

# WESTERN CONSTRUCTION

JOHN MCNERNEY, DIST. ENGR.  
PORTLAND CEMENT ASSN.  
816 W. 5TH. ST.  
LOS ANGELES 17, CALIF.

## KINGS RIVER PROJECT

Concrete-faced rock dams,  
a 6.2-mi. long tunnel, an  
underground powerhouse  
Special report starts on

... page 25

Slip-formed concrete pipe  
—best methods and costs

... page 48

COVER ..... see page 4

NOVEMBER 1957





One of the Heston fleet—an International L-190 with RD-406 engine, equipped with a 5-speed Fuller 5-A-62 Transmission.

## **FULLER** *Transmissions help keep mixers rolling on Heston's roughest jobs*

"We are well satisfied with our 5-speed Fuller Transmissions. They see some rough service out on the job sites, and they're plenty rugged. De-

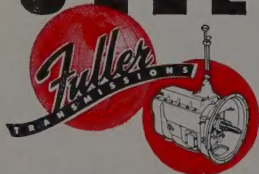
pendability like that is important to us, because concrete has to be delivered strictly on schedule," says Earl Geiss, Equipment Superintendent of Heston Concrete Corp., Indianapolis.

All 25 Heston trucks are equipped with the original 5-speed 5-A-62 Fuller Transmissions working behind RD-406 engines. Fuller Transmissions "put the power through" to

deliver ready-mix concrete to the job site even in the toughest sticky mud and sand off-road areas.

This satisfying performance can be yours, when you equip your trucks with Fuller Transmissions. From over 110 models available for rubber-tired equipment, you will find a Fuller Transmission designed to do *your* job better at less cost.

# FULLER



# TRANSMISSIONS

**FULLER MANUFACTURING COMPANY, Transmission Division, Kalamazoo, Michigan**  
Unit Drop Forge Division, Milwaukee 1, Wisconsin • Shuler Axle Company, Louisville, Kentucky (Subsidiary) • Sales Service, All Products, Western District Branch, Oakland 6, California and Southwest District Office, Tulsa 3, Oklahoma



# BOOTH HANDLING ALL THE WAY

## ...ON CRAWLERS ...ON RUBBER

Remember that an inch can mean a lot to a pin high up on the steel. Jerks and grabs mean costs that add costs!

You have never been on a smooth working crane until you've been on a Northwest. The Northwest "Other-Touch" Clutch Control brings power to the main drum clutches and at the same time preserves the *feel of the load* for the operator. Northwest Swing Clutches are Uniform Pressure Swing Clutches that give even pressure over the entire area of the clutch. This means smooth swing and perfect control of the machine and load. Other boom handling is augmented by the wide selection of Northwest boom hoist equipment—standard Worm Boom Hoist, the Northwest High-Speed Boom Hoist, (independent of all other operations with power controlled lowering). The 1 drum that permits 3 load lines with either of the above boom hoists—Here you can get just the equipment for handling any combination problems.

These are just a few of the things that make the Northwest a better crane. A Northwest Man will gladly give you the rest of the story.

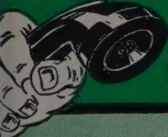
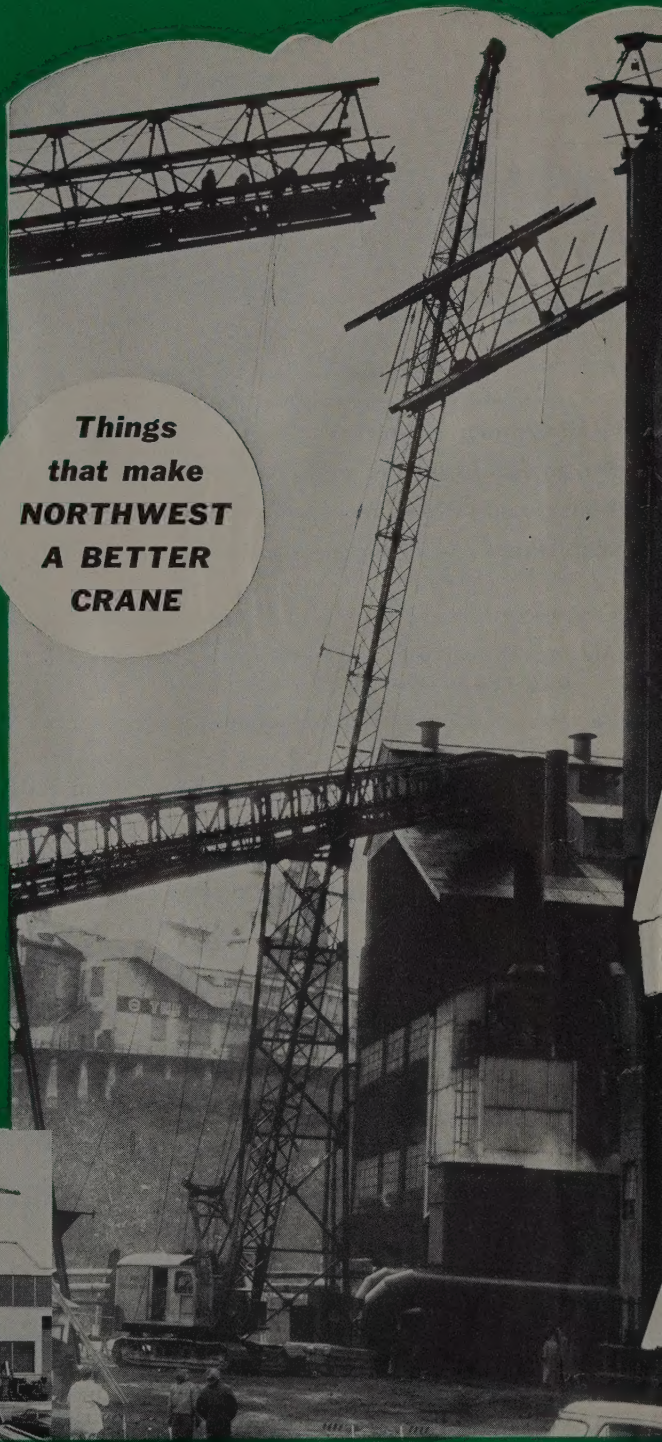
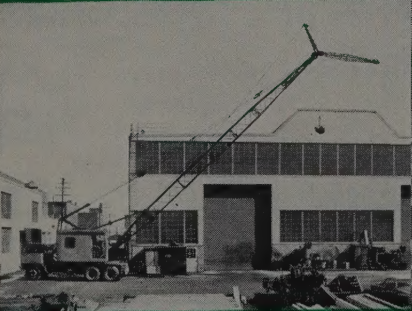
**NORTHWEST ENGINEERING COMPANY**  
Field Building, 135 South LaSalle Street, Chicago 3, Illinois

Things  
that make  
**NORTHWEST**  
A BETTER  
CRANE

**25 TON  
TRUCK CRANE**



**25 TON  
TRUCK CRANE**



## Call your local **NORTHWEST** Sales Agent

RENO, NEV., Sierra Machinery Co., Inc.  
MEDFORD, ORE., Cal-Ore Machinery Co., Inc.  
SPOKANE, WASH., General Machinery Co.  
WENATCHEE, WASH., Mid-State Truck & Mchy Co.  
PORTLAND, ORE., Balzer Machinery Co.  
SALT LAKE CITY, UTAH, Arnold Machinery Co., Inc.

PHOENIX, ARIZONA, Superior Equip. Co.  
EUREKA, CALIF., Brizard-Matthewes Machinery Co.  
REDDING, CALIF., Gerlinger Steel & Supply Co.  
SAN DIEGO, CALIF. Southern Equipment & Supply Co.

SAN FRANCISCO, CALIF.  
255 Tenth Street  
VERNON 58, CALIF.  
3707 Santa Fe Ave.  
SEATTLE, WASH.  
1234 Sixth Ave. South



## ARTICLES

|                                                                    |    |
|--------------------------------------------------------------------|----|
| <b>KINGS RIVER PROJECT, a special report</b>                       |    |
| Courtright Dam and Wishon Dam .....                                | 25 |
| Haas underground powerhouse and tunnel .....                       | 32 |
| Hot asphalt hauled 92 mi. in bottom-dump trucks .....              | 38 |
| Glen Canyon Dam access roads, rocky, dry, and dusty .....          | 40 |
| Slip-formed concrete pipe: what has been learned in Arizona .....  | 48 |
| <i>By H. Shipley</i>                                               |    |
| Overwater fills are feature of Washington job .....                | 58 |
| Aiding compaction with a chemical .....                            | 61 |
| <i>By Robert W. Owen and Leopold C. Nowalt</i>                     |    |
| Montana tackles its first soil cement project .....                | 64 |
| <i>By Clarence Farry</i>                                           |    |
| <b>EARTHMOVING—fourth of a series on job analysis</b> .....        | 68 |
| <i>By Richard Bennett</i>                                          |    |
| Whirley cranes and giant batch plant start work at Ice Harbor .... | 70 |
| First work starts at Oroville Dam Project .....                    | 72 |

## DEPARTMENTS

|                                 |     |
|---------------------------------|-----|
| Editorial Comment .....         | 23  |
| News .....                      | 80  |
| Contract Awards .....           | 90  |
| Alaska Newsletter .....         | 95  |
| Engineers and Contractors ..... | 98  |
| Supervising the Jobs .....      | 102 |
| Construction Briefs .....       | 106 |
| New Literature .....            | 108 |
| New Equipment .....             | 114 |
| News of Distributors .....      | 138 |
| Unit Bids .....                 | 152 |
| Advertisers in This Issue ..... | 155 |
| Backfill .....                  | 156 |

## FRONT COVER

A WORKMAN pulls the handle on the Gar-Bro bucket and another load of concrete drops on the rocky face of Wishon Dam, part of the Kings River Project. The concrete is being formed and smoothed by a special slip-form screed. Note cantilever added to improve balance. A 10-page article starts on 25.

*For 31 years the construction  
and engineering publication  
serving the special needs of  
ALL the West and Alaska*

### EDITORIAL

**EDITORIAL DIRECTOR**  
James I. Ballard

**MANAGING EDITOR**  
Robert L. Byrne

**NORTHWEST EDITOR**  
Blake Jackson

**ASSISTANT EDITORS**  
May A. Carroll  
Evelyn Malerstein

**PRODUCTION MANAGER**  
Patricia N. Mann

### BUSINESS

James I. Ballard.....President  
V. C. Dowdle.....Vice President, Advertising Sales  
L. P. Vrethos.....Secretary and Treasurer

#### ADVERTISING SALES

**BOSTON**—Bertrand J. Smith, 2311 John Hancock Bldg., Boston 16, Mass. Phone Hancock 6-1459  
**NEW YORK**—Fred Lockwood, 121 North Broadway White Plains, New York. Phone White Plains 8-2801  
**CLEVELAND**—Robert J. Lick, 313 East 216th St., Cleveland 23, Ohio. Phone REdwood 1-8562  
**CHICAGO**—Gordon H. Gannett, 1386 Asbury Ave. Winnetka, Ill. Phone Rogers Park 4-4500  
**MILWAUKEE**—Robert D. Sawyer, 2359 No. 72nd St., Wauwatosa 13, Wis. Phone GLENview 3-4288  
**SAN FRANCISCO**—John R. Vanneman, 609 Mission St. San Francisco 5, Calif. Phone YUkon 2-4343  
**LOS ANGELES**—Roderick V. Pierce, 126 So. Manhattan Place, Los Angeles 4, Calif. Phone DUInkirk 7-6353  
**WESTERN MANAGER**—Robert L. Logan, 609 Mission Street, San Francisco 5, Calif. Phone YUkon 2-4343  
**SALES PROMOTION MANAGER**—L. C. Arbutnot, 609 Mission St., San Francisco 5, Calif.

Published monthly by

**KING PUBLICATIONS**  
609 Mission Street  
San Francisco 5, Calif.  
Phone YUkon 2-4343



### CIRCULATION

**CIRCULATION MANAGER**  
L. V. Wilson

Subscription rate is \$10.00 per year. Cost per single copy is \$1.00. Cost per copy of Construction Equipment Directory, published each January, is \$5.00.

For change of address, write Circulation Dept., 609 Mission St., San Francisco 5, Calif.

Accepted as Controlled Circulation Publication at Los Angeles, Calif.

Copyright 1957 by  
King Publications



## As Western as Rock Itself

ROCKFILL DAMS are Western in origin, evolution and record examples. Their ancestry dates back to the 1850's when improved mining methods were taking the place of primitive operations in the California gold fields. Within a few years hydraulicking created a further demand for water in a region where streams were strictly seasonal. Storage for low flow months was the key to successful mining and those early engineers and builders worked with the materials at hand.

Initial efforts consisted of building log cribs with timber facing. As experience increased, so did the height of these dams until stability became an important factor. The natural step that followed was to fill the log cribs with hard granite, which was the bed rock of the Sierra Nevada. These rockfilled crib dams evolved into sizable structures. An outstanding example was the Old Bowman Dam (1872) which was 72 ft. high.

At this stage the timber crib had declined in importance until it served only two secondary purposes, first to permit a steeper than natural slope on the faces and second to provide an easy means of attaching the timber face. Possibly about 1875 some engineer made the important decision to eliminate the crib and let the rock fill take its natural slope. This presented no special problem on the downstream face but the upstream face had to present a relatively smooth surface for the planking. The solution was a layer or section of quarried rock which maintained the slope and permitted timbers to be extended up the face for attaching the planks. Except for the modern replacement of the timber face with reinforced concrete slabs and supporting ribs (about 1915) the evolution was complete.

In the meantime, hydraulic mining had been restricted by law, but the demands of irrigation (Escondido Dam, 1895) and the beginnings of hydroelectric power development maintained ever-increasing pressure for more dams.

The early storage and water delivery projects began to be welded into larger systems and many of these contained rockfill dams of various ages and size. By circumstance the majority of these structures were included in the hydroelectric

beginnings of the Pacific Gas and Electric Co.

Engineers of the organization studied these existing rockfill structures with relation to engineering and economic considerations. Factors which had dictated their original development—good foundations, abundance of hard rock and remoteness of the site—remained unchanged through the years. It was only natural that the original ideas and the sound principles be modernized and developed further.

Engineers of the PG&E added technical analysis and design to the structures as far as they are possible with this type of dam. Slope stability, curvature of the upstream face to compensate for settlement, modern details of concrete design and handling, including articulation along the edges of the facing slabs, sluicing as a means of securing better contact were among the many features studied and modernized. An outstanding example was Salt Springs Dam (1930) which included most of these improvements.

The organization has built a succession of rockfill dams and has demonstrated their effectiveness with experience confirmed in both design and economics. Credit belongs to the entire organization and any list of names of those responsible would result in unfortunate omissions. Today the same organization is building two of these structures under site conditions unchanged from earlier days. Design and construction procedures are described in a comprehensive article in this issue.

Engineers of the PG&E deserve professional recognition as having developed a type of engineering structure suited to unusual conditions. Wide use of this form of dam is naturally limited, but experience has demonstrated that where conditions are suitable it provides a logical solution for water storage. These engineers have brought credit upon themselves and their company by this development and have produced a type of engineering structure which is truly Western.

*Jim Ballard*



# AUSTIN-WESTERN HYDRAULIC CRANE



A-W hydraulic crane setting 24 in. x 20 ft. drain pipe on highway job near Philadelphia

## JAS. J. SKELLY, INC., Media, Pa., REPORTS:

### A-W crane's live boom and maneuverability speed construction operations



Paul Skelly says: "Our present job is located in Springfield Township near Philadelphia, and includes widening and repaving about 3 miles of road in a residential area. We purchased an Austin-Western hydraulic crane with 4-wheel drive and 4-wheel steer at the beginning of the job, because we felt it would help us with many

lifting and hauling jobs where other cranes would find it hard going. We've never made a better investment than with our A-W."

**Great for laying pipe.** "We've used the A-W to lay all kinds of pipe—everything from 15 in. concrete drains to 43 in. x 27 ft. corrugated arch. The unit is so accurate that we can lower pipe 1/4 in. or 1/8 in. at a time, which means faster and better fitting. Regardless of size, we can lay 5 or 6 joints of pipe in the same time it would have taken us to lay one joint by ordinary methods. We also find the A-W speeds up the unloading, placing and reloading of concrete forms to a remarkable degree."

**Sees wide use by contractors.** "Our experience with the A-W has convinced us that its use by contractors should increase by leaps and bounds in the next few years. In our business time is a big factor in profits, and this machine really saves time."

For more information on this remarkable crane, fill out and mail the coupon today. You'll be glad you did

#### AUSTIN-WESTERN

614 Farnsworth Avenue, Aurora, Illinois  
Please send complete information on the A-W hydraulic crane.

Name.....

Title.....

Company.....

Street.....

City..... Zone..... State.....

#### AUSTIN-WESTERN WORKS



Construction Equipment Division

ARIZONA—  
SHRIVER MACHINERY COMPANY..... Phoenix  
CALIFORNIA—  
EDWARD R. BACON COMPANY..... San Francisco 10  
SMITH BOOTH USHER COMPANY..... Los Angeles 54  
COLORADO—  
MACDONALD EQUIPMENT COMPANY..... Denver 16  
IDAHO—  
ENGINEERING SALES SERVICE, INC..... Boise  
MONTANA—  
HALL-PERRY MACHINERY COMPANY..... Butte  
HALL-PERRY MACHINERY COMPANY..... Billings  
HALL-PERRY MACHINERY COMPANY..... Great Falls

NEVADA—  
GRAID 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  
COLUMBIA EQUIPMENT COMPANY..... Spokane  
WYOMING—  
KEREMI TRACTOR AND EQUIPMENT COMPANY..... Cheyenne



NOVEMBER 1957



## Latest methods for rockfill dams

**On Pacific Gas and Electric Co.'s Kings River project the contractor has developed a variety of new methods for the construction of two concrete-faced rockfills, Wishon (above) and Courtright.**

WHEN AN EXPERIENCED and imaginative contractor works to the plans and specifications administered by an equally experienced and imaginative engineering design organization, an instructive as well as economical project is almost bound to result. This is certainly the case in the high Sierra east of Fresno, Calif., where Morrison-Walsh-Perini is building two rockfill dams for the Pacific Gas and Electric Co. as part of a \$80,000,000 Kings River Project. G&E has built such structures for a period of 30 years. It has used

that experience to create designs permitting the maximum in construction economy.

For instance, the maximum slope of the upstream face has been increased to 1:1, greater than in previous designs, which reduces the necessary total yardage. The thickness of the placed rock layer, a costly and time-consuming element, has been reduced to 8 ft. at the crest and 12 ft. at the toe (measured normal to the slope). And the specifications covering the construction of the concrete face are written in such a way to permit the contractor to make full use of

his equipment and inventiveness.

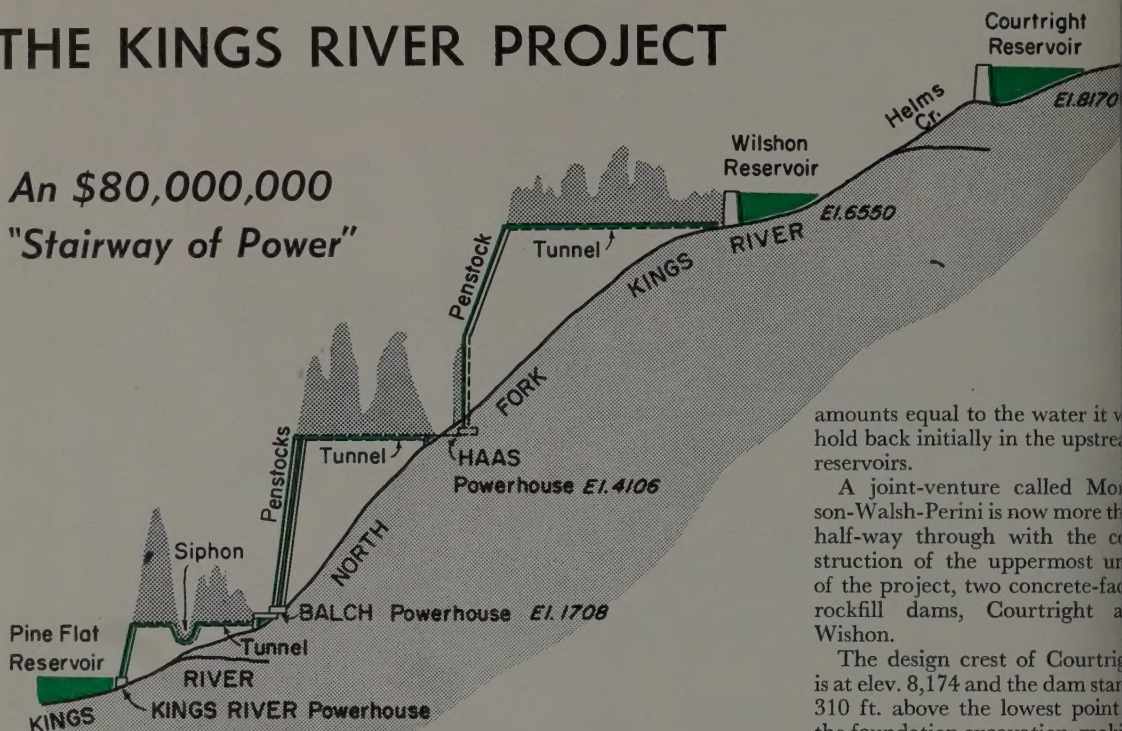
The contractor has responded in fine style and is using the very latest innovations in construction methods—several developed right on the project. Ammonium nitrate fertilizer is used for blasting whenever possible, a newly-developed preventive maintenance program keeps down-time to a minimum, an unusual organization of personnel featured by a color scheme for identification of every person on the job helps in keeping the project closely coordinated, two new ways to handle large rock eliminate the need for dangerous slings, a slip-form simplifies concrete work on the face. Many other smaller "tricks" show up almost wherever you look and will be described during the course of the article.

The contract for the construction of the two dams was awarded in 1955 to a joint-venture called Morrison-



# THE KINGS RIVER PROJECT

An \$80,000,000  
"Stairway of Power"



KINGS RIVER cuts through a land of superlatives and surpassing natural beauty. It is an area which boasts three National parks, Yosemite, Kings Canyon, and Sequoia. Mt. Whitney is there, highest peak in the United States, as is the General Sherman tree, the world's largest living thing. This is a suitable setting for the Kings River Project, a decades-old dream at last becoming reality. It's an ambitious, imaginative plan to harness a mountain river and extract from it the maximum in hydro-electric power and irrigation benefits.

The first step in building a complete "stairway of power" was taken in 1904 when engineering work began on development of the North fork of the Kings for the production of hydroelectric energy. Since 1927, power has flowed from a 34,500-kw. plant at Pacific Gas and Electric Co.'s Balch powerhouse.

But the major moves toward ultimate development had to await the construction of Pine Flat Dam to create a flood control reservoir that would also provide regulation for irrigation purposes of waters stored and released

upstream for power generation. Delayed by the depression and World War II, the project was finally completed in 1954, by the U. S. Corps of Engineers.

Pine Flat reservoir with a storage capacity of 1,000,000 ac. ft. also is important to the power development on the river because it provides a re-regulation function, governing releases for the most desirable irrigation schedules, so that upstream releases for power generation will not interfere with irrigation.

Because all the natural flow of the Kings is needed for irrigation, it would not be possible to hold back water to fill new power reservoirs except in years of heavier-than-normal precipitation. The way this problem was solved is the key to the entire Kings River Project.

First, PG&E buys water from other sources and delivers it to Kings irrigationists as needed. Second, in exchange for the outside water, the company acquires ownership to equivalent amounts of Kings water. Third, the company rents storage space in Pine Flat reservoir for its Kings water, "banking" the water in a drawing account. Fourth, PG&E will release its water from Pine Flat in

amounts equal to the water it will hold back initially in the upstream reservoirs.

A joint-venture called Morrison-Walsh-Perini is now more than half-way through with the construction of the uppermost unit of the project, two concrete-faced rockfill dams, Courtright and Wishon.

The design crest of Courtright is at elev. 8,174 and the dam stands 310 ft. above the lowest point of the foundation excavation, making it one of the highest structures of its type in the world. It will have a crest length of 850 ft. and will contain about 1,500,000 cu. yd. of rock faced with 30,000 cu. yd. of reinforced concrete including a cut-off. Winter is expected to slow the job down some time in November, leaving it about 50% complete. Morrison-Walsh-Perini hopes to finish it next season, making an all-out effort.

The narrow gorge at the Courtright site is nicely suited to a concrete arch, but design studies showed that because of the location of the various necessary materials a rockfill structure would be considerably more economical.

Wishon reservoir is about 3 miles downstream from Courtright on the North fork of the Kings where construction was started in 1954. The reservoir will impound about 128,000 ac. ft. of water, compared to 102,000 ac. ft. for Courtright. The 290-ft. high Wishon dam will have a crest length of 3,350 ft. at an elevation of 6,550 ft. It will contain about 3,700,000 cu. yd. of rock, faced with 100,000 cu. yd. of reinforced concrete including a cut-off. The spillway will contain six 40 x 12-ft. radial gates across the quarry floor of the left abutment. When winter closes in, the job will be about 80% complete.



should be finished next season without much trouble. Excavation of the Haas powerhouse has been completed and work continues on the 6.2-mi., 10-ft. diameter horseshoe tunnel leading from the Wishon reservoir to the powerhouse penstock. Conductor for the underground powerhouse and tunnel is a joint venture consisting of Morrison-Mudsen Co., Inc. (sponsor), Henry J. Kaiser Co., Macco Corp., and Perini & Sons, Inc. The Haas powerhouse is the first large underground power plant in the United States, although such installations are not uncommon in Europe. The underground location results in 28 ft. of additional head developed, and a less expensive penstock, which will be 100 ft. shorter than that required for a surface plant. Other unusual features of the Haas project are its butterfly-valve intake, the 330-ft. head unlined pressure tunnel, the 325-ft. high surge chamber, the 4,560-ft. penstock, and the large vertical-shaft impulse units. The capacity of the Haas powerhouse will be 128,000 kw.

Rothschild, Raffin & Weirick recently received a contract from PG&E to construct the Haas and Balch power plants. The Balch powerhouse, in service since 1927, will be enlarged by addition of two generating units. It will increase the capacity of the plant by 91,500 kw. A new penstock, almost a mile long, will serve the new units. The existing tunnel, 3½ mi. long, carries water to the penstock, where it discharges 2,400 ft. to the powerhouse.

Two existing concrete arch dams, at Balch diversion reservoir and Balch afterbay, will be engaged and raised to improve regulation of the river flow. Intrusion Spakt, Inc., is already at work on a contract to raise and enlarge the Balch diversion dam.

The final "step" in the Kings River Stairway of Power will be the Kings River powerhouse, which will provide 42,000 kw. From its tailrace, water will flow directly into Pine Flat reservoir. The plant will receive water from the Balch afterbay through a 3½-mi. tunnel which will include a 1,000-ft. long inverted siphon. Contracts for this latter work have not yet been awarded.



**OVERALL VIEW** of Courtright Dam shows three operations proceeding at once, the concrete facing at the bottom, the crane-placed rock, in the center, and the dumped rock at top.

Walsh-Perini. Major construction work started early in the season of 1956 and the peak of construction activity was reached in mid-summer of 1957. Both dams should be completed in the 1958 season.

Courtright Dam, with a crest at elev. 8,174, calls for about 1,500,000 cu. yd. of material, having a maximum height of 310 ft. (making it one of the highest rockfilled dams in the world), and has a crest length of 850 ft.

The design crest of Wishon Dam is at elev. 6,550, the crest length is 3,350 ft. The volume of the embankment will be 3,700,000 cu. yd.

The design of both dams is the same: a dumped-rock embankment faced upstream with a layer of crane-placed rock surfaced with an impervious concrete membrane.

### Plan of attack

A look at the contractor's general plan of attack will indicate the progressive thinking which has gone into the job planning.

Because of the remoteness of the site the contractor built a 2,100-ft. runway near Wishon. A four-seat Cessna 180 is based at the job and cuts the travel time to Fresno, the nearest city, from 2½ hr. to 25 min. In addition to transporting supervisory personnel, the plane is used to chase parts and, when needed, to transport ambulatory cases to the hospital. The plane has been averaging about 50 hr. of air time per month. For added safety, only two passengers, plus the pilot are allowed on the plane when it takes off. Coming in, however, a full load is permitted.

Two-way radios in the supervisors' pickups have several disadvantages. They're expensive, they constitute a

blasting hazard (especially important on this job where every speck of material to be moved must first be blasted loose), and they tend to influence superintendents to spend more time near their pickups than they ordinarily would. On some projects, of course, two-way radios are very helpful and even essential, but on this job Project Manager B. L. Perkins (previously general superintendent at Beardsley Dam) found a way to eliminate them entirely with no loss of coordination. He adopted a color system for identification of all job personnel.

It works like this. Every man on a job has a colored hard hat which identifies his craft or function. Here is the code: Electricians—white plus insignia; mechanics—blue; carpenters—green; pipefitters—black; operators—red; drillers—white; ironworkers—silver; teamsters—orange; oilers—white brim; laborers—yellow; surveyors—red and white check. Superintendents and foremen have a white stripe on their hats superimposed on the color appropriate to their craft.

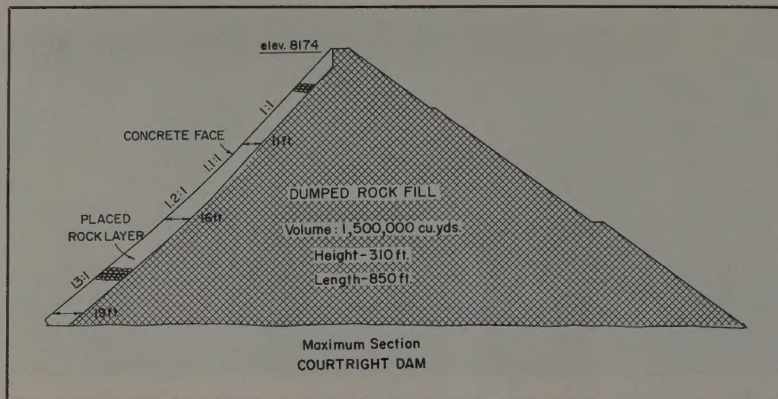
In addition every pickup is fitted with a flag of the proper color and design. Thus, a person familiar with the color code can get a fairly accurate idea of what is going on and where everybody is simply by standing on a vantage point and looking around.

The color system has worked very well. When it was first introduced the code was mimeographed and distributed but it was found that after just a few days the men had it committed to memory.

### Another visual aid

The job features another visual aid which is a big help to job control.





**DESIGN IMPROVEMENTS** include the steep upstream slope (1:1) and the thin layer of placed rock. The cross section of Wishon Dam is very similar to above drawing of Courtright Dam.

Each of the six cranes placing rock at Wishon and each of the ramps leading to various parts of the growing embankment are clearly labeled with large numbers black on white which can be seen and read a great distance away. This numerical labeling makes it easy for the superintendents to direct trucks where they are needed.

### Efficient job organization

The way the job personnel is organized is a big reason why the project is advancing so rapidly and with so little confusion. The crew working with each place-rock crane is a separate entity under the direction of a place-rock foreman. One superintendent is in charge of all the cranes and spends most of his time visiting one after the other to determine what supplies, material, or equipment they need. He then relays this information to the quarry, the supply yard or wherever it is needed, referring to the crane or ramp number.

Having an efficient job organization and a top-flight man in every key spot gives the project manager much-needed time for job planning. On a rockfill dam the various construction phases must be carefully coordinated and balanced to prevent tie-ups, pile-ups, and shortages. Adequate access must be maintained to all the sections of the embankments in order to provide a working area for all the equipment. This becomes progressively more complicated as the dams rise and working space becomes more restricted.

The importance of keeping the equipment busy becomes evident when it is realized that the contractor has about \$3,500,000 worth of equipment on the job plus as much as \$1,-

500,000 worth which is rented as needed.

The production peak at Wishon was reached in mid-summer 1957 when about 35,000 cu. yd. of material went into the embankment every 20-hr. working day. Now, however, with the dam about 80% complete, and the working space greatly reduced, the rate has dropped to about 19,000 cu. yd. per working day.

One headache the project manager always has comes from the fact that as the embankment rises the percentage of placed rock to dump rock needed every week increases. This means that blasting procedures in the quarries must be varied to produce constantly increasing percentages of large rock. Since it is impossible to create only large rock in a blast, it is being stockpiled continually for use near the end of the job next year when mostly large sizes will be needed. This foresight may save the contractor the necessity to over-excavate at the end of the job to obtain large rock.

Taking both dams together, the drilling is being done with two Ingersoll-Rand Drillmasters, five Jov TM-500 drills, and, for secondary drilling, as many as 12 Gardner-Denver DH-123 Air Tracs.

The region is characterized by large amounts of exposed solid granite. Near the surface, however, it tends to be blocky and breaks on its own planes, regardless of the blasting pattern. The Drillmasters are being used in the Wishon quarry. Holes 6½ in. in diameter are sunk about 52 ft. deep in a 15 x 18-ft. pattern. About 50 holes are used for each shot. This pattern pulls about 45 ft. of quarry face and loosens about 30,000 cu. yd. of material. The size of the fragments which can be used is limited by

the hauling equipment. At Wishon about one-third of the material will come from the spillway excavation.

### Blasting with fertilizer

In 1957 the contractor changed ammonium nitrate for much of the blasting and achieved very good results. Often used as fertilizer, it has only recently been introduced to the construction industry as a blasting agent and promises to be in widespread use before long. Ammonium nitrate is cheaper than other blasting compounds, is readily obtainable and is easy to handle. However, it is fairly hard to ignite which limits its use to rather dry holes and holes with diameters larger than, say, 3 in. Or brief instruction as to its use is needed.

This is how a hole is loaded. First about 50 to 100 lb. of 60% extra dynamite gelatin in 5 x 25-in. sticks placed at the bottom. Primer-coated sticks with gelatin in 1¼ x 8-in. sticks is brought up to the top of the hole from the bottom. Next, ammonium nitrate prills obtained from Monsanto Chemical Co., St. Louis, Mo., are poured in. The prills are soaked with 10% by weight of diesel oil to assure complete ignition. The top 5 or 10 ft. of the hole is plugged with loose material.

Including secondary blasting, about 1 lb. of ammonium nitrate is needed for every cubic yard of rock. When conventional blasting agents are used about 1 lb. per cu. yd. of rock is also required.

### Excavating and hauling

At both Courtright and Wishon the main excavating machine in the quarry is a Bucyrus-Erie 150B electric shovel with a 6½-cu. yd. Esco bucket. Supplementing these machines where needed are a Bucyrus-Erie 120B and several Northwest 80Ds.

To enable equipment to pass under the cable which supplies power to the electric shovels, the contractor manufactured several "cable towers" out of tubular steel. Moving such cable towers around in the quarry can be an awkward task but a clever method has been developed on this project which makes it very simple. Two steel brackets or "ears" are fastened to the lower surface of the horizontal cross piece. When it is desired to move the tower a Euclid rear-dump is positioned under the tower. The dump is then raised so that the leading edge fits into the brackets of the tower and



ts the tower off the ground. The truck is then free to drive to a new position, with the tower suspended on its upraised dump.

At the peak of the season at Wishon the hauling consisted of 24 Euclid 17-cu. yd. rear-dumps and 4 International Harvester Payhaulers. To withstand the beating administered to them by the abrasive granite every hauling rig is beefed up with about 1,000 lb. of additional steel. This consists mainly of 4 x 4 x 3/4-in. angles on the bottom of the beds, plus additional strength for the sides, fenders, and cab protector. At Wishon the length of the average haul from the quarry is 0.9 of a mile and from the spillway it is 0.4 of a mile.

### Preventive maintenance

To reduce down-time to an absolute minimum a great deal of time and effort is put into preventive maintenance—and it's paying off. By studying the catalogs and literature produced by the equipment manufacturers, the contractor has prepared complete check list for maintenance operations. Each hauling unit is checked every 100 hr. with more extensive treatment called for at 500, 1,000 and 1,500 hr. When a machine is transferred to another job the check list and log showing everything that has been done to the machine travels along with it. Each driver is furnished with a memo tablet for use in making a daily report. The driver's daily memo has space on it provided for the date, shift, unit number, hours unit worked, hours unit idle, hours repair, description of adjustments, repairs, and the operator's signature.

A complete check list, a log which travels with the machine, and a daily operator's report are the key features of the maintenance system which was described in detail in *WESTERN CONSTRUCTION* last month on pages 42 to 45.

The warehouse on the project contains about \$160,000 worth of spare parts—about half of which are automotive parts. A Cardex system with spot checks provides a continuous inventory.

### Power and light

Electric power for the project is brought in on a PG&E 60,000-volt line to a transformer station which breaks it down to 12,500 volts for distribution to various sub-stations around the job. The Bucyrus-Erie shovels require power at 2,300 volts.



**CABLE TOWERS** which carry electric shovel cables over truck path are fitted with brackets on the cross-piece which enable truck to lift them and carry them away on upraised dumps.

Two 10-hr. shifts are being worked on most phases of the project. Light for the night shifts is provided by a network of both permanent and temporary installations.

The portable light towers were designed and built by the contractor and can be pulled around the job by a pickup truck. Each carries its own 10-kw. generating set and each is mounted on four pneumatic automobile tires. The towers break down into three 8-ft. sections which nest together for transportation.

### Compressed air

Compressed air for the two dams is supplied from two stationary compressor houses containing a total of ten 750 Ingersoll-Rand units. This was the total being used at the height of operations. The permanent air lines are 4-, 6-, and 8-in. diameter Victaulic. The temporary air lines are exclusively aluminum pipe supplied by three manufacturers, Wade, Major, and Kaiser.

### Water monitors

According to the specifications the dumped rock, whenever possible, must be placed in the embankment in 60-ft. lifts. High lifts are called for to take advantage of the rolling and tumbling of the rocks in obtaining maximum density for the embankment. Specifications also called for the rock going into the fill to be washed by a three times greater volume of water. The purpose of this is to wash out fines separating the rock fragments, thus creating point-to-point contact between the rocks and

reducing or eliminating the possibility for future settlement.

The sluicing system was designed by and rented from the John W. Stang Corp. Four Chiksan Intelligent monitors, three mounted on skids and one mounted on a Cat D6, are being used at Wishon. Each monitor ejects a stream of water at the rate of 1,000 gal. per min. under pressure of 100 psi. Three pairs of electric pumps mounted on a raft floating in the river supply the water. Each pair consists of a 250-hp. pump in line with a 200-hp. booster.

The monitors are also used to sluice away the fines which are dumped at the top of the embankment to permit truck travel.

### Placed rock techniques

The total design volume of Wishon is 3,687,000 cu. yd. of which 197,000 cu. yd. is crane-placed rock. The volume of Courtright is 1,420,000 cu. yd. of which 76,000 is crane-placed rock. Although the placed rock represents less than 3% of the total volume of the dams, its share of the cost of the dam is about 10 times that percentage. It is easy to understand why the contractor has devoted a lot of time to improving methods for carrying out this phase of the operation.

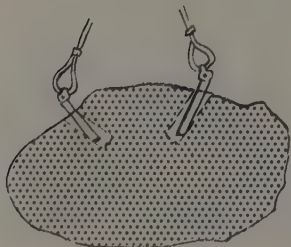
By organizing his field personnel in an efficient manner, by using highly skilled men as foremen and rock handlers, and by using the latest methods of lifting the rock, the contractor has achieved the enviable rate of 15 cu. yd. per hr. of rock placed with each 7-man crew.

The placed rock layer is built essentially like the ages-old "dry wall."

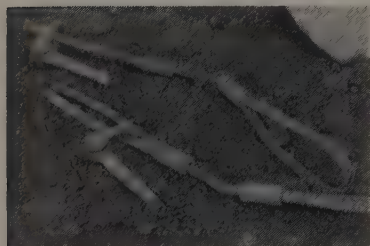
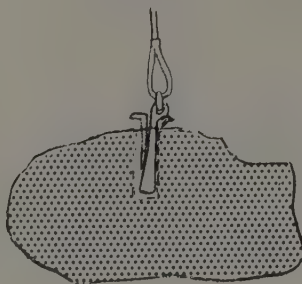


# Two pin systems for lifting rock

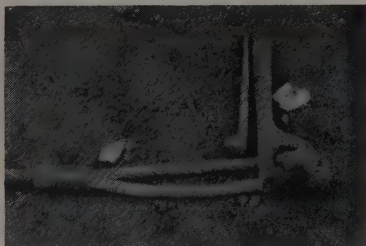
## Lewis



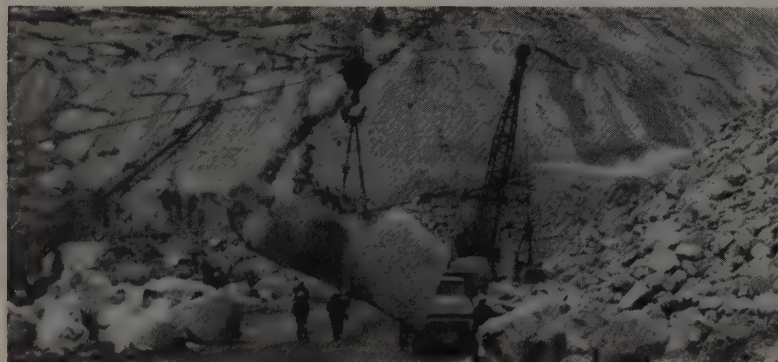
## Sullivan



LEWIS PINS are shown at the left in the drawings and photos above. Two holes angled toward each other are required. Pins slip out when lifting force is released. This method is being used at Wishon Dam.



SULLIVAN PINS are being used at Courtright Dam, where average rock size is slightly smaller than at Wishon. Only one hole is needed, into which is placed a tapered pin and a wedge.



