54 lin. ft. Furnishing and laying 15-inch diameter corrugated-metal pipe.....	4.00	6.00
82 lin. ft. Furnishing and laying 18-inch diameter corrugated-metal pipe.....	5.00	6.50
32 lin. ft. Furnishing and laying 24-inch diameter corrugated-metal pipe.....	6.25	9.00
9.8 M.b.m. Furnishing and erecting untreated timber in road bridge.....	325.00	370.00
14.4 M.b.m. Furnishing and erecting treated timber in road bridges.....	350.00	430.00
1.5 M.b.m. Furnishing and erecting timber in foot bridges.....	325.00	390.00
2 post Furnishing and erecting timber guard posts.....	10.00	8.00
0.2 mi. Removing fences.....	500.00	300.00
0.9 mi. Removing and rebuilding fences.....	1,000.00	1,150.00
60 post Replacement and additional posts for rebuilding fence.....	1.50	4.00
0.1 mi. Furnishing and erecting new fence.....	2,000.00	1,500.00
43 lin. ft. Furnishing and installing chain-link fence.....	5.00	5.00
34 lin. ft. Furnishing and laying 12-inch precast-concrete pipe with type B joints.....	3.00	4.00
56 lin. ft. Furnishing and laying 18-inch precast-concrete pipe with type B joints.....	6.00	6.00
238 lin. ft. Furnishing and laying HC50 72-inch precast-concrete pipe with type R2 joints.....	55.00	60.00
360 lb. Furnishing and installing metal slide gates.....	.70	.90
Lump Sum Furnishing and installing one automatic radial gate.....		
5,500 lb. Furnishing and installing miscellaneous metalwork.....	.70	1.30
50 lin. ft. Furnishing and erecting beam-type guardrail.....	6.00	.50

HIGHWAY—Construction of 0.9 mi. of graded roadbed south of San Francisco

California—San Mateo County—State. Guy F. Atkinson Co. submitted a low bid of \$1,288,816 for building 0.9 mi. of graded roadbed between Sierra and Candlestick points on San Francisco Bay. Unit prices were as follows:

	(1)	(2)
(1) Guy F. Atkinson Co.....	\$1,288,816	
(2) Eaton & Smith.....	1,332,388	
McCammion-Wunderlich Co.....	1,384,221	
Fredrickson & Watson Construction Co. and M & K Corp....	1,440,749	
Macco Corp., Morrison-Knudsen Co., Inc., and River Construction Corp.....	1,488,832	
D & H Construction Co. and M. H. Hasler Construction Co..	1,493,507	
Western Contracting Corp.....	1,509,170	
Plombo Construction Co.....	1,511,735	
Charles L. Harney, Inc.....	1,665,767	
Peter Kiewit Sons' Co.....	2,043,863	
115 cu. yd. Structure excavation.....	\$ 4.00	\$ 7.00
400 cu. yd. Ditch & channel excavation.....	1.50	3.00
1,765,000 cu. yd. Imported borrow.....	.713	.714
26,500 lb. Explosive (mud shooting).....	.32	.28
15,500 lin. ft. Drilling holes (mud shooting).....	.63	1.80
Dev. wat.sup. & furn. wat.equip..	100.00	3,000.00
6,700 M. gal. Applying water.....	1.00	2.40
300 hr. Idle time.....	1.00	33.00
8,000 sq. ft. P.M.S. ditch lining.....	.20	.45
2 cu. yd. Class "A" P.C.P.C. (structures).....	175.00	90.00
0.7 mi. New property fence.....	2,000.00	2,000.00
154 lin. ft. 18-m. C.M.P. (16 ga.).....	4.00	4.50

UNIT PRICES . . . CONTINUED

RAILROAD—Grading and draining for railroad and highway in Oregon

Oregon—Sherman County—C. of E. R. A. Heintz Construction Co. of Portland submitted a low bid of \$849,861 for grading and draining about 6.1 mi. of single track Union Pacific Railroad and about 5.4 mi. of U.S. 30 for The Dalles Dam project.