A VERY LARGE ROCK at Courtright is being lifted by two Sullivan pins. The two methods of handling rock are described in the column of text at the right.

Large rocks (specifications say that average size should be at least 3 tons) are placed one on top of the other with the joints staggered so as to prevent planes of weakness. Smaller rocks are placed in the voids and finally chink rocks (2-in. minimum measurement) are dumped in the remaining voids. The large rock must be placed with at least 3-point contact to prevent wobbling.

At Wishon the rock is handled by 5 Northwest 95 cranes and 1

Northwest 80D. Each crane can handle a section about 60 ft. wide.

To increase hoisting speed, extra lagging has been placed on the crane hoist drums to increase the circumference. At Wishon, the average size of the placed rock is about 5 tons. The larger the size the better since it takes approximately the same time to place a large one as a small one.

The dangerous practice of wrapping a cable around the rock in order to lift it has been almost elimi-

nated on this project. Instead, two effective pin systems are being used.

## Rock handling

At Wishon two or three holes are drilled in each rock so that the bottoms of the holes are closer together than the tops. Each hole is about 1 ft. deep. Lewis cylindrical high-strength pins are inserted into each hole and connected to the crane hook by slings. When the crane applies a lifting force the pins bind in the angled holes and grip the rock. When the rock is in place and the lifting force is removed the pins slip easily out of the holes.

At Courtright where the average size of the rock being placed is slightly smaller than at Wishon, Sullivan pins are used. With this system only one 2-ft. long hole must be drilled except on exceptionally large rock. Into this hole a tapered pin is inserted. The pin grows larger as it nears the bottom of the hole. A long thin wedge is then placed in the hole tightly against the pin. When a lifting force is applied to the pin it bears against the wedge with such force that the rock can be lifted. When the rock is placed and the lifting force removed, the pin can be extracted by pounding the wedge further into the hole. Both systems are being used with great effectiveness.

The Sullivan pins are also being used in the intake tunnel at Wishon to support the large pipe sections and butterfly valves during their installation.

The drawings and pictures which accompany this article explain more clearly how these pins are used.

A great deal of skill must be shown on the part of the placed rock foreman and the rock handlers. The man stationed at the top of the embankment must be able to look over the edge, estimate what size and shape of rock is needed, select the proper rock from the stockpile, determine where the hole or holes shall be drilled in order that the proper side will be on the bottom, and see that the holes are drilled toward the center of gravity of the rock. Only if the holes are drilled toward the center of gravity of the rock will destructive bending stresses in the pins be avoided. All this demands an unusual ability which is partly inborn and partly learned through long experience.

The chink rock is placed by means of a 6 x 6 x 1-ft. steel pan. The pans are often loaded manually but when more than four cranes are being used



Michigan front-end loader is put to service.

#### The concrete face

The impervious element in both dams will be a concrete slab on the stream face. The theoretical thickness of this slab will vary from about 1 ft. at the top to 2 ft. 7 in. at the bottom. The slabs are 60 ft. wide and vary in slope length from 31 ft. 2 in. at the bottom to 77 ft. 8 in. at the top. The concrete work is about half finished at Wishon and just getting started at Courtright.

Wishon reservoir is expected never to be entirely empty, thus making it impossible to clean and maintain the bottom section of the concrete face. For this reason the bottom 80 ft. has been covered by a double layer of 2-in. Ponderosa pine planks. The planks are lapped and are joined together with copper nails which resist corrosion.

The concrete slabs are supported at their horizontal edges by 4-ft. wide concrete beams and on the slope edges by 3-ft. wide beams. The beams are cast first and are mopped with asphalt in order to permit sliding between the beams and the slabs. The slabs are designed with 3,000-psi. concrete whereas the beams are constructed of 1,500-psi. concrete. The theory here is that under small settlement of embankment, the beams will crush before the impervious slabs. The slabs are connected to each other on all four sides by copper waterstops at mid-thickness. Above the copper seal is placed premoulded expansion joint material, and above that a mastic.

In the confined space below the copper seal is placed Styrofoam, a multi-cellular material manufactured by Dow Chemical Co. This material is strong enough to support the concrete when it is poured, but can be crushed to a smaller volume in case the concrete expands later. The first use of this material for expansion joints was for a similar concrete face at PG&E's Bear River Dam described in the February 1952 issue of WESTERN CONSTRUCTION.

#### Placing the concrete

All concrete is placed by the crane and bucket method. The 80 ft. of timber protection at the bottom of Wishon was used as the upper forms for that section. First the reinforcing steel was placed, then a 4-ft. wide section of timbers was



**FILLING THE VOIDS** between the large rock are small chink rock (minimum: 2 in.) which is placed by this 6 x 6 x 1-ft. pan. Michigan loader fills the pan at the top of the embankment.



**TWO METHODS** of forming the concrete face at Courtright were tried. In the foreground are prefabricated panels backed by strongbacks, and in the background is the slip-form screed. Experience at Wishon showed that the screed worked best.

placed about 6 ft. up the slope and then the concrete was dumped from buckets and vibrated into place with stingers.

Rather than the conventional prefabricated form panels braced with strongbacks, a 60-ft. wide slip-form was put to use as soon as the timber section was cleared.

The slip-form was built to the contractor's specifications by Clark Welding Works near Sacramento, Calif. The slip-form has a 4-ft. screed along its full 60-ft. length. It travels on rubber wheels on the adjoining slabs or on wooden bulkheads. Power is supplied by two Tulsa electric winches mounted near each end of the screed and connected through cables to the top of the embankment. So far, the paving rate has been limited by the amount of concrete that the crane can supply to the screed. This has been averaging about 50 cu. yd. per hr. The screed

is moved about 1 or 2 ft. at each advance. It takes about 10 hr. for a 77-ft. long slab to be poured.

The 1½-yd. Gar-Bro bucket is handled by a Northwest 95 crane. Concrete is mixed next to the crane by a 34E Koehring batcher which is supplied by dry batch trucks.

Concrete is brought to Courtright from the Wishon batch plant (Conveyco) over a 2-mi. road in transit-mix trucks.

Concrete pouring at Courtright started out with conventional prefabricated panels braced by strongbacks, but after a time this was found to be slower than the slip-form operation at Wishon. A new slip-form was designed by the contractor and built by Clark incorporating certain improvements based on experience gained with the Wishon slip-form. The major difference is that the superstructure of the new rig is perpendicular to the slope of the dam



rather than vertical. This gives it better balance and tends to offset the tendency for riding up over the concrete.

### Aggregate production

A 200-ton per hr. Conveyco crusher is turning out four sizes of coarse aggregate from a pit near Wishon. The four minus sizes are  $2\frac{1}{4}$ ,  $1\frac{1}{2}$ ,  $\frac{3}{4}$ , and  $\frac{3}{8}$ . Bank-run sand is No. 4 minus. The crusher supplying aggregates for the concrete at both dams is expected to stockpile enough materials for both jobs by the end of this season.

The main units in the crusher are a Cedarapids  $22 \times 36$  jaw primary, and a  $4\frac{1}{4}$ -ft. Symons cone crusher. All aggregates are washed.

### Concrete design

Otto Ehrenburg, chief concrete technician for the PG&E on the Kings River Project, is obtaining excellent results with a concrete design system based on fineness modulus control. After selecting appropriate fineness moduli for combined aggregate and coarse aggregate, the FM of the sand is found by tests, and the three percentages computed algebraically. Since the FM of the sand changes, several variants of the basic mixes are designed.

The FM's for the combined and

coarse aggregate are selected initially with the aid of a series of charts originally developed by Duff Abrams and later perfected by Joseph Kitts. The charts are very flexible in their application, and are not to be confused with the so-called Duff Abrams method.

Type II Permanente cement is being used. Additives are Pozzolan (supplied by Airox), which is substituted for about 15% by weight of the cement. Pozzolith 3 (Master Builders), which is used at the rate of about  $\frac{1}{4}$  lb. per sack of cement, and Dresinate XX, an air-entraining agent supplied by Hercules Powder Co. The amount of the air-entraining agent used in the mix varies rather widely but a rough average would be 8 oz. of 10% solution per cu. yd.

### Key personnel

For the PG&E, design is under the general supervision of Walter Dreyer, vice president and chief engineer; Carl Appleford, chief civil engineer, and J. B. Cooke, supervising civil engineer. Construction is directed by A. J. Swank, vice president in charge of general construction; H. W. Haberkorn, manager of hydroelectric construction, and Joe Pirtz, Jr., superintendent. George Thacher is project engineer over the entire Kings River

Project; Charles B. Joslin is resident engineer, and Horace K. Moulton, office engineer. For the two dams, P. J. Helbert is resident engineer. G. L. Hislop is office engineer, C. Ehrenburg is concrete technician, W. K. Flint is chief inspector, and Robert Farley is chief surveyor.

John Erdle is project engineer, the contractor in charge of the Kings River development. Del Billings is district camp manager. T. J. Boyer is in charge of first aid and safety.

For the two dams, B. L. Perkins is project manager and Chet Dapron is equipment superintendent.

At Wishon, H. D. Gard is general superintendent, and Mike Krupotic is assistant general superintendent. Job engineer is Max Dale. Master mechanic is Leo Boothe. Office manager is P. A. Campbell. Place rock foremen are Cecil C. and Rex Rice. Aggregate foreman is S. T. Brown.

At Courtright, William McMillan is coordinator (a position roughly corresponding to general superintendent). Job engineer is Don Hummel, office manager is Harry Park, and master mechanic is Bill Dicks. Claude Myers is excavating superintendent, Frank Sganga is quarry superintendent, James Duggan is concrete superintendent, and M. Moore is place-rock superintendent.

# Building a powerhouse underground

*The first major underground powerhouse in the U. S. is a spectacular feature of Kings River Project. Swedish rock bolt system is highlight of construction methods.*

KINGS RIVER CONSTRUCTORS, a joint-venture composed of Morrison-Knudsen Co., Inc. (sponsor), Henry J. Kaiser Co., Macco Corp., and Perini & Sons, Inc., have finished the excavation of the first large underground powerhouse in the United States and are driving toward completion of a 6.2-mi. long power tunnel. The two projects, being carried out under a single contract awarded in 1956, are major features of Pacific Gas and Electric Co.'s \$80,000,000 Kings River Project, 60 mi. east of Fresno, Calif.

In the United States are located three of the world's first four underground powerhouses, but none of the nearly 100 such plants built through-

out the world since World War II. The 125,000-kw. Haas plant now under construction is by far the largest of the four underground plants in existence in the U. S. The main chamber is 173 ft. long, 56 ft. wide and 85 to 100 ft. high. Included in the Kings River Constructors' contract is a 9-ft. penstock 753 ft. long (inclined at 70 deg.), an 18-ft. tailrace tunnel 1,953 ft. long, and an 18-ft. diameter access shaft 389 ft. deep.

At this writing the excavation is nearly finished and a contract for the structural work has been awarded to the San Francisco firm of Rothschild, Raffin & Weirick.

The powerhouse is at elev. 4,090 ft., about 500 ft. below ground sur-

face and 2,000 ft. back from the Kings River into a solid granite formation. By going underground, PG&E saved the cost of an additional 2,000 ft. of penstock that would have been required for a surface powerhouse. In addition, the underground location results in about 28 ft. less head.

Work started Nov. 19, 1956, with a single shift driving the 18-ft. horseshoe tailrace. About 17,000 cu. yd. of rock was excavated and perforated granite permitted the tunnel to be unsupported for its full length of 1,963 ft. By late January 1957 work was continuing on a 3-shift basis.

When the powerhouse area was reached, the first step was to open up a central floor-level chamber about 16 ft. wide, 70 ft. long and 10 ft. high. The sequence of operations in excavating the powerhouse can be seen clearly in the accompanying drawing.

Next two 8 x 8-ft. vertical shafts were driven to the crown of





## **JOB REPORT FROM GOLDSBORO, N. C.**

**on the new CAT\* DW15 (Series E)-No. 428 LOWBOWL Scraper**

Whenever a new machine is introduced, this question comes up: "What'll it do on a job?" Reports from actual jobs in different sections of the country show there's a definite answer for you on the new Caterpillar DW15 (Series E)-No. 428 LOWBOWL Scraper. Compared to competitive units of similar capacity, this new mover heads the pack with high production.

Here are facts and figures from a contract on U. S. Highway 117 near Goldsboro, N. C. The contract, handled by S. T. Wooten Construction Co., Stantonsbury, involved moving about 3,000,000 cu. yd. of material in a section 2.3 miles long. The material was coarse, moist sand (70%) and clay (30%). Hauling loads of 14.1 bank cu. yd., the DW15 (Series E) unit averaged 7.02 round-trip cycles an hour on a 3,600-foot cycle. Details are shown in the box to the right.

From every angle, the new DW15 is designed for high production at low cost per yard. Its Caterpillar engine packs 200 HP (maximum output capacity). It speeds up to 37.2 MPH plus the stability of four wheels, it delivers fast round-trip hauls with greater productivity than two-wheel rigs. Its new wide-section 26.5 x 25 tires provide maximum flotation. And the new No. 428 LOWBOWL Scraper (13 cu. yd. struck, 18 cu. yd. heaped), provides a faster loading rate clear to the end of the loading cycle.

For comparative cost-of-operation figures on other actual jobs, see your Caterpillar Dealer. He's a source of reliable information. Ask him to show you proof that the new DW15 (Series E)-No. 428 can pay off for you! Name the date—he'll demonstrate!

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

### **JOB DATA ON DW15 (SERIES E)-NO. 428 \***

|                                                 |                                        |
|-------------------------------------------------|----------------------------------------|
| <b>Material:</b>                                | Coarse moist sand (70%) and clay (30%) |
| <b>Round-trip distance</b>                      | 3,600'                                 |
| <b>Average load time (min.)</b>                 | 1.06                                   |
| <b>Average haul time</b>                        | 3.28                                   |
| <b>Average turn and dump time</b>               | .61                                    |
| <b>Average return time</b>                      | 3.61                                   |
| <b>Average cycle time (incl. delays)</b>        | 8.56                                   |
| <b>Average trips per hour</b>                   | 7.02                                   |
| <b>Bank cu. yd. per trip</b>                    | 14.1                                   |
| <b>Average hourly production (bank cu. yd.)</b> | 99                                     |

*\*The unit was push-loaded by a D8*

# **CATERPILLAR\***

\*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

**ONE GOAL: To concentrate our capabilities, resources and experience on the design, manufacture, distribution and service of job-tested heavy equipment.**

### **THE LATEST, MOST COMPLETE INFORMATION ON THE NEW HIGHWAY PROGRAM — FREE**

Here in one booklet is *all* the latest information on the new highway program. Find out how, where and when the money will be spent; standards for the new freeways, final routes of the Interstate System. Everything you need to know to share in the greatest construction job in history.

DEPT. WC-11, Caterpillar Tractor Co.  
Peoria, Ill.

Please send me immediately  
\_\_\_\_\_ copies of "The Road Ahead."

Name \_\_\_\_\_

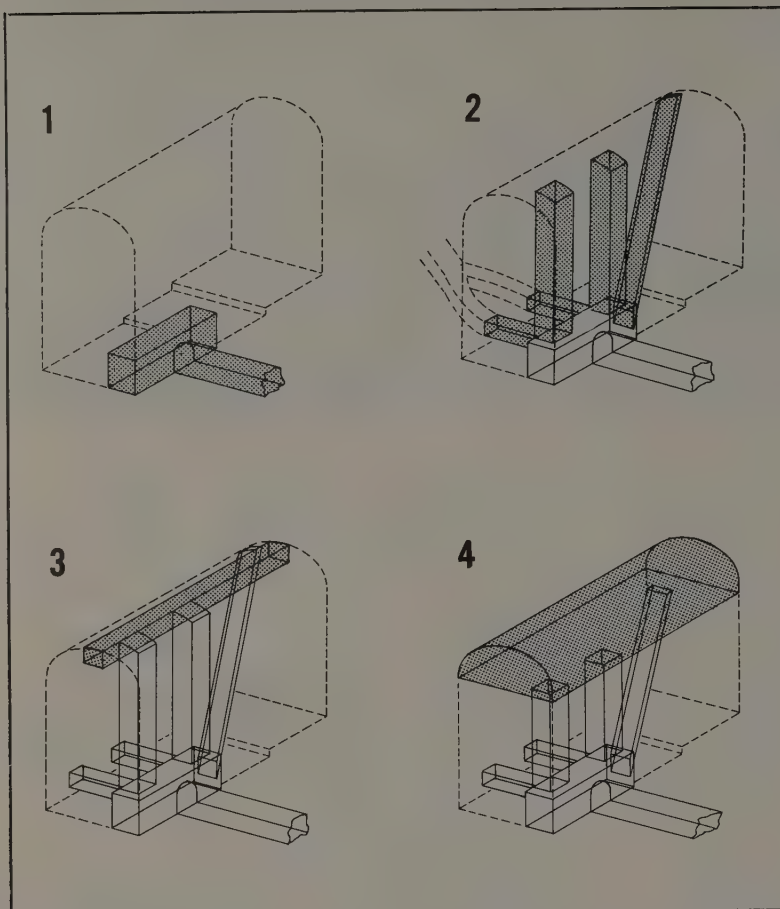
Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_







Successive stages in the excavation of the underground powerhouse are shown in the above sequence drawing. First step was to drive the tailrace tunnel into the powerhouse where a floor-level chamber was opened up. Second, two vertical shafts and a sloping manway were excavated. Third, a horizontal drift at the powerhouse crown was driven, connecting the three previous shafts. Fourth, the entire chamber roof area was excavated. The remaining rock was excavated by benching down with jackhammers and wagon drills.



PHOTO shows miners skirting the edge of one of the vertical shafts during the final benching-down operation. The roof has already been bolted and gunited.

chamber roof, along with a 51-deg. manway to the far end of the chamber. This manway permitted work to start on the vertical access shaft, not shown on the drawing.

The vertical shafts were driven from the bottom up, at the full 8 x 8-ft. dimension. During construction access to the top of the shaft was provided by a passageway up one side of the shaft protected by timber. A temporary platform was constructed at the top of the covered shaft to permit drilling to be carried out.

Prior to shooting the temporary platform was removed and the top of the access passageway covered.

After the two vertical shafts and the inclined manway were completed, an 8 x 8-ft. drift was driven the full length of the chamber at the crown, intercepting the two vertical raises.

This longitudinal drift was enlarged outward and downward to point below spring line, forming the entire chamber crown. Slushes were used to drag mucked material into the vertical raises. At the bottom the material was removed with Eimco 105 muckers, working with 6-cu. yd. Koehring Dumpsters equipped with exhaust scrubbers.

Heavy drilling was suspended while the crews placed rock bolts, wire mesh reinforcing, and gunite on the roof of the chamber.

The use of pneumatically-applied mortar is a safety feature, as the solid granite roof would stand without additional support.

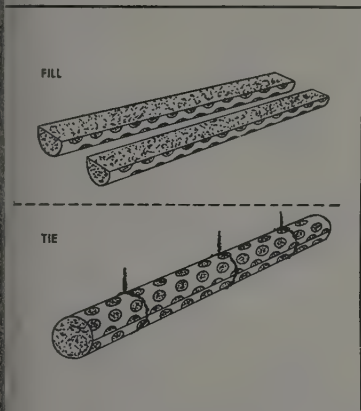
For rock bolting the contractor used the Perfo system, a method developed in Sweden. Two halves of perforated steel sleeve are filled with mortar and tied together with wire. The sleeve is inserted in the drilled hole and, if the hole is vertical or steeply inclined, wedged in place with small wooden wedges. Then a deformed reinforcing bar of the proper size and length is driven into the sleeve. This forces the mortar out through the perforations and causes it to fill solidly all the space between the sleeve and the surrounding rock.

The advantages of this system are several. There is no play in the bar; there is uniform bond the entire length of the bar (no points of concentrated stress); no maintenance is required as there is no chance for the bar to corrode, and the installation is easy since there need be no close drilling tolerances, complicated equipment, or specialists.

The sleeves are usually 6½ ft. long and are cut on the job to suitable working length. The sleeves are avail-



ble in two sizes,  $1\frac{1}{8}$  in. and  $1\frac{1}{4}$  in. Full information can be obtained from Perfo Division, Sika Chemical Corp., 35 Gregory Ave., Passaic, N. J. First step in the rock bolting operation was to drill 1,200 holes  $1\frac{1}{2}$  in. diameter on  $3\frac{1}{2}$ -ft. centers. The holes were 10,  $12\frac{1}{2}$ , and 15 ft. deep. After the mortar-filled Perfo sleeves were inserted, 1-in. re-bars were driven into the mortar. Wire mesh was suspended from the bars and the 5,000 sq. ft. of roof surface given a 1-in. layer of gunite.



#### ROCK BOLTING METHOD

Swedish system of rock bolting, called Perfo, was used on the powerhouse roof. Two sleeves of a perforated metal cylinder are filled with mortar, and tied together as shown. The cylinder is inserted into the hole drilled in the rock, and wedged temporarily if necessary. Next, a reinforcing bar is driven into the mortar. This forces the mortar out through the perforations where it fills the space between the cylinder and the walls of the hole.

A variety of rock drilling equipment was used during the stages shown in the drawing, with BBC-22 Atlas Copco airleg drills handling the bulk of the work.

After the dome had been excavated, (Stage 4 in the drawing) the remainder of the chamber was excavated using Gardner-Denver and Ingersoll-Rand jackhammers, with Atlas Copco airlegs specially job-converted for sinking.

#### Haas tunnel

Tunneling operations are almost exclusively in solid granite, with only a few short sections which require shoring. A 990-ft. access adit tunnel was driven at Sawmill Flats,  $3\frac{3}{4}$  mi. down river from Wishon Dam. Original project specifications provided for a possible second adit which probably will not be used because of excellent progress without it.

Tunnel crews, working on a 3-shift, day basis, have achieved remark-



**TUNNEL DRILLING** is done with 6 Gardner-Denver drifters mounted on a job-built two-deck jumbo. Bits are Sandvik Coromant and Brunner & Lay. Blasting pattern involves about 64 holes divided into 10 groups with 25 millisecond delays between most of the groups.

able production rates. Record for a single day was 142 ft. and the top week was 834 ft. From 7 to 9 rounds are fired every 24 hr. in the 13-ft. horseshoe tunnel.

Drilling in each heading is with 6 Gardner-Denver drifters, mounted on a job-fabricated 2-deck jumbo. Steels are equipped with  $1\frac{5}{8}$ -in. Sandvik Coromant detachable rock bits supplied by Atlas Copco Pacific, and with Brunner & Lay bits of the same size.

A standard blast pattern with a center burn and 9-ft. deep holes is drilled almost without variation, and about 40 cu. yd. are obtained per shot.

Conway type 100 muckers are used with 6-cu. yd. side-dump cars hauling material to a dump area adjacent to the adit.

#### Key personnel

For Pacific Gas and Electric Co., George B. Thacher is project engineer, Charles E. Joslin is resident engineer, and Horace K. Moulton is office engineer.

For Kings River Constructors, John F. Erdle is project engineer. For the Haas underground powerhouse Carl Larson is project manager, J. Eide is assistant project engineer, Paul McDonald is office engineer, and J. A. Hobson is office manager. Underground superintendent is Tom March, master mechanic is W. W. White, and walking bosses are Richard Bingham, Robert Harris, and Albert Marksbury.

On Haas tunnel, P. M. "Whitey" Lee is project manager, Charles G. Kincaid is assistant project engineer, and H. G. LaGrange is office man-

#### Typical heading crew per shift

- $\frac{1}{2}$  Walking boss (2 headings)
- 1 Shifter
- 6 Miners
- 6 Chuck tenders
- 1 Nipper
- 1 Electrician
- 1 Mechanic
- 1 Mucking machine operator
- 3 Motormen
- 1 Swamper
- 1 Dump crewman
- 1 Bull gang boss (day shift only)
- 5 Helpers (day shift only)

28  $\frac{1}{2}$  men per heading

#### Basic tunnel equipment

- 2 Jumbos, 2-deck, job-made
- 12 Gardner-Denver drifters
- 16 Ingersoll-Rand jibs
- 2 Conway 100 muckers
- 8 Goodman 10-ton locomotives
- 36 Century Steel side-dump cars
- Atlas Copco and Brunner & Lay  $1\frac{5}{8}$ -in. detachable bits
- Joy Axi-vane tandem fans every 3,000 tunnel feet

ager. Hugh Dennison is master mechanic and walking bosses are R. "Rusty" Ray, Oscar C. Peterson and Carl Cochran.



# Asphalt hauled 92 miles from plant to job site

DURING this construction season in eastern Modoc County, Calif., a long haul was made for plant-mixed asphalt that probably sets a record in the history of highway construction in the state.

Clements & Company of Centerville has a paving plant erected near Hatfield on State Route 210 close to the Oregon State line (see map). This contractor also had the contract for surfacing 7.9 mi. of State Route 28 east of Alturas between the junction of this route with US 395 and Cedarville. This called for placing about 9,000 tons of plant-mix. The contractor decided to haul this mix a distance of 92 mi. from the Hatfield plant.

There are several reasons that prompted this operation. In the first place the plant was established and in operation on a large and tested deposit of aggregate. Satisfactory aggregate is not closely available to the Modoc County job. Then too, the tonnage in the contract was not large and overhead costs for moving the plant in and out would have substantially increased the unit costs on this small amount. By utilizing bottom dump hauling units operating in tandem costs were greatly reduced.

In actual operation there were 15 to 17 four-axle bottom-dump trailers hauling in tandem. It took the loaded units about 3 hr. to travel the 92 mi. The plant ran from 5:30 a.m. to 2:30 p.m. Each tandem outfit hauled about 25 tons of mix and made two trips per day. This took care of a daily plant production of about 750 tons.

The bottom-dump units pulled in ahead of the Barber-Greene paver. The front unit was accurately spotted over a windrow sizing box. When the gates were opened they fell into the box and engaged it, so that it pulled ahead when the vehicle moved. After the front unit was emptied, the rear unit was pulled ahead, spotted over the box, and emptied in similar manner.

As loaded trucks arrived, they pulled in ahead of the paver and straddled the windrow until their turn came to unload through the spreader box. In normal operations and except when it was necessary to run the windrow out at night, at least 100 ft. of windrow was maintained in front of the paver, as a



maneuver area for the use of loaded trucks to pull into position over the spreader box.



TANDEM UNITS hauled 25 tons of mix and made two trips per day for the 92-mi. distance.



LOADS WERE dumped directly into a windrow sizing box. As the truck moved forward it dragged the box and placed the windrow, which was picked up by the paver.

When operations began in the morning, the paver was backed up to the spreader box spotted at the end of the finished pavement and the loaded unit spotted in position. From that point operations conformed to standard procedure.

No trouble was experienced in maintaining temperatures. Loads were covered, but the summer temperatures and large loads helped to retain the heat.

This contract was under the supervision of District II of the California Division of Highways at Redding. H. S. Miles is District Engineer. Ray Wilson was district construction engineer on this project and W. H. Bartlett was resident engineer. John R. Holgate was superintendent for Clements & Company.





## How oscillating wheels can save you untold street maintenance costs...



See the flow of compaction effort that the BROS Self-Propelled roller with torque converter drive provides for street seal coating, resurfacing and shallow lift compaction...

Here's how it is helping cities throughout the country make great savings in street maintenance costs:

- With full oscillation of all wheel pairs to provide uniform compaction, the BROS SP-54 helps "key" and "lock" aggregate materials tightly in the base course to prevent various pavement failures.
- Wheel oscillation of this roller also kneads the asphalt into a tight, solid surface, eliminating hairline cracks that would otherwise turn into

surface breaks. Very important, too, rubber tire rolling correctly imbeds the wearing course chips *without* crushing them.

- Besides such proven advantages, the BROS SP-54 offers these time-saving performance features: a torque converter drive provides smooth, easy handling and eliminates "tipping" of chips when starting; it also lessens drive line strain.
- Full-reversing type transmission with shuttle gear permits rolling in either direction without shifting; turn arounds are thus eliminated.
- Infinite speed range from 0 to 18 mph; positive chain drive to both rear wheel pairs; 50 HP engine and smooth, hydraulic steering provide fast, proper compaction results that you can't get from any other roller. See a BROS Distributor or write us for full information and/or a demonstration. BROS INCORPORATED, ROAD MACHINERY DIVISION; 1057 TENTH AVENUE S.E., MINNEAPOLIS 14, MINNESOTA.

Find out, too, about the complete BROS TEAM. With the SP-54, the BROS Preparator and Roto-Mixer make the perfect combination for low cost street construction. The Preparator (in-place materials reducer) reduces native over-size materials and old blacktop to proper roadbed sizes. The Roto-Mixer stabilizes and blends the base and wearing course materials to improve load bearing values.



ROAD MACHINERY DIVISION

# BROS INCORPORATED

(Formerly the WM. BROS BOILER & MFG. CO.)

1057 Tenth Ave. S.E. • Minneapolis 14, Minnesota



Arizona Equipment Sales, Inc., Phoenix, Arizona; Blakamore Equipment Co., Oakland, California; Coast Equipment Company, San Francisco, California; Crook Company, Los Angeles, California; McCoy Manufacturing Company, Denver, Colorado; Western Equipment Company, Boise, Idaho; Western Construction Equipment Co., Billings, Great Falls, Montana; The Harry Cornelius Company, Albuquerque, New Mexico; Pioneer Equipment Company, Reno, Nevada; Loggers and Contractors Machinery Co., Portland, Oregon; Totem Equipment Co., Seattle, Washington; Keremi Tractor and Equipment Co., Casper, Cheyenne, Wyoming.





**WATERHOLES BRIDGE** has been completed. The narrow canyon was the only obstacle in the 20-mi. access road contract being carried out

by contractor W. W. Clyde. A temporary dirt fill was used to support formwork. The same method was described in April 1957 issue, p. 66.

# First Glen Canyon roads completed

*The first sections of the more than 100 mi. of access roads leading into the remote Glen Canyon Dam site in Arizona and Utah have been completed. Dust, rock, and lack of water were the main problems, with plenty of heavy work still to come. Here's a field review of the major road contracts, past, present, and future.*

THE FIRST SECTIONS of highway built to primary standards linking the \$420,000,000 Glen Canyon Dam Project in northern Arizona and southern Utah were due for completion in October. Contracts totaling nearly \$4,000,000 for grading and surfacing 25 mi. of access highway in Arizona have been awarded by the Bureau of Reclamation, while on the Utah side of the Colorado River 40 mi. of new highway is under contract by the state at a cost of over \$3,000,000. The incomplete highway extends in a 100-mi. loop from Kanab, Utah, at the southern end of the state, to Bitter Springs, Ariz., 13 mi. below the Navajo Bridge on U. S. Highway 89. The Utah section runs almost due east for 63 mi., ending at the Utah-Arizona border 7 mi. northeast of the dam site. The Bitter Springs road swings south from the east rim of Glen Canyon to its junction with U. S. Highway 89, just 25.2 mi. south of the dam site and 110 mi. north of Flagstaff, Ariz. The only parts of the

"loop" highway not under contract are a 17.4-mi. section through the center portion of the Utah road and seven miles in Arizona from the state line to the west rim of the canyon.

Construction of an access road from the Arizona side started in October of 1956 with the awarding of a \$1,156,244 contract to the Strong Construction Co., Springville, Utah, for the grading of the first 5 mi. of the Bitter Springs Road. Strong's contract—from Highway 89 to the top of the Echo Cliffs—included some heavy rock work. From the bottom of the cliffs the road rises 1,000 ft. in 4½ mi. Part of the job was simplified by allowing the road to follow a ridge which winds up the face of the escarpment. The tough nut to crack was a cut 300 ft. deep and 1,500 ft. long through a vertical rise at the top of the mesa.

A road better fitted for mountain goats than men was pioneered to the top as the first step. Starting with jack hammers and dozers Strong leveled off an area large enough to

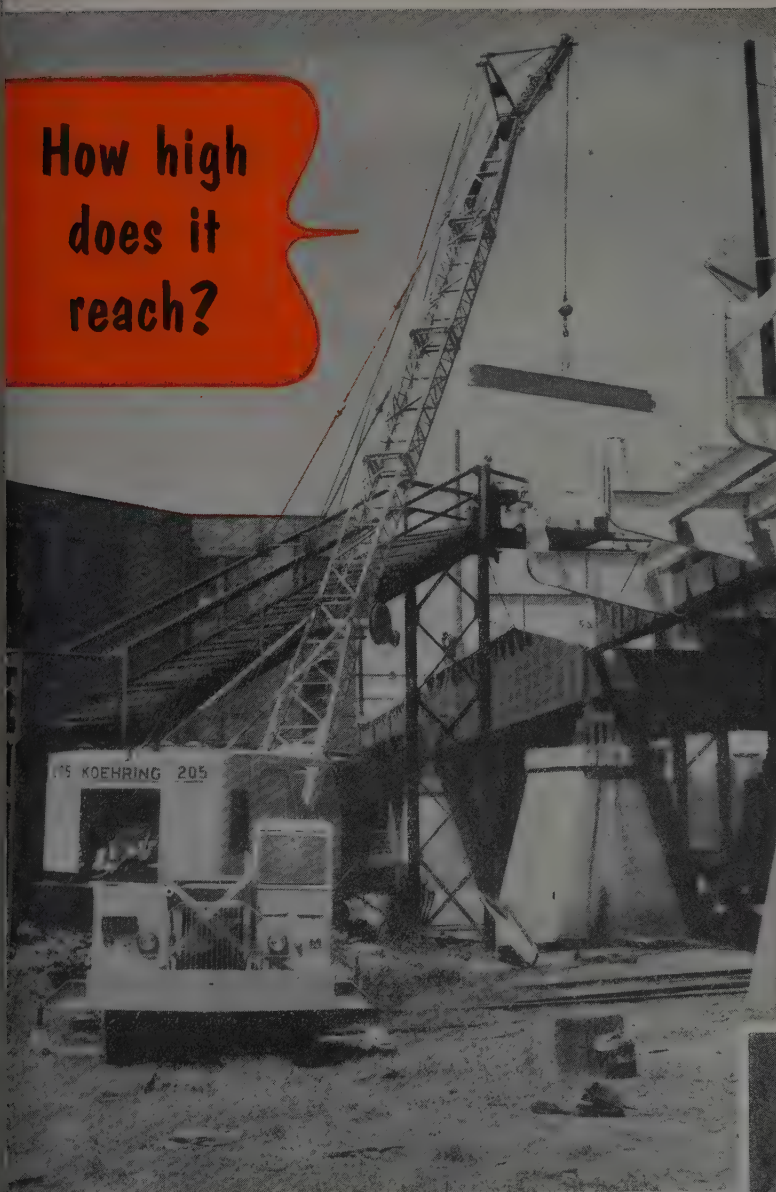
move in rock drills. Then he really went to work. Using Caterpillar D9s for the rough stuff he moved over 100,000 cu. yd. of rock a month. For the first three months the contractor used his big dozers to gouge through the abrasive sandstone along with a Winder-Weiss Portadrill mounted on a Caterpillar D6. Holes 6½ in. in diameter were sunk by the drill to depths of from 10 to 50 ft. by the fast rig which averaged up to 300 ft. a day.

## Unusual blasting mixture

For shooting Strong used a half and half mixture of ammonium nitrate and Atlas blasting powder patterned after techniques developed in the mining industry. The mixture was found to be less expensive than conventional explosives and it worked just as well in this type of rock, averaging ¾ lb. of powder to the yard. The nitrate was obtained from the Geneva Steel Works of the United States Steel Corp. at a cost



How high  
does it  
reach?



## Koehring 205 truck crane

handled all the high lifts on this viaduct job with 55-foot boom, and 15-foot jib. But that's not anywhere near the limit of its reach! This mobile crane safely handles up to 70 feet of main boom, or 65-foot boom, plus 15 to 30-foot jib — a total of 95 feet. It has plenty of load stability at every work radius. Maximum lift capacity is 15 tons (based on 85% rating).

Truck-mounted 205 is highly roadable, too — drives 30, 40 miles, or more, in less than an hour's time. Travel is unrestricted. Axle-load distribution conforms with street and highway regulations in most areas, even when carrying 25-foot boom over the steering end. Overall width — 8 feet.

When there's excavating or material-handling to be done, truck-mounted 205 converts to  $\frac{1}{2}$  to  $\frac{3}{4}$ -yard clamshell or dragline,  $\frac{1}{2}$ -yard shovel or hoe. Consider what all this versatility, big work capacity, and high-speed mobility can mean in time saving convenience and lower costs on your jobs. Better see Koehring distributor about this 205 soon. He's listed here. *Why not call him?*

Take your choice of mountings on the Koehring heavy-duty 205 — it's available on truck, Cruiser®, or crawlers (below) with all standard attachments.



K7007R

### OPERATING EASE:

40" main-drum clutch, self-adjusting.  
Main operating levers on antifriction, self-aligning bearings.  
Crane-to-truck remote-control available as optional equipment.

### SIMPLE, HEAVY-DUTY DESIGN:

Only 2 main-shafts in upper machinery, fewer parts, less maintenance.

Splined shafts, antifriction bearings.  
Butt- or pin-connected crane boom.  
Heavy-duty construction of welded, high-strength steels.

### 205 WORK CAPACITIES:

15-ton lift on rubber —  
(Cruiser or truck mounting).  
10-ton lift as a crawler crane.  
 $\frac{1}{2}$  to  $\frac{3}{4}$ -yard clamshell, dragline.  
 $\frac{1}{2}$ -yard dipper as shovel, hoe.



AMERICAN MACHINE CO., Spokane, Washington  
PACIFIC HOIST & DERRICK CO., Seattle, Washington  
COLUMBIA EQUIPMENT CO., Portland, Oregon  
HARRON, RICKARD & McCONE CO. of Southern California  
Los Angeles, California  
STANDARD MACHINERY CO., San Francisco, California  
KIMBALL EQUIPMENT CO., Salt Lake City, Utah

ACTION EQUIPMENT CO., Stockton, California  
NEIL B. MCGINNIS CO., Phoenix, Arizona  
THE HARRY CORNELIUS CO., Albuquerque, New Mexico  
SAN JOAQUIN TRACTOR CO., Bakersfield, California  
ENGINEERING SALES SERVICE, INC., Boise, Idaho  
WESTERN CONSTRUCTION EQUIP. CO., Billings, Montana  
WESTERN CONSTRUCTION EQUIP. CO., Great Falls, Montana





## Digging **6 FEET WIDE** with dual booms

When extra-wide trenches were needed for storm sewers on this new housing project, contractor brought in a big, Parsons dual-boom 310 Trenchliner. Above photo shows how it cut the trench 6 feet wide — and provided digging depths down to 12 feet. Big-capacity belt conveyor easily handled the extra yardages from the dual bucket lines. Notice, too, how the long, high-reach, arc-type conveyor put spoil bank well back beyond edge of trench.

### Maximum depth — 17 feet

On most jobs, this big-production 310 Trenchliner is used with just one heavy-duty digging boom. As a single-boom machine, it cuts 18 to 54 inches wide — at depths to 17 feet. Production ranges from 5 inches to 20½ lineal feet of trench per minute.

In close quarters, it digs within 15 inches of side obstructions. Boom is shiftable to any off-set position.

Reversible, power-shift spoil conveyor readily discharges to either side. Want to know more about the big 310 Trenchliner? Your Parsons distributor has complete details — call him today.



If your work requires a small, utility-size trencher, then look into this Parsons 155. It's compact, low, narrow — only 5 feet-4 inches wide, 7 feet-4 inches high. Yet, it digs 16 to 26 inches wide — 10 feet deep. Other Parsons sizes range from a small, mobile model on rubber tires to "big-inch" and "middle-inch" wheel-type Trenchliners.

P744R

|                                           |                       |
|-------------------------------------------|-----------------------|
| AMERICAN MACHINE COMPANY                  | Spokane               |
| PACIFIC HOIST & DERRICK CO.               | Seattle               |
| COLUMBIA EQUIPMENT CO.                    | Portland              |
| HARRON RICKARD & McCONE CO. OF SO. CALIF. | Los Angeles           |
| KIMBALL EQUIPMENT CO.                     | Salt Lake City        |
| NEIL B. McGINNIS CO.                      | Phoenix               |
| THE HARRY CORNELIUS CO.                   | Albuquerque           |
| ENGINEERING SALES SERVICE, INC.           | Boise                 |
| STANDARD MACHINERY CO.                    | San Francisco         |
| WESTERN CONSTRUCTION EQUIP. CO.           | Billings, Great Falls |
| COLORADO BUILDERS SUPPLY CO.              | Denver                |
| ACTION EQUIPMENT CO.                      | Stockton              |



**PARSONS TRENCHLINERS®**  
A DIVISION OF SPERRING COMPANY

of \$70 a ton. This compares with \$200 a ton for the granular type powder.

Once into the cut Strong put in Caterpillar 80 scrapers behind Cat D8s, and the faster Model C Roadster Tournapulls. An 80D Northwest shovel with a 2½-yd. dipper was moved into the cut in the last two months of excavation along with three 27-yd. Model B Tournarockers. This type of hauling equipment was better suited to the job because of its maneuverability in the cramped working space at the bottom of the cut. Eight months were needed to bring the cut to within 20 ft. of grade, requiring the removal of over 500,000 cu. yd. of rock, most of which was shoved over the edge of the cliff.

By comparison the grading of the remaining 20 mi. of the Bitter Springs Road could be described as routine. From the top of the Echo Cliffs to the dam site the only obstruction in the rolling desert terrain was Waterholes Canyon, a narrow twisting gorge draining downstream from the dam site into the Colorado River. A contract for the grading and drainage of the remaining 20 mi. of the Bitter Springs Road and construction of a bridge across Waterholes Canyon was awarded in January by the USBR to the W. W. Clyde Co., also of Springville, Utah. Low bid for the job was \$1,011,819.