(1) R. A. Heintz Construction Co.	\$ 849,861
(2) Morrison-Knudsen Co., Inc.	871,611
Vernie Jarl	945,141
Gibbons & Reed Co.	1,041,390
C. R. O'Neil	1,058,216
Kuckenberg Construction Co.	1,134,940
Fred H. Slate Co. and E. C. Hall Co.	1,168,835
Thayn Construction Co.	1,193,882
Lewis Hopkins Co.	1,197,519
H. Earl Parker, Inc.	1,294,238
D.&H. Construction Co. and M.H. Hasler Construction Co.	1,312,369
John Delphia	1,343,751
Grove, Shepherd, Wilson & Kruger, Inc.	1,387,469
J. Ira McNutt	1,569,063

	(1)	(2)
1 job Clearing and grubbing	\$41,000.00	\$5,000.00
1,454,000 cu. yd. Excavation, common	.195	.22
235,500 cu. yd. Excavation, rock	.85	.95
151,500 cu. yd. Embankment foundation excavation	.32	.25
13,500 cu. yd. Granular topping, in place	.95	.60
14,300 cu. yd. Filter blanket, in place	.90	.75
40,300 cu. yd. Rock revetment	.75	1.25
46,600 sq. yd. Wind erosion protection stone, in place	.18	.15
1,400 lin. ft. Rounding of tops of cutbanks	.20	.15
830,700 c.y.m. Yard-mile overhaul	.13	.15
500 hour Rolling, additional roller hours	12.00	5.00
18,000 M gal. Sprinkling	1.00	.75
960 cu. yd. Structural excavation, unclassified	3.50	1.25
2,120 cu. yd. Gravel backfill, in place	2.50	1.25
200 cu. yd. Concrete for revetment rock, in place	35.00	35.00
500 lin. ft. 8" dia. perf. C.M.P., 16 gage, in place	2.50	2.25
70 lin. ft. 12" dia. C.M.P. culv., 16 ga., in place	3.30	3.00
200 lin. ft. 18" dia. C.M.P. culv., 12 ga., in place	6.50	6.25
210 lin. ft. 18" dia. C.M.P. culv., 16 ga., in place	4.60	4.25
310 lin. ft. 24" dia. C.M.P. culv., 10 ga., in place	11.00	9.75
410 lin. ft. 24" dia. C.M.P. culv., 14 ga., in place	6.70	6.50
160 lin. ft. 36" dia. C.M.P. culv., 10 ga., in place	17.00	15.00
190 lin. ft. 36" dia. C.M.P. culv., 12 ga., in place	13.00	12.50
220 lin. ft. 54" dia. C.M.P. culv., 8 ga., in place	33.00	28.00
250 lin. ft. 54" dia. C.M.P. culv., 12 ga., in place	24.00	21.00
10 lin. ft. Jack 36" dia. C.M.P. culv., 8 ga., in pl.	35.00	40.00
55 lin. ft. Jack 54" dia. C.M.P. culv., 8 ga., in pl.	50.00	65.00

2 cu. yd. Concrete	110.00	150.00
5,800 cu. yd. Base course, in place	2.50	.75
1,400 cu. yd. Crushed stone leveling course, in place	2.75	3.25
17 ton MC-2 prime coat, in place	50.00	48.00
23 ton Asphaltic cem. (150-200 penetration), in place	50.00	45.00
260 cu. yd. Mineral aggregate, in place	5.00	4.00
3,600 cu. yd. Loading ballast	.26	.40
2,600 each Ties stockpiled	.20	.50

HIGHWAY—Grading and draining in Arizona

Arizona—State. Lyle Price of Flagstaff submitted a low bid of \$484,890 for about 8 mi. of roadwork consisting of grading and draining. The work begins about 16 mi. south of Ashfork Junction and extends southerly over a new alignment of U.S. 89.

(1) Lyle Price	\$484,890
(2) Fisher Contracting Co.	494,988
Isbell Construction Co.	520,388
Dale F. Payne	556,761
W. J. Henson	568,181
Phoenix-Tempe Stone Co.	579,500
Western Constructors, Inc.	589,650
Peter Kiewit Sons' Co.	641,898

	(1)	(2)
40 Acres Clearing and grubbing	\$ 375.00	\$ 150.00
395,325 cu. yd. Roadway excavation	.70	.67
10,500 cu. yd. Overbreakage	.525	.5025
7,500 cu. yd. Slides	.35	.335
1,660 cu. yd. Drainage excavation	1.29	1.40
26,950 lin. ft. Grader ditches	.07	.07
1,077 cu. yd. Structural excavation	2.74	3.70
23,135 cy. mi. Overhaul	.25	.30
38,130 cu. yd. Borrow (CIP)	.32	.45
1 L. Sum Provide water supply	1,000.00	1,000.00
11,350 M. gal. Apply water	1.50	2.25
2,275 Hour Rolling	7.00	8.00
1,478 cu. yd. Class A concrete (including cement)	46.80	53.00
158,515 lb. Reinforcing steel (bars) (CIP)	10	.12
488 lin. ft. 24" C.M.P. (CIP except excava.)	5.30	5.00
256 lin. ft. 36" C.M.P. (CIP except excava.)	10.00	10.00
304 lin. ft. 42" C.M.P. (CIP except excava.)	12.75	12.00
318 lin. ft. 48" C.M.P. (CIP except excava.)	14.40	15.00
364 lin. ft. 60" C.M.P. (CIP except excava.)	23.50	25.00
3 Each Cattle guard (2-unit) (std. C-14) (CIP except excava. and concrete)	500.00	530.00
70 each Right of way markers (std. C-1) (type B or C) (CIP)	6.00	7.00
72,090 lin. ft. Line fence (std. C-15 or C-16) (CIP)	.19	.20
12 each Steel fence gates (std. C-15 or C-16) (Type 1) (CIP)	50.00	38.00
12,310 lin. ft. Reconstruct fence (CIP)	.18	.15
2,500 lin. ft. Grader road	.20	.25

BITUMULS®

saves you money on maintenance!

Performance is the Reason



BITUMULS is asphaltic binder in emulsion form.

Applied cold, it bonds well with every type of clean surface; it thoroughly coats all types of aggregates, wet or dry. It can be used in damp weather and even at relatively low temperatures. For the deep penetration required on trench repair (shown in the photo), Bitumuls has no equal.

These features add up to real savings on any maintenance program: you save the time and expense of heating; you eliminate the need of a special prime or tack coat; you work with local aggregate of all kinds, lowering the expense of importing material; you save time lost due to showers; and you can start work-season earlier, keep going later in the year.

There are Bitumuls Engineers who work out of offices near you. Call on them whenever you feel that they can assist on maintenance problems.

AMERICAN
Bitumuls & Asphalt
COMPANY

Oakland 1, California • Seattle, Washington • Portland 7, Ore.
Inglewood, California • Tucson, Arizona

200 BUSH STREET, SAN FRANCISCO 4, CALIFORNIA

BUY

these cost-reducing
forms for concrete:

1. EFCO "Lifetime" Steel Forms

BUY these forms for your: (a) Minimum form requirements. (b) Larger form requirements where reuse of the form equipment and simplicity of the form work seem to make purchase more practical.

2. SPECIAL ECONOMY Forms

These are designed and manufactured to your specifications and are supplied with or without supervisory service for your special form requirements.

RENT

3. ECONOMY Steel Forms

RENT these forms for your: (a) Larger unusual form requirements. (b) More difficult form requirements. These forms are supplied with supervisory service.

For details and estimates, call or write:

**ECONOMY FORMS
CORPORATION**

HOME OFFICE: DES MOINES, IOWA

DISTRICT SALES OFFICES: St. Louis, Mo. • Kansas City, Mo. Lincoln, Neb. • Minneapolis, Minn. • Ft. Wayne, Ind. • Cincinnati, Ohio • Cleveland, Ohio • Meluchen, N. J. • Springfield, Mass. • Washington, D.C. • Decatur, Ga. • Dallas, Texas • Los Angeles, Calif. • Oakland, Calif. • Denver, Colo.

News of DISTRIBUTORS

Gar Wood promotes Whitbread

Announcement of the appointment of B. F. Whitbread as product sales manager for Gar Wood hydraulic hoists and dump bodies was recently made. Whitbread has been manager



B. F.
Whitbread

of Gar Wood's direct factory truck equipment sales branch in Los Angeles since 1950. He will work closely with the company's nation-wide distributor organization and its 14 factory truck equipment sales branches.

Yuba re-enters Hydraulic dredge field

Yuba Manufacturing Co., San Francisco, manufacturer of bucket ladder dredges for nearly 50 years, recently announced its re-entry into the hydraulic dredge field. Yuba will build hydraulic dredges upwards of 6 inches, for such diversified uses as harbor construction, hydraulic fills, channel excavation, levee construction and production of sand and gravel. George Pelton, with more than 30 years' experience in the hydraulic dredge field, will be in charge of the company's dredging program.

LeTourneau-Westinghouse establishes Western depot

A Western parts depot, to handle emergency parts requirements of distributors of LeTourneau-Westinghouse equipment in California, Oregon, Washington, Arizona, Nevada, Utah, Idaho, and in British Columbia, was recently established at Emeryville, Calif. This depot will provide a representative stock of genuine LeTourneau-Westinghouse parts required for providing prompt emergency parts service for all distributors and contractors in the Western area.

Financing firm names field rep.