From rim to rim Waterholes Canyon measures over 140 ft. although it narrows to 97 ft. at the skewbacks and less than 10 ft. wide at the bottom. Taking advantage of the peculiar nature of Waterholes terrain bridge builders used a temporary earth fill as a base for the falsework. Starting with dozers, over 6,000 cu. yd. of sand and rock were pushed over the side of the canyon filling the narrow lower half to a depth of 67 ft. This was described on page 34 of the September WESTERN CONSTRUCTION.

A surfacing contract for the Bitter Springs Road and airport at Page, Ariz., was awarded by the Reclamation Bureau May 31 to the Alexander Construction Co., Minneapolis, Minn. The contractor's low bid for the job was \$1,587,655. Surfacing of the 25 mi. of highway in September with 109,000 tons of plant-mix required for the road and 12,000 tons needed for the airstrip. In mid-August the contractor transported the first sections of a Model 848A Barber-Greene hot plant to his camp north of the Page, Ariz., townsite where crushing equipment had already been





## ONE-SECOND DUMP *increases output 9%*

Operator drives up, trips the body-release lever — and **gravity** tilts the 6-yard body 70 degrees. One second later the load is out, and Koehring Dumptor® is on its way back for the next load.

Because there is no waiting for slow-acting body hoists, Dumptor saves 15 to 25 seconds every time it dumps. This earns an important increase in extra yardage output. For example — take a typical 1,000-foot haul where you would normally make 16 trips an hour. By saving an average of 20 seconds dump-time on each trip, Dumptor gains 320 seconds, or 5.3 minutes more productive haul-

time per hour. You make 17½ trips instead of 16. This, alone, adds 9% to hourly production. And — you get the same one-second dumping every time, under heaviest loads, in all temperature extremes, because gravity-dump never balks, never wears out. No body-hoist — no expensive hoist replacement parts, maintenance, or down-time.

Find out for yourself what this can mean to you in increased production and lower hauling costs. Also look into the other advantages you get with Koehring heavy-duty 6-yard Dumptor — no-turn shuttle haul, 24% gradeability, ton of strength for every ton of load capacity.

K724R

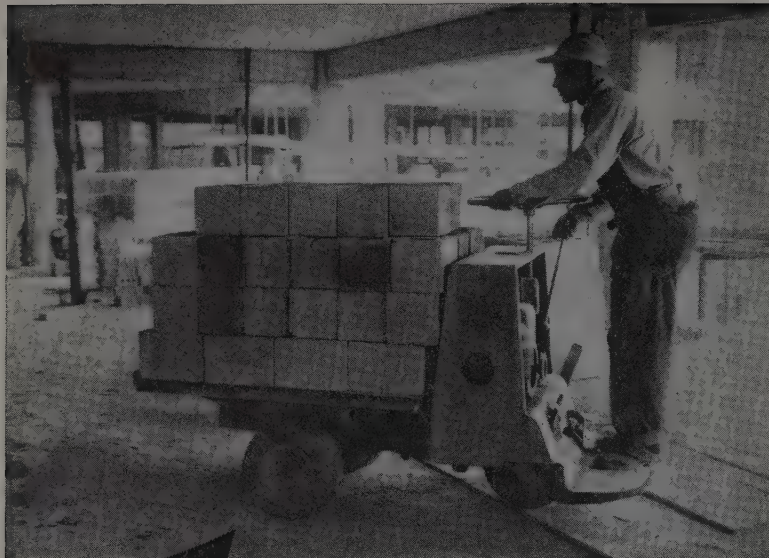
AMERICAN MACHINE CO., Spokane, Washington  
 PACIFIC HOIST & DERRICK CO., Seattle, Washington  
 COLUMBIA EQUIPMENT CO., Portland, Oregon  
 HARRON, RICKARD & McCONE CO. of Southern California  
 Los Angeles, California  
 STANDARD MACHINERY CO., San Francisco, California  
 KIMBALL EQUIPMENT CO., Salt Lake City, Utah

ACTION EQUIPMENT CO., Stockton, California  
 NEIL B. MCGINNIS CO., Phoenix, Arizona  
 THE HARRY CORNELIUS CO., Albuquerque, New Mexico  
 SAN JOAQUIN TRACTOR CO., Bakersfield, California  
 ENGINEERING SALES SERVICE, INC., Boise, Idaho  
 WESTERN CONSTRUCTION EQUIP. CO., Billings, Montana  
 WESTERN CONSTRUCTION EQUIP. CO., Great Falls, Montana

**KOEHRING heavy-duty DUMPTOR®**

Subsidiaries and Divisions: JOHNSON • PARSONS • KWIK-MIX • KOEHRING OF CALIF. • BUFFALO-SPRINGFIELD • KOEHRING-WATEROUS LTD. • HYDRAULIC PRESS



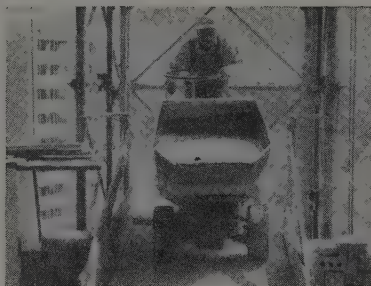


**6 MOTO-BUGS**

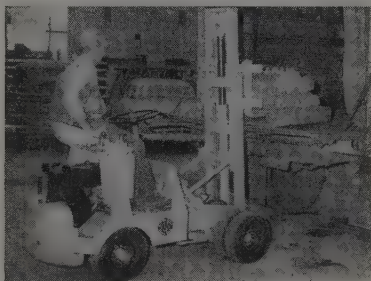
## supply 50 masons in 9-story building

Supplying brick, block and mortar to a 50-man masonry gang on a 9-story housing project was a big job in itself. The men were laying about 30,000 brick a day. To keep up with the crew, contractor mechanized his material-handling with a fleet of six Kwik-Mix S-10 Moto-Bugs. They were equipped with interchangeable  $\frac{3}{4}$ -ton-capacity platforms and hopper bodies. Shuttling back and forth between ground stockpiles, masonry saw and mixers, the Moto-Bugs delivered mortar, facing brick and block in a steady stream to the work crew — rode to the upper floors on elevator-hoist.

Light in weight, maneuverable, the S-10 can turn in 61-inch radius — clear 33-inch doorways — climb 16% ramps with full  $\frac{3}{4}$ -ton hopper or platform load. Its 10 or 15 cu. ft. gravity-dump hopper, 4-foot platform, and  $\frac{1}{2}$ -ton (6-foot) fork lift attachments are all interchangeable. Want more facts? Call your local Kwik-Mix distributor today.



Riding the hoist, Moto-Bug delivers another load of mortar to upper-floor masonry crew.



For heavier work, check big R-15 Moto-Bug — has  $\frac{3}{4}$ -ton (7-foot) fork lift, 15 or 18 cu. ft. hopper, 1-ton platform. Also complete line concrete, plaster-mortar, bituminous mixers.

KM74SR

|                                               |                       |
|-----------------------------------------------|-----------------------|
| AMERICAN MACHINE COMPANY.....                 | Spokane               |
| PACIFIC HOIST & DERRICK CO.....               | Seattle               |
| COLUMBIA EQUIPMENT CO.....                    | Portland              |
| HARRON RICKARD & McCONE CO. OF SO. CALIF..... | Los Angeles           |
| KIMBALL EQUIPMENT CO.....                     | Salt Lake City        |
| NEL B. McGINNIS CO.....                       | Phoenix               |
| THE HARRY CORNELIUS CO.....                   | Albuquerque           |
| SAN JOAQUIN TRACTOR CO.....                   | Bakersfield           |
| ENGINEERING SALES SERVICE, INC.....           | Boise                 |
| STANDARD MACHINERY CO.....                    | San Francisco         |
| WESTERN CONSTRUCTION EQUIP. CO.....           | Billings, Great Falls |
| LEACO CO.....                                 | Hobbs                 |
| ACTION EQUIPMENT CO.....                      | Stockton              |
| PACIFIC BUILDERS SUPPLY CO.....               | Portland              |
| ARMSTRONG CASTER CO.....                      | Denver                |



**KWIK-MIX MOTO-BUG®**  
A DIVISION OF KOENIG COMPANY

put into operation. The 4-unit plant is the latest model in the Barber Greene line and one of the largest asphalt producers in existence. The Pugmill, rated at from 325-350 ton per hour uses a 12150 Penetration Oil which is sprayed continuously into the mill where it is mixed with the volumetrically separated aggregate. The oil is fed from two 22,000 gal. tanks into the plant. For further description see WESTERN CONSTRUCTION, Oct., p. 50.

## Water is scarce

Water is pumped two miles from the Colorado River through a 6 in. steel line. Four pumps working in combination are used in lifting the water 800 ft. from settling basin on the river to the rim where it is pumped to Alexander's spread at Manson Mesa. A total of 300 gal. of water per minute supplied by the line is used in wetting the stabilizing course and makes up 8% of the plant-mix.

Asphalt oil is shipped from Standard Oil Company of California refineries at Los Angeles, Calif., to Flagstaff, Ariz., where it is transferred to 6,400-gal. tank trucks for the 100 mi. haul to the dam site. A total of 32,000 gal. or five truck loads daily will be needed once the plant is fully operational with two courses of 2 $\frac{1}{2}$  in. mat required for the road and a 3-in. mat for the airstrip. At the height of operations the contractor expects to hit 2,000 ft. of new mat on the road (spread and rolled) per 10-hr. shift. All work on the road and airport is to be completed by Nov. 29.

Equipment and materials to be used in the construction of the dam will eventually flow over the Bitter Springs Road from the railroad at Flagstaff, Ariz., over 100 mi. to the south. Since Flagstaff is the nearest supply point to the Glen Canyon dam site, 90% of the cost of the road was paid for by the Federal Government with 10% of the construction costs plus maintenance after completion of the dam, Arizona's share in the venture. Utah's road is being built as a Federal Aid Primary Project with 50 to 74% of the cost federally financed.

Less than 18 months ago the only way into the dam site was over 70 mi. of unimproved county road from Kanab, Utah, negotiable only by 4 wheel drive. Graveled and maintained by the State Highway Department after the signing of the Upper Colorado River Storage Project into law, this road has provided access to



the dam site for USBR crews working out of Kanab as well as the first contractors on the job.

A total of six road and bridge contracts have been awarded by the state of Utah to date for the grading and surfacing of 39.55 mi. of highway to primary standards from Kanab to the Utah-Arizona border. These at a glance are:

\$785,295 for the construction of 2.4 mi. from the Utah-Arizona state line. Contract awarded to the Industrial Construction Co., Las Vegas, Nev., in December 1956.

\$555,195 for 8 mi. of highway from the end of Industrial's section to the Paria River. Awarded in January to Farmer-Abbott & Waldren, Tremonton, Utah, contractors.

\$1,082,569 for construction of 3.65 mi. of highway starting 6 mi. east of Kanab and continuing through the Buckskin Wash, 17 mi. west to the Paria River. Awarded to the W. W. Clyde Co. in February.

\$190,876 for construction of three small bridges in the first eighteen miles under Clyde. Awarded to Newton Construction Co., Layton, Utah.

\$83,012 for the construction of a single bridge in the twelve miles under Industrial. Contract awarded to the Wangsgaard Construction Co., Tremonton, Utah.

\$440,000 for the construction of two bridges across the Paria River and Buckskin Wash under Clyde.

**Rock job coming up**

Still not under contract is 17.4 mi. of road through the mountainous Cock's Comb area of southern Utah. Though bids on this final section of highway are expected to be advertised Nov. 1 by the Utah State Road Commission. A major rock job, construction will involve excavation of an estimated 1,500,000 cu. yd. of unclassified material. The area through the Cock's Comb is chiefly sandstone of varying degrees of hardness, crisscrossed by minor faults and fractures. The weakened nature of the rock may assist in excavation by making an easier job of ripping, although it increases the possibility of blowouts. Alignment of the new road will follow in a general way the present traveled road with a cut 180 ft. deep and 800 ft. long to be drilled through the top of the formation. Project cost will be around \$2,250,000.

The first contractors pushing a road through from the Utah side were faced by the twifold problems of lack of water and fine "blowsand"



**20 seconds!**

Paving contractor on a large U. S. airbase needed dependable, high-speed batching to keep two, 34-E pavers busy full time pouring 12-inch slab. He installed this Johnson automatic one-stop plant with the following results:

### 1669 batches in one day

With a top speed potential of 180 batches an hour, the plant easily met job requirements of 130 batches hourly. During one 11½-hour peak, it weighed out a total of 1669 batches — averaging better than 145 batches an hour. Actual pour for the day was 2300 cu. yds. of concrete. Each 1.38 cu.-yd. batch consisted of 5 materials — sand, 2 sizes of aggregates, and 2 types cement. Average batcher fill-time was 10 seconds — discharge time 10 seconds. A separate, fully automatic batcher was used for each material — all weighing up at the same time — all split-second air-ram controlled. Get the complete story on Johnson automatic plants for 1, 2, or 3-stop operation — call your Johnson distributor now.



All sizes, types of portable, 2 and 3-stop plants are also available — with multiple arrangements of single-material batchers. Instant Moisture Control, automatic push-button operation, and graphic weight recording.



Also check big payload performance of Johnson all-welded clamshell buckets — 3 types and 10 sizes from ¾ to 3 cu. yds. Complete Johnson line includes everything from concrete buckets, silos, bins, elevators to concrete plants with 120 mix selections.

J746R

|                                   |                       |
|-----------------------------------|-----------------------|
| A. H. COX & COMPANY               | Seattle               |
| CRAMER MACHINERY CO.              | Portland              |
| WESTERN MACHINERY CO.             | Salt Lake City        |
| THE HARRY CORNELIUS CO.           | Albuquerque           |
| KING AND EAST MACHINERY CORP.     | Denver                |
| ENGINEERING SALES SERVICE, INC.   | Boise                 |
| COOK BROS. CONST. MACH. CO.       | Los Angeles           |
| C. S. JOHNSON CO. STOCKTON BRANCH | Stockton              |
| ANDREWS EQUIPMENT SERVICE, INC.   | Spokane               |
| COOK BROS. EQUIPMENT SALES        | Phoenix               |
| WESTERN CONSTRUCTION EQUIP. CO.   | Billings, Great Falls |
| COOK BROS. TRUCK & EQUIP. CO.     | Oakland               |



**JOHNSON batch PLANTS**

A SUBSIDIARY OF KOEHRING COMPANY





**GRADING AND COMPACTION** equipment at work on the 8 1/2-mi. section near the Utah-Arizona border. Here, as elsewhere, lack of water

was a big problem. In one case the contractor pumped it 800 ft. up out of the Colorado River canyon, then overland 4 1/2 mi.

which not only required continuous wetting in compaction, but also clogged equipment. Industrial's water had to be pumped through 24,000 ft. of aluminum pipe from the Wahweap, a narrow side canyon emptying into the Colorado River above the dam site. To insure sufficient water the contractor had to put in dams and stopgaps, pumping into reservoirs adjacent to a road dozed through the canyon. Germer-Abbott's water was pumped from the Paria River, and transported by truck to the job. Water for the 18 mi. under Clyde was taken from a well at one end of the road and the Buckskin Wash at the other where it was pumped into 3,000-gal. water trucks for use in compaction.

Unclassified road material for roll fill embankment varied from nearly

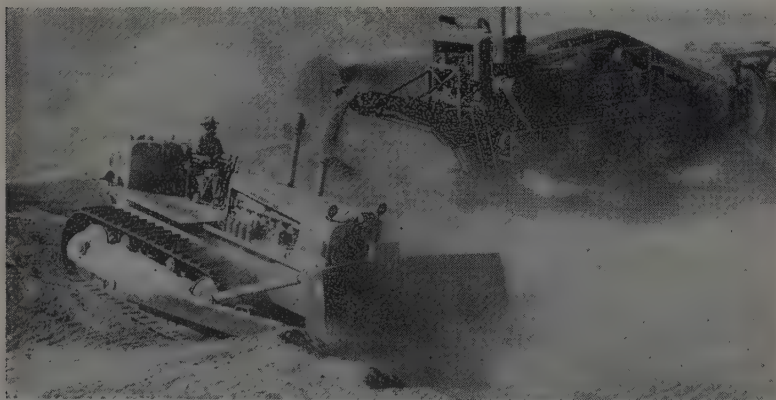
pure sand at the state line to a sand, gravel, clay mixture in the Clyde section. Some 7 to 9 in. of select material used in the first 18 mi. compares with a 6-in. layer for the rest of the road. The need for the additional inches was due to the presence of sodium salts in the soil which have a swelling effect on the roadbed when wet. Increasing the depth of the select material one to three inches not only aids in absorbing the swelling action of the salts, but also effectively seals the embankment. Compaction equipment used by Clyde included double and single sheepsfoot rollers, two pneumatic flat iron rollers, and a flat wheel roller for surfacing.

Rubberized equipment was used almost exclusively by Clyde up to finishing the subgrade. The road was cleared with Caterpillar D8 tractors

and DW 21 scrapers. The contractor moved 500,000 yd. of road material in six months. Equipment used by Clyde included three DW 21s, six Caterpillar D8s, one International TD 24, four Caterpillar Model 12 motor patrols, and three International water trucks with 3,000-gal. tanks.

Surfacing equipment included a Universal Crusher producing 3,500 tons of aggregate per 8-hr. shift, and a Seaman Speed Mixer using 250 gal. of oil per min. Paving called for 2 1/2 in. of base course and 6 in. of surface material, 2 1/2 in. of which were mixed with a bituminous road-mix material. Final surfacing was with a bituminous aggregate and MC-3 asphalt oil. The oil was shipped from Utah Oil Co. refineries at Salt Lake City in 6,000-gal. tankers. Rigs used included Kenworth, Peterbilt, and Mack tank trucks with 4 to 8 truck loads laid daily. Using the Seaman, Clyde laid down and rolled 6 to 7 mi. of mat in a 70-hr. week.

The Utah side of the Glen Canyon Highway will have a 37 1/2-ft. road width under present contracts. Plans call for a 2-in. leveling course using a plant-mix surfacing eventually to be put down giving the highway a finished width of 36 ft. Surfacing of the Bitter Springs road calls for a 34-ft. finished width with two 17-ft. lanes. The three Utah sections were expected to be completed by Oct. 1, while surfacing of 25 mi. in Arizona will be finished Nov. 29. The 7 mi. of unfinished highway on the west side of the Colorado River will eventually be built by the State of Arizona.



**LACK OF WATER** in the area meant that it was dustier than usual around the crushing plant. Dust caused problems for both men and machines. Note mask on operator.



# CARBIDE INSERT? or MULTI-USE?



**CAUTION:** Flood control project on Will's Creek, Cumberland, Md.

**OPERATING CONDITIONS:** Soft to medium limestone

## TIMKEN® multi-use bits most economical, gave lowest cost per foot-of-hole in Maryland flood control project

... says E. J. Albrecht Company of Chicago, Illinois

IN drilling through soft to medium limestone on a flood control project in Cumberland, Md., E. J. Albrecht Co. got lowest cost per foot-of-hole with Timken® multi-use rock bits. With correct and controlled reconditioning, Timken multi-use bits give the lowest cost per foot-of-hole when full increments of steel can be used in ordinary ground.

But in hard, abrasive ground, Timken carbide bits would have been the best bit to use. They give you higher speeds and greater econ-

omy in extremely deep holes, constant gauge holes, small diameter blast holes.

Both Timken multi-use and carbide insert bits are time-savers. They're interchangeable in the same thread series. Dozens of different bits fit the same drill steel. Bit-changing goes fast and easy right on the job.

Timken rock bits are made from our own electric furnace fine alloy steel. And they have special shoulder unions to protect threads against drilling impact.

For help in selecting the best

type bit for your jobs, to cut your drilling costs, write: The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".



Timken threaded multi-use rock bit



Timken threaded carbide insert rock bit

# TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

**your best bet for the best bit for every job**

See the next Timken Televent hour, "The Innocent Years" over NBC-TV, Thursday night, November 21st.



# Cast-in-place pipe for irrigation

*Program of water conservation on Salt River Project makes extensive use of monolithic concrete pipe cast directly into trench. Tests proved product adequate, and experience with laying 20 mi. develops field procedure and costs.*

AS PART OF its water-conservation program the Salt River Project has been alert to any new method for saving losses common to unlined earth ditches. Water is so vital to the future of this irrigation system that concrete lining and use of concrete pipe have been subjects of constant engineering study and field testing. Most recent development in this program of reducing conveyance losses has been the extensive installation of monolithic cast-in-place concrete pipe. Since October 1955 more than 21 mi. of this type of pipe, commonly referred to by its trade name of No-Joint pipe, has been installed. Our methods, test results, and field operations are being presented in this article to add to the available literature on the conserving of the West's most valuable material resource.

## A word about the Project

The Salt River Project is the oldest multiple Reclamation Project in the United States and one of the most successful, having paid off its original debt of \$10,000,000 in 1955. It was originally dedicated by Teddy Roosevelt in 1911, and agricultural revenue derived since that year

**By H. SHIPLEY**  
**Assistant General Manager**

Salt River Project  
Phoenix, Arizona

amounts to \$1,000,000,000 while the Federal Income Taxes from this enterprise have netted approximately \$335,000,000.

This irrigated oasis is in the heart of Arizona's Maricopa County and envelops the fastest growing city of the United States—Phoenix. Originally, this irrigated area contained 242,000 ac., but to date it has lost some 42,000 ac. to subdivisions, industry and highway construction.

During World War II, irrigation and farming enterprises did very little improvement work due to low priorities assigned such projects. Recently, Congress recognized that these older Reclamation projects had to rehabilitate and modernize their facilities. Therefore, pursuant to the Act of Congress approved June 17, 1902 (32 Stat. 388), acts amendatory

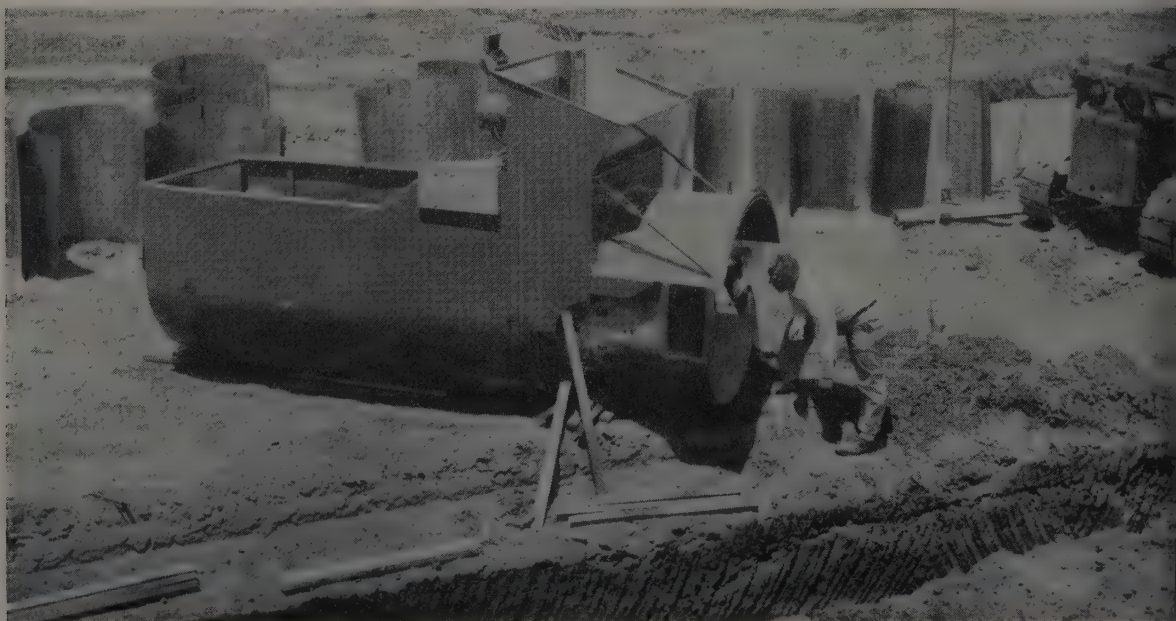
**READY TO BE placed in this trench the No-Joint machine includes the front-end shield (at left), the hopper for concrete and the inside bottom form. Mechanical spades work the concrete down around the form aided by vibrators. Top inside-forms are placed as machine pulls itself forward.**

and supplementary were approved October 7, 1949 (63 Stat. 724) and passed by Congress which provided interest free loans for this purpose.

Under the guidance of the Phoenix office of the Bureau of Reclamation, the Salt River Project embarked on rehabilitation program in 1950. Construction of new structures, placing of concrete and gunite linings and installation of concrete pipe were the three main objectives. Due to the cost of precast pipe, that particular facet of the program was relegated to play a minor role. However, pipe became a major project with the introduction of the monolithic cast-in-place concrete pipe.

Reasons for the installation of concrete pipe in the irrigation waterways, or laterals of the system are:

1. Conservation of water, a very precious commodity in Arizona.
2. Maintenance of the old earth ditches was becoming very costly due to the hand labor required to clean inaccessible reaches.
3. Increased road widths conflicted with original ditch right-of-way.
4. Urban development demands that laterals be covered for safety.





# KOLMAN

Model 101 is the **ONLY**  
**Completely Portable**  
**Conveyor-Screen Plant**  
 with all these advantages

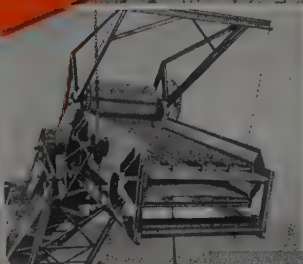


50' x 36" Kolman 101  
 Conveyor-Screen Plant



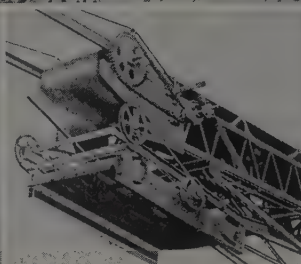
## NO DISASSEMBLY FOR TRANSPORTATION

The heavy-duty Kolman conveyor, available in lengths to 70 feet, is capable of supporting the complete unit during travel. You'll save valuable time with its rapid set-up and break-down.



## SINGLE, DOUBLE, OR TRIPLE-DECK SCREENS

Rugged construction of Model 101 permits use of one, two, or three-deck Kolman screens without additional supports to make several sizes of material at once! Available in widths from 18" to 42".



## SINGLE-DECK SCREENS FOLD UNDER FOR TOWING

No need to remove screen for towing. Kolman's "Folding Feature" shifts weight of the screen forward, reducing total length and eliminating sway. Faster, safer, easier to move.



## PORTABLE FEEDER-TRAP COMBINATION

Reciprocating plate feeder is installed in trap so both are integral part of conveyor. Gives positive constant flow of material. Adaptable to any type of feeding.



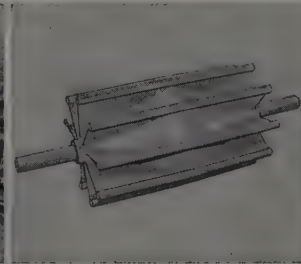
## MOTOR-TO-GROUND CONTROLS

Over unit throttle and clutch controls are extended to a point easily accessible to the operator on the ground. Both controls save time and labor.



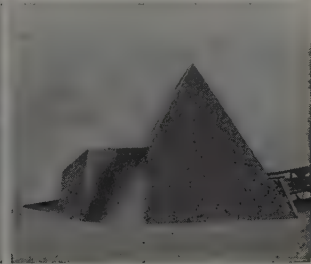
## HEAD PULLEY CLUTCH CONTROLS BELT

Conveniently located where operator can observe trucks, clutch increases screening efficiency and permits screen to run empty to clear it of sticky or lodged material.



## SELF-CLEANING WING-TYPE TAIL PULLEY

Self-cleaning feature of the wing-type design protects belt against stone cuts and bruises. Welded steel plate construction. Bar type head pulleys eliminate lagging.



## WING WALLS PORTABLE WITHOUT REMOVING

Rigidly braced steel plate enclosure prevents gravel from working into tail section. No planking to be picked up and moved from one location to another. Greater convenience.

**Costs Less to Buy, Less to Operate. See Your Nearest Dealer**

### CALIFORNIA

ANGELES—Brown-Bevis Industrial Equip. Co., 6550 E. Washington  
 KLAND—Spears-Wells Machinery Co., 1832 West 9th St.

### COLORADO

VER—Farris-Moritz Equipment Co., 5790 Colorado Blvd.

### IDAHO

SE—The Sawtooth Company, 1115 Grove St.

### MONTANA

TE, BILLINGS, GREAT FALLS and MISSOULA—Hall-Perry Machinery Co.

### NEW MEXICO

UQUERQUE and FARMINGTON—J. D. Coggins

### NEVADA

O—A-D Machinery Co., 251 W. Commercial St.

### OREGON

PORTLAND—Contractors Equipment Corporation, 2727 S.E. Union Ave.

### UTAH

SALT LAKE—Rasmussen Equipment & Supply Co.

### WASHINGTON

SEATTLE—Air-Mac, Inc., 3838 4th Ave. South

### WYOMING

CHEYENNE, CASPER, ROCK SPRINGS and SHERIDAN—Wortham Machinery Co.

### ALASKA

FAIRBANKS, ANCHORAGE—The Carrington Co., 91 Columbus St., Seattle

### Western Representative

S. A. MADRID  
 1739 32nd Ave., San Francisco 22

**SEND THIS COUPON FOR FREE Literature**

## KOLMAN Manufacturing Co.

5670 W. 12th St. Sioux Falls, S.D., U.S.A.

Send literature on following:

- ☐ 101 Heavy Conveyor
- ☐ 202 Junior Conveyor
- ☐ Vibrating Screens
- ☐ Traps ☐ Feeders

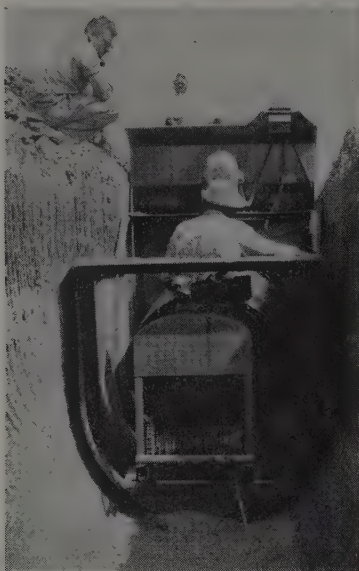
Please quote.....size or.....capacity

Name .....

Address .....

City .....





**MOUNTED** on a steel sled and pulled by power winch at a rate of about 250 ft. per hr. for the 30-in. size pipe, the machine casts directly into the shaped trench.

of children since the new residents are not familiar with irrigation facilities and practices.

As mentioned previously, the installation of concrete pipe was not an active project. However, after a visit to Yuba City, Calif., where we observed an installation by Gilbert D. Williamson, the founder of No-Joint, we knew that if the physical properties were as reported, this type of pipe was destined for the Salt River Project. Bert M. Pringle, our vice-president, is a retired construction man and farmer in the valley, and was one of the members who made the trip. After observing 30 min. of No-Joint installation he said "Let's buy a machine and go home and go to work."

Two machines were ordered, a 30-in. and a 42-in. In order to be sure that this pipe would perform satisfactorily in this area, we planned a 200-ft. test section. With the assistance of Bill Adair, field engineer of the U. S. Bureau of Reclamation, test procedures were set up. Tests were also made under the same conditions with precast reinforced concrete pipe and plain pipe. Methods for making the test and the results obtained are reviewed as a feature of this article.

It is realized that the result of one test is not conclusive, but along with test results obtained by Ernest C. Fortier, consulting engineer of Fresno, Calif., we were very confident that the installation of No-Joint was ideal for the soil conditions that exist in 90% of the Salt River Valley.

At the inception of the No-Joint



**INSIDE** forms for sides and top of pipe are handed to operator in 4-ft. lengths, as shown, and hook onto the preceding section. No outside top-form is required. Interior shape is maintained by struts placed inside the form. From 2 to 4 hr. later the struts are removed, forms collapsed and pulled forward.

program, a custom-made trenching machine was brought from California. This Butcher Trencher was very satisfactory but for irrigation operations was too specialized a piece of equipment. By the time our third mile of monolithic pipe was installed, our engineer, Dick Juetten, designed a shaping bucket for our most versatile piece of equipment—the Gradall. We have seven of these machines operating on the project on maintenance and construction.

Other than the No-Joint pipe ma-



**SPECIAL** shaping bucket designed by Dick Juetten, of the project engineering staff, enables the Gradall to prepare the ditch to proper shape for pipe casting.

chine, the rest of the equipment standard, such as a dozer, grader or water truck. Arizona Sand & Rock Co. delivers the 6-sack concrete ready-mix in 6- and 8-yd. trucks. This concrete is premixed at the yard and has proven very satisfactory. The company has assigned a radio dispatcher at the jobsite and the pours proceed with very little difficulty.

### Description of No-Joint machine

The No-Joint pipe machine consists of a steel sled or slip form which closely fits the sides and semicircular bottom of the excavated trench. A gasoline engine is mounted on the bottom and forward end of the form. This engine operates a manually controlled, varied speed cable drum which moves the sled forward by attaching a steel cable to a deadman. The engine also operates a generator electric motor assembly. The electric power actuates a vibrator that is attached to the bottom of the inside form. Frequency of the vibrator may be changed.

The inside form, outside top form and hopper, consisting of one assembly, are supported by and attached to the sled by hinges. The hinges permit the traveling form to adapt itself to the bottom of the inside form.

A spading mechanism, consisting of a spade shaped tool on each side of the hopper, is moved up and down by a geared mechanism actuated by an electric motor mounted on the hopper. The spading device moves the concrete down and around the form while the vibrator compacts it. Speed of the spading mechanism may also be varied.

The collapsible metal semicircular forms which are fed into the front of the hopper assembly are hooked together as the traveling form moves forward. These forms contact and support the top and sides of the pipe. They are held in place by wood struts or spreader bars placed at the bottom of the forms. These forms, approximately 4 ft. in length, are 20-gauge sheet aluminum alloy and are provided with fastening hooks at the top. The arc is approximately  $\frac{3}{4}$  of the circumference of a circle.

### Construction procedure

With a year-round growing season, we are able to schedule the placement of  $\frac{1}{2}$  mi. of open irrigation lateral, including the  $\frac{1}{4}$ -mi. turnout structures, in about 10 days. Under this construction schedule the



# GALION MODEL 118 MOTOR GRADER



## *The Best Value in a Heavy-Duty* CONSTANT-MESH GEAR TRANSMISSION GRADER

### TIME-PROVED STANDARD FEATURES

115 hp International diesel engine (125 hp G.M. diesel available).

Weight with scarifier 24,910 lbs.

Power and weight balanced to provide utmost "push-power" at the blade.

Extra-large single plate MOR-LIFE clutch with "Cermetalic" disc facing.

Six overlapping forward speeds (1.3 to 22.6 mph). Two reverse speeds (8.5 mph high reverse).

- Hand steering with hydraulic booster.
- Full hydraulic operation by finger-tip hydraulic control system—Galion designed and built—safe, dependable, efficient.
- Extra-large positive-traction tires—same size front and rear.
- Heavy front axle assembly.
- Full visibility of work being done.
- Full-floating axles.

**THE GALION IRON WORKS & MFG. COMPANY**  
General and Export Offices — GALION, OHIO, U. S. A.



Write for literature on Model 118 Motor Grader and the Galion complete line.

#### GALION DISTRIBUTORS IN CALIFORNIA

**ALLIED EQUIPMENT COMPANY**  
Fresno, Five Points, Madera, Reedley, Trimmerville

**BAY CITIES EQUIPMENT, INC.**  
Oakland 7, San Jose

**BRAMAN-DICKERSON CO., INC.**  
Riverside

**BROWN-BEVIS INDUSTRIAL EQUIP. CO.**  
Los Angeles 22, Bakersfield, San Diego, Ventura

**DELTA TRACTOR CO.**  
Stockton

**FARMERS MERCANTILE CO.**  
Salinas

**HOWARD-COOPER CORP. of CALIF.**  
Eureka, Redding

**ORTON'S EQUIPMENT CO., INC.**  
Stratford

**SACRAMENTO VALLEY TRACTOR CO.**  
Sacramento

**STEVENSON EQUIPMENT CO., INC.**  
Santa Rosa

**SANFORD TRACTOR & EQUIP. CO.**  
Reno, Nev.

### MOTOR GRADERS • ROLLERS



TRENCH ROLLERS • PORTABLE ROLLERS • 3-WHEEL ROLLERS • TANDEM ROLLERS • MOTOR GRADERS



farmer may order water through new concrete pipe lateral within 2 weeks of his previous irrigation. The irrigation frequency is often equal to this period of time in this area.

The first operation in replacing an irrigation lateral with a concrete pipe is the removal of trees and old irrigation turnout and road crossing structures. After these structures are removed, using conventional equipment, the open lateral is filled  $\frac{2}{3}$  full with a bulldozer and the remaining ditchbanks are leveled out. Usually water is delivered through the ditch before start of construction, so compaction of the fill material by a sheepfoot roller is all that is required. This completes the site clearing operation and the construction forces prepare to excavate the trench.

A trench 4 to 5 ft. deep and semi-circular is excavated to grade with a Gradall. The construction forces generally excavate only enough for the following day's pour, and as a result the trench is moist enough for a concrete pour.

The traveling slip form is placed in the trench which must be completely free of water, mud and debris before pouring concrete. The form is fastened to a headwall or turnout structure with a short section of precast concrete pipe connected to the turnout. The joint is then cleaned, moistened and a layer of mortar is applied before the adjoining section is formed.

#### Low-alkali cement used

Stiff premixed concrete is transported to the site by a ready-mix concrete company. A six-sack mix of Type 2 low-alkali cement with an air entrainment agent is used, and the well-graded coarse aggregate has a  $\frac{3}{4}$ -in. maximum size. The sand used in the mix passes through a  $\frac{3}{16}$ -in. or  $\frac{1}{4}$ -in. square opening. Water-cement ratio is controlled to provide a maximum of 3 in. before consolidation.

As concrete is placed in the hopper from the truck the cable drum winds up the cable attached to a deadman

pulling the traveling form forward. Spades in the traveling slipform move the concrete down and around the circumference of the pipe and the vibrator on the inside form compacts it. As the machine moves forward on this sled the collapsible semicircular forms are inserted into the machine by a man who hooks them together. At the same time another workman inside the traveling form inserts the horizontal support struts to hold the forms in position. He also smooths the concrete in the invert of the pipe, if necessary.

For the 30-in. pipe the pour is at the rate of 250 ft. per hr., finishing the day's pour of 500 to 560 ft. in 2 to  $2\frac{1}{2}$  hr.

A man working at the rear of the traveling form wood-floats the upper outside surface of the newly formed pipe, when required, and regulates the speed of the spading mechanism. A 6-in. minimum cover of damp earth backfill is placed over the concrete, about 8 to 12 ft. in back of the machine.

## Results of bearing and hydrostatic tests

The load test and the pipe saddles were patterned after the ASTM sand bearing test equipment. The test was modified in that a sand bed was not placed under the pipe. Actual field conditions were used for the pipe support, that is, the excavated formed earth ditch. A summary of the load tests follows:

1—A 4-ft. section of No-Joint was tested 39 days after pour but was **not** cured. Surrounding earth was extremely dry. A load of 39,410 lb. was required to produce an 0.01-in. crack, D-load of 3,941. (ASTM specifications for extra strength reinforced culvert pipe, C 76-52, required only 30,000 lb. for a 4-ft. length).

2—A 4-ft. section of reinforced concrete pipe, cured and 33 days old, was backfilled and compacted thoroughly (usually neglected in the field) to spring line. An 0.01-in. crack was produced with a 47,320-lb. load.

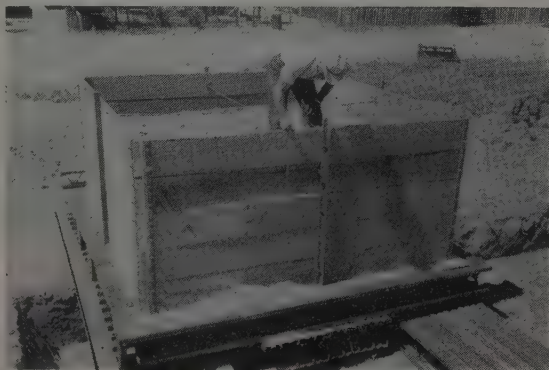
3—On an 8-ft. No-Joint section (119 days after pour, no curing) a 4-ft. bearing block was placed centrally so that 2 ft. of the pipe extended on either side. The pipe was covered with 1 ft. of compacted backfill. A load of 64,888 lb. was required to produce an 0.01-in. crack.

#### Concrete strength

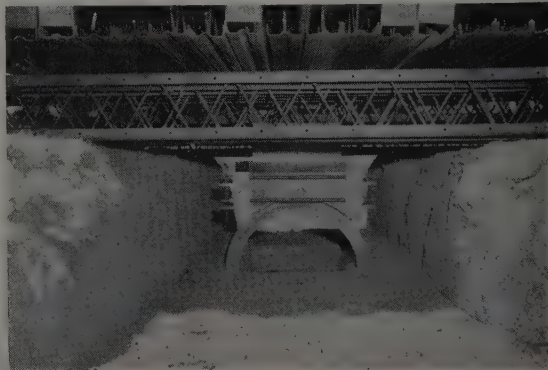
The compressive strength in con-

crete cylinders averaged 2,450 psi. on 7-day tests and averaged 3,950 psi. in 28-day tests.