Forest J. Paulson has been named representative for eastern Washington by C.I.T. Corporation, large industrial financing firm. Paulson will



Forest J.
Paulson

make his headquarters in Spokane. C.I.T. serves business and industry in the installment financing of machinery and equipment.

Texas Company revises research organization

Dr. Wayne E. Kuhn was recently named general manager of the newly-created research and technical department of The Texas Company. Since 1938 he had been manager of

YUBA-SCHROCK MOTORIZED HEAD PULLEY For Belt Conveyors and Bucket Elevators

"PULLEY WITH THE
DRIVE INSIDE"

Safe, compact, simple
—no chains, no belts,
no sprockets, no
exposed motors.



Built by YUBA for sale in Arizona, California, Idaho, Montana, Nevada, New Mexico, Oregon, Texas, Utah, Washington.

Built and sold in other states by Iowa Manufacturing Company, Cedar Rapids, Iowa.

Pulley shell of this revolutionary head pulley rotates around electric motor and reduction gears, which are held stationary by torque arm attached to conveyor frame. Quickly in-

stalled — requires no more room than idler pulley. All moving parts protected against weather, grit, dirt. Diameters 10½" to 56". 1/3 to 125 hp. for voltages to 2300. Job proved.

Write TODAY for folder and name of nearest distributor.



YUBA MANUFACTURING CO.

Pulley and Sprocket Dept.

70

Phone 628

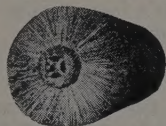
Benicia, Calif.

Space is sold as advertisers' inches. All advertisements in this section are 1/8 in. short of contracted space to allow for borders and composition.

CLASSIFIED

Rates are 8.50 a column inch. Copy should be sent in by the 20th of preceding month if proofs are required; by the 23rd if no proofs are required.

FOR SALE



Trade in Your Old Cores

FLASH! ! DO YOU KNOW We Manufacture New ROTARY SWEEPER CORES

Most Any Popular Make To Fit
MEILI — BLUMBERG — GRACE — HOUGH — LULL
ROSCO — LITTLEFORD — DETROIT HARVESTER —
SPEARSWELL and Others — Send Your Specs

REFILLS — SPECIALISTS

WITH SPRING STEEL
WIRES AND FIBRES

REPAIRS—ANY MAKE SIZE OR TYPE—24 HR. SERVICE

PECKERWOOD STEEL WIRE DRAGS

LARGE

6" Wide—Any Length
to 12 Feet



ONLY
\$3.50 Fool
Buy in Lengths
Assemble Your Own
In Any Shape Desired.

SINCE

NAME YOURS
No frame required

Drags Not Staple
Set
SMALL
PECKERWOOD

Fits Your Frame

3" wide—15" Long
Now **\$2.50 ea.**



Prices Subject to
Change Without Notice

VAN BRUSH MFG. CO., INC.
327 SOUTHWEST BLVD., KANSAS CITY, MO.

1928

FOR SALE

Used Machinery for Sale

NORTHWEST—Model 80 D Shovel.
Very good condition. Serial No.
8694. Murphy Engine.

SPEEDER—Model 60—Shovel—back-
hoe combination Cat. Engine.

QUICKWAY—Model E—Backhoe no
mounting. EXTRA LOW PRICE.

PITMAN—Hydra-Lift—Model B—
Mounted on Ford F-6 Truck—EXCEL-
LENT CONDITION.

REX—16S Mixer—Wisconsin Engine—
4 Pneumatic Tires.

GALION—Model 118 Motor Grader
Demonstrator.

QUICKWAY—Model J Backhoe
mounted.

Arnold Machinery Co., Inc.

433 West 2nd South • Salt Lake City 1, Utah
1302 West Broadway • Idaho Falls, Idaho

BARGAIN

1947 Ingersoll Rand Diesel Compressor HKA-500
model. Recondition motor and in A-1 shape.
Speed 1100 R.P.M. Price \$2500.00

Box 18028 Bridgeport, Wash., c/o Gunther &
Shirley Co. and E. V. Lane Corporation.

FOR SALE

NEW
MODEL SA BLAW KNOX
CONCRETE SPREADING MACHINES
WITH CONTINENTAL ENGINES
20' SPREAD
SCHNITZER STEEL PRODUCTS CO.
3300 N. W. Yeon Ave.
Portland, Ore.
Phone Capital 9231

POSITIONS

SERVICE MANAGER WANTED

Excellent opportunity for Serv-
ice Manager qualified in re-
pair, overhaul and mainte-
nance of engines, tractors and
road equipment. Old estab-
lished Bay area firm. Top Sal-
ary. Send full particulars and
references to Box No. 10-B.

3 DW 21 Caterpillar Motor Scrapers
Ready to Roll — Excellent Condition

All Modifications

For Sale by Owner

H. S. GIDDINGS

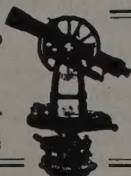
1230 Griffith Avenue, Wasco, California
Phone Wasco 369

FOR RENT

SOLD RENTED REPAIRED

Transits • Levels
Steel Tapes • Compasses

Portland Instrument Co.
334 S.W. 5th nr. Stark
PORTLAND 4, ORE., AT 3598



RENT STEEL SHEET PILING

Get the exact lengths and
sections you need from
Foster—all standard makes,
delivered on time—and at
Foster's standard low rental
rates. Also Rental Pile
Hammers & Extractors.



L.B. FOSTER co.
PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
HOUSTON 2 • LOS ANGELES 5

Engineers—Foremen—Office Men

Learn latest methods to organize and run
work. Prepare for the top jobs. Send post
card for details.

Geo. E. Deatherage & Son
CONSTRUCTION CONSULTANTS

411 So. 5th Ave. Lake Worth, Florida

FOR SALE:

Caterpillar D7, Model 3T, just completely over-
hauled. Excellent condition.

Athy Tracks—8 complete tracks—Good as new.
Never been used. Model 707.

Call or write Ralph Gatter
GATTER TRUCKING, INC.
CUT BANK, MONTANA
170J or 193

DESIGNING ENGINEER

Well-established manufacturer needs first-class engineer
to design and improve construction machinery.

Excellent salary—Good future.

SALES ENGINEER

Also need two or more experienced sales engineers
familiar with heavy construction; one for Midwest and
one for Pacific Coast.

Write Box 10-A

Western Construction

MORE CLASSIFIED ON NEXT PAGE

MANUFACTURERS

FOR SALE

Just Released!

1100 Tons of MP-101

STEEL SHEET PILING

Every Desirable Length up to 60-ft.

SPECIALLY PRICED

Attractive Savings for
Western-Mountain and
Gulf States Delivery.

RENTAL or SALE GET OUR QUOTATIONS

Offer Subject to Prior Sale

H-BEARING PILE • PIPE FOR PILING

L.B. FOSTER co.

1721 Commerce Bldg., HOUSTON 2, TEXAS
3460 Wilshire Blvd., LOS ANGELES 5, CALIF.
CHICAGO 4 • PITTSBURGH 30 • NEW YORK 7

FOR SALE STEEL SHEET PILING

NEAR BREWSTER, WASHINGTON

Shipped New — Used Only One Job

Carnegie	MP-101	MP-102	Tees
Length	Pcs.	Pcs.	Pcs.
72-65 ft.	105	100	2
65-60 ft.	210	50	9
60-50 ft.	210	5	18
50-45 ft.	290	2	7
45-40 ft.	120	1	13

Also quantity 35 ft. and shorter—Quick Shipment Regardless of job, location. Write, Wire or Phone.

MISSISSIPPI VALLEY EQUIPMENT CO.

511 Locust St., St. Louis 1, Mo., Chestnut 4474

FOR SALE

1—Koehring Model 34E, Twin Batch Paver purchased April 1946. Powered by G. M. Diesel. F.O.B. Utica, N. Y. \$5,000.00.

1—Ransome 34E, Dual Drum Paver. Powered by Cummins Diesel. F.O.B. Chelsea, Michigan. \$12,000.00.

1—1/2-yd. Insley dragline, in good shape.

All in good condition and reasonably priced.

RUFFRIDGE-JOHNSON EQUIPMENT CO., INC.

3024 S.E. 4th St. Minneapolis 14, Minn.
Lincoln 7648 — PRIOR 7147

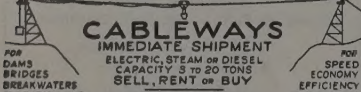
SPECIAL LOW PRICES—WHILE THEY LAST

Unused — Pacific General Electric Gear-Motors
Class II Heavy Duty Gears—220 or 440 V.
8—25 H.P.—Slip Ring—100 RPM...\$650.00 ea.
1—50 H.P.—Sq. Cage—84 RPM...\$850.00 ea.

Smith, Lindstrom & Duncan, Inc.