On one seepage and pressure test a line 2,556 ft. long was used. The pipeline was filled and after 24 hr. 2,469 gal. were required to recharge the line. A City of Phoenix water meter measured the refill. The specified allowable loss is 300 gal. per in. of internal diameter per mile for a 24-hr. period. Therefore, the allowable recharge quantity is 4,356 gal. compared to the 2,469 gal. actually used, or only 57% of the allowable. This test was made with a 9-ft. head, which is 1.7 times the operating head. Some No-Joint pipelines are subjected to a 13-ft. operating head.



LOAD for bearing test on 4-ft. section of No-Joint pipe after 39 days without curing showed 39,410 lb. as compared to ASTM requirement of 30,000-lb. load for extra strength reinforced culvert pipe.



PIPE to be tested was cast directly into excavated earth ditch and not on a sand bed. This change from the ASTM standard test was made to simulate actual field service conditions.



According to the temperature, 2 to 4 hr. after the pour, the struts are moved and the collapsible metal forms are unhooked, turned and rehooked. These forms are then pulled out by cable to the position in the trench where they will be used for assembling the next day's pour. The forms are unhooked, lifted out of the trench, sprayed with light fuel oil, and placed along the bank.

Backfilling the trench to a minimum of 2½ ft. is completed the next day or two. The soil cover is kept damp while curing the concrete.

### Cost information

Prior to the installation of No-Joint the conventional concrete slipform was the most economical method of rehabilitating the old earth waterways. The monolithic pipeline is as economical as the slipform with all the added advantages of a closed system.

Since no two jobs are the same due to right-of-way problems, tree removal, over excavation in rocky areas and hauling of backfill, the costs vary. The following is the summary of average costs per running foot on seven 30-in. and two 42-in. concrete pipe installations:

|                       | Pipe Size |        |
|-----------------------|-----------|--------|
|                       | 30-in.    | 42-in. |
| Labor .....           | \$0.62    | \$0.76 |
| Material .....        | 1.45      | 2.38   |
| Transportation        |           |        |
| and heavy equip. .... | 0.42      | 0.62   |
| Miscellaneous .....   | 0.62      | 0.82   |
| Overhead .....        | 0.22      | 0.26   |
| Total .....           | 3.33      | 4.84   |

Another comparison of costs with precast is taken from actual bids for pipe installation on April 29, 1957. We prepared all right-of-way, made the initial leveling out with the dozer, and performed all the field and office engineering.

|                       | Bid price per foot |               |
|-----------------------|--------------------|---------------|
|                       | Precast pipe       | No-Joint pipe |
| 30 in.—8,800 ft. .... | \$ 6.73            | \$4.09        |
| 42 in.—3,000 ft. .... | 10.76              | 6.20          |
| 48 in.—4,850 ft. .... | 12.80              | 8.09          |

### Future plans

The firm of Concrete Ditch Lining Service, owned and operated by Philip R. Congrove, has obtained a franchise with the No-Joint company to operate in Arizona and we hope that for the following year, at least 18 mi. of this pipe will be installed. We will have to accomplish this without interrupting the irrigation demands throughout the year.

### Two-year record and personnel

Since October 1955 we have installed a total of 113,465 ft. The pipe has given very satisfactory service. We also recognize that the soil conditions are favorable for this type pipe, the lower operating heads are ideal and the absence of extreme low temperatures all contribute to the success of this low cost concrete pipe. Of course, we get the characteristic expansion and contraction cracks of concrete pipe. They have all been circumferential, extremely few, far less than the 4-ft. lengths of precast pipe.

I would like to mention a few of



COMPLETED section of No-Joint pipe, with casting machine at work in the background. A day's pour of 30-in. pipe is usually about 500 ft., completed in 2 to 2½ hr.

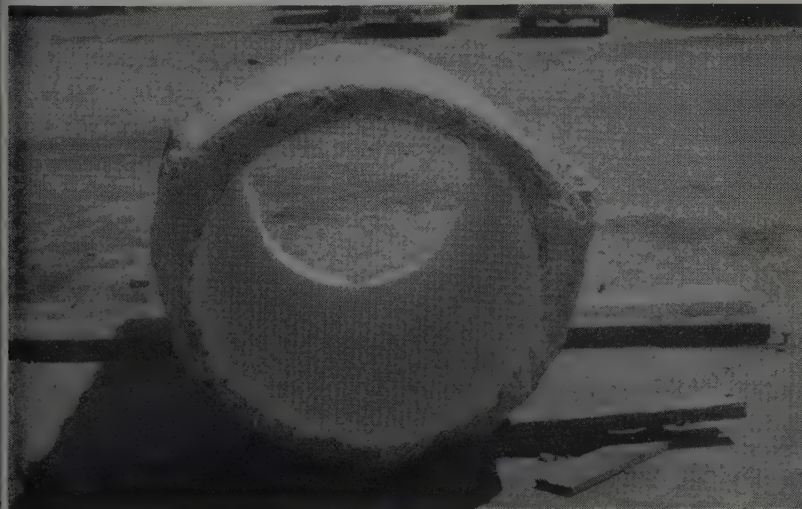
the men who are responsible for this program both in office and field.

Engineers have been Jake Miller, Reid Teeple, Don Womack, Bert Griffin and Tom Sabin designing the structures; field construction has been directed by Bud Simser, superintendent of construction and maintenance; Floyd Wright, supervisor; Cecil Williams and Stone Chapman, construction foremen; Bill Blanton, pipe machine foreman; Ken Skinner and his survey crews, and finally, the inspection has been carried out by Charlie Dacon, Lee Coons and Frank Oglesby.

R. J. McMullin is general manager of the Salt River Project.

### Highway program film

TEST ROAD, U.S.A., a new 18-min. color-sound film just completed, covers the "most ambitious experimental highway construction program in the nation's history," the test road near Ottawa, Ill., sponsored by the American Association of State Highway Officials. The film is now being scheduled for viewing by engineering groups, highway department officials, road commissioners, state and county boards, community organizations, as well as special meetings of distributors and manufacturers. Write Seaman-Andwall Corp., Milwaukee 1, Wis., for information.



EXCAVATED section of pipe showing the lower part that is cast directly against the ditch excavation. Inside of the arch is supported by temporary metal forms and struts. Outside of the top is not formed, but may be wood-floated if necessary.



# These TD-24 full-time let you run power circles

**Exclusive, all-weather, seconds-fast International gasoline conversion starting.** Direct combustion heat conditions the TD-24's engine, seconds-fast—for full diesel performance. You avoid the warm-up delays and service complications of a surplus starting engine—earn money while “slow starters” are warming up!

**Exclusive International Cerametallic-faced engine clutch action.** The TD-24 is the only king-sized crawler with this big feature. Immune to heat and cold, this long-lasting clutch gives full-load power-transfer efficiency—anywhere, anytime! This dry-type clutch of simplified design eliminates “high frequency” servicing demanded by clutches with “cooling systems.”

**Exclusive, years-proved Planet Power steering.** Why put up with load limiting “dead track drag” on the turns in a king-sized steering clutch crawler? Why not profit from TD-24 Planet Power steering that enables you to pull or push as big a load on the turns as on the straight-away? See how TD-24 two-track turning power never backs off from a load. “Take the turn” to new profits with Planet Power steering!

**Exclusive cycle-speeding on-the-go shifting.** In either Torque-Converter or Gear-Drive model, the TD-24 gives instant stall-preventing Hi-Lo shifting, without stopping or even declutching. Fingertip matching of speed to load under full power gets the job done sooner!

**Exclusive TD-24 fingertip operating ease** provides the operator comfort incentives and the means to give full days of full capacity cycle-speeding production! **Find out how these and all the other TD-24 production exclusives** can equip you to run power circles around anything else on tracks. See your International Construction Equipment Distributor for a TD-24 demonstration!



**Planet Power steering** and Hi-Lo “power-crowd” keeps the TD-24 loading the “75” Payscraper® at top effective speed—adds up to increased daily yardage. Only 30 to 45 seconds needed to heap-load a “75” Payscraper—on this Dominic Leone Construction Co., Inc., Colorado road job!





# production exclusives around "cycle-stallers"



with such offset loads as a boulder-bucking angled  
—benching a road round a hill—TD-24 Planet Power steering  
ou concentrate the power where you want it. You stay on  
e—production stays up!



**On slam-bang rock-dozing** or moving other heavy materials,  
instant TD-24 Hi-Lo shifting adjusts tractor power to load resistance  
—increases production, avoids delay! And you get fast reversing  
to speed shuttle-dozing!



**INTERNATIONAL<sup>®</sup>**  
**CONSTRUCTION**  
**EQUIPMENT**

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors... Self-Propelled Scrapers... Crawler and Rubber-Tired Loaders... Off-Highway Haulers... Diesel and Carbureted Engines... Motor Trucks... Farm Tractors and Equipment.





## 3 mi. of fill cuts out 32 mi. of road

**Washington towns on north bank of Columbia River connected by fill along shore. Fill provided better location than route along steep bank.**

LESS THAN 3 mi. separate Megler and Knappton, Wash., but it is a 32-mile journey by road. Rocky bluffs, backed by heavily forested hills, fall off steeply onto the north shore of the Columbia River. But now Erland and Bickle, Portland, Ore., contractors, are at work, pushing rock into the river to form a two-lane road.

Megler, on the west, is the northern landing for the Astoria-Megler ferry carrying US 101 across the Columbia River. The next river crossing is a bridge at Longview, 60 mi. east. The new road will cut 21 mi. from the distance from Naselle, Wash., to the ferry at Megler, Wash.

One of the problems facing Erland and Bickle is the disposition of rock and dirt along the road with respect to where it is needed. Of the 15,100 ft. of road to be constructed, 10,300 ft. of it is in five fills across open water. Almost half of this, 4,000 ft., is on the Knappton end. But almost all of the suitable rock for underwater fills is located on the other end of the project. Consequently, hauls are as long as 5,500 ft.

All underwater fills must be of rock materials up to elevation 7, out of the reach of the normal tide. The fill rises to elevation 15 with common dirt, faced with 6 ft. of selected rock. The fills are 38 ft. wide, with  $1\frac{3}{4}$  to 1 slopes. Cuts, the deepest 140 ft., will have  $1\frac{3}{4}$  to 1 slopes in dirt,  $\frac{1}{2}$  to 1 in rock.

Because of the location of the rock, the contractor decided to start the

spread near the middle of the job. No roads were available, so the equipment was loaded onto barges and towed to the job site from Astoria which is 10 mi. across the river and from Portland, 130 mi. up the river. The beachhead was narrow and confining, but their Caterpillar D9 tractor, four D8s and two Cat No. 80 scrapers quickly expanded the working room.

As the job opened up, the contractor brought in a shovel and hauling units and started two spreads, one for rock and one for dirt. The rock spread includes two Cat DW21 tractors with Athey PR21 Rock Wagons, 2 D2s, a 3-yd. Koehring shovel and a D8-mounted drill rig. The dirt spread includes 3 Model C Turnapulls, a D9, a D8 and a Cat No. 12 motor grader. Another D8 and a  $\frac{3}{4}$ -yd. American dragline are kept busy on other assignments.

Of the 665,900 yd. of excavation, more than 179,000 yd. is solid sandstone rock. Some of the rock originally thought to be solid, however, has proved to contain a large amount of clay, necessitating a search for rock borrow.

Rock is drilled below grade with the D8-mounted drill rig, an Ingersoll-Rand D45 drill powered by a 600-cfm. I-R rotary compressor. Al-

though conditions vary greatly, the average is 3-in. holes on 6-ft. centers up to 72 ft. deep. Powder requirements vary from 0.6 to 1.4 lb. per yd. of excavation. To date the powder used is DuPont and Pacific.

Broken rock is dozed down to the shovels, keeping the shovels on the grade. This makes it easier for the shovels and eliminates frequent moves and construction of haul roads, speeding up production. Working on a 1,000-ft. haul, the two DW21s each move 55 to 60 loads a day.

When completed, the road will have two 11-ft. lanes with 8-ft. shoulders. A large parking area 11 ft. wide is being constructed around the ferry approach. Only the ferry approach and part of the Knappton end of the road will be finished above grade, with 6 in. of stone ballast and 2 in. of asphalt concrete.

Erland and Bickle started on the \$1,199,762 grading project February 5, 1957. The contractor has 30 working days to complete, expecting to finish in September 1958. The men work one 9-hr. shift, 5 days a week. Joe Bickle, one of the partners, is project manager, and W. F. Martin is superintendent. Ray Darling is the resident engineer for the State of Washington.



ROCK FOR THE underwater fills was drilled by Ingersoll-Rand unit on Caterpillar D8 providing stability with mobility. The Koehring 3-yd. shovel loads into Cat DW21-Athey PR21s. Steeply timbered bank which made the fill location economical is shown in the picture at top of page.



# Soil compaction improved by additives in water

**Tests indicate that more uniformity in moisture content and faster penetration can be secured by chemicals in the water.**

By **ROBERT W. OWEN**

Chief Chemist  
and

**LEOPOLD C. NOWALT**

E. W. Smith Chemical Company  
La Puente, Calif.

IN RECENT YEARS an attempt has been made to decrease the cost of soil compaction by adding materials to the water used to moisten the soil. This development has been received with mixed reactions on the part of soil experts and construction engineers. These reactions vary all the way from definite opposition to reasonable questions on application procedures and how cost reductions are to be realized. In this article we will attempt to put the record straight on what to expect of these additives, and what not to expect.

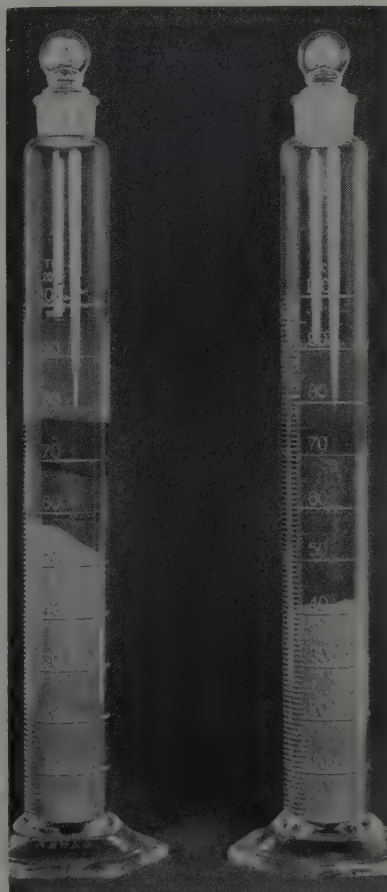
Additives now on the market have been developed for the sole purpose of expediting the securing of optimum moisture content. This is the most important factor (outside the type of soil itself) to be considered in soil compaction. The other factor relating to the proper selection and use of equipment does form a logical part of this discussion. That these compounds will do this is well attested, by both laboratory experiments and by field tests.

There are three laboratory tests which have been used by different companies to indicate the better penetration of soil when used as directed. One company has used (1) the standard laboratory "Draves Wetting Time" test, in which time required for a weighted strip of a special cloth is measured, both in plain water and in water containing the additive, and (2) a test wherein the time required for plain water and water containing the additive to percolate through soil contained in glass graduates is measured. Another company has compacted the soil to a specified dry density, and then allowed both water and water containing the additive to percolate through the compacted soil. All three tests indicate that the water containing the

additive will penetrate the soil faster than plain water. The details of one particular test follow:

Two 80-gram portions of the same soil were placed in two 100-ml. glass stoppered graduates. The soil in each graduate was shaken down in a uniform manner; the total volume of soil in each graduate was the same. Simultaneously, 15 ml. of plain water was poured carefully into the left graduate (see picture), and 15 ml. of water containing the additive was poured into the other one.

The picture was taken a short time after the beginning of the test. It needs only a casual glance to show that the moisture in the cylinder on the right (containing additive) has penetrated farther than that on the left. A closer inspection also reveals that the water is distributed more uniformly throughout the soil layer,



**PENETRATION** of water-with-additives (on right) into the fine adobe was deeper and had more even distribution through the soil, as indicated by more uniform color.

as indicated by the more uniform coloring of the sample with the additive.

The more even distribution of the moisture in this test indicates that better compaction can be obtained because all of the soil will be at the optimum moisture content (provided the proper amount of water is used), whereas the uneven distribution of moisture will give spots with too little moisture, and other spots with too much moisture, which cannot be compacted properly.

The above conclusions from the laboratory have been borne out in the field to a certain extent. The E. T. W. Engineering Co. of Los Angeles worked on a fill for the Channell Heights Housing Project where diatomaceous shale and clay, and shale and clay were being compacted. According to Arthur Tharalson of the company, they experienced great difficulty in obtaining the specified compaction on this project. At about the half-way point they began adding one of the additives to the water. The final results of the field density tests, performed by a soil laboratory, were uniform throughout the grading job. The soil laboratory did not know that any additive was being used during the last half of the job. According to Tharalson, they were able to use larger lifts during the latter part of the job, and got their compaction in much less time.

Westway Engineering Co. of Los Angeles graded the base for a highway in Palos Verdes. The soil was a very dry diatomaceous earth. According to Jack Prince, president of the company, the use of an additive on this job proved very advantageous in the time saved on the job. Prince says that with this type of soil in particular the use of an additive is "generally very advantageous."

The two jobs cited above have come directly within the authors' experience. A third job has come indirectly to our attention, which if it can be verified shows the advantage of using a water additive even better. In this case it was noted that on a 6-in. lift, water penetration (without additive) was only 4½ in., while on another strip where an additive was used with the water the penetration of the water was a full 6 in.

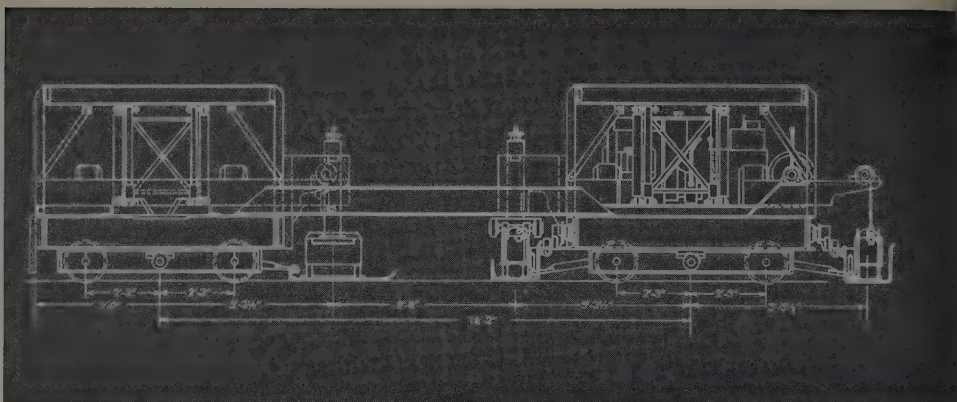
The examples from the field indicated these advantages.

(1) Soil compaction is more readily accomplished because of more uniform moisture condition.

(2) Soil compaction is accomplished more rapidly because of more rapid moisture penetration.



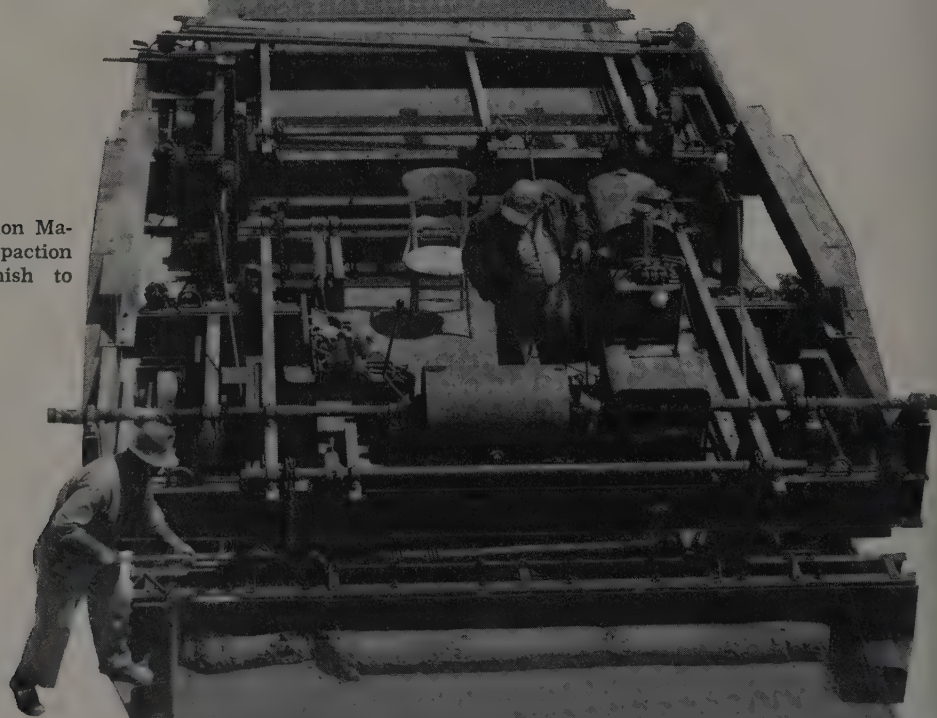
Two Detroit Special finishing machine frames engineered into one rugged unit combining finisher and float operation. Equipped with quick crown change screeds. Supplied in either 12' to 18' or 20' to 25' working widths. Hydraulically controlled pneumatic tired transportation assemblies optional.



# ***FLEX-PLANE***

***First Again  
with Faster — Finer — Finishing Combination***

"FLEX-PLANE" Combination Machine gives greater compaction and applies superior finish to Connecticut Turnpike.



**WORLD'S LARGEST BUILDER OF CONCRETE FINISHING EQUIPMENT**



U. S. ROUTE 16—near Farmington, Michigan. Loselle Construction's Combination increases daily finishing average.

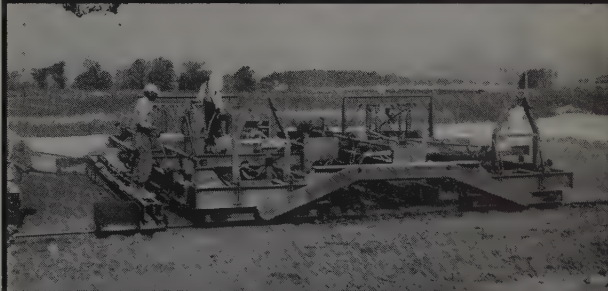


"... 4400 feet of 22-foot pavement finished in one day." ... "keeps up with three dual drum pavers." ... "450 lineal feet of 24' pavement per hour." These are typical reports from contractors using the revolutionary new Flex-Plane Combination Finisher-Float Machine which does the combined jobs of transverse and longitudinal finishers. On the average, users finish over 3000 feet of pavement a day, requiring only two or three hand finishers depending on type of joints being used.

On-the-job checks show longitudinal surface smoothness to be unsurpassed by any other equipment regardless of condition of forms. Results prove it to be the fastest, most efficient finishing machine in use today.

But why not get all the facts? Write today for your copy of the data-packed "Flex-Plane Finisher-Float Machine" brochure. See for yourself why contractors consider it the finest machine of its type in the world.

U. S. ROUTE 30 — J. A. Jones Construction Company uses combination on straightaway paving — Flexplane self-widener on interchanges near Mansfield, Ohio.



CONNECTICUT TURNPIKE—DeLillo Construction Company's Combination cuts hand finishing to a minimum.



368

S. ROUTE 12—Kalamazoo, Mich.: Bypass is worked Carl Goodwin & Sons. Contractors generally report substantial savings over previous finishing methods.



U. S. ROUTE 23—Combination Machine owned by Denton Construction Company keeps up with three dual drum pavers south of Brighton, Michigan.



THE FLEXIBLE ROAD JOINT MACHINE COMPANY  
535 THOMAS RD., WARREN, OHIO



# Big equipment for Ice Harbor Dam

**Cranes worth \$1,000,000 and a batch plant capable of producing 300 cu. yd. per hr. spearhead the equipment fleet for the work under way at Ice Harbor Dam in Washington. 600,000 cu. yd. of concrete is called for.**

A MILLION DOLLARS' worth of cranes is a lot for any contractor's equipment inventory. Nonetheless that is what the contractor firm of Montag, Halverson, Austin, and Associates have on the site at their Ice Harbor Dam joint venture job on the Snake River in Washington. They are well under way on a \$30,000,000 first step construction contract for the U. S. Army, Corps of

Engineers, Walla Walla District.

Faced with as tight a work schedule as ever tagged a job's specifications, the MHA&A operators are relying on the latest in equipment. Having just finished up as one of the prime contractors on the Corps of Engineers \$350,000,000 multipurpose The Dalles Dam downstream on the Columbia River, the Ice Harbor contractors are well in-

doctrinated in the Army Engineers methods and demands as pertains to work schedule maintenance.

The MHA&A's work schedule at Ice Harbor calls for the placing of nearly 600,000 cu. yd. of concrete and embedded parts in less than 15 months with a double session of winter months included as a time factor in the schedule. With the first bucket of concrete poured in June 1957 the contractor must wind up the first step construction phase by August 1958. Included in the contract's concrete placement work is the forming and erecting of nearly 5,000,000 lb. of reinforced steel and structural steel to be embedded or placed in the south 7½ bays of the spillway; the spillway stilling basin; the powerhouse, intake, and substructure; the south shore abutment and the south shore non-overflow section; fish ladder, fish attraction waters, channel, and powerhouse.

## Hungry Horse batch plant

MHA&A's first step in meeting this schedule of concrete and steel placement was to make certain that a batch plant capable of delivering a quota to fit the job's demands was available. In this the contractor was fortunate in being able to secure the \$250,000 batching plant used in the completion of the Hungry Horse Dam contract work in Montana. This plant, originally constructed for the Shasta Dam in California, is one of the two largest plants in the United States. It includes four mixers, each with a capacity of 80 cu. yd. an hour. They were also fortunate in securing as superintendent of the batching plant L. W. Nichols who set up the original Hungry Horse plant, after it was transported from Shasta, and operated it from 1949 to 1952.

With a crew of 19 men assigned on a two-shift schedule, the Ice Harbor batch plant consumes an average of five to six 400-barrel capacity railroad cars of cement a day. A spur line from the mainline of the Union Pacific runs to the dump pit and the batch plant storage bunkers.

The hazards of excessive summer heat with daytime temperatures at 100-deg. level necessitated a "moonlight" schedule of concrete placement during the summer months.

(Continued on page 71)



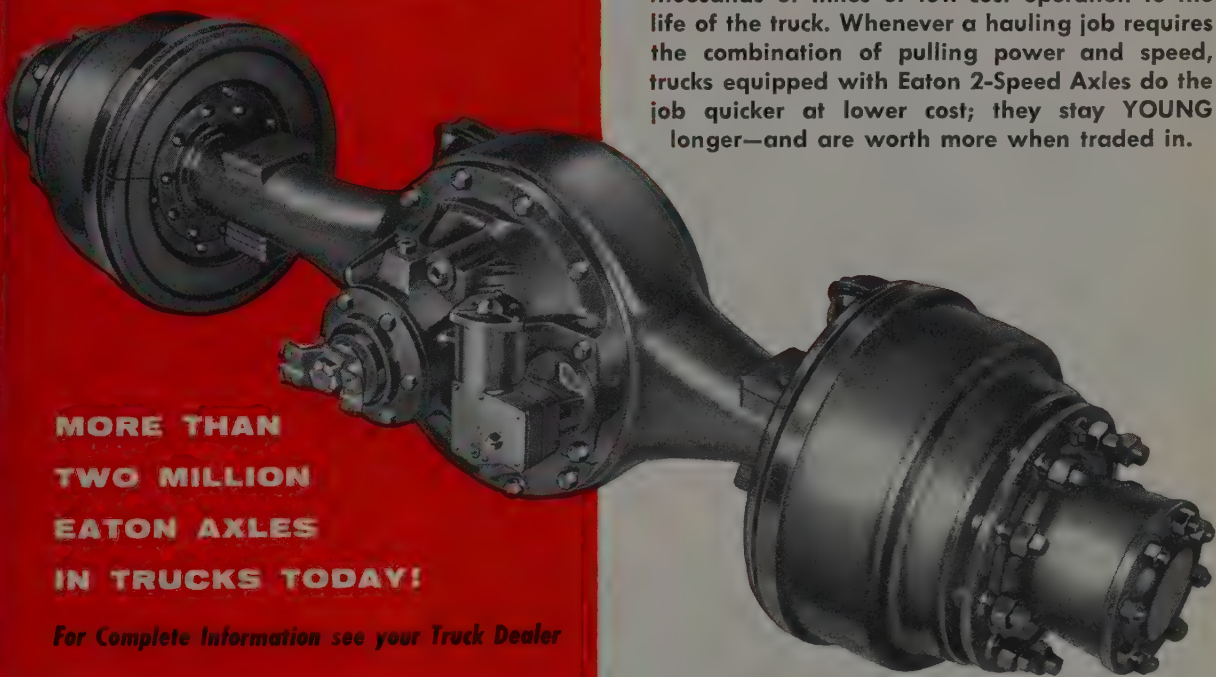
THREE WHIRLEY gantry cranes, 85 ft. high, handle concrete placement. Schedule calls for 80,000 cu. yd. of concrete to be placed each month. Completion date is Aug. 1958.



BATCH PLANT used for Montana's Hungry Horse Dam is now at work at Ice Harbor turning out 300 cu. yd. per hr. Plant was built originally for California's Shasta Dam.



# Eaton 2-Speed Axles keep trucks YOUNG!



**MORE THAN  
TWO MILLION  
EATON AXLES  
IN TRUCKS TODAY!**

*For Complete Information see your Truck Dealer*



## **Add Extra Thousands of Low-Cost, Trouble-Free Miles**

Drivers of Eaton 2-Speed Axle trucks select from *double* the conventional number of gear ratios—pick the gear ratio best suited to road, load, and traffic conditions. Using the **RIGHT** gear ratio for every condition permits engines to run in their most efficient and economical speed range—reduces stress and wear on engine, transmission, and the axle itself. This reduction in stress and wear keeps trucks on the job and out of the shop, cuts operating and maintenance costs, and adds thousands of miles of low-cost operation to the life of the truck. Whenever a hauling job requires the combination of pulling power and speed, trucks equipped with Eaton 2-Speed Axles do the job quicker at lower cost; they stay **YOUNG** longer—and are worth more when traded in.

# EATON

AXLE DIVISION  
**MANUFACTURING COMPANY**  
CLEVELAND, OHIO



**PRODUCTS:** Engine Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Hydraulic Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Forgings • Heater-Defroster Units • Automotive Air Conditioners • Fastening Devices • Cold Drawn Steel • Stampings • Gears • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers



# Montana's first soil-cement road



**BULK CEMENT** was applied by Hercules spreader in three lanes to cover the 26-ft. roadway. Local borrow material had been spread over the prepared subgrade to a depth of 8 in.



**MIXING** was done by a Seaman-Andwall Pulvi-Mixer, starting as soon as two lanes of cement had been applied. Mixing was to full depth. Cement content was 7.2% by volume.



**THREE** tank trucks, hauling from a coulee 7 mi. from the job, added water during moist mixing. The contractor handled the processing work in 1,000-ft. sections.

*Near the Canadian border the State Highway Commission puts down its first cement-stabilized material on a 6-mi. F.A.S. route.*

**By CLARENCE FARRY**

Project Engineer,  
Montana State Highway Commission

A 6-MI. section of Federal-aid secondary route in Hill County, Montana, was the state's first soil-cement road project. A little less than three years after soil-cement was introduced in Montana to rebuild a section of Warren St. in Helena, the State Highway Commission awarded its first contract for soil-cement on a highway job.

The new road extends 6 mi. south of U. S. 2 at Rudyard and lies only 35 mi. south of the Canadian border. This makes it one of the northernmost soil-cement projects in the United States. Located in the heart of northern Montana's rich wheat country, the 26-ft. road is expected eventually to connect with U. S. 87, principal highway between Havre and Great Falls.

O'Neil Construction Co., Havre, was the successful bidder among six firms competing for the contract. The total unit cost of \$1.55 per sq. yd. included borrow material for the soil-cement, portland cement, water, 91,610 sq. yd. of processing, and aggregate and bituminous material for the double bituminous surface treatment.

## Soil borrowed and spread

Soil was obtained from borrow sources along the highway. It was spread over the prepared subgrade to a width of 40 ft. and a depth of 8 in. Portland cement, 7.2% by volume, was used to stabilize the center 26-ft. portion to a depth of 6 in.

The borrow material was placed in two 4-in. layers, with the bottom layer compacted before placement of the top. After the material was in place, the entire roadway was shaped to true grade and crown.

Soil-cement processing was delayed briefly when trouble developed with the conveyor screw used to un-



load the bulk cement from hopper-bottom rail cars. The contractor obtained another screw conveyor of the type used for handling wheat in the area. He modified the conveyor slightly and dug a shallow pit for the dump trucks. This solved the problem and greatly expedited the unloading.

### Cement spread and mixed

Two 5-yd. dump trucks were used to haul cement from the rail siding. At the site, each load was weighed on platform scales before the cement was deposited into a Hercules spreader for placement on the roadway. The spreader was set to cover the 26-ft. width in three lanes.

After two lanes of cement had been spread, a Seaman-Andwall Pulvi-Mixer mixed the soil and cement for the full depth of treatment. Three tank trucks equipped with spray bars supplied water during wet mixing and finishing operations. Water was hauled from a coulee about 7 mi. away.

Finishing procedures followed normal soil-cement construction practice. After the Seaman had thoroughly mixed the soil and cement with water, and while the mixture was still very damp and loose, a rubber-tire roller moved in to begin initial compaction. Observers on the project credited the road's good appearance and riding qualities in part to the skill of O'Neil's motor grader operator who shaped the road before final rolling began.

A steel-wheel roller was used after final shaping to press any loose material well into the surface. Passes with a broom drag followed by a light application of water and the self-propelled rubber-tire roller gave the soil cement base a smooth, well-knit surface.

The contractor handled processing in 1,000-ft. sections. As final rolling was completed on each section, water was added to the surface and an RC-2 bituminous material applied as a cure. The cure was then covered immediately with  $\frac{1}{2}$ -in. crushed gravel cover material. The chips were rolled into the unhydrated soil-cement base with a 10-ton steel-wheel roller, followed by supplementary rolling with the rubber-tire roller. This assured a firm bond between the surface and the base.

### Final surface treatment

When the entire 6-mi. road had been completed in this manner, the final surface treatment was applied. This consisted of an application of MC-5 bituminous material and the same type of cover material as mentioned before.



**INITIAL COMPACTION** was by rubber-tired rollers working on the mixed material while it was still very damp. Steel-wheel rollers followed. A smooth, tight finish was secured.



**SURFACE** treatment was an application of RC-2 bituminous material placed immediately as a cure and covered with  $\frac{1}{2}$  in. of crushed gravel.



**GRAVEL COVER** was pressed into the unhydrated soil-cement to provide a firm bond between surface and base. Later, a second bituminous shot was applied, and covered with small chips. A broom drag removed small irregularities before final rolling.



Once production got rolling, O'Neil's crews were able to build from 2,000 to 3,000 ft. of 26-ft. roadway each day. Good organization on the contractor's part, plus efficient supervision and inspection by state highway commission personnel, resulted in producing a top-notch job.

State Highway Commission personnel who assisted on the project included Thomas H. Ratchford, senior assistant construction engineer; William Perry and William J. Neeley, materials supervisors; L. A. Horvick, division engineer; and the

author who served as the project engineer.

Among several of the first interested visitors on hand to watch construction of Montana's pioneer soil-cement road were L. B. Fox, state construction engineer; Ken Sanders, Bureau of Public Roads, Missoula, Mont.; and several city officials from Big Sandy, Mont.

Completion of the Montana project brought to 43 the number of states where soil-cement projects have been built during 1956-1957. By mid-summer this year, soil-cement award statistics revealed that since

1935—when the first fully-engineered soil-cement job was built—over 200,000,000 sq. yd. of soil-cement has been used for paving roads, streets, airports and parking areas. This would be roughly equivalent to 16,500 mi. of 20-ft. pavement.

Other Montana soil-cement projects now in the planning stages include an 11-mi. road job in Powder River County. Soil-cement is also being considered for extending a four-lane highway serving Malmstrom Air Force Base near Great Falls.

## First Western soil-cement was placed 20 years ago

**U. S. Forest Service put down 3,840-ft. test section. Purpose was to control summer dust and winter erosion. Tools were strictly agricultural.**

TWENTY YEARS ago this month, the first use of portland cement as a road stabilizing material in the West was reported by this publication (WESTERN CONSTRUCTION NEWS November 1937, page 441). This field test was conducted by the U. S. Forest Service in the San Bernardino National Forest. A section 3,840 ft. long was placed by the California Region, U.S.F.S. with the co-operation of the Portland Cement Association.

Because of the tremendous advances made in the use of soil-cement, or cement stabilization, both as to the volume of work and the methods employed it is of significance to review briefly this first project as it was described in detail in the pages of this publication 20 years ago.

Purpose of the experiment was to find a low-cost form of road surfacing for the recreational areas around Lake Arrowhead which would control the dust nuisance for tourists during the summer and help to solve the equally serious erosion problem during the winter months.

Soil in the area was high in granitic origin and extremely fine producing a serious dust nuisance and hazard. Analysis of the soil showed that 70% of the material passed the 10-mesh sieve and 20% of the material passed the 200-mesh sieve.

According to the article, the first step was to scarify the surface to a

depth of  $7\frac{1}{2}$  in. which was to provide a 6-in. layer of soil-cement after compaction. This was followed by pulverizing with the use of disc harrows and spring-tooth cultivators pulled by tractor. Pictures of this operation showed that the equipment was borrowed directly from the field of agriculture. About 25 passes were necessary to break up the material. This work was carried forward in sections about 600 ft. long which was considered the distance that could be handled in one day's operation.

Moisture tests showed the material averaged about  $2\frac{1}{2}\%$  and the optimum ran around 14%. Original efforts were made to add water necessary to bring the soil up to optimum after the cement had been placed, but this proved unsatisfactory. The procedure was then changed to provide for adding the water a day before the cement was applied.

This water was added by means of streams from fire hose attached to a 2-in. pipe laid along the road. A meter in the pipe line measured the water applied to each section. Water was then mixed into the soil by further passes of the cultivators until the mixture had a uniform moisture content of about 10%.

The following day sacked cement was deposited along the side of the roadway and these sacks were distributed by hand in rows of four across the section. Spacing of these rows of sacks was calculated to provide 7% of cement. The paper sacks were then slit and the cement spread out on the surface by hand. The farm harrows again took over to mix the soil and cement, with 40 to 50 passes of the equipment required to produce a satisfactory mixture in the dry condition.

More water was then added by the hose to bring the mixture up to its 14% optimum allowing for evaporation loss. Mixing then was continued

to secure uniformity.

At this stage an experiment in equipment was tried with the use of a traveling pug-mill pulled by tractor. This equipment proved satisfactory for mixing but it did require the use of a motor patrol to shape the material.

After the mixed material was bladed to cross section, compacting was started using a sheepfoot roller. About twenty passes were required to secure compaction, and during this process, hand labor was used to pick sticks, roots and large rocks out of the mix.

Next, a standard farm spike-tooth harrow was used to break up the surface left by the roller and to provide a uniform mulch about 1 in. deep. After a final shaping with the patrol it was truck-rolled to bind it together and a 10-ton tandem roller was used for final compaction.

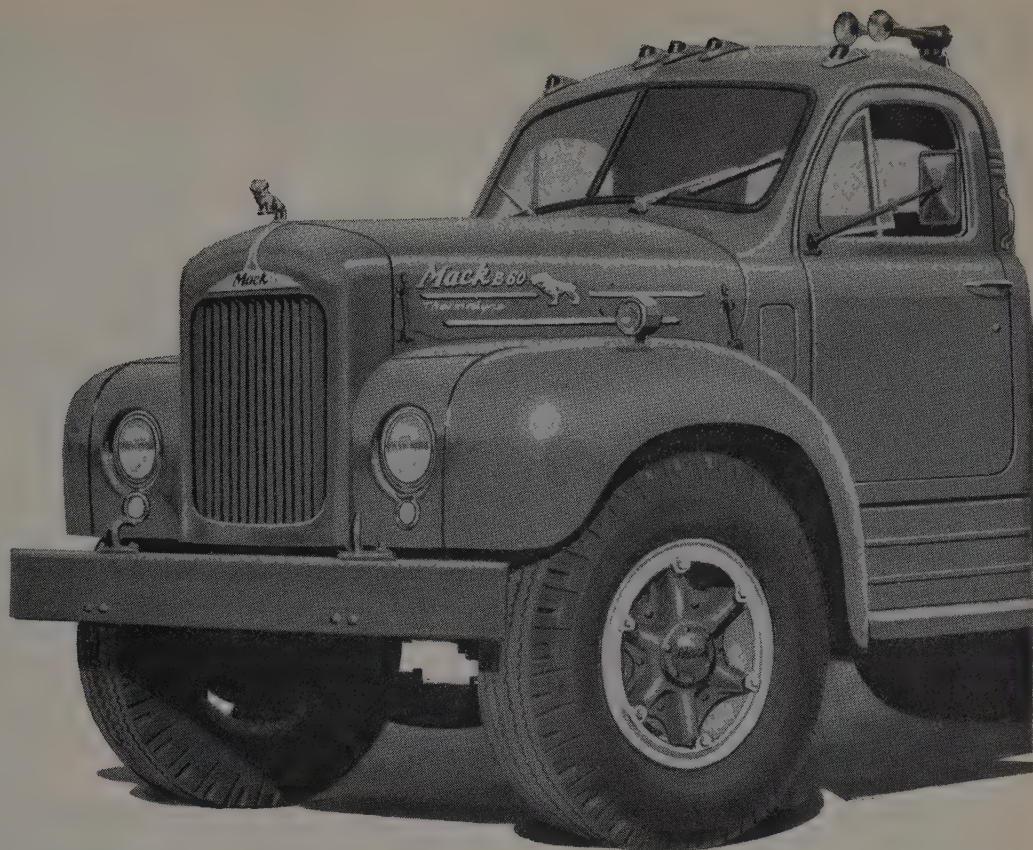
Curing was carried out by adding a 3-in. depth of loose earth which was thoroughly wet and kept moist for several days. After seven days this top surface was removed and the soil-cement exposed to traffic.