16 Toland St., San Francisco, Calif. AT. 8-1552

LOW COST INSTALLATION AND OPERATION



CABLEWAYS
IMMEDIATE SHIPMENT
ELECTRIC, STEAM or DIESEL
CAPACITY 3 to 20 TONS
SELL, RENT or BUY

FOR DAMS
BRIDGES
BREAKWATERS
FILTRATION AND
SEWERAGE PLANTS

FOR SPEED
ECONOMY
EFFICIENCY
FLOOD SAFETY
LABOR REDUCTION

AMBURSEN DAM CO INC
295 MADISON AVE NEW YORK

STOP that WATER

With FORMULA No. 640, a clear liquid which penetrates 1" plus in concrete, brick, stucco, plaster, etc. Seals out water, dirt Holds 20' head. Use outside and in. Preserves all absorbent materials. Sold 14 years. Quick, economical, sure. \$3 in 55's. Free sample. See Sweet's.

HAYNES PRODUCTS CO., OMAHA 3, NEBR.

FOR SALE

Barber-Greene 830-840 Mixer and Dryer Hot-Mix Plant, complete with electric shakers, tunnel, boiler, steam-heated tanks, and all necessary equipment; 1/2-yard Quickway truck-crane; TD 18 International Tractor with carry-all; 2 International dump-trucks; AC blade; Motor roller; Howe truck-scales; Various other pieces of small equipment. MUST BE SOLD IMMEDIATELY, AND AT A SACRIFICE. Mid-Valley Corporation, 414 E. Mill St., Porterville, California. Phone 1440.

the company's technical and research division. Until recently the research organization had functioned as a division of refining. As the research and technical department, it now has departmental status.

Creative Metals expands its line

Creative Metals Corp. of Emeryville, Calif., is adding to its line of industrial materials handling equipment. Asphalt spreader boxes are the first construction industry item to be made. The company's test program includes concrete buggies, buckets, and screeds, and a multi-wheel, self-propelled pneumatic roller.

Emmett Hughes named Western sales mgr.

Emmett N. Hughes, former West Coast division manager for Micro Switch, a division of Minneapolis-Honeywell Regulator Co., has been named Western sales manager in charge of all sales operations on the Coast, including the Rocky Mountain States. His headquarters are in Los Angeles.

Blaw-Knox promotions

Joseph R. Schaeffer has been appointed chief engineer of the Blaw-Knox construction equipment department. R. A. McCullough has been named to Schaeffer's former post of assistant chief engineer.

Aeroil announces new sales mgr.

Aeroil Products Co., Inc., has announced the appointment of Jack W. Weber as its new sales manager, with complete charge of national and export sales.

Ross Miller joins St. Paul Hoist

Ross Miller has been named sales manager of St. Paul Hydraulic Hoist. He has had 35 years experience in the truck equipment field. Immediately prior to his present appointment, Miller was vice president and general manager of National Lift Co.

Byron Jackson takes on new man

Ross Barrett was recently appointed by Byron Jackson Co. to head an expanded department responsible for public relations, advertising, and sales promotion. This department will also supervise market analysis for new BJ products and services.

James Kuppe now sales mgr.

At its recent annual sales meeting, James E. Kuppe was appointed general sales manager of Carver Pump Co., manufacturer of centrifugal pumps for construction, irrigation, and industry. He succeeds Robert E. Tanner in this position, who is also vice president and general manager of the company.

Jack How joins Lupton agency

Jack How, who has been associated with construction advertising for more than 15 years, has joined John Mather Lupton Co., New York advertising agency. How has been in charge of all construction and concrete machinery advertising for Worthington Corporation for the past eight years. He was with Caterpillar from 1936 to 1941, in the advertising and publicity department. For three years before the war he was in public relations work in San Francisco and during the war he did personnel work for the Navy.

Proposed merger

The Dorr Company, with headquarters in Stamford, Conn., and Oliver United Filters, Inc., of Oakland, Calif., announce the execution of an agreement for the merger of the two companies. If approved by stockholders of both companies, the merger will become effective Dec. 31, 1954.