At the time that the road section was finished the question of providing a wearing coat had not been settled. Plans called for the road to be left in its original condition during the winter season with observations determining the need for a final wearing coat.

Because the job was definitely an experiment, with no precedent for setting up job specifications, the work was carried out by force account with labor coming from a CCC Camp. Estimates indicated that the cost for materials, labor, and equipment use would average about 40c per sq. yd. Material alone represented a cost of 16c per sq. yd.

This experimental project was carried out under the supervision of J. C. Beebe, assistant regional forester, in charge of engineering. C. L. Young, associate civil engineer, was directly in charge of the work for the U. S. Forest Service. He was assisted by A. R. Brickler and Robert Hazelwood, field engineers of the Portland Cement Association.





**MACKS** earn more . . . get more done . . . because  
**PART FOR PART, MACK TRUCKS ARE THE BEST BUILT**

**Make the Mack Transmissions!**

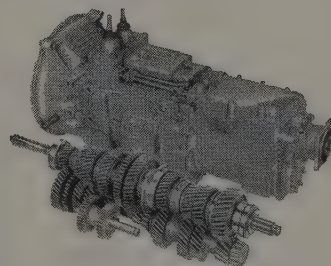
Only Macks have Mack-built transmissions. They're the finest units made, manufactured to standards no other automotive maker approaches. There's one for every trucking requirement—from four- to twenty-speed. And all are built for almost unbelievable endurance under maximum loads.

Only Macks have them . . . as only Mack trucks have the incomparable Mack engines, cabs and frames. In fact, no other truck built like a Mack, stands up like a Mack, has the low-upkeep, high-performance, higher earning power of a Mack. Mack Trucks, Inc., Los Angeles, Denver, San Francisco, Seattle, Portland, Salt Lake City, Albuquerque.

**MACK**  
*first name for*  
**TRUCKS**

4693-A

The exclusive, Mack-built, 20-speed Quadruplex, shown with gears and shafts.



**HERE'S WHAT MAKES MACK TRANSMISSIONS  
 THE WORLD'S FINEST**

- To make sure that Mack transmissions are untouched for strength and endurance, the exclusive Mack tetrapoid gears are drop forged, generator cut and case hardened.
- To give your drivers effortless, smoothly paced control through all speeds, Mack makes transmissions with closely spaced ratios and constant mesh, helical gearing.
- To make sure that every drop of fuel pays off in productive pulling power, Mack can give you gear ratios in regular progression through all speeds.
- To hold maintenance and upkeep expenses to a minimum, Mack provides transmissions with pressure lubrication of bushed bearings and with magnetic plugs.
- To assure long-lasting, stress- and vibration-free operation, Mack transmissions are designed to work in harmony with all other Mack components.



# EARTHMIVING . . .

*Fourth of a series—Delays rob the job of profit.  
A simple form keeps the record for each unit.*

By **RICHARD BENNETT**  
Construction Consultant  
Saratoga, California

A PROMINENT CONTRACTOR has stated, "I will spend more money on checking and recording delays, their causes, their costs, and research into methods for their reduction, than for any other record." Too few contractors have this attitude toward the problem of cutting down delays in productive operating time for their equipment units. More attention to this subject and the building up of records showing causes, effects, and responsibilities would do much to increase job profits.

Generalized information on the subject of delays cannot be applied directly to any individual job, and even different regions of the country will have an important effect on national figures. On the other hand, some general facts which have been made available by the Highway Research Board of the National Research Council help to indicate the importance of this subject, and to point out some of the major causes.

In the use of rubber tired tractor scrapers these figures from the Highway Research Board place weather (rain, cold and wet grade) as the greatest cause of delay and it may represent as much as 50% of the total available working time. Obviously, this is a factor which needs interpretation throughout the West since it will mean one thing in the Puget Sound area and another in southern Nevada. Other delays such as time required to open up cuts, trim slopes, maintain and repair equipment and time lost from lack of operators are relatively small by comparison.

Such delays are classed as major since they involve shutdowns of 15 min. or more in duration.

Under a corresponding list of minor delays (15 min. or less) the most important represents the time lost in having the unit wait for a pusher, while the other types of minor delays, being rather small by comparison, include maintenance and repair of the unit, maintenance of haulage road, personnel, traffic, etc.

Without going into more detail on rather general studies it is obvious that delays in equipment operation

are luxuries and run into costs which reduce job profits.

What can be done about it?

There is only one procedure which will begin to reduce delays for any contractor. This is to become serious enough about the problem to develop facts concerning the cause of delays

and the placing of the responsibility. Only by the accumulation of information direct from the job can a contractor analyze his own operations and take corrective measures.

At first, the collecting of facts relating to delays on big units of equipment may seem to represent more time and cost than appears justified. A very simple and job-tested form which can be used on major units (see the chart below) is a small clipboard attached to the steering wheel of the unit with a blank form which the operator is required to fill out for all delays to the nearest

| EQUIPMENT<br>DELAY REPORT                                                       |              |        |                 | Date            |                |
|---------------------------------------------------------------------------------|--------------|--------|-----------------|-----------------|----------------|
|                                                                                 |              |        |                 | Equip. No.      |                |
| Delay<br>No.                                                                    | Elapsed time |        | Minor<br>Delays | Major<br>Delays | Shift Hrs. 8   |
|                                                                                 | Stop         | Start  |                 |                 | Cause of delay |
| 1                                                                               | -            | 8-18   |                 | -18             | Servicing      |
| 2                                                                               | 8-32         | 8-35   | -03             |                 | Wait - Pusher  |
| 3                                                                               | 9-16         | 9-23   | -07             |                 | Water - engine |
| 4                                                                               | 10-14        | 11-22  | -04             |                 | Wait - pusher  |
| 5                                                                               | 1-18         | 2-52   |                 | 1-08            | Rain           |
| 6                                                                               | 3-12         | 3-16   |                 | 1-34            | Repair engine  |
| 7                                                                               | 4-06         | 5-00   | -04             |                 | Wait - Pusher  |
| 8                                                                               |              |        |                 | -54             | Rain           |
| 9                                                                               |              |        |                 |                 |                |
| 10                                                                              |              |        |                 |                 |                |
| 18                                                                              |              |        |                 |                 |                |
| 19                                                                              |              |        |                 |                 |                |
| 20                                                                              |              | Time - | Hrs. & Mins.    |                 |                |
| Totals                                                                          |              |        | -18             | 3.14            |                |
| Summary: Major delays 15 minutes or more.<br>Minor delays less than 15 minutes. |              |        |                 |                 |                |
| Total time minor delays                                                         |              |        | -18             | Hours           | 4 %            |
| Total time major delays                                                         |              |        | 3-14            | Hours           | 40 %           |
| Actual productive time                                                          |              |        | 4-28            | Hours           | 56 %           |
| This report to be made for each item of equipment<br>for each scheduled shift.  |              |        |                 |                 |                |
| Signed                                                                          |              |        |                 | Operator        |                |



minute of down-time according to his own watch. Maintaining this form is so simple that it will not interfere with the operator's duties, since he is only called upon to make the few notes after he has actually been stopped and has such an interval of time available.

He notes the hour and minute his unit stopped and the hour and minute when it started up again, together with a word or two as to the cause of the delay. That is all that is called upon to do and the tabulation and analyzing of the information is carried out by others. Each shift, or day, one of these fresh forms is placed on each unit while the old one is removed and made available for office study. Observation indicates that operators are usually most willing to cooperate in the use of this form when they are told that it presents important information on the history of the job.

A sample of this form is shown with an indication of how it works.

Organizing this raw material into a more usable form can be done in

many ways. Every contractor will have his own ideas as to how to organize and study records coming direct from the job. Since the indicated form relates to a short period of only one shift or one day the next step is to total the cause of the delays and the recorded time for the period of a working month.

One method which I have found effective is to plot each daily record of a machine as a vertical bar using cross-hatching to illustrate the part of the shift the unit was operating and the different types of delays. For every succeeding working day a similar bar is drawn using the same total height representing the 8-hr. shift. As this chart is extended for a week or more the pattern begins to appear with the horizontal bands. A widening of the "Operating" symbol shows the total delays are being reduced, whereas a noticeable increase in the width of a delay symbol, as the chart is expanded through the month, will focus attention on this type of delay, and a solution to the problem.

## ICE HARBOR DAM

(Continued from page 64)

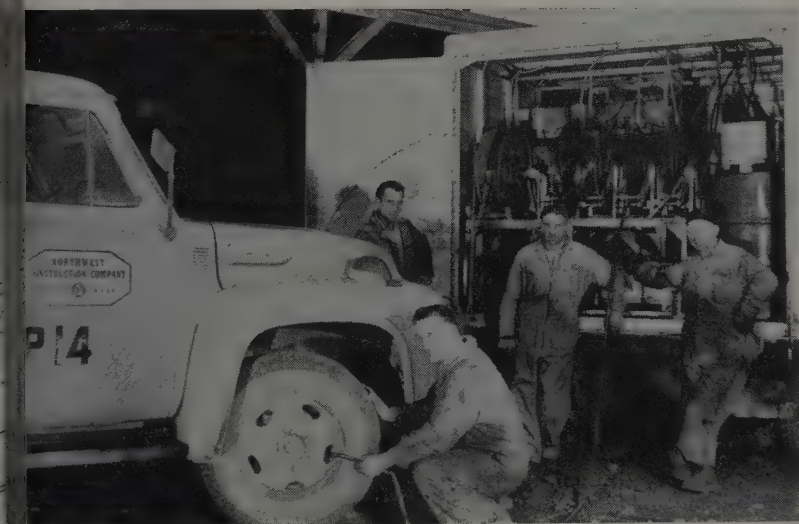
Operating from May through September on a two shift basis—4:30 p.m. to midnight and midnight to 8:00 a.m.—the contractors maintain a better than 300 cu. yd. per hour placement clip. Eight trucks, each carrying a load of two 4-cu. yd. buckets, were used on the job to transport the batch plant output the 1/4 mi. to the excavation site.

The contractors were fortunate in that their aggregate pit was less than five miles distant from the dam site and a specially constructed access road avoided the inconvenience of traffic hazards from the crossing state highways and farm access roads. All aggregate was washed and weighed at the pit site and passed from the dump trucks to a dump pit where a belt conveyor hoisted the 1,700 lb. per bucket load to the storage bins of the plant. Aggregate used was in sizes 2, 3, and 6 in.

With this assurance of a sufficient supply of batch plant concrete mix for placement the MHA&A contractors set about insuring that there would be no bottleneck at the construction placement site itself. Three Whirley gantry type cranes, 85 ft. in height, self-propelled and mounted on 100 lb. per ft. railroad tracks, were ordered from the Washington Iron Works at Seattle. Each crane was topped by a 150-ft. horizontal boom with a 180-deg. sweep, allowing for coverage of 300 ft. in a complete sweep of the boom's arc.

With these three movable gantry Whirley cranes strategically located so as to be within reach of any placing site within the first step cofferdam, the contractors had ample assurance that there would be no tie-up in the concrete placement work. However, as further assurance, an 802, 1201, and 803 crawler Lima with 80-ft. sticks were added to the crane fleet. A single crawler mounted 4500 Manitowoc crane and a Manitowoc 3000 were also added. To top off the schedule defense, four mobile truck cranes of 20 to 30-ton capacity were included. With this fleet of concrete placement equipment on the job, MHA&A went at the job of placing the near 600,000 cu. yd. of steel and concrete specified in their contract before August of 1958. Three hundred men made up a shift. A weekly payroll of over \$100,000 was budgeted and a full scale concrete placement goal of 80,000 cu. yd. per month was set with daily placements averaging approximately 3,000 cu. yd. per day.

## Mobile maintenance truck



NORTHWEST Construction Co., Seattle, Wash., has developed a mobile maintenance truck that services its entire fleet of 171 earthmoving and paving machines.

This is a compact, multi-purpose vehicle fully equipped to dispense grease, oil, water, gasoline, diesel fuel and air whenever needed in the field. It is the mainchild of maintenance foreman Hoyer Baer.

Nerve center for the mechanized service station is a receiver-mounted Ingersoll-Rand 36-cfm. compressor. This unit, which has a 200-psi. pressure rating, sup-

plies the air that activates the entire lubrication system.

It is mounted in a small space in the front left corner of the truck, and is operated by a Timken full torque power takeoff driven, through a special transfer case, by the truck engine.

Five 40-ft. hoses on reels across the back of the truck are used to supply most lubrication needs including oil for crankcases, grease for bearings and rollers, lubricant for gear boxes, and the oils and greases already mentioned.

Air for tires, gasoline and diesel fuel for engines are also dispensed.



# Oroville Dam project work starts

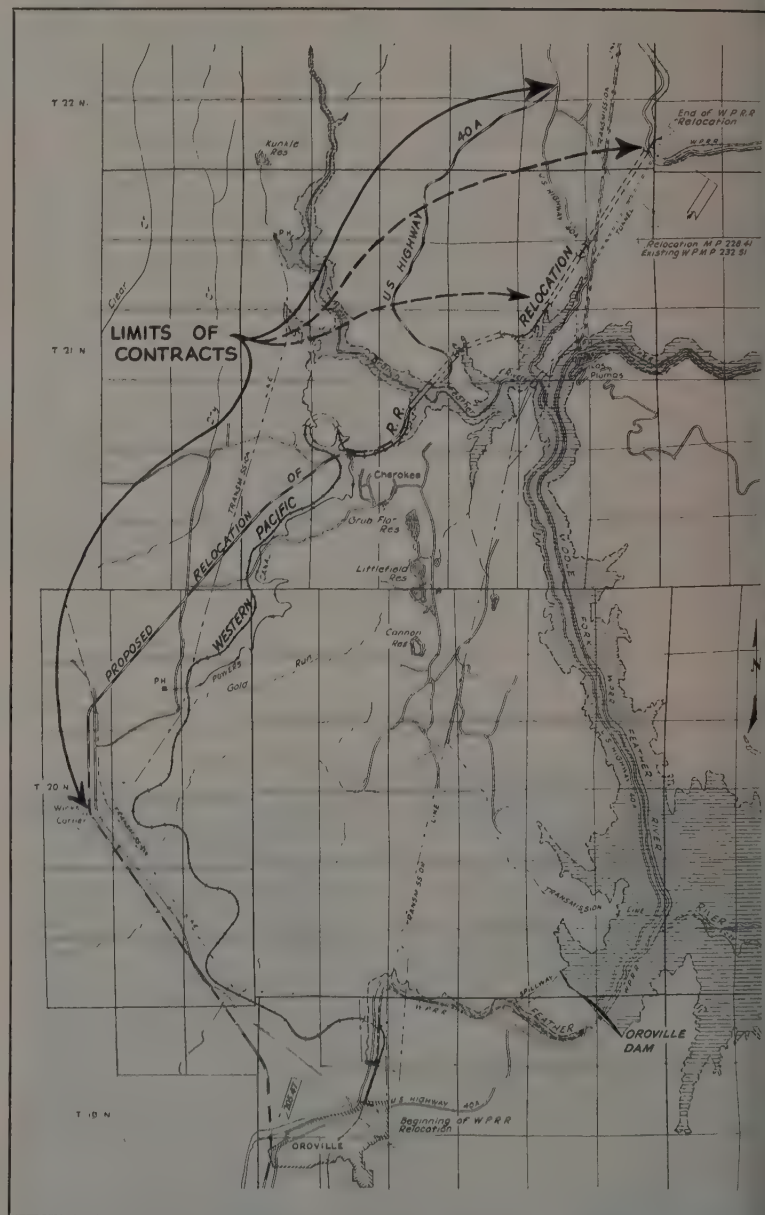
**Railroad tunnels and highway relocation under way to clear reservoir site. Bridge contracts to be awarded. Design work continues on dam and power facilities.**

THE Oroville Dam and Reservoir, one of the features of the Feather River Project, authorized for construction by the California Legislature in 1951, is now in the preliminary construction phase under the direction of the California Department of Water Resources. The Legislature early in 1957 appropriated \$25,190,000 toward the relocation of the Western Pacific Railroad and State Highway U. S. 40 Alternate to bypass the proposed Oroville reservoir area.

Relocation of the Western Pacific Railroad between Oroville and Big Bend, a distance of 27.0 mi. along the present route, involves construction of 22.9 mi. of new railroad line through steep mountainous terrain. Relocation of U. S. 40 Alternate will require 19.3 mi. of new road between Oroville and Jarbo Gap to replace 20.5 mi. of the old route within the reservoir area. Removal of both the railroad and the highway from the Feather River Canyon is essential before effective construction on the dam foundations can be started.

Two contracts have been let, the first of which was awarded to Peter Kiewit Sons' Co. for construction of tunnels No. 4 and No. 5 along the railroad relocation route. These tunnels will be about 4,400 and 8,800 ft. in length, respectively. Principal components of the contract are open cut excavation for tunnel approaches, tunnel excavation and concrete lining, construction of portal structures, and furnishing and installing electrical and communication ducts in the tunnel lining.

The contractor has finished the access road from U. S. 40 Alternate to the two adjacent tunnel portals in Dark Canyon and has completed the installation of compressor plant and change house, has opened both portals and is presently assembling the tunnel jumbo and related facilities to begin underground work. The contractor proposes to utilize standard



LOCATION MAP OF OROVILLE DAM AND CURRENT CONSTRUCTION

gage railroad track with four standard gondolas to transport tunnel muck to the spoil area.

The second contract, awarded to McCammon & Wunderlich, and Wunderlich Construction Co., is being directed by the State Division of Highways under service agreement with the Department of Water Resources. The contract consists of grading and paving 13.3 mi. of highway between Wicks Corner, 7 mi. north of Oroville, and Jarbo Gap plus

2.6 mi. of railroad roadbed grading for the relocation of the Western Pacific Railroad along a section of the railroad route which parallels or closely adjacent to the highway relocation.

The highway portion of the contract will provide one 24-ft. traveled way on 8.9 mi. and two 24-ft. traveled ways on 4.4 mi. of the project. Four reinforced concrete slab bridge and two welded girder overhead crossings of the new railroad line are



*for earth-moving jobs on construction sites,  
choose...*



# CUTTING EDGES

## *Because*

- They've got the stand-up-and-take-it qualities that really pay off when the going starts to get rough... special analysis, abrasion-and-fatigue-resistant hot-rolled steel that's scientifically fabricated and inspected for perfection.
- They're available in many lengths, widths, thicknesses, hole spacings; flat or curved sections, designed for graders, scrapers, dozers and allied equipment.



**CUTTING EDGES**  
THE COLORADO FUEL AND IRON CORPORATION

5096

Albuquerque • Amarillo • Atlanta • Billings • Boise • Boston • Buffalo • Butte • Chicago • Denver • Detroit  
El Paso • Ft. Worth • Houston • Kansas City • Lincoln (Neb.) • Los Angeles • New Orleans • New York  
Oakland • Oklahoma City • Philadelphia • Phoenix • Portland • Pueblo • Salt Lake City • San Antonio  
San Francisco • San Leandro • Seattle • Spokane • Wichita



included in the contract.

Rapid progress is being made on both the railroad and highway grading. The completion of this contract would make available a traveled way between Wicks Corner on the Oroville-Chico road and Jarbo Gap on the existing State Highway U. S. 40 Alternate, except for the crossings of the West Branch of the Feather River, where the construction of a combination highway and railroad bridge with an over-all length of about one-half mile is required.

In construction of the railroad and highway it has been necessary to relocate a portion of the Middle Miocene Canal of the Pacific Gas and Electric Co. One of the major features of this relocation is a 1,285-ft., 42-in. welded steel pipe siphon.

The last progress estimate indicated grading work 25% complete; concrete structures including bridges, overheads and arch culverts 45%; metal pipe culverts and welded steel pipe siphon 60%; and clearing about 85%.

The Department of Water Resources intends to advertise for two more features of the railroad relocation about Nov. 1. These would be the railroad bridges over the Feather River about 1 mi. north of Oroville near the beginning of the railroad relocation and over the North Fork of Feather River where the relocated line will join the present line. The bridge at Oroville will be a 10-span, steel, deck-type, plate-girder structure 1,000 ft. in length. The crossing of the North Fork of Feather River will be approximately 700 ft. long and will be either a steel cantilever truss structure with a clear central span of 300 ft., or a reinforced concrete arch with a 350-ft. span flanked by concrete viaducts. Award of contracts for these structures will commit all construction funds appropriated to date.

Design of the West Branch Bridge, a joint highway and railroad structure, has been completed by the bridge department of the Division of Highways under contract to the Department of Water Resources. However, funds for construction of this unit were lost in the legislative disagreement over water rights and completion of the highway and railroad relocation is being delayed by failure to provide funds for this structure. The two contracts now under way, together with the West Branch Bridge, were the controls in the construction schedule which would have vacated the dam site for foundation work in the fall of 1959.

Contract plans and specifications for all other features of the highway and railroad relocation are essentially complete and await only the appropriation of additional funds by the legislature to carry forward this vital program.

The Department of Water Resources is also proceeding with the design of the other features of the Feather River Project in the vicinity of Oroville. Primary, of course, is the dam itself where three types of structures, (1) concrete gravity, (2) arch and buttress, and (3) earth and rock-fill dams, are being studied to determine the most economical and safest structure for the site.

Robert M. Merian of Oroville has just completed the final exploration contract at the dam site for the department. This work involved the construction of 750 ft. of 4 x 7-ft. tunnel in each abutment of the dam site. This work together with previous diamond drilling and tunnel work completes the exploratory operation of the department. Final design criteria and selection of the type of dam will be the major subject of discussion at the next meeting of the department's staff with its consulting board late this year.

Also, the subject of intensive design activities is work on the power features of the project which have been revised somewhat to eliminate undesirable river fluctuations past the City of Oroville and to provide a more feasible afterbay for regulation of power releases. This plan contemplates a diversion dam and canal starting about 4 mi. below the main Oroville Dam; a 6-mi. canal of 11,000 sec.-ft. capacity through and north of the Thermalito area to a power plant which would develop about 90 ft. of head; and an off-stream afterbay immediately east of U. S. 99-E. Re-regulated flows from the afterbay would be returned to the river 7 mi. southwest of Oroville.

### Personnel

Walter G. Schulz is Chief Engineer of the Division of Design and Construction, State Department of Water Resources, in charge of Feather River Project work, and Theodore Neuman is acting construction engineer. Charles V. Heikka is project engineer for the department with headquarters at Oroville, and William Grant is resident engineer on the railroad tunnel contract. R. E. Stickel is project engineer for the Division of Highways on the McCammon-Wun-

derlich job and Muller Chapman is resident engineer.

Project manager for Peter Kiewit Sons' Co. is John W. Alltucker; Paul Eller is project superintendent and Frank McLean is project engineer. Floyd Helm is project manager for McCammon-Wunderlich, and Harold Skeans is project superintendent.

## TWO NEW BOOKS

### Bur. of Recl. Tables

Well known to irrigation and hydraulic engineers through its previous editions, the Bureau of Reclamation has completed an 11th edition of its "Hydraulic and Excavation Tables." This handbook is produced primarily to meet the requirements of engineers in the Bureau of Reclamation, but copies can be obtained by the public from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., or from the Bureau of Reclamation in Denver. Cost \$2.00 per copy.

The latest edition is a major revision and the size has been more than doubled to 350 pages. It includes 71 tables as compared to 49 tables in the previous 10th edition which was released in 1950.

### ASCE Practice—Vol. 3

Volume 3 of the "American Civil Engineering Practice" series has just been released. This volume deals extensively with all types of concrete design and construction including prestressed structures. Sections are also devoted to foundation design, retaining walls, steel bridges, concrete bridges, steel towers including tanks, reinforced concrete chimneys, silos and bins, timber structures and a concluding section on earthquakes and earthquake-resistant design.

Volume 1 of this series included sections covering surveying, highway and airport design, soil mechanics, general foundation design and tunnels. Volume 2 was confined generally to the field of hydraulics with sections on hydrology, dams, hydroelectric power, irrigation water supply, sewerage and harbor engineering.

Volume 3 is of standard handbook size, containing extensive tables, charts and drawings in every one of its sections. Published by John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, New York. Volume 3 is priced at \$25.00.



## Corps of Engineers work totals \$46,000,000

BIDS ON CONSTRUCTION work totaling approximately \$46,000,000 in estimated cost will be invited by four districts of the North Pacific Division of the Army Corps of Engineers during the present fiscal year ending next year June 30, according to Brig. Gen. L. H. Roote, Division Engineer.

The Portland District has scheduled 16 major civil works projects with an individual cost range from \$100,000 to more than \$20,000,000 including dam construction, bank protection work, construction of levees, repair of dikes, channel dredging and construction of breakwater, together with supply items and miscellaneous works. The largest item is for the main contract on Cougar Dam on the South Fork of the McKenzie River. Total estimated cost of projects scheduled for bids in the Portland District is approximately \$27,500,000.

The Walla Walla District will invite bids on eight projects, ranging in cost from \$100,000 to approximately \$5,000,000, including generators for Ice Harbor Dam on the Snake River, embankment protection in the dam's reservoir area, construction of levees, channel improvement, and access roads and other initial work in connection with John Day Dam on the Columbia River. Projects scheduled for bids in the Walla Walla District total in estimated cost more than \$14,000,000.

The Seattle District will call for bids on six projects with a cost range of \$100,000 to over \$700,000, including road and bridge construction, rail relocation, river and harbor channel dredging, and breakwater construction. Total estimated cost of Seattle District projects is approximately \$2,300,000.

The Alaska District will invite contract bids on two civil works projects estimated to total in cost between \$1,000,000 and \$2,000,000. Both are channel projects involving dredging. The proposed projects which are estimated to exceed \$1,000,000 each in final cost are as follows:

In Alaska there will be bids advertised next March for dredging a channel 70 ft. wide and 12 ft. deep through the several shoals in the waterway between El Capitan passage and Chukchi Strait.

Improvement of the Columbia River between Vancouver and The Dalles will be advertised early in January and will include rock removal from the navigation channel at Eagle Creek Point.

Construction of a road on the west side of the reservoir, to be formed by the Hills Creek Dam from Packard Creek to the upper crossing, is scheduled for bidding next spring.

One of the largest individual items will be for construction of Cougar Dam, a rock-fill structure with earth core, including outlets works, with an engineer's estimate of over \$10,000,000 and bids call scheduled for next March.



## Consulting firm in Denver builds headquarters adapted to needs

*Modern exterior and floor space designed for engineering functions.*

KEN R. WHITE, consulting engineer of Denver, had the usual problems of adapting rented space to fit an expanding engineering staff. As a solution this building was designed to permit full use of the space by the firm, or to possible subdivision of the space for tenant rental.

The first floor contains the administrative and reception areas. With the conference room on this floor and available to all departments, the flow of clients and sales representatives is kept away from the working areas. Each department leader has open desk space in his own area to permit direct supervision of the work. Intercommunication between departments is maintained by local service on the telephones and by an intercom system.

The photogrammetric unit occupies the lower floor and contains the darkroom, booths for the Balplex stereocompilation instruments, and the reproduction department. The employees, through a committee,

operate a small coffee room with the proceeds utilized for employee benefits such as soft ball equipment, picnics, and parties. The vault is used to store record drawings and for classified documents issued by Government agencies.

The entire building is air conditioned. Heating is by forced warm air with supplemental hot water base board radiation. The exterior walls are brick, with portions of the building accented by precast stone panels. The interior faces of the exterior walls are brick. Acoustical plaster ceilings lower the noise level greatly.

Each draftsman has a reference table behind his drafting desk. All furniture is uniform throughout the office. Reference files, supplies and similar material are maintained in a central spot in each department.

The general contractor was Carl L. Myers, electrical work was done by Belmont Electric and the mechanical work by L. Ralph Fry. All these firms are located in Denver. The total costs of construction, including pavements, air conditioning, electric, general and landscaping, was less than \$12.00 per sq. ft. The total square footage of the building is 13,500.

Embankment work to protect the reservoir area at Ice Harbor Dam near the existing railroad is scheduled for bidding next summer. Bids will also be called in June for the main generator

units of the Ice Harbor Dam development.

Cofferdam construction for the first stage of the John Day Dam is scheduled for next April.

# BIGGER



The Lovell Clay Products Company, Billings, Montana, manufacturer, recently purchased the Fruehauf-Schonrock Cable Dump Trailer shown above. It is used for bulk shipment of clay used in Lovell's complete line of clay products. The firm utilizes

convenient Fruehauf Factory Branch service facilities for maintenance work throughout its fleet, which operates on routes in western Nebraska, northern Colorado, Wyoming, eastern North and South Dakota and Montana.

**FRUEHAUF  
BUILDS RUGGED  
UNITS TO DO EVERY  
KIND OF CONSTRUCTION  
HAULING JOB  
PROFITABLY!**



Steel Platforms



Machinery Trailers



Tilt Platforms



Insulated Hot Oil Tankers



Hoppers



# ROADBUILDING PROFITS...

## Practically a Certainty with the Fruehauf-Schonrock Volume★Dump Trailer!

### Every Exclusive Feature Is A Big Cost-Cutter

★ Exclusive Fruehauf-Schonrock design offers lower center of gravity, better weight distribution, maximum payloads.

★ Simple, practical lifting mechanism makes dumping safer and more efficient, costs less initially, and requires little maintenance.

★ Patented Booster Fifth Wheel aids in easy lifting, adds years to cable life.

★ Cable dump system functions efficiently even with tractor and Trailer at right angles in tight places.

★ Unusually rugged construction makes unit ideal for tough construction jobs on all kinds of terrain.

★ Cable mechanism can be utilized to pull either tractor or Trailer out of holes or mud.

★ Wide choice of underconstructions, body heights, lengths, capacities, tailgates, latching mechanisms, and accessories gives you the cable dump Trailer to fit your exact needs.

## FRUEHAUF TRAILERS

"ENGINEERED TRANSPORTATION"

*World's Largest Builder of Truck-Trailers*

**FRUEHAUF TRAILER COMPANY**

*Western Manufacturing Plants: Los Angeles and Seattle*

**SALES AND SERVICE:** Los Angeles • Oakland • Fresno • W. Sacramento  
San Diego • Portland • Seattle • Spokane • Phoenix • Billings  
Salt Lake City • Denver

*World's Largest Builder of Truck-Trailers*

**FRUEHAUF TRAILER COMPANY**

10961 Harper Avenue • Detroit 32, Michigan

✓ **PLEASE SEND FREE, ILLUSTRATED LITERATURE AT ONCE ON FRUEHAUF CONSTRUCTION UNITS DESIGNED FOR PROFITABLE USE IN THE WEST!**

NAME \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_

Stationary Gooseneck Carryalls

Removable Gooseneck Carryalls

## AGC midyear meeting in Seattle

THE LARGEST MIDYEAR board meeting of the Associated General Contractors of America was held during September in Seattle, and action taken on a variety of matters affecting the construction industry. More than 500 representatives of leading construction firms and most of the association's 125 chapters and branches throughout the country attended the sessions as guests of the Seattle and Mountain Pacific AGC Chapters.

Official action by the Governing Board included:

Nomination of Vice President Fred W. Heldenfels, Jr., Heldenfels Brothers, Corpus Christi, Texas, for 1958 president, and James W. Cawdrey, Cawdrey & Vemo, Seattle, for vice president. Heldenfels' organization is a leading southwestern highway construction firm and Cawdrey & Vemo is a widely-known building construction company.

### Recommendations

Recommendation that Congress study problems arising under Davis-Bacon laws with a view toward making needed amendments, including provision for court review.

Reiteration of need for strengthening provisions in the Taft-Hartley Act banning secondary boycotts, and a call for legislation to eliminate the "no man's land" existing in federal-state jurisdiction over unfair labor practice cases.

Re-emphasis of need for holding negotiated wage and other labor benefits to reasonable levels in order to reduce inflationary pressures.

Recommendation that chapters and members continue to develop strong labor committees to cope with a trend of some unions to bargain with unqualified or irresponsible employer groups.

Recommendation that chapters and members resist inclusion of any restrictive provisions in labor agreements.

Commendation of work of the McClellan investigating committee.

Approval of steps to establish a national joint cooperative committee between the AGC and the four major groups representing mechanical specialty contractors. The board also noted that general contractors "maintain complete responsibility for the (construction) project to insure an orderly progression of work, harmonious subcontractor relations, and maximum service to owners," in order to preserve the single contract method of construction.

AGC recognized the efforts made by

the cement and steel industries to expand their facilities to alleviate material shortages and help meet the increasing requirements of the construction industry. Cement supply is now adequate, AGC reported, despite the recent strike, and deliveries of heavy structural steel shapes and plates are reported normal in many areas.

The first general session of the meeting was opened with brief remarks by AGC President Lester C. Rogers, Chicago, followed by AGC Executive Director James D. Marshall, who presented his midyear report to the boards. Marshall pointed out in his report that the future can be a "bad period" for contractors in spite of large construction volume, because of inflation, tax demands and "confusion" within the labor movement. He said the association should remove as many hazards as possible and make the industry aware of those which cannot be removed.

Heavy-construction contractors reviewed recent staff activities; considered errors in bidding, noting that most claims reported were not handled in a way that would encourage "careless or fraudulent" bidding practices; heard a strong recommendation for organized disaster relief; studied contract forms and specifications and were informed on Internal Revenue Service equipment depreciation and salvage value policies.

This group approved a motion urging AGC support for long-range advance planning of public works construction and discussed legislative developments, problems of small business and escalator clauses.

The group also recommended that AGC urge "limitations by the executive branch be minimized to avoid inequities to the contractor and higher ultimate cost to the government; that provisions be incorporated in contracts for construction work relating the desired rate of progress to the availability of funds; and that contracting agencies be permitted to transfer funds available but not earned on one project to other projects whereon earnings have exceeded allocations."

Highway contractors heard AGC President Rogers report on recent discussions between the AGC and the American Road Builders Association and gave a vote of confidence on his work to improve cooperation between the two groups. William A. Bugge, president of the American Association of State Highway Officials and Director of State Highways for the State of Washington, discussed highway legislation expected to come before Congress next year. The

meeting also heard reports on the progress of the Federal-aid highway program, and meetings of AGC representatives with the AASHO.

The meeting approved a motion recommending that the AGC support legislation which the AASHO expects to have introduced in the next session of Congress correcting a situation that prohibits the Bureau of Public Roads from reimbursing state highway departments for money paid to contractors for materials until they are actually incorporated in the work.

Also approved was a motion authorizing continued AGC discussions with AASHO on the problem of lump-sum bidding.

### Motion picture is ready

Moving picture entitled "The Constructors" is scheduled to be ready in November, according to Education Committee Chairman John E. Healy, II, Wilmington, Del. The film is designed to encourage pre-college students to prepare for a career in construction engineering. A manual is to be prepared for use by chapters with the film. The prints will be procured for review by chapters and other interested groups.

A central clearing house for young engineers who are seeking employment in the construction industry has been proposed and a subcommittee was named to study the idea.

Promotion of wider activities on the part of chapter education committees was urged and chapters without such committees were urged to form them.

### Bank building in Portland

AWARD of a contract to Hoffman Construction Co. of Portland has been made by the First National Bank of that city for a \$3,500,000 headquarters building. The structure will be five stories high and will require the demolishing of two buildings now occupying most of the site.

### Harbor improvement at L. A.

INITIAL step in a program to spend \$3,500,000 for a tanker terminal at Los Angeles Harbor was the recent award of a contract of \$639,000 to Connolly-Pacific Co. The immediate contract will provide for construction of a rock dike around an 18-ac. area. Later the area will be filled with dredged material. The new dock will handle the modern 100,000-ton tankers.



## Contractors may question building specifications

AS A RESULT of recent requests from representatives of the AGC and subcontracting groups, the California Division of Architecture will designate a limited number of days within the bidding period when contractors may submit questions concerning any aspects of plans and specifications.

According to the recent announcement the program would provide for designating certain dates within the original bid call during which time all planholders would be permitted to ask questions concerning the plans for the project. These requests would then be answered by the Division of Architecture through the issuance of supplements to the specifications or written notices which would be furnished to all planholders of record. There would be no oral answers made to questions.

## New tank-trailer plant

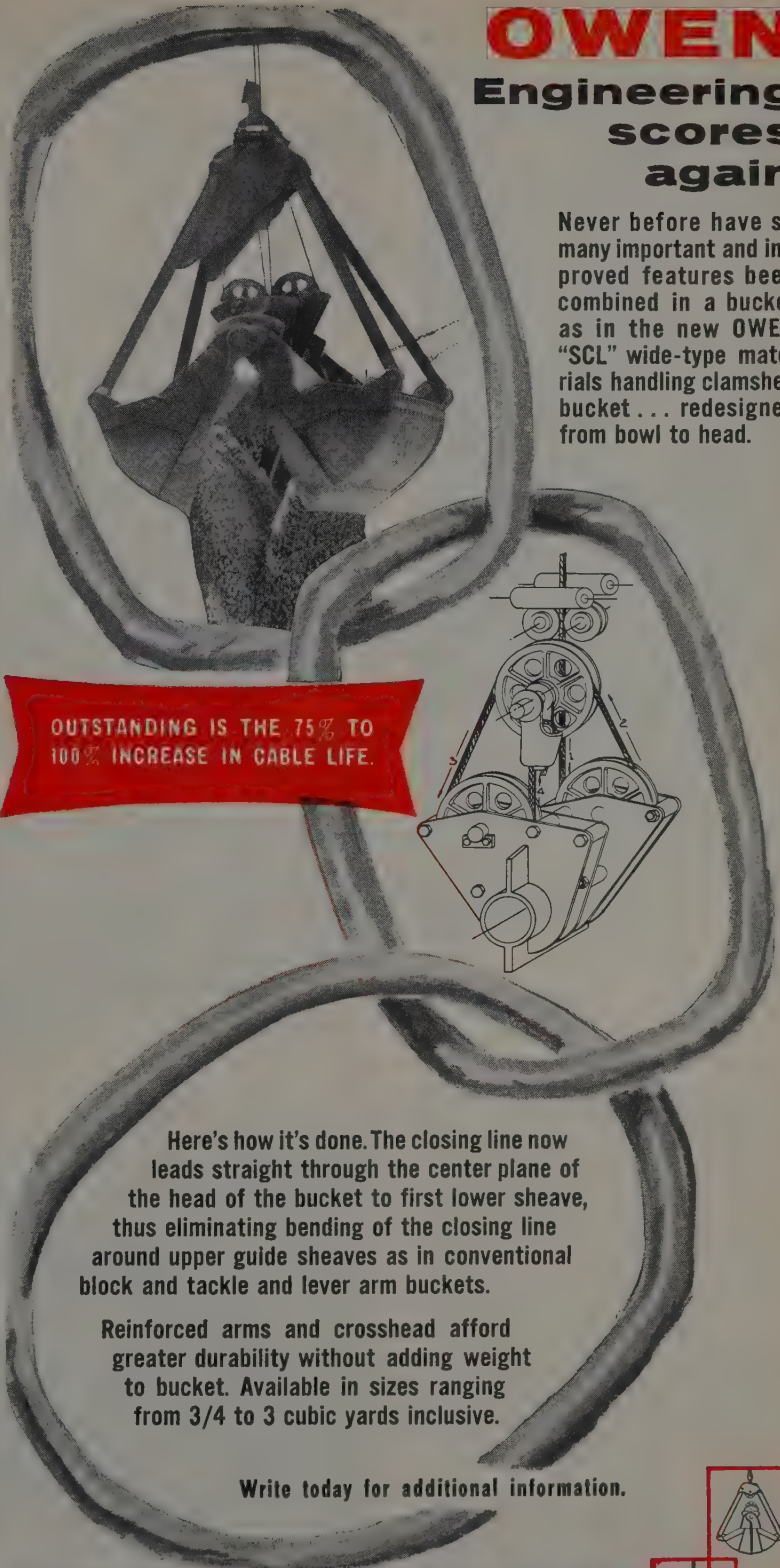
IMPROVEMENT and possible expansion of an existing building in Fresno, Calif., will provide a new tank-trailer factory for the West. The move has been made by the Independent Metal Products Co. of Omaha, a division of the Huehauf Trailer Co. The remodeled plant will go into production next month and will manufacture bulk tank-trailers for highway transportation of petroleum products, milk, wine and other liquids. Modification of the existing building has estimated a cost \$1,000,000 which will include the installation of conveyor equipment as well as offices and a paint shop.

## 200 piles for plant

\$2,000,000 industrial plant covering about 4 ac. will be built by Eitel-McCullough in San Carlos, Calif. Contract will be carried out by Williams & Burrows with the first phase consisting of driving 1,200 piles to a depth of about 10 ft. A new feature of design for such an industrial plant will be the placing of the utility and electrical distribution system on the roof of the structure. The building will be of single-story construction except the office area which will be of two stories.

## \$5,000,000 building plan

MAJOR building development representing a final cost of about \$15,000,000 and including nine large structures is advancing to the point of major construction activity in Beverly Hills, Calif. Building sites have been acquired by National Properties, Inc., on Wilshire Boulevard and two structures are completed and the rest in active planning stage.



# OWEN

## Engineering scores again

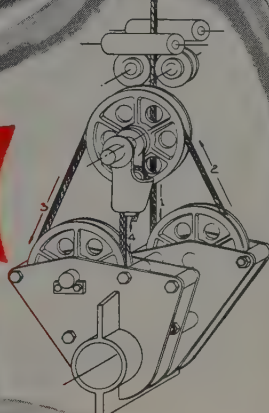
Never before have so many important and improved features been combined in a bucket as in the new OWEN "SCL" wide-type materials handling clamshell bucket... redesigned from bowl to head.