ADVERTISERS in this issue

A

Aetna Life Affiliated Companies.. 82
Allis-Chalmers Manufacturing Co.
Tractor Division 22 & 23
American Bitumuls & Asphalt Co....131
American Hoist & Derrick Co.... 75
American Pipe and Construction
Co. Cover 3
American Rubber Manufacturing
Co. 33
American Tractor Equipment
Corp.101
Armco Drainage & Metal Products,
Inc. 98
Austin-Western Company, Div.
Baldwin-Lima-Hamilton Corp... 48

B

Baldwin-Lima-Hamilton Corp.,
Austin-Western Crusher111
Barber-Greene Company 26
Basalt Rock Company, Inc. 85
Blaw-Knox Company
Equipment Division 81
Foote Construction Equip. Div. .115
Broderick & Bascom Rope Co. 97
Bucyrus-Erie Company18 & 19
A. M. Byers Company 21

C

Case, J. I., Company 95
Caterpillar Tractor Co.27 & 77
Chapman Valve Mfg. Company... 12
Chicago Bridge & Iron Company... 46
Chicago Pneumatic Tool
Company38 & 39
C.I.T. Corp. 71
Coast Manufacturing & Supply Co.102
Colorado Fuel & Iron Corp., The.. 16
Columbia Geneva Steel Division,
United States Steel Corp. 91
Commercial Shearing and Stamp-
ing Co. 80
Continental Sales & Service Co....100
Cook Bros. Equipment Co. 44
Cummins Engine Company,
Inc.14 & 15

D

Dow Chemical Company, The.... 83

E

Economy Forms Corp.132
Electric Steel Foundry Co. 94
Electric Tamper & Equipment Co.127
Euclid Division, General Motors
Corporation 11

F

Fuller Manufacturing Company.. 45

G

General Electric Company,
Apparatus Div. 79
General Motors Corporation
Chevrolet Motor Division..... 34
Detroit Diesel Engine Div..... 13
Truck & Coach Div.107
Gilson Screen Company126
Goodrich, B. F., Company, The... 5
Gorman-Rupp Company119

H

H & L Tooth Company 17
H-S Engine Co.100
Hercules Powder Company.....109
Homelite Corp. 20
Huber Manufacturing Company.. 42
Humbolt Chicago Pipeline Project.128

I

Ingersoll-Rand Company72 & 73
International Harvester Co.,
Industrial Power8 & 9

J

Jackson Vibrators127
Johnson, C. S., Co. 6
Johnston, A. P., Company, Inc....135
Joy Manufacturing Company.... 10

K

Kaiser Steel Corp. 87
Keasbey & Mattison Company... 40
Kenworth Motor Truck Corporation 93
Koehring Company & Subsidiary
Companies6, 7 & 30
Kwik-Mix Company 6
Kolman Manufacturing Co.....121

M

Macwhyte Company 41
Mall Tool Company116
Moffett Engineering Co.128
Monarch Road Machinery Co....124

N

Northwest Engineering Co..... 3

O

Onan, D. W., & Sons, Inc.129
Owen Bucket Company 86

P

Pacific Telephone and Telegraph
Company122
Parsons Company6 & 30
Pittsburgh-Des Moines Steel
Company 99

R

Raymond Concrete Pile
Company Cover 4
Richfield Oil Corp. 32

S

Screen Equipment Co., Inc. 29
Standard Oil Company
of California 25
Stephens-Adamson Mfg. Company 24
Stow Manufacturing Co.125
Superior Concrete Accessories, Inc. 28
Superior-Lidgerwood-Mundy Corp.,
Lidgerwood Industries, Inc....102

T

Texas Company, The Cover 2
Thermoid Co. 37
Thew Shovel Co., The 43
Timken Roller Bearing Co., The
Rock Bit Div. 31

U

Union Oil Co. 35
United States Steel Corp.36 & 91
United States Steel Supply Division
United States Steel Corp. 36
Universal Form Clamp Co.123
Universal Manufacturing Corp.... 74

V

Victor Equipment Co. 89

W

Water Seals, Inc.112
Wellman Engineering Company..105
White Motor Company, The113
Wisconsin Motor Corporation124
Western Construction 30

Y

Yuba Manufacturing Company...132

Johnston Stainless Welding Rods

Practical, Down-to-Earth Welding Rods
Alloys as they are supposed to be

Corrosion Resistant—
Clean metal

Strong—
Low in cracking

A. P. JOHNSTON CO., INC.
1845 E. 57th St., Los Angeles 58

BACKFILL, uncompacted

You can't store water behind a set of drawings

The passing of 25 years hasn't taken any of the value from the words of Jim Tripp, set forth in a **Western Construction** article of that otherwise far-away year. Tripp had been superintendent on Coolidge Dam in Arizona, and it was on that experience that he drew for his remarks on "construction symmetry of design." Here is some of his text:

"From the constructor's viewpoint, it is not enough that the design be sound—it must also be practicable. In past years when I bent my energies to design work, I would quite often bring forth what I thought to be an intellectual nugget. But, when the field forces dissected my plan, the nugget seemed changed to 'fool's gold.' I asked myself why, and to seek the answer I became a construction man.