**OUTSTANDING IS THE 75% TO 100% INCREASE IN CABLE LIFE.**

Here's how it's done. The closing line now leads straight through the center plane of the head of the bucket to first lower sheave, thus eliminating bending of the closing line around upper guide sheaves as in conventional block and tackle and lever arm buckets.

Reinforced arms and crosshead afford greater durability without adding weight to bucket. Available in sizes ranging from 3/4 to 3 cubic yards inclusive.

Write today for additional information.



**The OWEN BUCKET Co.**  
 BREAKWATER AVENUE, CLEVELAND 2, OHIO  
 BRANCHES: New York • Philadelphia • Chicago  
 Berkeley, Calif. • Fort Lauderdale, Fla.






AT a guided-missile plant near Littleton, Colo., this Manitowoc 3,900 crane with a 170-ft. boom sets high steel in the assembly building. Contract is held by Shurtleff & Andrews Co. of Salt Lake.

## Montana Highway work hits record total

BIDS totaling slightly more than \$3,000,000 were recently accepted by the Montana Highway Commission for highway projects.

Largest job of the group went to Peter Kiewit Sons' Co. at \$1,172,000 for grading, draining and providing asphalt surfacing on slightly more than 12 mi. of highway in Beaverhead County. Another job in the same general area went to C. B. Lauch Construction Co. of Great Falls for constructing a 280-ft. steel and concrete bridge over the Union Pacific railroad and a shorter structure in Beaverhead County.

At a later opening the Commission received bids on thirteen highway jobs totaling more than \$3,400,000. The top job went to Robertson & Cave, Inc., and Sletten Construction Co. of Great Falls for grading, surfacing, draining and the building of one steel bridge in Cascade County.

Another large job went to Peter Kiewit Sons' Co. at \$557,000 for grading, placing soil-cement base and plant-mixed bituminous surfacing on about 11 mi. of highway in Powder River County. A job almost as big went to Roth Construction Co. of Rapid City, South Dakota, at \$477,000 for grading and bituminous surface treatment for 14 mi. of highway in Blaine County.

As a result of these two large lettings

Fred Quinell, Jr., State Highway Engineer, has announced that contracts awarded thus far in 1957 approach \$17,000,000 and represent a record for highway construction to be carried out in Montana during any year. A further letting in December will raise the total to about \$20,000,000 which exceeded the corresponding figure in 1956 by about \$4,000,000. The program includes two contracts awards on the Interstate system and plans call for letting six more contracts on this system by July 1958. This will commit all available state money for the Interstate program.

## Keene Creek bids opened

WHEN bids were opened by the Bureau of Reclamation for constructing the Keene Creek dam and a conduit on the Rogue River project in Oregon the low figure was submitted by a combination of D. L. Cheney Company, Cherf Brothers and Sandkay and S. Birch & Sons Construction Co. for \$2,894,000. The bid was almost 20% above the engineers' estimate.

The Keene Creek dam will be an earth-fill structure 65 ft. high and 580 ft. long located about 16 mi. from Ashland, Ore. In addition to the dam, the work will include tunnels and a pressure pipeline to deliver water to the power conduit.

## A \$63,000,000 project

WITH an estimated cost of \$63,000,000 the Sacramento Municipal Utility District has been granted a 50-yr. license to develop hydroelectric power on the South Fork of the American River and adjacent streams. The project is required to meet increasing demands for power in the district.

In its final form the development would include eight dams providing reservoirs with a total capacity of about

276,000 ac.-ft., three powerhouses with an installed total capacity of 160,000 kw., tunnels, conduits, and electric facilities.

At the same time the FPC issued a order permitting Michigan-California Lumber Co. to intervene in the planne development. This company has valuable timber lands in the area to be flooded by the project and is petitioning for an exchange of acreage through the U. S. Forest Service.

## Hydro project to start

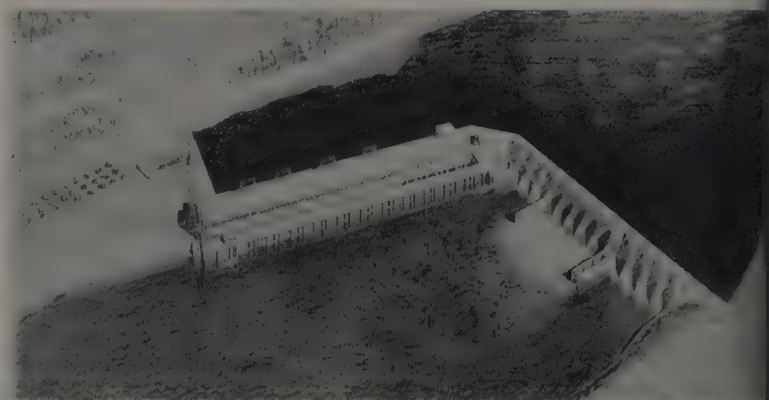
A \$50,000,000 hydroelectric project will be started immediately following securing of necessary permits by Southern California Edison Company as part of its Big Creek development. The main feature will be a dam 330 ft. high at 950 ft. long, across the San Joaquin River about 60 mi. northeast of Fresno. An 8-mi. tunnel, 20 ft. in diameter, will deliver water to a two-unit powerhouse.

## Big concrete pipe contract

UNITED CONCRETE PIPE Corp., Baldwin Park, Calif., a subsidiary of U. S. Pipe & Foundry Company, has received a \$5,400,000 contract for supplying aqueous reinforced concrete pipe. The pipe will be used to construct an effluent ocean outfall as part of the \$60,000,000 expansion program of the Los Angeles Hyperion Sewage Treatment Plant.

More than 6 mi. of pipe are required, most of it 12 ft. inside diameter. The unit will use about 7,900 tons of reinforced steel and 109,000 tons of cement aggregate to manufacture the pipe.

The effluent outfall line will be installed by Hyperion Constructors, a joint venture of DeLong Corp., Heath Tibbitts Construction Co., Peter Kiewit Sons' Co., Macco Corp., Raymond Concrete Pipe Co., and Tavares Construction Co.



## ROCKY REACH DAM AS IT WILL LOOK COMPLETED

Construction of the dam and power house for the Rocky Reach hydro-electric project on the Columbia River near Wenatchee, Wash., by Public Utility District No. 1 of Chelan County, is progressing at the rate of 1,400 cu. yd. concrete poured per day. Scheduled for completion in 1962, the project will be equipped with seven generator units and have a total capability of 775,000 kw. Engineering for the project and supervision of all construction is under the direction of Stone & Webster Engineering Corp. The dam and power house structure will have a total length of about 5,000 ft. and will require a total 950,000 cu. yd. of concrete.



# THE MODERN PIPE

## JOINS FAST, STAYS TIGHT

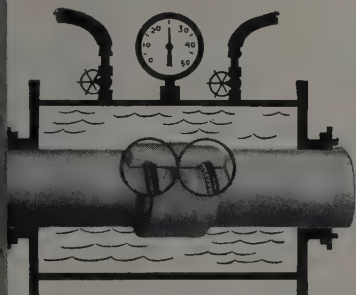


### "K&M" ASBESTOS-CEMENT PIPE and exclusive FLUID-TITE Coupling

For gravity sewer systems, "K&M" Asbestos-Cement non-pressure Pipe is the modern answer to the need for low-cost, permanent water-tight connections. The exclusive FLUID-TITE® Coupling makes installation quick and easy—and permanent.

**No special equipment; little skill needed.** Just two easy steps: 1. Lubricate rubber rings; 2. Slide pipe into coupling. The FLUID-TITE principle keeps piped fluids in, keeps external fluids and roots out, and allows pipe-laying that keeps up with the trench digger in speed. Installation costs go down when you specify the *modern* pipe and coupling system . . . "K&M."

**Learn the advantages** of the *modern* pipe from the K&M distributor. Or write to us for complete information.



penetration of external fluids and entrance of  
fluids are eliminated by "K&M" FLUID-TITE  
Coupling installed with "K&M" Asbestos-  
Cement Sewer Pipe. Here, external water under  
7 psi pressure (far beyond ordinary field con-  
ditions) has no effect on the FLUID-TITE joint.

**KEASBEY & MATTISON**  
COMPANY • AMBLER • PENNSYLVANIA



## Prestressed bridge for forest area road

IT'S NOT OFTEN you will find a small concrete bridge going up in the center of a logging area but that was the case early this year in Oregon. Crown Zellerbach Corp. replaced two worn out log bridges in the Sugarloaf section of the Clatsop County Tree Farm with two prestressed concrete bridges with spans of 58 and 60 ft.

While General Contractor Pettijohn Engineering Co. was pouring the piers at the sites, Empire Prestress Concrete Co. was fabricating the deck sections on casting beds at their Portland, Ore., plant. The finished sections were delivered 95 mi. to the bridge sites on logging trailers, swung into position with cranes and bolted together with high-strength bolts. Precast concrete curbs were attached on each side with conventional mild steel bolts. After erection the wire handling hoops are burned off.

Before traffic was allowed on the bridges James and Honey, of Portland, the consulting engineers who designed the structures and supervised construction, required that the longitudinal mortar seams be poured and cured.

The bridges were designed for off-highway loading totaling 143,000 lb. Concrete for the piers was 3,000-psi. conventional stone concrete, for the deck sections 5,000-psi. stone concrete. Each



4½-ft. wide deck section contains thirty-six ⅜-in. wire strands stressed to an initial force of 14,000 lb. for a total of 504,000 lb.

Bert Ross is superintendent of operations for Clatsop County and Vern Day was resident engineer for Crown Zellerbach.

## PRIMACORD

### Detonating Fuse

Plain • Reinforced • Wire countered • Plastic

#### SAFE

Complete detonation... no unexploded caps or powder. Cannot be set off by friction, sparks, ordinary shock; even a direct hit by lightning did not detonate Primacord.

#### EFFICIENT

Contacts every cartridge, even in deck loads. Initiates entire charge almost simultaneously. Can be hooked up to fire front line first, giving relief of burden and better fragmentation.

#### ECONOMICAL

Lowest overall cost because you get full efficiency from the explosive—no waste; and better fragmentation with less powder. Only one cap required—no cap in the hole.

PRIMACORD-BICKFORD  
Hot Wire Fuse Lighters  
Detonating Fuse  
Safety Fuse  
Celakap



COAST MANUFACTURING & SUPPLY CO.  
LIVERMORE, CALIFORNIA



## New Aid To Contractors!

Barnes Construction Pump Selector can help you avert costly delays—improve job-to-job efficiency—by moving more water faster, "on schedule!"

Unique chart inside shows typical construction jobs matched to pumps that do the job best—conveniently keyed to give you the right combination at a glance. Get yours from any of these Barnes distributors:



Central Equipment Co., Berkeley, Calif.  
Rasmussen Equipment & Supply Co., Salt Lake City, Utah  
Larson Equipment Co., Los Angeles, Calif.  
Lowry Equipment Co., Redding, Calif.  
The Rix Co., Inc., San Francisco, Calif.

Write Department L-117 for details



## State Building awarded

CONTRACTS totaling nearly \$6,500,000 have been awarded for construction of an addition to the state office building in San Francisco's Civic Center. The general contract went to Barrett Construction Co. of San Francisco for \$3,817,000.

An additive alternate bid was called for in the general work contract for facing the Golden Gate Ave. elevation above the base course with adhesive type ceramic veneer. The low bid received on the project was favorable and the alternate was accepted.

The new office building will have seven stories plus a full basement and a penthouse for mechanical equipment. The building's main mass is a slab form 118 x 379 ft., entirely of reinforced concrete construction.

The main entrance lobby will be located on Golden Gate Ave. and will connect directly with the 35-year-old existing state building facing on McAllister Street. Entrances will also be provided on Larkin and Polk streets.

## Money for John Day Dam

ANOTHER \$1,000,000 appropriation has been made available to advance preliminary work at the John Day Dam site on the Columbia River. Authorized in 1950, this additional dam for power and navigation will provide slack water for a distance of about 75 mi. from the John Day site to McNary Dam. It will also provide for a power installation of 1,250,000 kw.

Although no major construction activity will be possible with existing funds the money now available will provide for the construction of an access road from State Highway No. 8 in Washington to the dam site as well as more detailed planning and design. The first small appropriation for the project was in 1956 with about \$500,000 and last year an additional \$1,500,000 was made available, which has now been supplemented by the current \$1,000,000 appropriation.

## High bids on another job

ANOTHER Western project has required a second bidding because the original proposals were too much in excess of the engineers' estimate. This job was for the dredging of a 45-ft. draft channel in the Los Angeles Outer Harbor. When the first bids were opened by the Board of Harbor Commissioners the lowest was \$1,800,000 and this was considered excessive. A second bid call provided a low figure of \$1,568,000 from the Standard Dredging Corp. Second low was a figure of \$1,736,000 from Pacific Dredging Co., and Utah Dredging Co. submitted a bid of \$1,777,000. The work will involve the removal of 1,400,000 cu. yd. of material by dredge.

## Geology for engineers

Written to inform engineers on what they should know about geology and at the same time to discuss for geologists those phases of civil engineering necessary for their work, "Principles of Engineering Geology and Geotechnics," serves a dual purpose and fills a necessary void in technical literature. The authors combine practical experience in both fields with an extended background in teaching both sciences so that the book is a combination of text and handbook. The first part of the volume contains general information on rocks, soils, soils mechanics, subsurface water and subsurface exploration which are applicable to all types of structures. Much of the remainder of the volume serves to translate this type of information into the solution of problems relating to design and construction of particular engineering structures. Published by McGraw-Hill Book Co., Inc., 330 West 42nd Street, New York 36, New York, the book has 730 pages with extensive illustrations and is priced at \$10.00.

## New bids at Rocky Reach

NEW BIDS have been received by Chelan County Public Utility District No. 1 at Wenatchee, Washington, for completion of its Rocky Reach Dam and hydroelectric project on the Columbia River. Bids received on the first call were all rejected as being too high compared to the engineers' estimate.

On the second call, all bids received were below the engineer's estimate of about \$61,250,000 prepared by Stone & Webster Engineering Corp., who had revised their estimate up from \$55,250,000 used at the first opening.

If permitted to use their own plan for river diversion, the low bid would be that received from Rocky Reach Builders, a joint venture of L. E. Dixon Co., Arundel Corp., American Pipe & Construction Co., Guy F. Atkinson Co., and Hunkin-Conkey Corp. The bid was slightly over \$52,400,000 which was about \$2,500,000 less than the bid of the same group using the diversion plan contained in the design plans.

Rocky Reach Builders, the firm submitting the lowest bid, is carrying out a \$12,000,000 contract for Phase 1 of the project at the present time, with about half of the required concrete in place.

Construction to be carried out under the bids just received would include the final stage with completion of the spillways, building of three additional spillways and construction of the non-overflow section together with the powerhouse. Cost of the entire project when finally completed will be close to \$200,000,000.

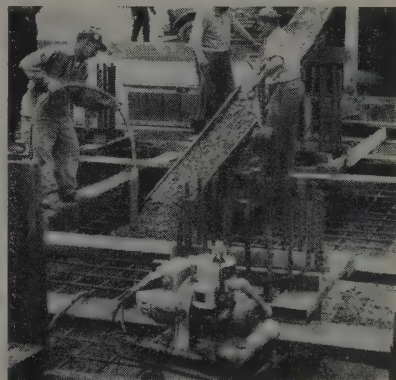
## Full Line of Carryable Construction Equipment Now Offered by Homelite



**Carryable Diaphragm Pump . . .** This self-priming, 120 pound diaphragm pump will handle water in the thickest sand, muck, or mud. Capacity: 5,000 g.p.h. Size: 3". Complete line of centrifugal pumps are also available in sizes from 1½" to 3".



**Chain Saws For Every Job . . .** Now you can choose from a full line of lightweight, powerful Homelite chain saws. From 3½ to 7 horsepower . . . 19 to 29 pounds. Brush cutting and clearing attachments are available to handle all your cutting jobs.



**One-Man Electric Vibrator . . .** It takes only one man to place concrete with powerful, Homelite high-cycle or universal electric concrete vibrators. Carryable Homelite generator provides power for high-cycle vibrators and 110 volt DC for all universal vibrators, tools and floodlights.

**HOMELITE**  
a division of Textron Inc.  
PORT CHESTER, NEW YORK



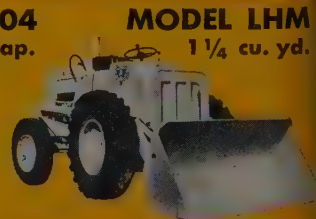
# HOW **TROJAN** FROM A **YALE**



**MODEL 154**  
2 cu. yd. cap.



**MODEL 104**  
1 1/2 cu. yd. cap.



**MODEL LHM**  
1 1/4 cu. yd.



# OWNERS BENEFIT & TOWNE TRADITION!

With the famous YALE trade-mark appearing on the new line of TROJAN tractor shovels, owners are finding that Yale & Towne's 90 year tradition of only the best in engineering, materials and manufacturing can pay-off in operating benefits . . . Today, every TROJAN, regardless of size, is designed and built to *dig, carry and load* better than any comparable machine on the market — and here's how they do it . . .

TROJAN'S straight line horizontal thrust utilizes the total weight and power of the machine for maximum *digging* efficiency; the low load *carrying* position permits fast, stable and safe travel; the high-lift reverse curve safety arms carry material to maximum *loading* height with exceptional speed and complete personal safety for the operator . . . Compare — you'll find that only TROJAN has *all* the operating features checked below — features that mean extra dollars in profits to you!

Because TROJAN distributors sincerely believe that a new TROJAN will outperform any comparable machine, they will gladly arrange a demonstration *any place, any time* — you make the comparison!

#### ✓ REVERSE CURVE SAFETY ARMS . . .

for full 360° vision at all times with absolute personal safety for operator.

#### ✓ ALLISON TORQMATIC TRANSMISSION . . .

for fast, easy shifting-*forward or reverse*-at full power without foot clutch.

#### ✓ STRAIGHT LINE HORIZONTAL THRUST . . .

allows constant crowding of pile while maintaining full traction and steerage.

#### ✓ INDEPENDENT BUCKET ACTION . . .

lets you fill buckets to heaping every time—even from windrows or low piles.

#### ✓ LOW LOAD CARRYING POSITION . . .

gives greater stability—allows faster, safer travel with far less spillage.

#### ✓ FASTER TIME CYCLE . . .

is the natural result of these features. Faster work means greater job profits!



## TROJAN\*

\*REG. U. S. PAT. OFF.

YALE & TOWNE

## TRACTOR SHOVELS

2 & 4 Wheel Drive Front-End Loaders

CONTRACTORS MACHINERY DIV., THE YALE & TOWNE MANUFACTURING COMPANY, BATAVIA, NEW YORK; SAN LEANDRO, CALIFORNIA

# Low bids and contract awards

## ARIZONA

**Southern Engineering and Construction Co., Inc.**, of Long Beach, Calif., received a \$1,054,692 contract for the construction of a municipal water system for Page. The work includes laying of pipelines, installation of pumping plants, filtration and chemical equipment and the erection of a steel water tank. **San Xavier Rock & Sand Co.** of Tucson submitted a low bid of \$457,231 for grading and surfacing in city of Tucson, Pima County. **Tanner Bros. Contracting Co., Inc.**, of Phoenix submitted two low bids for roadwork in Coconino County—a low bid of \$274,525 for 7½ mi. of grading and surfacing the Flagstaff-Holbrook highway and \$799,707 for 2.5 mi. of grading and surfacing the Cameron-Navajo bridge highway. **Copper State Construction Co.** of Mesa submitted a low bid of \$231,771 for 13 mi. of grading and surfacing the Flagstaff-Valle Airport highway in Coconino County. A low bid of \$174,031 was submitted by **Tiffany Construction Co., Inc.**, Phoenix, for grading and surfacing the Casa Grande-Maricopa highway in Pinal County. **Western Constructors, Inc.**, of Phoenix submitted two low bids for work in Cochise and Pinal counties—\$99,063 for bridge construction, grading and surfacing approaches on the San Simon-Hilltop highway in Cochise County and \$183,109 for 2.5 mi. of grading and surfacing the Oracle Jct.-Globe highway in Pinal County. **Isbell Construction Co.** of Phoenix submitted a low bid of \$430,462 for 5 mi. of grading and surfacing the Phoenix-Payson highway in Maricopa County. A low bid of \$505,131 was submitted by **Martin Construction Co.**, Tucson, for 4.9 mi. of grading and surfacing the Nogales-Lowell highway northeast of Nogales on State Rte. 82 in Santa Cruz County.

## CALIFORNIA

**Diversified Builders, Inc.**, of Montebello received a \$3,540,000 contract for construction for the Eleventh Naval District. The work includes two steel hangar buildings with shop area, radar tower, sewage treatment plant, addition to telephone building, access roads, and auto parking areas. **Tom E. Norcross**, Long Beach, received a \$1,337,300 contract for general work of physical education building at Los Angeles State College of Applied Arts and Sciences, San Bernardino Freeway campus, Los Angeles. **M. H. Hasler Construction Co.** and **F. W. Case Corp.** (joint venture) of Los Angeles submitted a low bid of \$1,556,014 for Robles Diversion Dam, Robles-Casitas Diversion Canal, Ventura River Project **Thomas Con-**

**struction Co.** of Fresno submitted a low bid of \$213,928 for construction of bridge and approaches south of Galt in Sacramento and San Joaquin counties. **Phoenix Construction Co., Inc.**, Bakersfield, received a \$304,971 contract for grading and paving about 4 mi. of U. S. 466 in and near the city of Bakersfield in Kern County.

## COLORADO

**Winslow Construction Co.**, Englewood, submitted a low bid of \$728,903 for 13.9 mi. of grading, structures and surfacing from east of Idalia to Colorado-Kansas State Line in Yuma County. **Z. H. Lowdermilk, Inc.**, of Englewood submitted a low bid of \$489,302 for 2.9 mi. of grading, structures and surfacing from Cortez extending south on State Highway 106 in Montezuma County. **Hoyle and Elbert Lowdermilk, Inc.**, of Englewood submitted a low bid of \$142,762 for grading, shaping, structures and surfacing north of Conifer in Jefferson County. A low bid of \$183,157 was submitted by **Peter Kiewit Sons' Co.**, Denver, for 10 mi. of grading and surfacing south of Limon on State Highway No. 71. **Pioneer Construction Co.**, Pueblo, submitted a low bid of \$503,764 for grading and surfacing 11 mi., between Limon and Last Chance on State Highway No. 71 in Washington County. **Walker Bros.** of Frankton submitted a low bid of \$420,075 for 4.6 mi. of grading, structures and surfacing between Whitewater and Gateway in Mesa County. **E. J. Rippey & Sons**, New Castle, submitted a low bid of \$410,338 for grading and structures between Matterhorn and Ophir, State Highway No. 145 in San Miguel County. **C. L. Hubner Co.**, Denver, submitted a low bid of \$408,110 for 2.1 mi. of grading, structures and surfacing from Blakeland to Deer Creek Jct. in Douglas and Jefferson counties. A low bid of \$655,432 was submitted by **Northwest Engineering Co.**, Denver, for 2.1 mi. of grading and surfacing in city and county of Denver.

## IDAHO

**Neilsen & Miller** of Twin Falls received a \$244,726 contract for constructing the roadway, drainage structures, concrete bridge and surfacing on 1.3 mi. of U. S. Highway 26 and State Highway 46 in city and county of Gooding. A \$107,801 contract was received by **Western Construction Co.**, Pocatello, for reconditioning the roadbed, drainage structures and a 28-ft. bridge on 5.1 mi. of the Parker-Egin road in Fremont County. **Marion J. Hess** of Malad received a \$423,138 contract for grading, surfacing and construction of 5 concrete bridges on 5.1 mi. of State Highway 68, and gravel surfacing on 5.1 mi. of State Highway 46 in Camas County. **Brown's Industries, Inc.**, of McCall submitted a low bid of \$191,607 for 3.2 mi. of grading and surfacing and

construction of one bridge, Payette National Forest, Valley County. **Morrison-Knudsen Co.**, Boise, received a \$1,719,808 contract for grading, surfacing and construction of 5 bridges on 27.7 mi. of State Highway No. 71, Brownlee-Cambridge, in Washington County. **Quinn Bros. & Robbins** of Boise received a \$669,497 contract for roadwork on the Ketchum Clayton highway in Blaine County.

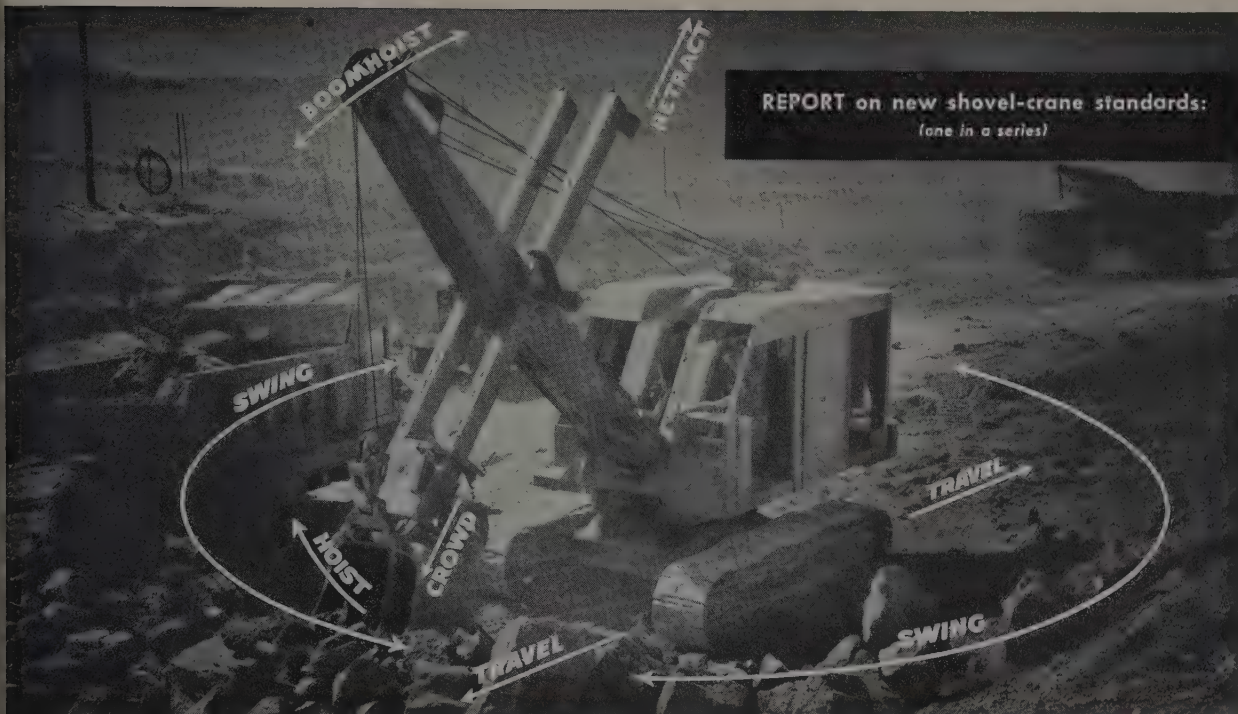
## MONTANA

**Peter Kiewit Sons' Co.**, Billings, received a \$1,172,599 contract for 12 mi. of grading and surfacing the Idaho Line-Dillon highway in Beaverhead County. A \$272,264 contract was received by **Wm. W. Strever** of Billings for 9.4 mi. of grading and surfacing the Scobey-Canadian Line Highway in Daniels County. **Wickens Brothers** of Suffolk received a \$257,052 contract for 8.1 mi. of grading and gravel surfacing the Lame Deer-Colstrip highway in Rosebud County. A \$174,510 contract was received by **Norgaard & Hilling** of Williston, North Dakota, for 7.5 mi. of grading and surfacing the Brockton-North Highway in Roosevelt County. **Roth Construction Co.**, Rapid City, South Dakota, received a \$140,702 contract for 9.1 mi. of grading and surfacing the Presserville-Girard-Fairview highway in McCone County. **Nilson-Smith Construction Co.**, Great Falls, received a \$208,004 contract for 8 mi. of grading, surfacing and structure on the Conrad-East Road in Pondera County. **Albert LaLonde Co.** of Sidney received a \$153,812 contract for 7.9 mi. of grading and surfacing the Glendive-Richey highway in Dawson County. **C. B. Lauch Construction Co.**, Great Falls, received two contracts for road work in Beaverhead and Cascade counties. A \$148,617 contract for bridge construction on the Idaho-Dillon highway in Beaverhead County and \$153,436 for bridge construction on the Cascade-Ulm highway in Cascade County. A \$124,586 contract was received by **O'Brien Construction Co.**, Great Falls, for 4.5 mi. of grading, gravel surfacing and ditch lining on the Skalkaho highway in Ravalli County. **Baltrusch Construction Co.**, Havre, received a \$160,032 contract for 3.7 mi. of grading and gravel surfacing the Chester-Gildford highway in Hill County. **Chert Brothers, Inc.**, and **Sandkay Contractors, Inc.**, of Ephrata, Wash., submitted a low bid of \$947,885 for earthwork and structures, Helena Valley Canal, Helena Valley Unit, Montana, Missouri River Basin Project.

## NEVADA

**Rice Bros., Inc.**, of Lodi, Calif., received an \$872,241 contract for 14 mi. of grading and surfacing on U. S. Highway 6 between Nye-White Pine County Line and Junction Preston-Lund road in White Pine County. **B. C. Richter Construction Co.** of Oroville, Calif., received a \$448,546 contract for 14.5 mi.





**REPORT on new shovel-crane standards:**  
(one in a series)

**ALL OPERATIONS ARE COMPLETELY INDEPENDENT** — In addition to eliminating shifting time, *Independent-Travel* allows the operator to swing and hoist the load while travelling. Whether to

save time or to jockey the boom around obstacles, the operator can swing the boom while his machine is travelling in either direction. This optional feature can be used with any front-end attachment.

# Getting 9 hours' output in 8

**Independent-Swing-and-Travel** is available on 11 Link-Belt Speeder models. Eliminates shifting . . . saves 20-30 seconds each move

Link-Belt Speeder users are setting new high-production standards by equipping their machines with *Independent-Swing-and-Travel*. Why? It eliminates time losses ordinarily occurring when the operator shifts from swing to travel and from travel to swing. With *Independent-Travel* shifts are eliminated and the machine can swing and travel simultaneously . . . you can jockey the boom around obstacles in tight quarters, move away from bank cave-ins in split seconds!

If you'd like complete details, proof that *Independent-Travel* can up output . . . cut maintenance and spare parts costs, too — see your Link-Belt Speeder distributor or write Link-Belt Speeder Corporation, Cedar Rapids, Iowa.



**MORE USABLE HORSEPOWER** — Size for size, Link-Belt Speeder shovel-crane utilizes more of the engine's available horsepower. This bonus pays off in added power at the bucket teeth, greater line pull plus extra power to swing, hoist and travel. Although it gets more usable power and line pull out of the same engines used in other shovel-crane, a Link-Belt Speeder remains well within the engine manufacturers' recommended operating speeds.

14,324

*It's time to compare . . . with*

# LINK-BELT SPEEDER

*Builders of a complete line of shovel-crane . . . with exclusive Speed-o-Matic power hydraulic controls*

of grading and surfacing from south of Steels Creek in Clover Valley to Junction U. S. 93, south of Wells.

## NEW MEXICO

**Reeder Construction Co.** of Albuquerque submitted a low bid of \$728,648 for channelization of the Rio Grande, Socorro Area, Middle Rio Grande Project. **Adams Construction Co.**, Santa Fe, received a \$498,016 contract for 10.6 mi. of grading and surfacing the Cedarvale-Corona road in Torrance and Lincoln counties. **Haake Construction Co.** of Santa Fe received two contracts for roadwork in Otero and Sierra counties—a \$640,206 contract for 4.1 mi. of grading and surfacing U. S. Highway 54, Tularosa-Alamogordo road in Otero County and \$131,533 for 6.2 mi. of grading and surfacing the Cuchillo-Winston highway in Sierra County. **Mesilla Valley Construction Co., Inc.**, of Las Cruces received a \$163,718 contract for grading and surfacing 7.1 mi. of the Rocky Arroyo road toward Sitting Bull Falls in Eddy County. A \$125,704 contract was received by **Crocker Construction Co.**, Denver, Colo., for rehabilitation of Albuquerque Division of Middle Rio Grande Project. **C. R. Davis Construction Co.** of Albuquerque submitted a low bid of \$213,463 for earthwork, clearing and irrigation rehabilitation, Belen Unit 5, Middle Rio Grande Project. **Richey Construction Co.**, St. Johns, Ariz., submitted a low bid of \$119,335 for earthwork, clearing and structures of irrigation rehabilitation Belen Unit 6, Middle Rio Grande Project.

## OREGON

**Rogers Construction Co.**, Portland, submitted a low bid of \$678,196 for grading and paving the Columbia River highway, Goble-Tide Creek section in Columbia County. **Valley Construction Co.** and **Tower Sales Erecting Co.** of Portland submitted a low bid of \$512,643 for bridge construction on the Pacific Highway, North Jefferson-Santiam Junction in Marion and Linn counties. A low bid of \$498,559 was submitted by **Hannan Bros. Co.**, Portland, for bridge construction on the Pacific highway in Multnomah County. **Earl McNutt Co.** of Eugene submitted a low bid of \$415,723 for grading the Salem Bypass section of the Pacific highway in Marion County. **Gibbons & Reed Co.** of Portland submitted a low bid of \$340,111 for bridge construction on the Pacific highway in Multnomah County. A low bid of \$256,373 was submitted by **Birkemier Construction Co.**, Milwaukee, for bridge construction on the Pacific highway in Multnomah County. **Glen Ousley Construction Co.** of Eugene submitted a low bid of \$156,703 for grading and paving the Ross Lane-Jacksonville section of the Crater Lake Highway-Jacksonville road in Jackson County. **J. W. Briggs** of Bend submitted a low bid of \$1,527,020 for construction of a relocated U. S. Forest Service road

at Cougar Reservoir on the South Fork McKenzie River. **K. L. Goulter & Son**, Seattle, Wash., received a \$1,509,290 contract for relocating U. S. Forest Service West Side road from Hills Creek Dam to the Packard Creek section on the Middle Fork Willamette River southeast of Oakridge in Lane County. **Gresham Construction Co.** and **Alcan Construction** in joint venture submitted a low bid of \$3,306,483 for construction of housing for Klamath Falls Air Force Base, Klamath Falls.

## UTAH

**L. A. Young Construction Co.** and **Vernal Sand & Gravel Co.** of Salt Lake City received two contracts for roadwork in Sevier and Piute counties—a \$161,544 contract for grading and surfacing, Glenwood Easterly to Jct. with State Road No. 24 in Sevier County and \$153,335 for grading and surfacing, Koosharem-Greenwich in Sevier and Piute counties.

## WASHINGTON

**Cherf Brothers, Inc.**, and **Sandkay Contractors, Inc.**, of Ephrata submitted a low bid of \$562,650 for potholes east canal enlargement, Columbia Basin Project. **George W. Lewis and Thompson Construction Co.**, Kennewick, submitted a low bid of \$613,028 for earthwork, concrete lining, and structures, Wahluke Branch Canal, Columbia Basin Project. **C & E Construction Co., Inc.**, Yakima, received a \$104,991 contract for 2.8 mi. of grading and surfacing in Yakima County. A \$426,988 contract was received by **Wilder Construction Co.**, Bellingham, for construction of overcrossing and approaches in Whatcom County. **Hardisty Construction Co., Inc.**, Vancouver, received a \$324,880 contract for 12.7 mi. of grading and surfacing, Mabton to Prosser in Yakima and Benton counties. **Glenn Dusky** of Moses Lake received a \$122,010 contract for 6.6 mi. of grading and surfacing the Booker-Scootenay road in Adams and Franklin counties. **N. Fiorito Co.** of Seattle received a \$218,679 contract for 2.1 mi. of grading and surfacing the King County road in King County. **Louis Elterich Co. & Del Guzzi, Inc.**, of Port Angeles received a \$470,536 contract for construction of North Fork of Skagit River Bridge in Skagit County. A \$273,464 contract was received by **N. A. Degerstrom Co.** of Spokane for 5.6 mi. of grading and surfacing Davenport to Gravelle road in Lincoln County. A \$183,915 contract was received by **Woodworth & Co., Inc.**, of Tacoma for construction of undercrossing in Pierce County. **Materne Bros. Co.** of Spokane received a \$187,221 contract for 17.7 mi. of grading and surfacing Monse to Okanogan in Okanogan County. A \$183,815 contract was received by **Russell-Gillett Co.**, Cle Elum for construction of Stampede road and Cabin Creek road U'Xings, Kittitas County.

## WYOMING

**Platte Valley Construcion Co.** of Grand Island, Neb., received a \$677,550 contract for grading, draining and structures on 5.3 mi. of 4-lane divided highway on the Wheatland-Chugwater road from Chugwater north in Platte County. **Asbell Bros. Construction Co.** and **Wyoming Paving Co.** of Riverton received a \$694,569 contract for grading, surfacing and structures on 5.1 mi. of section I of 4-lane divided highway and for grading and surfacing on 10.4 mi. of the south bound lanes of sections I and II of 4-lane divided highway on the Wheatland-Chugwater road from Chugwater north in Platte County. A \$363,946 contract was received by **Chas. M. Smith** of Thermopolis for structures on 4-lane divided highway on the Wheatland-Chugwater road from Chugwater north in Platte County. **Rognstad-Olson Construction Co.** of Casper received a \$246,203 contract for construction of underpass under the C. B. & Q. railroad on the "F" Street Route of the Casper Urban System in Natrona County. **Knisely-Moore Co.**, Douglas, received a \$261,912 contract for grading, draining, construction of twin girder span separation structure over the C. & S. Railway tracks and misc. work on the Cheyenne Urban System, Hynds Boulevard Route, in Laramie County. **Woodard Construction Co.**, Rock Springs, received a \$126,826 contract for grading and surfacing on 5.3 mi. of the Bedford-Turnerville road in Lincoln County. A \$106,111 contract was received by **Wyoming Paving Co.** of Riverton for grading and surfacing 14.6 mi. of the Riverview road in Fremont County. **Husman Bros. Inc.**, Sheridan, received a \$189,107 contract for grading, draining, surfacing and structures over Lodgepole Creek on 3.6 mi. of the Newcastle-Claireton road in Weston County. **Forgey Bros. Co.** of Casper received two contracts for roadwork in Park and Washakie counties—a \$107,601 award for grading, draining and misc. work on 6.2 mi. of the Greybull River road in Park County and \$165,091 for grading, surfacing and structures on 4.9 mi. of the Worland-Neiber road in Washakie County. **Spiegelberg Construction Co.** of Laramie received a \$1,802,781 contract for construction of an office building for Wyoming Highway Department at Cheyenne.

## ALASKA

**Baker & Ford** of Bellingham, Wash., received a \$3,714,452 contract for construction of five nose wing hangars on Elmendorf Air Force Base. The hangars, built to handle large military aircraft, will be turned over to the U. S. Air Force. **Morrison-Knudsen Co., Inc.**, of Boise, Idaho, submitted a low bid of \$399,900 for construction of Communications General on King Salmon.



# ALASKA Newsletter

By CLIFFORD S. CERNICK, Anchorage

**WINTER LULL**—On the Denali highway, Alaska's newest roadway leading into Mount McKinley National Park, workmen have put up a sign proclaiming that the road is "closed for the winter." In the Matanuska Valley, harvest time is over and pumpkins are being set aside for Hallowe'en. The hillsides in the valley's lowlands are yellow with fall colors. In Anchorage, radio stations are advertising "winter sales" and motorists are urged to get their cars "winterized." The signs are all there, including the first snowfall on the high peaks—winter, though it's not here yet, is so close we can feel its cold breath. Construction activity in Alaska is slowing to a lull in anticipation of the ice, snow and bitter cold that will soon be here.

**A QUICK SUMMARY**—As winter nears and construction activity tapers off, it's time to begin thinking again of next year's construction. A telephone check with several key construction industry officials indicates that next year's construction volume will probably drop off in comparison to 1957. Work on defense radar stations in Alaska is now virtually complete. The congressional economy wave has drastically cut into work scheduled on Alaskan military bases. There will probably be no abrupt falling off of construction, but there's every indication some downward trend is developing.

**STRAWS IN WIND**—Because of the decline in construction and near-winter weather, a perceptible increase in unemployment in Alaska is reported by officials of the Territorial Employment Service. Although the labor force in Alaska is 4,000 less than a year ago, approximately 1,000 more persons are jobless. The latest report I have shows more than 3,000 unemployed workers in the territory out of a total labor force of 51,225. The labor force a year ago was 55,329 and the total unemployed then was 2,168. Unemployment figures for Alaska's major cities: Anchorage, 1,498; Fairbanks, 1,262; Juneau, 134 and Ketchikan, 200.

**MANPOWER CUTS**—Anchorage business leaders are becoming more concerned about manpower cuts announced by the military and by the uncertainty surrounding military construction planning. Latest announcement from the Air Force at Elmendorf, near Anchorage, was that at least 1,000 military and civilian jobs will be eliminated here

before next June 30. The Army at Fort Richardson, also near Anchorage, reports it has no exact figures on the anticipated cuts but declared they would be "substantial." Because the economy of Anchorage is linked so directly with military and defense construction expenditures the Anchorage Chamber of Commerce has set up a special committee to study the problem. A similar situation confronts business leaders in Fairbanks, Alaska's second largest city.

**HOUSING GOES BEGGING**—Last year at this time housing in Anchorage was at a premium, but with manpower cuts hundreds of apartments have been made available. The Alaska Housing Corporation, which owns 1,262 apartment units, reported that it now has 100 vacancies, a situation virtually unheard of here. A study of the "houses for sale" section of the classified pages in the newspapers is interesting in this connection. One newspaper has five columns of classified advertising homes for sale. Such items as homes for sale and apartment vacancies usually are an excellent index to the condition of an Alaskan community's economy.

**GREAT WHITE HOPE**—Discovery of oil by the Richfield company on Alaska's Kenai peninsula, only 40 air miles from Anchorage, is looked to as a possible source of new jobs, new construction and greater prosperity for Anchorage. Richfield's discovery well, with a capacity of more than 900 barrels a day, may be only the first of many in this virtually unexplored territory. Should the actual scope of the "oil boom" measure up to present hopes and expectations, the resulting new Alaska industry, according to city officials, would more than offset the current employment and construction slump.

**UNION CLEARED**—In the wake of unemployment which developed in Alaska this summer and fall, a group of Laborer's Union members complained to International Headquarters of the union that there was discrimination used in despatching workers to jobsites and other irregularities in handling of union affairs. The International office sent Fred Gardner to Anchorage who suspended all officers of the local and took over as trustee. Gardner launched an immediate investigation of the union's affairs. He announced that there was no evidence of any dishonesty or corruption on the part of former offi-

cials of the local but indicated he would remain in trusteeship for about a year. He also reported certain changes were being made in procedures employed by the union's management.

**NEW DISPATCHING SYSTEM**—As part of Gardner's union probe, he discovered that the method of dispatching laborers to the jobsites left much to be desired. Gardner has ordered a new dispatching system, requiring unemployed members of the local to register each week. This will insure that those workers who remain in Alaska throughout the winter will get first call on available jobs, while those who arrive here from the states will have to wait their turn until all Alaskans are given employment. (One of the main beefs on the part of resident Alaska construction workers is that many times they remain unemployed while men newly-arrived from the states are given jobs.)

**GOVERNOR'S MESSAGE**—Alaska's governor Mike Stepovich made a forthright statement of his views on Alaska labor disputes at an educational conference sponsored by the Alaska Territorial Federation of Labor. The governor said that labor's responsibilities include "performance of an honest day's work, observance of contracts and union agreements and refraining from strikes except for a just cause." He commented that labor leaders and the rank and file must "promote justice in union activities and develop a cooperative attitude toward responsible management." The recently-appointed Republican governor is a pioneer resident of Fairbanks.

**CONSTRUCTION NEWS NUGGETS**—Work is being pushed on slum clearance in three major Alaska cities—Anchorage, Fairbanks and Juneau. . . J. Irwin Miller, president of M-B Construction Company of Anchorage and Seattle, recently received a check for \$1,260,571 as a partial payment on the \$11,000,000 Elmendorf paving contract. Afterwards, M-B and Patti-MacDonald companies were given a check for \$1,442,532 as partial payment for installation of Nike sites near Anchorage. . . Construction of 15 new schools within the next two years is planned by the Alaska Native Service. The program as currently outlined would cost about \$4,300,000. . . The city of Anchorage will be repaid by the Bureau of Public Roads for maintaining highways which go through the city. . . Housing and commercial construction in Alaska's cities is continuing at a brisk pace—in Anchorage this summer, building permits issued by the city averaged a total of \$100,000 a week or more. . . Currently being constructed in downtown Anchorage are a large bank building, and an office building.

# A

# NEW\*

# kind

Here's proof the new Athey 3-door design works! Note the high crest of the dumped material. No tie-ups, trailer rides easily away from load.



## **\*Trailer capacity nearly 4 times trailer weight with "T-1" steel**

The latest in the earthmoving field! It's the new Athey PW20 Bottom Dump Trailer and it's loaded with new design features.

Constructed of high-strength "T-1" steel, the PW20 is trimmed of excess weight, capable of handling 40-ton payloads at less cost. The capacity of the PW20 is nearly 4 times the trailer weight.

An exclusive high arch axle and 3-door design eliminate resistance of the dumped material. The load is dumped through three doors; two extra wide bottom doors and a rear door. The unit rolls easily away from the dumped load, without tire spinning, cutting time from your dumping cycles.

Combined with the Cat DW20 Tractor, the new PW20 offers you big capacity payloads, high-speed hauling, fast loading, instantaneous dumping, high production and low maintenance.

Get the complete story on the Athey-Cat PW20-DW20 Bottom Dump. Your Athey-Caterpillar Dealer can furnish you all the facts, or write direct for the new PW20 booklet.

## **\*Low loading height, easier to load, better stability and roadability**

Low loading height of 8' 9½" (average) and low center of gravity are additional PW20 advantages. Shovel cycles are faster, hourly production increased. And you get better roadability at high speeds, on turns, with the PW20's low center of gravity.



# of Bottom Dump!



**ATHEY-CAT  
PW20-DW20**

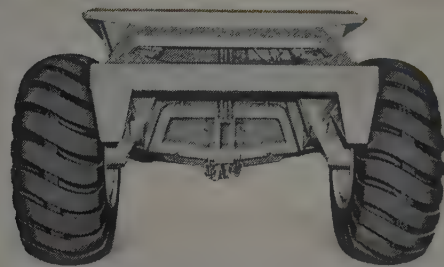
## New, exclusive 3-door design — high arch axle end dumping tie-ups

Rear discharge door, extra high clearance, and arch axle design are exclusive PW20 features. The PW20 rides away from the load with minimum resistance from the dumped material. You have no more "bogging down" at the dump common with old fashioned bottom dump rigs. You reduce "pushing" and save dumping time. Dumping is instantaneous and clean with 6-foot-wide bottom doors, rear door and steep sloping body sides. And if you want to spread or control the load, you can do so with the PW20's dependable, hydraulic-actuated dumping mechanism. No other hauling unit has the engineering features of the PW20 — features that add up to increased production at lower costs per yard.

**ATHEY PRODUCTS CORPORATION**  
5631 West 65th Street, Chicago 38, Illinois

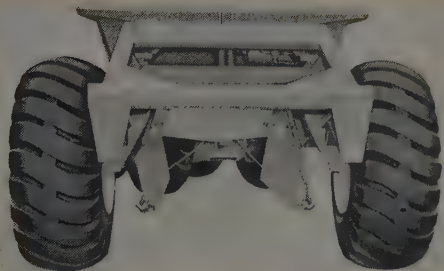
**WRITE TODAY FOR NEW PW20 BOOKLET**

*THE Complete TRAILER LINE... by the Leader*



**REAR DOOR CLOSED**

Rear door positively locked in place by cable pressure. Complete insurance against haul road spillage. As bottom doors open and cable slackens . . .



**REAR DOOR OPEN**

Spring loaded rear door swings upward providing clear opening; material flows out behind wheels.

# Atthey

# ENGINEERS and CONTRACTORS

Following his retirement as director of Region 2 of the Bureau of Reclamation at Sacramento, Calif., **Clyde H. Spencer** accepted a position with the Sacramento Municipal Utility District to manage construction of the District's Upper American River Project just starting. The new SMUD project engineer had spent 38 years of continuous service with the USBR. Virtually all of his career up to his appointment as regional director in 1953 was devoted to construction projects. He was construction engineer for Hungry Horse Dam in Montana from 1947 to 1953.

Appointed as director to succeed Spencer at Sacramento is **Bernard P. Bellport**, currently construction engineer on the Solano project in California. With the Bureau since 1936, Bellport's entire career has been devoted to work on the Central Valley Project.

**Col. A. E. McCollam**, Sacramento District Army Corps of Engineers chief, announces the appointment of **Elmer B. Mellor**, a structural engineer, as head of the Corps military design department. A registered civil engineer, Mellor will supervise design work on some \$60,000-\$100,000 worth of construction planned for Northern California.

**Robert N. Pomeroy**, president of the contracting and engineering firm of J. H. Pomeroy & Co., Inc., San Francisco, announces the election of three new directors: **A. C. Jonsson** and **F. A. Divita**, both vice presidents, and **D. G. Whittemore**, secretary-treasurer. **Dr. John F. Brahtz**, director of engineering, who is in charge of the engineering division of the company at Los Angeles, was elected vice president—engineering division.

**John A. Blume & Associates**, Engineers, announce the new firm name and expansion to larger facilities at 612 Howard St., San Francisco 5, Calif. Engineering officers of the firm are **John A. Blume**, **H. J. Sexton**, **J. P. Nicoletti**, **R. L. Sharpe**, **D. M. Teixeira**, and **A. I. Flaherty**.

**E. J. Johnson** has been appointed superintendent-engineer for the South San Joaquin Irrigation District in California. A registered professional engineer in the states of Wyoming and Montana, Johnson has had 35 years of general engineering practice, serving 15 years as project engineer for highways and 15 years in private practice.

**Newton L. Hinkson**, vice president of Bleifuss, Hostetter & Associates, Consulting Engineers, died at his home in

Los Altos, Calif., after several months illness. A member of the American Society of Civil Engineers, Hinkson was well known as a hydroelectric engineer, having spent 16 years in that field with TVA, Harza Engineering Co., International Engineering Co., and Bechtel Corporation.

New officers of the American Society of Civil Engineers were recently installed at the annual meeting of the Society in New York City. Among them were two men from the West. To serve two years as a vice president is **Samuel B. Morris**, Los Angeles, former general



Morris



Rinne

manager of the Department of Water and Power of the City of Los Angeles and a consulting engineer. **John E. Rinne**, San Francisco, engineer with Standard Oil Co. of California, was installed as a director for a three-year term. The new national president of the society is **Louis R. Howson**.

**Col. Albert L. Reed** has been assigned district engineer for the Corps of Engineers at Albuquerque, N. Mex., replacing **Col. Robert E. Cron, Jr.**, the district engineer since 1955, who has retired from active service. Just previous to his new assignment, Colonel Reed was serving as Midwest engineer and construction officer at Kansas City, Mo.

**David F. Shaw** has joined Kaiser Engineers and has been elected a vice president of Henry J. Kaiser Co. He comes to Kaiser Engineers after more than ten years experience with the Atomic Energy Commission. Under **L. H. Oppenheim**, vice president and assistant general manager, Shaw will be responsible for the direction of several of the company's major industrial engineering and construction projects.

**Donald K. Grant**, secretary and contract manager for Guy F. Atkinson Co., has been elected to the board of directors of Northern California Chapter, The Associated General Contractors of

America, Inc. Grant succeeds **Stephen D. Bechtel, Jr.**, of the Bechtel Corporation, who resigned for the reason that business keeps him out of the state for protracted periods of time.

Simultaneously with the above announcement, **Frank W. Callahan**, Chapter manager, announced that **Robert F. Young** has been appointed field representative. He will operate from Sacramento, covering the 46 northern counties of California in the field of Chapter membership promotion and contractor relations.

**John E. McDermott**, Hammond, Ore. construction inspector for waterway facilities for the Portland District, Corps of Engineers, recently retired following 39 years of Federal service.

In Idaho, Shoshone District highway engineer **Roy W. Jump** has been appointed as survey and plans engineer at Boise for the State Highway Department, replacing **James H. Cairns** who was promoted to assistant state highway engineer as announced in these pages last month. The Shoshone District position will be filled by **Charles Glasby**, a former Highway Department employee who recently was affiliated with a consulting engineering organization.

**Mark Mills**, senior resident engineer at Willcox for the Arizona State Highway Department, has been promoted to assistant district engineer, and has been assigned to Commission District 3 with headquarters at Safford.

**Richard H. Clough**, until recently a partner in Lembke-Clough & King, Inc., Albuquerque, has joined the faculty of the University of New Mexico as associate professor of civil engineering. A specialist in soil structures, Dr. Clough was connected with the University before joining the construction company. He is a member of the American Society of Civil Engineers.

**Leonard Bushnell**, a member of the American Society of Civil Engineers, recently opened an office for the practice of civil engineering in San Jose, Calif., at 206 Bank of America Building.

**Lawrence E. Hall**, until recently in charge of engineering studies for the Washington State Power Commission in Seattle, has joined the System Operations Department of the General Office of Puget Sound Power & Light Co. Bellevue. He holds membership in the American Society of Civil Engineers.

**Stephenson B. Barnes**, consulting structural engineer of Los Angeles, and a member of the American Society of Civil Engineers, was recently named "Man of the Year" by the construction industry of Southern California. The achievement award honored him for both his professional and civic attainments.

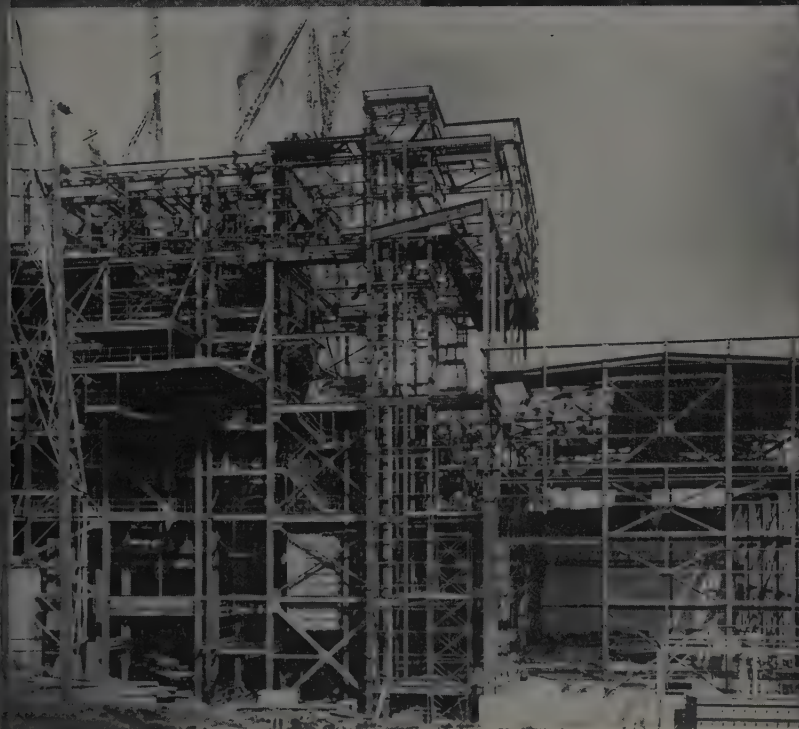
**David L. Narver, Jr.**, American So-



# STRUCTURAL STEEL ERECTION

for exacting requirements on projects of every type

**PITTSBURGH  
DES MOINES**



Steel for parking, steel for power—or steel erection for your own eventual project—all benefit by the special skill, expedition and satisfaction provided when Pittsburgh-Des Moines handles the job. Broad-gauged in experience and resources, including three modernly-equipped fabricating plants, we place a complete organization at your service. Phone, wire or write for consultation.



## **PITTSBURGH • DES MOINES STEEL CO.**

Plants at PITTSBURGH, DES MOINES, SANTA CLARA, FRESNO, and CADIZ, SPAIN

### **Sales Offices at:**

|                      |                               |                       |                          |
|----------------------|-------------------------------|-----------------------|--------------------------|
| PITTSBURGH (25)..... | 3420 Neville Island           | DES MOINES (8).....   | 921 Tuttle Street        |
| NEWARK (2).....      | 1719 Military Park Bldg.      | DALLAS (1).....       | 1225 Praetorian Building |
| CHICAGO (3).....     | 624 First National Bank Bldg. | SEATTLE.....          | Suite 528, 500 Wall St.  |
| EL MONTE, CAL.....   | P. O. Box 2068                | SANTA CLARA, CAL..... | 627 Alvino Road          |
| DENVER (2).....      | 323 Railway Exchange Bldg.    |                       |                          |

ciety of Civil Engineers member, and an associate with Holmes & Narver, Inc., since 1942, has been promoted to assistant vice president of the engineering organization.

\* \* \*

**Howard B. Blodgett**, ASCE, chairman of the Department of Civil Engineering at the University of Nevada, has been elevated to dean of the College of Engineering. Succeeding him as chairman of the Department is **Professor John A. Bonell, Jr.**

\* \* \*

**Gordon L. Burt**, ASCE, is the new City Engineer of Portland, Ore. At the time of this recent appointment Burt was engineer-manager of the Bureau of Sewage and Refuse Disposal for the City.

\* \* \*

**Leroy Martin**, ASCE, formerly City Engineer of Fresno, Calif., has opened a consulting engineering office known as the AAA Engineering Co., with headquarters at Fremont in the San Francisco Bay area. Martin will specialize in structural and municipal engineering.

\* \* \*

Two Certificates of Merit have been awarded by the U. S. Army Engineer North Pacific Division for outstanding records in accident prevention on big Alaskan construction projects during 1956. The winners were **George Avery**, Alaska District resident engineer at King Salmon, and the contracting firm of Patti-MacDonald & Associates. **Col. P. V. Kieffer**, Alaska District Engineer, presented the awards to **G. E. Lefler**, project manager for Patti-MacDonald in Anchorage, and to Avery at District headquarters.

\* \* \*

State Highway Engineer **William E. Willey** announces the appointment of **J. R. Van Horn** as assistant state engineer, construction and maintenance. Van Horn was recently transferred to the headquarters offices at Phoenix from Douglas, where he had served as district engineer.

\* \* \*

**Richard H. Wilson**, assistant state highway engineer—administration for the California Division of Highways, retired the end of October after 34 years of service. **J. P. Murphy**, planning engineer, has been promoted to succeed him. Other promotions are: **J. A. Legarra**, design engineer, to planning engineer. **George Langsner**, engineer-planning for District 7, Los Angeles, to design engineer at Sacramento. **Lyman R. Gillis**, engineer-operations for District 7, to district engineer-planning. Promoted to succeed Gillis is **Alfred L. Himelhoch**.

\* \* \*

**Hyde Forbes**, engineer and geologist, announces his partial retirement from active practice. His office and practice will be continued by **William G. Dunn** and **Richard S. Harding**, in consultation with Forbes, at 1535 Castilleja Ave., Palo Alto, Calif., with laboratory facilities at 1798 Filbert St., San Francisco.

\* \* \*

Retiring with more than 23 years

service with the Corps of Engineers is **Eugene J. Lammers**, head of the contracting officer's estimate section since completion of Bonneville Dam, where he was a construction inspector from 1934 to 1937.

\* \* \*

**Huber and Knapik**, consulting civil engineers of San Francisco, announce the moving of their office to 57 Post St.

\* \* \*

**Willis T. Moran**, chief of the chemical engineering laboratory branch of the Bureau of Reclamation's Engineering Laboratories at Denver, Colo., retired recently. A recognized authority on cement chemistry, Moran completed more than 37 years of Government service.

\* \* \*

**George Kurtilla** of the Seattle District Office of the Corps of Engineers recently left for Washington, D. C., to accept a position on the staff of the Board of Engineers for Rivers and Harbors. Kurtilla had been assigned to navigational facilities studies for the Seattle District and will continue this type of work in Washington.

\* \* \*

**Victor E. Cole** was recently elected a vice president of Henry J. Kaiser Co., and in his new position will be the project manager responsible to **E. T. Larsen**, Kaiser Engineers' vice president for engineering, for the direction of the engineering and construction work done by the company in connection with Kaiser Steel Corp.'s \$194,000,000 expansion program.

\* \* \*

**Lt. Col. James B. Newman III**, executive officer in the U. S. Army Engineer District, Seattle, Wash., for the past year, has been appointed deputy district engineer. Colonel Newman moves up as a result of the transfer of **Lt. Col. A. L. E. Zacherle** to Monterey, Calif. To fill the position vacated by Colonel Newman, **Roy O. Smith**, chief of the construction division in the Seattle District, has been appointed acting executive officer.

\* \* \*

**Frank R. Bonnickson**, highway design engineer for Region 7 of the Bureau of Public Roads, San Francisco, has retired after 38 years of service. All of this was in old District 2, Western Headquarters, and later in Region 7. In 1953 when the Western Headquarters were dissolved, Bonnickson was assigned as assistant division engineer by **Raymond Archibald**, who was then district engineer of Division 7. After Archibald's resignation, Bonnickson became acting division engineer during the critical period of reorganization of the division (later Region 7).

\* \* \*

**Francis A. Dunwell** is enjoying a new assignment in Hawaii, where he is supervising materials engineer in the District Public Works Office of the 14th Naval District in Honolulu. His prior connection was with the Bureau of Reclamation where he was in the earthwork branch at Palisades, Idaho.

**Roy K. Cramer**, senior civil engineer with the Bechtel Corporation, San Francisco, is in charge of engineering of powerhouses and power conduits in connection with the Sacramento Municipal Utility District, Upper American River Project. Until his newest assignment Cramer worked on Bechtel's Swift Project, Washington state.

\* \* \*

**William O. Miller** has resigned as vice president of the Vagtborg Lift-Slab Corp. to become a technical representative with the Prescon Corporation, prestressing specialist. He will make his headquarters in Southern California.

\* \* \*

**Arthur L. Williams**, a veteran with the Los Angeles Department of Water and Power, with 35 years service, was recently made assistant chief electrical engineer, succeeding **James D. Laughlin**, retired. Williams' former position was that of engineer of design and construction, which is now filled by **Edgar L. Kanouse**. **Oscar L. Sidenfaden** was named assistant engineer of design and construction, replacing Kanouse.

\* \* \*

The appointment of **Walter R. Howat** as Denver District Engineer for The Asphalt Institute has been announced. Howat will replace the incumbent, **John F. Pearring**, who has resigned to return to the engineering staff of the Idaho State Highway Department. For the last five years Howat was construction engineer and deputy resident engineering officer at the Denver Naval Air Station, during which time he served for a six-month period as construction manager for the eastern states for the U. S. Air Defense Command with headquarters at Colorado Springs. Howat will furnish engineering services to the Institute in the Intermountain States.

## CALENDAR

**Nov. 11-13**—Structural Clay Products Industry, annual convention, Greenbrier Hotel, White Sulphur Springs, W. Va.

**Dec. 2-6**—Committee C-1 on Cement and C-9 on Concrete and Concrete Aggregates of the American Society for Testing Materials, fall meeting, Fortin de las Flores, Mexico.

**Dec. 4-5**—The Asphalt Institute, annual meeting, New York Athletic Club, New York City.

**Dec. 9-13**—Committee D-18 on Soils for Engineering Purposes of the American Society for Testing Materials, joint meeting with the Mexican Society of Soil Mechanics, University of Mexico, Mexico City.

1958

**Jan. 16**—Beavers Award Dinner, Biltmore Bowl, Los Angeles, Calif.

**Jan. 20-23**—American Road Builders Association, annual convention, Washington, D. C.



# PETER KIEWIT SONS' CO. produces:

## Aggregate and mineral filler for bituminous surface course

In one arrangement of Cedarapids Units, large size pit material is initially crushed by a 2540 Portable Primary Jaw Crusher and further reduced by an 1836 Primary Jaw. Material then goes through an Intermediate Roll Crusher Scalping Unit and finally a Roll Crusher Secondary Plant. With this efficient combination of Cedarapids units, Kiewit produces minus  $\frac{3}{8}$ " fine aggregate containing rock dust mineral filler, and  $\frac{3}{4}$ " surface course aggregate.

## Three sizes of aggregate for concrete and binder course

In a different combination of units, the same Cedarapids Unitized Plant produces  $1\frac{1}{2}$ " concrete aggregate,  $\frac{3}{4}$ " concrete aggregate, 1" hot-mix binder course aggregate.

## Washed aggregate

From stockpile and double log washer, a Cedarapids 24" x 50' Conveyor delivers aggregate to a Cedarapids 4' x 12' triple-deck Horizontal Vibrating Screen installed over the loading bin and equipped with spray bars for final washing.

Kiewit bids in practically any state or country and can be sure of finding the right combination of Cedarapids units for each job. Units in Kiewit's Unitized Plant at Minot, N. D. can be arranged in a wide variety of combinations without major changes in the individual units.

## Different combinations of **ONE VERSATILE CEDARAPIDS UNITIZED PLANT**

supply many sizes of concrete and hot-mix  
aggregates for Minot Air Force Base



**IOWA MANUFACTURING COMPANY Cedar Rapids, Iowa, U. S. A.**

The flexibility of this Cedarapids Unitized Plant, and the contractor's ingenuity in varying the unit combinations to meet specifications for both concrete and hot-mix aggregate, assure maximum efficiency at low production cost.

There's a combination of Cedarapids crushing, screening, scalping and washing units that will solve your problem by producing almost any quantity, any specification, and meet practically any production condition. And remember, 100% portability lets you take them where the best contracts are. Ask your Cedarapids distributor to explain Unitized operation and show you how you'll profit.

# SUPERVISING the jobs

ing as his assistant, with Lee Durham, field engineer. The office is managed by Harry Parker. Miles Molesworth is first aid supervisor under T. J. Boyd who is in charge of safety for the entire Kings River Project. Supervising the job as coordinator is William McMurrin, assisted by Claude Myers, excavating superintendent; W. H. Kelly, excavating foreman; Dewey Coursey, truck foreman, and B. Farrell, swing foreman.

Quarry superintendent at Courtright is Frank Sganga, while Tom Willis is



**GROUP OF CONTRACTOR PERSONNEL for Wishon Dam:** Front row (l. to r.), P. A. Campbell, T. J. Boyd, (entire project), John Daley, B. L. Perkins (also on Courtright),

C. E. Cole, R. H. Gore, L. Boothe. Second row (l. to r.), M. Krumpotic, J. Eby, J. R. Williams, L. V. Wright, H. D. Gard, F. Baldwin, W. Wimsky, S. T. Brown, E. L. Richardson.

Project manager for both Wishon and Courtright dams under construction in central California for Pacific Gas and Electric Co. by Morrison-Walsh-Perini, and described starting on page 25 of this issue, is B. L. Perkins. The dams are a part of the Kings River Development for which John Erdle is project engineer. Max Daley is Erdle's assistant, and Carlos Hahn is field engineer. Chet Dapron is equipment superintendent for both dams.

At Wishon, H. D. Gard is general superintendent, and Mike Krumpotic is assistant superintendent. P. A. Campbell is office manager; K. E. Smith is in charge of warehouse, and Paul L'Esperance is purchasing agent. Assisting as foremen are: W. Wimsky and L. Wright, quarry excavation; R. H. Gore, truck; Bill Cross, dumped-fill. Excavation superintendent (swing) is A. S. Hunter, assisted by these foremen: E. Marshall and J. L. Narramore, quarry excavation; E. Riggs, truck, and D. Traacy, dumped-fill. Quarry superintendent is John Daley, with F. Baldwin and E. Richardson, drill foremen, and Harry Norbury, powder foreman.

At Wishon also is S. T. Brown who is aggregate and dry batch plants foreman. General foreman on forms, carpentry and tie-downs is A. Earnhardt, assisted by L. Swanson, P. Fort and L. Erickson, carpenter foremen. E. Miller, W.

Hedges and C. Alexander are in charge of mixing and placing concrete, screed operation and cleanup, while A. Ashmore is concrete finishing foreman, and H. Revels, re-steel subcontract foreman. Cecil Cole is general foreman in charge of loading, hauling and placing face rock during the day, with Rex Rice foreman on the swing. Electrical general foreman is Jack Eby, and pipefitter foreman is Joe Bobosian. In the mechanical end of the Wishon job under Superintendent Dapron are the following key supervisors: Leo Boothe, master mechanic;



**Perkins**

**Boothe**

I. Bartole, day foreman; D. L. Harrison, swing; H. Long and J. Hansen, graveyard, and J. R. Williams, lube.

At Courtright Dam, under Project Engineer Erdle, Don Hummel is work-

general foreman on drilling, assisted by Oscar Lacy. E. Irwin is powder foreman. James Duggan is concrete superintendent. Other foremen are E. E. Kelley, carpenter; C. K. Knight, labor, and Ed Shipman, pipefitter. In charge of cut-off trench work is Rex Hinegardner, aided by Verle McGaughey, trench foreman. Marion Wiley is electrical foreman. Superintending rock placement is M. Moore, and Clyde Pease is assisting as foreman. Under Chet Dapron, Bill Dickson is master mechanic, assisted by Claude Morgan (day), Bob Sandling (swing), Coy Sanders (graveyard), and Ray Arnold, lube.

District camp manager for the entire Kings River Development is Del Billings, assisted by Julian Johnson, camp manager.

\* \* \*

Two of the prime features of the PG&E Kings River Development east of Fresno, Calif., are Haas underground powerhouse and 6.2-mi. long power tunnel. A joint venture known as Kings River Constructors, comprised of Morrison-Knudsen Co., Inc., (sponsor), Henry J. Kaiser Co., Macco Corp., and Perini Sons, Inc., has the contract for the two units. John Erdle, who is project engineer for Wishon and Courtright dams, is also project engineer for this phase of the development.

Carl Larson, veteran M-K project



manager, is in charge at the powerhouse, with **J. Eide**, assistant project engineer. **Paul McDonald** is office engineer, and **J. A. Hobson** is office manager. Underground superintendent is **Tom March**. **W. W. White** is master mechanic. **Richard Bingham**, **Robert Harris**, and **Albert Marksbury** are walking bosses.

On Haas tunnel, **P. M. "Whitey" Lee** is project manager, and **Charles G. Kincaid** is assistant project engineer. The office is managed by **H. G. LaGrange**. Master mechanic is **Hugh Dennison**, and walking bosses are **Rusty Ray**, **Oscar C. Peterson** and **Carl Cochran**.



Lee



McDonald

Larson

**Ed Johnson**, superintendent, and **Art Adams**, general foreman, head the crew on a \$154,018 contract recently awarded to **John P. Stegge** for grading and surfacing 3.7 mi. of highway on Route 104 in Sonoma County, Calif. Started during September, the work will be finished some time in November.

\* \* \*

**W. O. Richey**, project manager for **C. H. Levell & Co.**, is in charge of a recent award to this contractor for electronic facilities at the Army Electronic Proving Ground at Fort Huachuca, Ariz. Superintending construction of these technical buildings is **W. B. Brady**. Doubling as office engineer and safety engineer is **C. Kircher**. The \$3,217,000 project got under way in July and work is expected to be finished about September 1958.

\* \* \*

**Larry W. Morrison** is supervising a recent award to **Morrison & Co., Inc.**, for grading, drainage, surfacing, oiling and paving five sections on P.S.H. 3 and 3E in Walla Walla County, Wash., a \$113,990 undertaking. Head mechanic is **T. R. Denison**. Crushing is subbed to **C. & E. Construction Co.**, and concrete to **Shademan Brothers**. Job started Aug. 23 and is scheduled for completion Nov. 20.

\* \* \*

**A. W. "Barney" Barnewitz**, project manager, **Fred Exner**, superintendent, and **Tommy Thompson**, mechanic superintendent, are top men employed by **Frank Capriotti** on his recent award to rehabilitate sewage treatment plant at **Stead AFB** in Nevada. Work on this \$166,145 contract started in September and will be finished next May.

\* \* \*

**J. F. Porcher**, project manager; **Gordon McGrew**, job superintendent, and **Bill Tate**, general foreman, key men for the contracting firm of **Griffith Company**, are in charge of the **Houston Freeway** job which recently went to the firm on a low bid of \$3,161,807. Work involves 3.6 mi. of grading, surfacing, and construction of 6-lane divided freeway, six major structures and pumping plant in **Orange County, Calif.** **Bill Crocker** is office manager, and other important men

are **Ray Tambash**, master mechanic; **Jack Conners**, bridge foreman, and **Jess Bittner**, grade foreman. Job started in June and will probably end about August next year.

\* \* \*

**G. W. "Buck" Fink** will be project manager, and **Henry Dougherty** project engineer on a \$5,271,079 award for design and construction of a bridge and



Fink

highway facilities in **Melbourne, Australia**, which went to **Utah Construction Co.** According to **C. S. Davis**, general vice president of **Utah**, completion is expected in about two and a half years.

\* \* \*

**Fred Hartson**, superintendent for **Balt-rusch Construction Co.**, is in charge of a 12-mi. grading and gravel surfacing job on the **Arnolde Creek-Hays-Harlem** highway in **Blaine County, Mont.**, on which **Balt-rusch** was the successful bidder at \$547,714. Assistant superintendent is **Robert Erickson**, and master mechanic is **Clyde Richardson**. This highway job includes 1,000,000 yd. dirt, 200,000 tons 3-in. base course, 22,000 tons ¾-in. crusher run, 5,500 tons chips, and 151,000 gal. of oil. **Balt-rusch** has the following equipment working on the project: 3 DW21s, 2 D8s and scrapers, 1 TD24 and scraper, D8 push Cat, a D9 push Cat, 2 No. 12 graders, D7 and sheepfoot roller, D6 dozer, **Pioneer 120Js** primary crusher, 35S secondary crusher, two 2,000-gal. water trucks and 3,000-gal. semi water truck. Construction started the first of August and con-

tractor expects to have it complete September 1958.

\* \* \*

**Ray Lynch**, bridge superintendent for **Imperial Paving Co.**, is supervising construction of a 300-ft. highway bridge over the **Rio Grande** at **Salem, N. Mex.** The 147,861 structure has 26-ft. roadway, precast concrete girders, pipe pile bents. Scheduled for completion in November, the job started in August.

\* \* \*

**Tom L. Steward**, projects manager, and **Harry L. Swofford**, superintendent, were named by **B. Lue Bettilyon**, president of **Bettilyon Construction Co.**, to head the personnel constructing the additional buildings at the **Guided Missile Laboratory** located near **Salt Lake City, Utah**. The \$1,000,000 project got under way in July with December set as the completion date.

\* \* \*

**R. L. Dever** is superintending a \$1,834,739 4-lane highway contract recently awarded to **Armstrong & Armstrong** on a low bid of \$1,834,739. The work is on a 7-mi. stretch and covers grading, five bridges, drainage structures, base course, 3-in. hot-mix surfacing on U. S. 60-85 north of **Socorro County, N. Mex.** **Dever** is assisted by the following foremen: **T. C. Carr**, bridge, **L. D. Arnold**, crusher, and **Albert Sauls**, grading. Construction started in September and is earmarked for December 1958 closing.

\* \* \*

**W. G. Harding** and **Clair Palmer** are superintending 2.9 mi. of grading and surfacing on the **Salmon River** highway west of **Willamina** in **Polk County, Ore.**, for **A. L. Harding, Inc.**, contractor for the \$149,954 project. Office manager is **Ed Williamson**; master mechanic, **M. C. Harding**. Work started in August and will be finished next spring.

\* \* \*

**Hank Eliason**, job superintendent, assisted by **Jim Perry** and **John Buell**, asphalt plant and paving superintendent respectively, is in charge of grading, draining, surfacing and asphalt paving on 1.3 mi. in **Clarkston, Asotin County, Wash.** The \$212,317 job is now in the finishing stage.

# Caterpillar announce in the world's mos

The engine that delivered outstanding performance is now available as the D353 Industrial

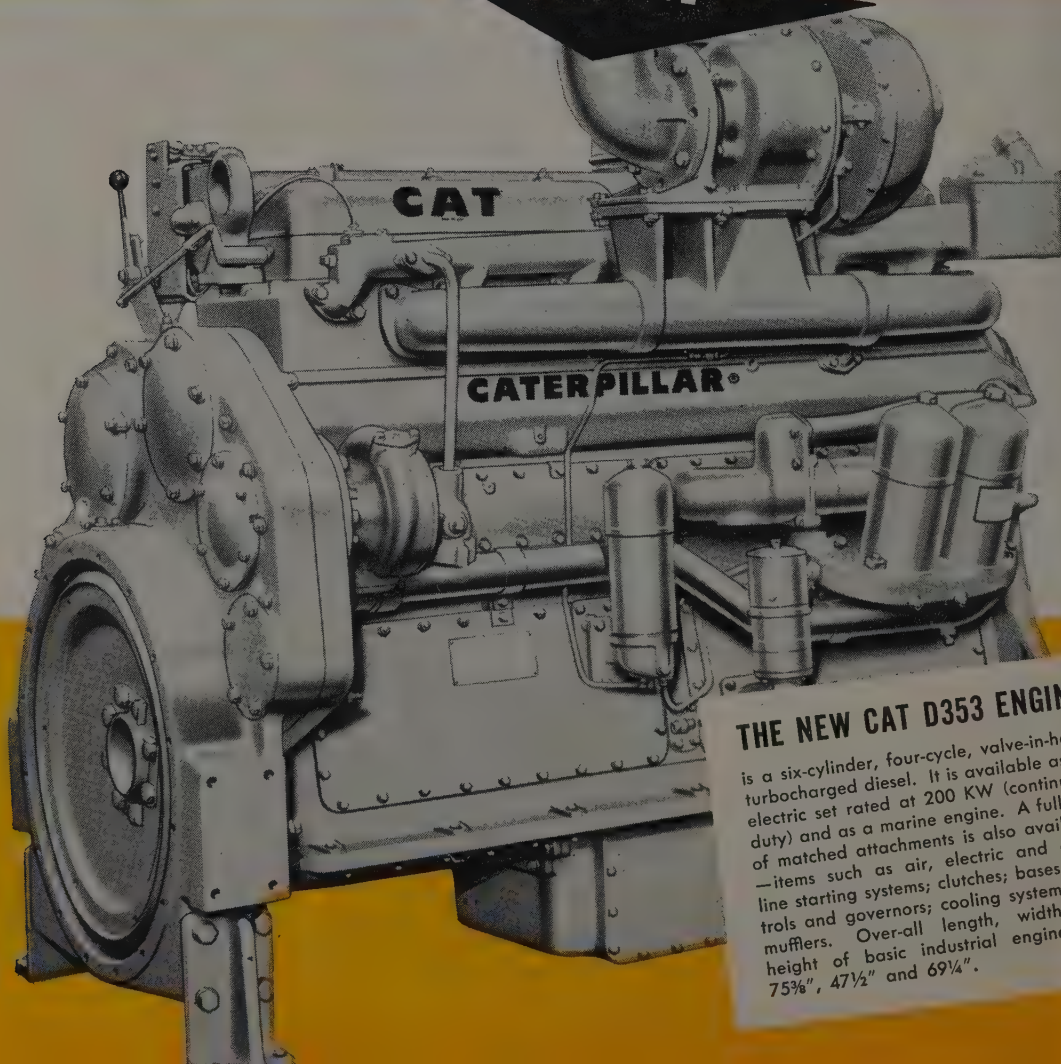
D397  
650 HP†

D375  
430 HP†

**New D353**  
**390 HP†**

D342  
225 HP†

D33  
140 HP†



**THE NEW CAT D353 ENGINE**  
is a six-cylinder, four-cycle, valve-in-head turbocharged diesel. It is available as an electric set rated at 200 KW (continuous duty) and as a marine engine. A full line of matched attachments is also available — items such as air, electric and gas line starting systems; clutches; bases; controls and governors; cooling systems and mufflers. Over-all length, width and height of basic industrial engine are 75¾", 47½" and 69¼".



# Another heavy-duty engine Advanced line of diesels

performance in the famous D9 Tractor  
Engine, Electric Set and Marine Engine

|      |         |                       |                       |         |        |        |
|------|---------|-----------------------|-----------------------|---------|--------|--------|
| D337 | D326    | D318                  | D315                  | D318    | D315   | D311   |
| HP†  | 200 HP† | (SERIES G)<br>175 HP† | (SERIES G)<br>115 HP† | 137 HP† | 91 HP† | 65 HP† |

†Maximum output capacity

Adding to Caterpillar's line of modern heavy-duty engines, there's now the Turbocharged D353 rated at 390 HP (maximum output capacity). This engine, a prototype of the unit in the mighty D9 Tractor, is job-proved after thousands of hours of operation in the field!

Like all modern CAT\* Diesels, the D353 incorporates in its design the advanced features developed by Caterpillar in a quarter century of diesel leadership. Compact and sturdy, it is built for the hard work. Its four-cycle design delivers the long, effective power stroke that puts power to more efficient use than other types of engines. Its turbocharger utilizes waste energy from the engine exhaust to increase over-all efficiency and economy. Its fuel system requires no adjustment. There are no cylinder ports to clean. And its exclusive Caterpillar angle-orifice injection valves, combined with the pre-combustion chambers, permit the use of a wide range of fuels including premium diesel fuels as well as low-cost No. 2 furnace oil *without fouling*. All these and other features add up to performance that no unit in its power class can match.

With the addition of the D353 to the Caterpillar Engine line, you now have a wider choice than ever for your

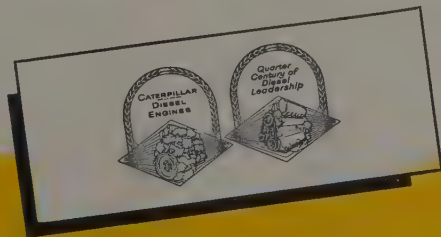
requirements. Engines are available up to 650 HP (maximum output capacity) and electric sets up to 350 KW (continuous duty). Either as original or replacement power, there's one among hundreds of different arrangements that exactly meets your needs. Leading manufacturers of machinery can supply these models in the equipment they build.

For complete information about the new D353 and other Cat Diesels, see your Caterpillar Dealer. Let him show you how diesel leadership based on a quarter century of experience can engineer the modern, heavy-duty diesels of tomorrow.

Caterpillar Tractor Co., San Francisco, Calif.; Peoria, Ill., U.S.A.

## CATERPILLAR\*

\*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.