"I discovered that a master carpenter's way of laying out work was not my way. Where I needed only a drafting board and quiet, he needed a place to stand or tie himself before he could set up the lines which I so easily drew and indicated. A carpenter has but a plumb and level to do the things which I had a host of good drawing instruments to indicate. Therefore, my plans were not altogether practicable; they were not symmetrical from the constructor's viewpoint.

"I do not maintain that my idiosyncracies are by any means the criterion, but I do want to emphasize that the question 'How is this design of mine going to be built?' is quite as important as 'What is this design to do?'"

A good word for down-time

When the editors of **Western Construction** talk about Down-time, they spell it with a capital letter. And they laugh. Because, to us, Down-time stands for the cartoon series we published two or three years ago.

We still see some of those cartoons, clipped from old copies and tacked up on job office walls—usually with some local names penciled in. Remember the one about the tunnel crew that holed through a good quarter-mile from the band stand and the waiting crowds? "I've got news for you, Hardrock!" was the chuck-tender's understatement to his partner as they shouldered through their "portal!" That one's at Pit 4 now.

Well, we've got Hank Domagalski back in our pages. Last month he

found a tender spot, to say the least, among the boys who do form carpentry. This month his target is the teamster, and he apparently picked one who hasn't been reading the advertising pages!

The dandy thing about Domagalski's work is that no one will laugh at it who isn't in the know. You can dream up a lot of crazy situations in

Twenty-five years ago in *Western Construction*

"The grading of Denny Hill [Seattle] and improvement of Sixth Avenue and other streets, covering an area of 30 blocks, and involving the excavation and removal of 2,700,000 cu. yd. from city streets and 1,500,000 cu. yd. from private property, will be completed about September 15, 1930. Contract for this work was awarded September 20 to **Geo. Nelson & Co.**, of Seattle, at \$1,516,974, the excavation unit price being 25c per cu. yd."

* * *

"On November 1, the McKiernan-Terry Drill Co., New York, became the **McKiernan-Terry Corp.** and acquired the ownership of the National Hoisting Engine Co., Harrison, New Jersey, and Steele & Condict, Inc., Jersey City."

* * *

"**Force, Currigan & McLeod**, of Oakland, will finish 11 mi. of California state highway construction in Kern County from Bakersfield to Cottonwood Creek about December 1. . . The job includes one large cut, 70 ft. deep, containing 75,000 cu. yd. of earth. About 60% of this is being moved by pumping water to the top of the cut and washing the material into an adjacent fill. The remainder of the cut is being excavated with shovels and the material hauled by truck."

* * *

"The second annual meeting of the **California Sewage Works Association** was held in conjunction with the 31st annual convention of the League of California Municipalities in Oakland on October 7 to 9. . . The Association now has 219 members of whom 94 registered for the meeting."

any business, but the best ones are the ones you don't have to share. Hank Domagalski is a construction man himself; and he singles out the laughs that are exclusive among construction men.

Thirty-six years on tracks

The Caterpillar tractor people have been nosing around everyone's yard and farm this year, looking for the oldest rig still in service. Whatever they found was pretty sure to add color to the company's 50th anniversary, being observed throughout 1954.

Naturally, the best possibilities lay in California, for that's where the company originated—as the C. L. Best Tractor Co. and the Holt Manufacturing Co. Also, a farm machine might have been expected to win the laurels, since its service would have been, at least, under fairly constant conditions.

Sure enough, the winner was a 1918 Holt "75," a crawler still operating—pulling a combine—on a grain ranch near Denair, California. Owner of the Holt now, and for the entire 36 years, is Charles Nielson.

It's a safe bet Nielson feels he has gotten his money's worth by now, so this is one case where the winner got no money. Instead, \$1,000 went to the Caterpillar salesman who located the machine and submitted its story. This lucky fellow, singled out from 233 others scattered all over the world, was William Jopes of Valley Tractor & Equipment Co. in Modesto.

We'll have to tie a string around our finger—and remember to find out if any construction crawlers were even entered in the competition. It would be interesting to see just how long, for comparison, a contractor can keep a tractor going.

NEXT MONTH

AWARD WINNER'S STORY

. . . Arnold Carver is departmental communications engineer for California's Division of Highways. And a man with a sharp comprehension of communication needs in highway maintenance. For the past eight years he has pioneered in the business of highway department short-wave facilities. His work won him the Hewes Award in 1954, and next month he tells the **Western Construction** audience about it. This is no high-brow electronics article. It's the story of meeting a need in highway engineering.

. . . The Editors