### Caterpillar "Firsts" a Quarter Century of Diesel Leadership

"Hi-Electro" hardened cylinder liners  
Chemically conditioned cylinder liners  
Stainless-steel piston protectors  
Aluminum alloy bearings  
Interchangeable, adjustment-free fuel  
injection equipment

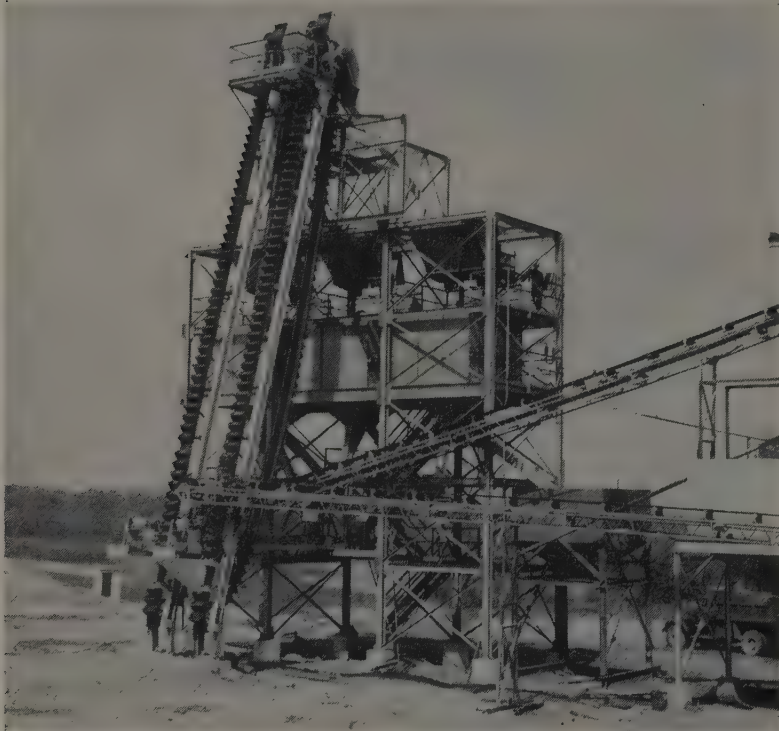
- Capsule-type injection valves
- Service meters
- Superior lubricants (detergent oils)
- Notarized, certified power

**AND  
MANY MORE!**

### Certified Power for Cat Diesel Engines

Through the years, Caterpillar Engines have earned a reputation for *honestly rated power*. Now Caterpillar backs this reputation with a notarized certificate covering the horsepower capabilities of each engine. Caterpillar is the first and only manufacturer to give you this assurance of capacity. You have a right to demand certified power when you invest in an engine. You get it when you buy from your Caterpillar Dealer!

# CONSTRUCTION BRIEFS



## Classifier bounces rock

A NEW PROCESS for upgrading gravel from natural deposits has been developed by the Construction Equipment Division of the Blaw-Knox Co., Mattoon, Ill.

The plant is relatively simple, consisting primarily of bins, conveyors and elevators, vibratory feeders and impact plates. It can be operated and maintained by personnel normally employed in gravel pit operations.

The process makes use of the fact that the soft deleterious materials have elastic properties widely different from the hard, sound stones. The stones are elevated into an overhead hopper. From this hopper they are gravity-transferred to a vibratory feeder. Stones are delivered from the lip of the vibratory feeder in a controlled manner so that they drop in the required pattern on to the surface of a massive inclined plate, made of abrasion and impact resistant alloy steel.

The bounce of the stones depends upon their elastic properties and their shape. The hard stones of any given

gravel will respond in such a manner as to give a characteristic distribution curve. The soft stones will also pattern themselves into a curve—but a different, and shorter curve.

Bounced stones are collected in three separate compartments with stones of similar elasticity being dropped into the same bins. The compartments are separated by adjustable dividers.

The divider furthest from the impact plate is set at a distance from the plate so that the product in that compartment will contain the desired composition. For example, an aggregate composed of 99% by weight of hard stone and 1% per weight of soft stones.

The material collecting in the compartment closest to the impact plate will be predominantly soft stones and will be discarded from the stage. The material collecting in the middle compartment will contain some hard and some soft. This is automatically and continuously recycled to the feed to be dropped again on the impact plate.

The net result of the operation of the

first stage is the production of beneficiated product and a discard. The discard from the first stage still contains too large a percentage of hard stone to be rejected. To recover the large part of the sound hard stones, the first stage discard is fed to a second and smaller separating stage. The operation of the second stage is analogous to the first.

Since the plant must be engineered to some extent to the type of natural gravel deposits found in the area in which the plant will operate, Blaw-Knox Co. maintains a laboratory and pilot plant for the purpose of testing samples of gravel. Blaw-Knox is making the facilities available to all gravel producers for testing samples.

## Rock bolts hold slabs in powerhouse spillway

PACIFIC GAS AND ELECTRIC CO. is using rock anchor bolts to prevent rock slippage on its American River Powerhouse near Placerville, Calif.

Crews are installing the heavy steel bolts to anchor blocks of granite which have been undercut by waters being released down the header box spillway channel from the flume above the powerhouse.

The spillway channel is maintained for emergency purposes to divert the 172-ft. head of water entering the powerhouse. The water is released monthly down the spillway.

In anchoring the rock, crews drill through the ponderous slabs to bedrock with 6 to 8 ft. of bearing. The 6 to 8-in. bolts are fitted at one end with a 6-in. slot that accommodates a wedge. As the bolt is driven in against the wedge at the back of the hole, the slot expands against the sides of the hole making a tight fit. A plate and cinch at the threaded end holds the granite slab in place, preventing further slippage.

The rock anchor bolts used by Pacific Gas and Electric Co. on this installation were manufactured by Bethlehem Pacific Coast Steel Corp. at its Seattle plant.

Prior to using this type of installation PG&E used cables to anchor the loose rock. The new method, which does not require a trained crew, is being tested. The American River location was the first site selected for this new type of rock anchor installation.

POWER will flow ahead of schedule from The Dalles Dam main generating units on the Columbia River. Col. Jason Graham, Portland District Engineer, has announced that the Pacific Northwest Power pool will begin receiving 7,000 additional kw. from the first main unit generator before October 1. The second of the fourteen 78,000-kw. units will begin its supply to the system sometime prior to its scheduled date of Nov. 1.





**TOP PERFORMANCE LOADING TOPSOIL** In Lemoyne, Pennsylvania, one of the 66 TRACTO-LOADERS owned by Pennsylvania Dept. of Highways gets heaped loads of topsoil with its Tip-Back Bucket. Dumps load in center of truck, too — no protruding wheels ahead of cowl to rob operator of valuable reach. Material is used to landscape cloverleaf near Harrisburg.

## ONE FLEET ORDER — **66 TRACTOMOTIVE LOADERS**



**PENNSYLVANIA JOINS  
OTHER STATES  
THROUGHOUT THE  
COUNTRY  
THAT ARE NOW  
TRACTO-LOADER®  
FLEET OWNERS**

Pennsylvania Department of Highways makes invests the taxpayer's money wisely. It has standards for equipment purchases . . . and motive TL-10, 1-yd TRACTO-LOADERS more meet every requirement. Proof — a fleet of 66 at one time!

But now these versatile loaders are busy making taxpayers happy. Strategically located in counties throughout Pennsylvania, the TL-10's eat a variety of materials to keep roads and bridges in top shape. This winter, they will help

keep traffic flowing — load cinders and chemicals for icy roads and remove snow.

And whenever there is inside loading . . . the TL-10 is the ideal machine with its short, 11-ft turning radius. Works where small loaders are normally used.

Make *your* investment a sound investment. Make it a TRACTO-LOADER — 5 models; ½ to 2 cu yd. See your Allis-Chalmers construction machinery dealer.

**TRACTO** — a sure sign of modern design

**SOLD AND SERVICED BY YOUR ALLIS-CHALMERS CONSTRUCTION MACHINERY DEALER**

Phoenix Equipment Company—Phoenix

**CALIFORNIA**  
Tractor Sales—North Sacramento  
& Equipment Sales—Redding  
Co.—Eureka & Ukiah  
Engine & Equipment Company—Berkeley

**CALIFORNIA**  
Machinery Co.—San Diego  
Tractor Co.—Bakersfield  
Service Co.—Los Angeles

**IDAHO**  
Southern Idaho Equipment Co.—Idaho Falls and Twin Falls  
Southern Idaho Equipment Co. of Boise, Inc.—Boise

**MONTANA**  
Mountain Tractor Company—Missoula and Kalispell  
Richland Machinery Company—Sidney  
Seltz Machinery Company, Inc.—  
Billings and Great Falls

**NEVADA**  
A D Machinery Company, Inc.—Elko and Las Vegas  
Reno Equipment Sales Co.—Reno

**OREGON**  
Haupt Tractor Company—Medford and Klamath Falls  
Wood Tractor Company—Portland  
Timber Tractor Company—Springfield

**UTAH**  
Cate Equipment Company—Salt Lake City

**WASHINGTON**  
Pacific Hoist & Derrick Company—Seattle  
American Machine Company—Spokane

**WYOMING**  
Studer Tractor & Equipment Company—Casper

# NEW LITERATURE

For your convenience in obtaining free copies of literature described, the company address is provided with each review.

## Inter-office communication

An 18-page, 2-color booklet, "Automation Business Control with Dictograph," describes a two-way circular system of communication offered by Dictograph. Now in use by 89% of the country's major companies, Dictograph offers free flowing two-way communication, immediate contact, automatic privacy. Booklet contains numerous illustrations. For a free copy address **Dictograph Products, Inc.**, 95-25 149th St., Jamaica 35, N. Y.

## Kelite offers steam cleaner bulletin

A bulletin describing the Mark series of three direct-fired Kelite steam cleaners is being offered by **Kelite Corp.**, 81 Industrial Rd., Berkeley Heights, N. J. In addition to illustrations of each model, the bulletin carries a table of specifications for each machine, as well as a list of specifications and optional features for all three Kelite steam cleaners. Ask for Bulletin P-5571.

## Oliver bulletin on 990 scraper

The Oliver Corp., 400 W. Madison St., Chicago, Ill., has released a 6-page bulletin on its new 990 Scraper. According to the manufacturer, this small self-propelled machine extends the applications of scraper equipment. With 6.7-cu. yd. heaped capacity, it is an ideal unit for the small contractor for many grading, filling, spreading and cleanup assignments. It is also a practical "in-between" rig for use on large projects. Bulletin I-703 describes and illustrates its features and includes specifications. Copies are available on request.

## High early strength cement

Detailed information, test reports, comparative strength diagrams and other engineering data covering a new Belgian high early strength portland cement is presented in an illustrated 12-page bulletin published by S. A. Cimenteries & Briqueteries Reunies, Brussels, Belgium. Known as C.B.R. III, this portland cement complies with ASTM C 150-1955 specifications, which sets normally, but hardens very rapidly. A Gilmore test reportedly shows the following average result: initial setting—1 hr. 40 min.; final setting—4 hr. 30 min. Rapid development of high early strength is not obtained by the addition of chemical products. No cal-

cium chloride ( $\text{CaCl}_2$ ) or other accelerators are used. Copies of the C.B.R. III bulletin and additional information can be secured by writing to **Indussa Corp.**, 511 Fifth Ave., New York 17, N. Y.

## Pre-heater maintenance

A new maintenance manual on KIM Hotstart electric pre-heaters for gasoline and diesel engines has just been released by the manufacturer. The 12-page manual deals with the regular inspection and servicing of KIM units and outlines a program of preventive maintenance that insures greater efficiency and longer life on installations. Contained in the pocket-sized booklet are models and sizes, parts lists for standard and special units, exploded drawings of the various models and informative material on replacement of elements. Copies of the maintenance manual may be obtained by writing the **KIM Hotstart Mfg. Co.**, West 917 Broadway, Spokane 1, Wash.

## Calcium chloride information

A comprehensive manual on the subject of handling, storing and applying calcium chloride has been published by the Calcium Chloride Institute under the title of Manual HM-1. The text is illustrated and describes how to store calcium chloride, plus procedures for handling the product, types of storage facilities and preparation of facilities for short and long term storage in all seasons. Although the manual is devoted primarily to the uses of calcium chloride in the highway industry, the text and illustrations also apply to all industries where calcium chloride is used and where it must be stored, handled or applied. Single copies are available on request to the **Calcium Chloride Institute**, 909 Ring Bldg., Washington 6, D. C.

## Report on vermiculite concrete

A summary report covering a test program to demonstrate the adequacy of vermiculite concrete as a horizontal diaphragm is now available from **Vermiculite Institute**, 208 South LaSalle St., Chicago 4, Ill. Test results show that vermiculite concrete roof decks have a high safety factor in resisting earth-

quake loads. The tests were directed by S. B. Barnes, consulting structural engineer of California. This report is of special interest in areas subject to seismic disturbances, since it has become increasingly important in such areas to determine the ability of roof deck materials to resist lateral forces and function as a horizontal diaphragm.

## Wire, strand, rope data

Specifications and design data on wire, strand and rope used on guyed structures and suspended systems of all kinds, except gigantic suspension bridges, are given in a 22-page catalog published by the Bridge Division of **John A. Roebling's Sons Corp.**, Trenton 2, N. J. Contents include specifications and diagrams pertaining to galvanized wire, galvanized bridge strand, galvanized bridge rope, fittings, and special fittings. Copies available on request to the company.

## Catalog on grating

A 16-page catalog available from **Borden Metal Products Co.**, Elizabeth 6, N. J., gives emphasis to the three basic grating types used in construction. Included are dimensional drawings, more than thirty grating subtypes; eisafeload tables for steel grating, aluminum grating, roadway grating and sidewalk slabs; plus other tables for panel widths, tread widths, floor armor, etc. Various safety treads and nosings are also shown in the catalog as well as detailed instructions for selecting, specifying and ordering grating.

## Tool catalog features tube working tools

The publication of an 8-page Tool Catalog is announced by The Weatherhead Co. Identified as Catalog 6111, the features the new line of tube working tools which Weatherhead has added to its line of brass and steel tube fitting hydraulic hose, hose ends and assemblies. The catalog illustrates and describes tools for flaring, burnishing, double flaring, cutting, bending, joining copper and J.I.C. steel tube. Copies of Catalog 6111 are available from the **Weatherhead Co.**, Customer Service Department, 128 West Washington Blvd., Fort Wayne, Ind.



## IH releases Payhauler booklet

An 8-page illustrated folder describing the two models of Payhauler, off-highway truck, is available from International Harvester Co. On-the-job reports and numerous photos of the units on road, quarrying and mining operations are given on the 24-ton "95" and the 18-ton "65." The last page of the folder offers a quick reference to brief specifications of the two machines. For your copy, write: Booklet CR-592-G, International Harvester Co., Construction Equipment Div., 180 N. Michigan Ave., Chicago 1, Ill.

## Mechanized material handling

The American Econmobile 600 hi-lift hydraulic loader which offers lower material handling costs with a completely mechanized system is described in a folder available from American Road Equipment Co., 4201 North 26th St., Omaha, Neb. In addition to the handling of palletized material, a wide range of attachments make the machine useful for such jobs as loading aggregate, pouring concrete walls, columns, and floors, and erecting structural units. On-the-job photographs, specifications, and illustrations of attachments are included in the 2-color brochure. Available on request from the company.

## Stran-steel products

The products of the Stran-Steel Corp. are presented in a recently published catalog. The publication contains complete technical information relative to the corporation's line of joists, studs, channels, ribbed decking and metal curtain walls. It is illustrated and contains several pages of loading tables. The 24-page catalog is available free by writing Stran-Steel Corp., Detroit 29, Mich.

## Huber-Warco bulletin on 3-wheel rollers

The construction and effective use of Huber-Warco's 3-Wheel Rollers, standard and variable weight models, are described in a new bulletin. This bulletin is divided into sections featuring information and illustrations of the main frame, "live" suspension of the sub-frame, torque converter, tail shaft governor, 2-speed transmission and the completely-adjustable guide roll assembly. In addition, the gear train assembly, the new final drive design and the independent braking systems are prominently displayed and explained. On the back cover is the firm's complete line of road machinery—tandem rollers, 3-wheel rollers, graders and the Huber-Warco Maintainer. Bulletin HWR 531

is available from any Huber-Warco distributor or by writing Huber-Warco Co., Marion, Ohio.

## Report on detergent-inhibitor

A 14-page illustrated Technical Report describing a new type detergent-inhibitor is available from the Enjay Co., 15 W. 51st St., New York 19, N. Y. Known as Paranox 302, it is designed to give outstanding performance in both low temperature stop-and-go automotive service and high temperature diesel service. The report includes complete information on the inhibitor, covering typical analyses, field evaluations, taxi fleet tests, passenger car field tests, laboratory engine performance tests, sludging studies, ordnance qualifications tests, etc. Copies of Technical Report ELD-7197, Paranox 302 and additional information are available by contacting the company.

## Costs cut with Signode steel strapping

The savings in labor and material costs resulting from the use of strapping are described in a 4-page brochure. Available from the Signode Steel Strapping Co., 2600 N. Western Ave., Chicago 47, Ill. The publication emphasizes the cut labor and material costs, reduced set-up time, and reduced stripping time that results from the use of Signode's form tying methods. Included in the brochure is an illustrated case history which describes how one contractor was able to save 350 man hours in pouring column forms for a six-story building. Copy available by writing to the company.

## Heavy-duty automatic curb paver

The Etnyre heavy-duty automatic Curb-Paver is fully described and illustrated in a 4-page bulletin. The new machine eliminates the need for curb forms in laying bituminous curbs. It lays curb in any straight or curved pattern, automatically cleans and preheats surface, compacts curb to over 90% at self-propelled rates of 4 to 8 ft. per min. The booklet gives full specifications, shows shape and dimensions of 12 standard mold designs, photos of curbs laid by machine. Uses and advantages are discussed. For a copy, write E. D. Etnyre & Co., 200 Jefferson St., Oregon, Ill.

## Method of rod operation given

Operation of the Lenker L-E-Vation Rod is described in a folder issued by

the Lenker Manufacturing Co., 599 Chestnut St., Sunbury, Pa. Measuring 5.4 ft. in length when closed and 10 ft. when extended, the rod is of weather-proof maple. Numerals are printed on a white durable 10-ft. endless steel band graduated in feet either to tenths and hundredths or to inches and eighth inches. Price of the rod is \$33.00; refill bands \$6.00 each, F.O.B. Sunbury, Pa. For a copy of the folder write to the company.

## Tension materials for professional concrete

A 15-page catalog which gives specifications for tensioning materials used in prestressing concrete has been issued by the Construction Materials Division of John A. Roebling's Sons Corp., 640 S. Broad St., Trenton 2, N. J. Included in the products presented are uncoated stress-relieved strand, galvanized strand, anchor fittings, end fittings, bearing plates, and jacketing equipment. Also given are illustrated examples of prestressed structures. Ask for catalog PC-936.

## Shoring and scaffolding for highways

A bulletin titled, "How to Use Steel Shoring and Scaffolding in Highway Construction" has been released by the Patent Scaffolding Co., Inc., 38-21 12th St., Long Island City 1, N. Y. Illustrated with typical job applications, the booklet details methods of using the company's equipment for road building. Included are engineering layouts and how to get them for your particular work. Ask for Bulletin G208.

## 3-in-1 utility spray

Complete information on the Littleford Model 101 Utility Spray tank can be obtained from Littleford Bros., Inc., 453 E. Pearl St., Cincinnati 2, Ohio. Applications of the 101 include repairing of rural roads, patching city streets, and spraying driveways and parking lots. It offers three operations in one unit—bar spraying, with the standard 10-ft. tubular bar with shifting mechanism or 8-ft. mechanically operated full circulating bar; hand spraying; and pouring pot patching.

## Front end wheel loaders

A 16-page catalog describing the Tracto-Loader line of front end wheel loaders may be obtained from local Allis-Chalmers dealers or directly from Tractomotive Corp., Deerfield, Ill. The catalog illustrates, describes, and gives specifications for each of the five Tracto-Loader models currently in production. Ask for Form No. 1033-5-57.

# A tale of two roads



**CONTRACTOR:** E. M. Duesenberg, Inc.,  
Clear Lake, Iowa.

**JOB:** Moving 4,000,000 cu. yd. for an eight-mile section of a four-lane divided highway (Route 69) near West Des Moines. Job includes cuts to 50 feet and Iowa's first complete cloverleaf.

**CATERPILLAR FLEET:** Two D9s, two D8s, three D7s, one D6, five DW21s, three No. 12 Motor Graders, one DW20, three D8-No. 463 Scraper units and three D6-No. 6S Bulldozers.

**MATERIAL:** Heavy glacial clay, shale, wet silty clay.

**PRODUCTION:** 20,000 yards per 20 hours on 2,000-foot round-trip hauls.

**PERFORMANCE:** "The D9 just can't be beat for power and for all-around performance. It really is showing its stuff in this tough clay. And this is our fourth season with some of the older DW21s. We've never had any transmission trouble or had the bowl off any of them. I feel sure our new DW21s will give us as good or better service."

JACK R. HEPP  
Project Manager

CAT\* D9 Tractor push-loads a DW21-No. 470 Scraper heavy glacial clay. Says Jack R. Hepp, Project Manager: "The D9 really is showing its stuff in this tough clay."

AMERICA'S new highway building program presents the nation's road builders with their greatest opportunity . . . their biggest challenge. That's why you'll find contractors using Cat-built equipment wherever you find the big, tough jobs. At the way up to the giant 320 flywheel HP D9, there's a complete line of Caterpillar track-type Tractors designed to deliver more production at lower cost with less down time. Whatever your own needs may be, just call your Caterpillar Dealer for



# builders

THEY'RE WORKING ON DIFFERENT SECTIONS OF U. S. 69 (IOWA'S NORTH-SOUTH INTERSTATE HIGHWAY). THEY'RE ENCOUNTERING DIFFERENT PROBLEMS. BUT THEY'RE BOTH DEPENDING ON CATERPILLAR FLEETS TO SOLVE THEM.



with No. 8 Ripper push-loads a DW21, while at right a push-loads a second DW21. Says Foreman Don Washburn: "Our new D8 with its ripper is really a productive unit."

demonstration. And remember this: you can count on him to back all his equipment with efficient 24-hour service and quality Caterpillar parts.

Caterpillar Tractor Co., San Francisco, Calif.; Peoria, Ill., U.S.A.

## CATERPILLAR\*

\*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

**WANTED—  
THE HARD WORK**

**CONTRACTOR:** R. B. Burch, Inc., Cedar Rapids, Iowa.

**JOB:** Moving 3,000,000 cu. yd. for a 10.8-mile section of Route 69, west of Indianola, Iowa. Cuts up to 50 feet.

**CATERPILLAR FLEET:** Two D9s, D8 with No. 8 Ripper, two D8s with sheepfoot tampers, 11 DW21s, and a No. 12 Motor Grader.

**MATERIAL:** Clay.

**PRODUCTION:** 35,000 cu. yd. per 20 hours on 3,600-foot round-trip haul.

**PERFORMANCE:** "Our new D8 with its ripper is really a productive unit. It loosens this hard clay, saving wear on our machines and giving us bigger loads. And our new DW21s are doing a great job. With the new LOWBOWL design, we load in the same amount of time or less and get three more yards per load."

**DON WASHBURN**  
Foreman

# NEW EQUIPMENT

*For your convenience in obtaining more information quickly the manufacturer's address provided with each review.*

## New 35-ton Maxi truck

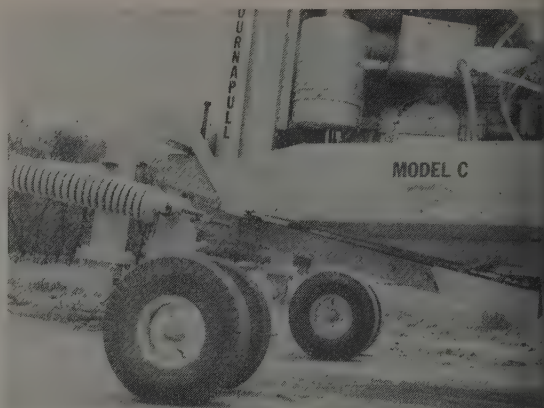
Availability of a new 35-ton truck crane carrier has been announced by The Maxi Corp. Two models are available to crane manufacturers, the T-84-F (8 x 4 drive) and T-64-F (6 x 4 drive). The new truck has a number of improved design features including the new patented Maxibrake attachments. The design features include: welded high-strength, alloy steel frame, removable outriggers with slide-type extensions both rear and midship, air assist on clutch, power steering, tow hooks front and rear, and extra large removable panel inside



cab for better accessibility to left side of engine. The Maxibrake attachments provide an automatic spring-actuated, mechanical application of brakes when the air supply is depleted through extreme use or other causes. The truck driver can also set the brakes for parking or emergencies with the attachments, at any time, by releasing the air through cab controls. Trucks are available with either the Waukesha Model 1-45 GKB, 6-cylinder, 207-hp. gasoline engine or Cummins NHB1-600 6-cylinder diesel engine. Main and auxiliary transmission provide a total of 12 forward speeds and 3 reverse speeds. Top speed is 38.8 mph. with a low-low speed of 1.7 mph. Brief specifications: total weight 39,300 lb., wheel base (center to center of tandems) 16 ft. 6 in., overall length 28 ft. 3 in., overall width 10 ft. 3 in. For complete specifications and additional information, contact **The Maxi Corp.**, P. O. Terminal Box 3129, Los Angeles 54, Calif.

## Roading dolly doubles as field crane

A unique new accessory has just been announced for use with Le-T-Westinghouse Model C Tournapulls. Manufactured by the Reisser Corp., it is a convertible wheeled dolly which quickly attaches under the nose of the C size prime mover to bring the unit within legal axle limits for fast job-to-job roading over the highway. The unusual feature of the unit is the convertibility which makes it a dual purpose tool. On arrival at the job, instead of being removed and laid aside to stand idle until the next equipment move, the dolly is easily transformed into a 2-ton mobile utility crane. Hitched behind a panel or pick-up truck, it can handle any of a wide variety of hoist and carry assignments. Featuring a simple three point hook-up, the dolly can be attached to the prime mover in less than 10 min. With the dolly positioned on the ground in front of the Tournapull, the operator merely lowers the scraper bowl of the machine to just above ground



level and noses over the dolly frame. When the bumper plows on the front of the Pull butts against the vertical channels of the dolly frame, positioning is complete. By raising the scraper bowl to maximum height the nose of the machine is forced down against the dolly. This downward pressure automatically lifts the rear of the dolly frame up against the belly-pan of the Tournapull. This done, all that is necessary now is to fasten four bolts. The price of the Dolly-Crane complete is \$1,730 f.o.b., Blair, Nebraska. Further information and specifications on the Dolly-Crane are available by writing to **Reisser Corp.**, P. O. Box 362, Blair, Neb., or by contacting your local LeT-WesCo distributor.

## High clearance tractor goes anywhere

A 2,800-lb. "go-anywhere" tractor is being made by **Atwood Vacuum Machine Co.**, 1404 Eddy Ave., Rockford, Ill. Low pressure, barrel-shaped Terra-Tires made by Goodyear Tire & Rubber Company's aviation products division are

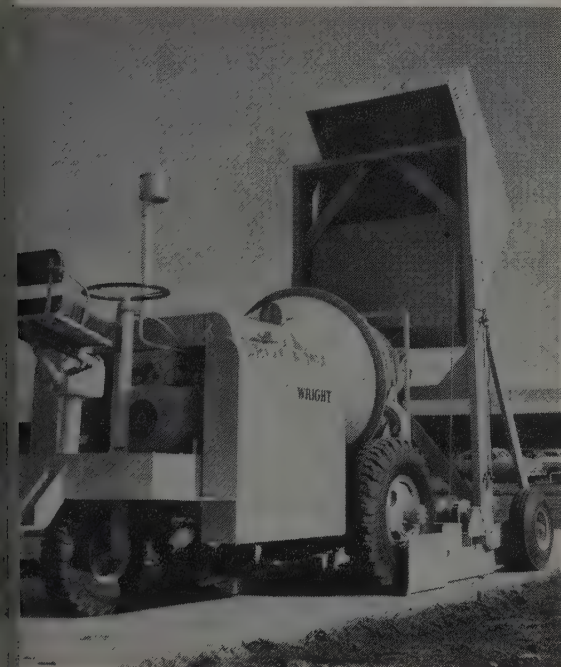


to enable the tractor to navigate almost any type of terrain, making it adaptable for highway construction, mining, farming and other industrial uses. Because of its high clearance, hydraulic power steering, scaled speeds and walking beam construction for front tire suspension, the tractor is said to have almost unlimited operating range. It is adaptable to special rigging and has a draw bar pull of 2,450 lb. for pull mowers, wagons, agricultural and industrial equipment. Wheelbase is 80 in. long, with 44-in. tread centers and 11 ft. turning radius. Maximum speed is 13.2 mph.



## Self-propelled concrete mixer

A new and self-sufficient mobile concrete mixer has been manufactured by the Good-All Electric Manufacturing Co., 100 First St., Ogallala, Neb. Called Drive-A-Mix, the new unit enables two men to mix and deliver 20 cu. ft. of concrete



in 4 or 5 min. It is self-propelled and is powered by a 2-hp. engine. It travels easily over hilly terrain and through sand and loose gravel. A low center of gravity makes it tip proof. It has a 20-cu. ft. drum. The mobile mixer has a road speed of 12 mph. and, because of a unique tricycle steering design, permits tight turns and traveling pours without maneuvering, concrete buggies and wheelbarrows. It is 7 ft. 8 in. high, 74 in. wide, and 11 ft. 6 in. long. Gross weight is 3,469 lb. Drive-A-Mix carries its own water supply. Each unit is equipped with 104-gal. capacity water tanks. Normally, 5 cu. yd. of concrete can be mixed without re-filling.

## Gasoline engine-driven welder

The Lincoln Electric Co., 22801 St. Clair Ave., Cleveland, Ohio, announces a new model of its widely used 6090, 200-amp., gasoline engine-driven portable arc welder. The welder,



called the K-6090, is NEMA rated 200 amp. at 40 volts and 60% duty cycle, has dual controls for the generator output, an electrical outlet providing 1 kw. of auxiliary d. c. power, an idling device, and is powered by a 36-hp. water-cooled engine. Controls on Model K-6090 include a five step selective current control and a continuous voltage control which also provides fine adjustments in the current. The ranges of the steps on the selective current control overlap, so that it is possible to obtain either a high or a low open circuit voltage for any current, thereby selecting the type of arc most appropriate for the work. The auxiliary power is 115 volt, d. c. which may be used for power tools or lighting. Welding controls, auxiliary power outlet, and wing-nut output terminals for the welding cable are externally mounted and readily accessible. A high compression head Continental F-162 gasoline engine that drives the welder develops 36-hp. at the 1,450-rpm. operational speed of the welder. Its output is said to exceed the normal demands of the generator and provide reserve power for smoother and more responsive operation and extend the life of the welder. For complete information write to the company.

## Compaction unit converts grader

A rubber-tired compaction unit called the Graderoll has been announced by the Midland Manufacturing Co., P. O. Box 534, Columbus, Ohio. It is designed for use with any tandem drive motor grader and installs easily on the rear of the machine, thus converting the grader into a combination road-maintenance and pneumatic-compactor unit. In this way, compaction work is accomplished simultaneously with the blading of the material, thereby reducing considerably overall road maintenance time and costs. The unit also eliminates the need for extra, more expensive towing equipment for pneumatic compaction. Effective compaction weight on each of the six tires is approximately 1,536 lb. when working with a grader weighing 23,000 lb. Since the grader's front tandem drive tires also act as compaction tires, and the Graderoll covers the width between the motor grader's two tires, over-all effective compaction width is approximately 90 in.

## Distortion and floor sag eliminated in new dump body

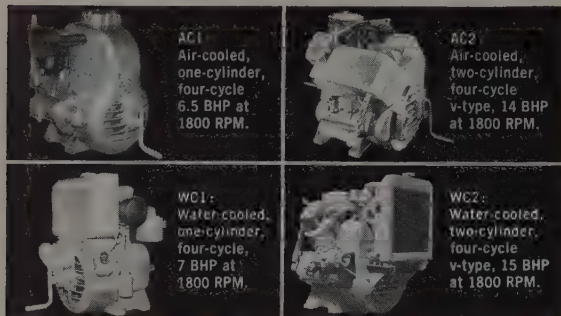
Specifically designed for use with Heil HMT 63-102 or HMT 63-117 Head-Mount Telescopic Hoist, The Heil Co., 3000 W. Montana, Milwaukee 1, Wis., announces the new HMT-11 Dump Body. The HMT-11 has the Heil underbody construction with interlaced cross-members. This results in



a body floor welded both to the top of the cross-member and the long channel. Consequently, distortion and floor sag are virtually eliminated. Hi-tensile steel construction throughout, with tailgates reinforced on all edges with rugged box-section members, and heavy-duty steel plate hinges are among the features of the new dump body.

# THE BIG 4 IN DIESEL POWER

AMERICAN MARC Inc. dominates the field of lightweight, low-horsepower Diesels by building its diversified line from the "Big Four" basic models illustrated here. Purchase and maintenance of engines and parts are simplified by the use of these compact and rugged prime movers.



**AC1**  
Air-cooled,  
one-cylinder,  
four-cycle  
6.5 BHP at  
1800 RPM.

**AC2**  
Air-cooled,  
two-cylinder,  
four-cycle  
v-type, 14 BHP  
at 1800 RPM.

**WC1**  
Water-cooled,  
one-cylinder,  
four-cycle,  
7 BHP at  
1800 RPM.

**WC2**  
Water-cooled,  
two-cylinder,  
four-cycle  
v-type, 15 BHP  
at 1800 RPM.

AMERICAN MARC also manufactures Diesel generating plants from 3 to 10 KW (AC or DC, and industrial three-phase), Diesel pumping units from 48 to 1700 GPM, marine propulsion, refrigeration units and power-packages for other services. American MARC can adapt any of its Big 4 engines to fit every job requiring from 5 to 20 BHP.

INQUIRIES ARE INVITED FROM DISTRIBUTORS AND DEALERS

**AMERICAN MARC INC.**

**DIESEL**



**ENGINES**

1601 West Florence Ave.  
Telephone OR 8-7174

Dept. WC-117  
Inglewood, Calif.

AMERICA'S LARGEST MANUFACTURER OF AIR-COOLED DIESELS

## New lightweight diesel

The new Diamond T diesel, Model 922, offers light weight and heavy duty specifications. The manganese-alloy frame lightened through use of aluminum crossmembers, and front bumper, hood, battery box and other parts are made entirely of aluminum. Aluminum cases on the transmission and auxiliary transmission, and aluminum hubs for many



the available axles also trip the weight of this new model. Gross Combination Weight rating for single axle tractors, 65,000 lb.; 76,000 lb. for tandem axle models. A complete equipped chassis, with all standard equipment including trailer connections, ranges in weight from approximately 10,000 lb. for single axle vehicles to as low as 12,210 lb. for tandem axle models. Three Cummins diesel engines are available for Model 922, the NHB-600, the HRFB-600 and the NTO-600. For complete information write to **Diamond Motor Car Co.**, 4401 W. 26th St., Chicago 23, Ill.

## New crane features heavy-duty beam support

The Becker Crane & Conveyor Co., 1010 Euclid Bldg., Cleveland 15, Ohio, has developed a new base-mounted crane. The new crane features a specially designed, heavy-duty beam support bearing which provides safe load support while requiring a minimum of maintenance. The bearing consists of a large tapered roller bearing located at the top



of the support column. Below are a pair of steel rollers which bear on a wear band welded to the column. These rollers are mounted on anti-friction bearings and are fully adjustable. The exclusive adjustment feature permits fast accurate leveling of the crane beam without the use of shims. Basic construction of the crane is such that the total beam deflection under full load does not exceed .060 in. per ft. The unit bolts to a suitable foundation and is not dependent on external structural members for support. The crane is built in sizes ranging in capacity from 500 to 10,000 lb. with boom lengths from 8 to 20 ft. Full 360-deg. rotation is provided and when electrical hoist equipment is to be used, a special commutator assembly, permitting full rotation, can be provided. Either tag line or bar electrification of the beam can be provided.

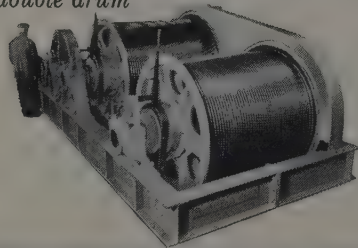


single drum

# SPECIAL CARPULLERS

**Specify**  
• load  
• speed  
• special conditions

double drum



*For your  
Special  
Carpuller  
consult  
Superior-  
Lidgerwood-  
Mundy—They  
Know How.*

Write for New 24  
page Bulletin C-616

**SUPERIOR-LIDGERWOOD-MUNDY CORPORATION**

Main Office and Works: SUPERIOR, WISCONSIN, U.S.A.

Pacific Coast Representative: GEORGE E. SWETT & COMPANY

100 Howard Street, San Francisco 5, California



## Compaction wheels for Scoop

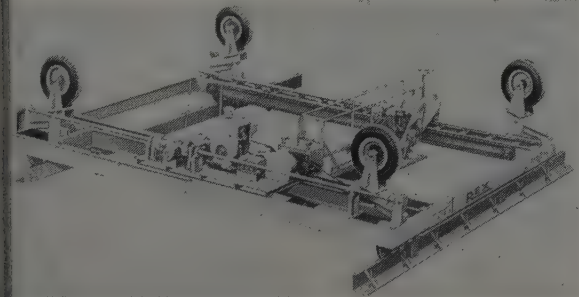
Mixermobile Manufacturers, Inc., 8027 N.E. Killingsworth St., Portland, Ore., have added compaction wheels to their LD8AD Scoopmobile. Each compaction wheel is 24 in. wide, 64 in. in diameter and weighs 4,200 lb. making a total of 16,800 lb. This weight added to that of the machine gives a



total of 45,300 lb. With the bucket empty the front axle weighs 24,440 lb., the rear 27,770. With the bucket loaded the weight increases to approximately 50,000 lb., which is evenly distributed per axle. These compaction wheels are interchangeable with the rubber-tired wheels and have as much, if not more, tractive effort.

## Finishers offer non-stop widening

A new line of Rex longitudinal float finishing machines in models from 10- to 32-in. working widths and offering numerous design and operating advancements is announced by Chain Belt Co., General Road Machines Division, Niles, Ohio. Powered-frame widening is one of the major working advantages of the new finishers. This optional feature permits easy nonstop changes in widths to speed work and reduce costs in



interchange and tapered-lane work. Width changes are quickly accomplished by Rex telescopic end frame design. For rapid, easy portability, transportation wheels are also available. Hydraulic pedestals at each corner lift the finisher off forms without blocking or need of special tools. Speed of operation is stressed in these new models. One engine powers traction wheels and another screed travel through two separate speed transmissions. This provides closest possible control of finish and better results. The large float measures 12 ft. in length and has up to 12-in. lag for fast working under all conditions. Float operates on double track with provision for easy crown adjustment. All controls are grouped for efficient operation and maximum visibility. Removable side rails permit collapsing machine for trailing on the transportation wheels or truck loading.

# TECHKOTE

## ... products for Concrete

### CONCRETE CURING COMPOUNDS

Clear — Pigmented — Black

### TILT-UP COMPOUNDS

Wax Base — Non-Wax Base

### LIFT SLAB COMPOUNDS

(YOUTZ-SLUICK METHOD)

Wax Base — Non-Wax Base

### SPRAY EQUIPMENT

Hand and Power Operated

### JOINT-SEALING COMPOUNDS

(COLD APPLIED IN 3 TYPES)

Ready Mixed Rubber Base Mastic,  
Rubber Base Emulsion and 2 Component Mastic

### SEALING COMPOUND APPLICATORS

### AIR-ENTRAINING AGENT

### AIR-ENTRAINING AGENT DISPENSERS

### AIR METERS FOR CONCRETE ENGINEERING

- Comply with all leading specifications
- Distributed and stocked in principal cities

### DISTRIBUTORS

San Francisco, California, W. J. Burke & Co.  
Sacramento, California, W. J. Burke & Co.  
Los Angeles, California, W. J. Burke & Co.  
San Diego, California, Squires-Belt Material Co.  
Portland, Oregon, W. J. Burke & Co.  
Seattle, Washington, W. J. Burke & Co.  
Billings, Montana, Midland Materials Co.  
Casper, Wyoming, Casper Concrete Co.  
Denver, Colorado, K. C. Construction Supply Co.  
Albuquerque, New Mexico, W. J. Burke & Co.  
Salt Lake City, Utah, Intermountain Concrete Specialties  
Phoenix, Arizona, Superior Building Materials  
San Antonio, Texas, Rufus A. Walker & Co.  
Honolulu, T. H., R. L. Castendyk Company  
Vancouver, B. C., Canada, Burrard Construction Supplies, Ltd.

TO BE SURE . . .

USE THE FINEST!

TECHKOTE



COMPANY

INCORPORATED

600 Lairport Street, El Segundo, California

## Hydraulic drive for crusher

Lippmann Engineering Works, Inc., 4603 W. Mitchell St., Milwaukee 14, Wis., has developed an optional hydraulic drive system for their portable crushing and conveying units for pit and quarry use. Smoother and more simple in application, this method of driving lessens vibration, noise, maintenance, and improves power transmission with a steadier more level fluid application of hp. This plus containment of power within the driving mechanisms themselves without the loss of power in vibration transmittal and degeneration to sub-structures, as is found in ordinary drives, makes this method of drive not only more self-sufficient, but tends to have less wear and tear on plant mountings. The drive works by oil pumped through flexible pipe lines from a reservoir tank to hydraulic motors mounted individually as driving units on the various plant components. Return lines bring the oil back to the reservoir tank. Pressure is constantly and automatically regulated to provide whatever power is required for each drive.

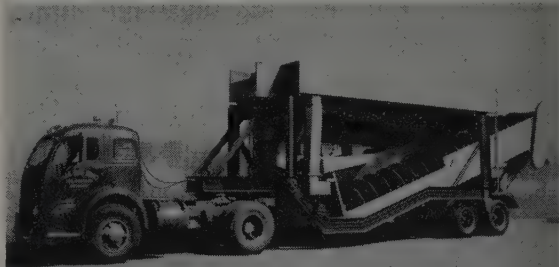
## Marion increases capacity of 43-M truck crane

Marion Power Shovel Co., West Center St., Marion Ohio, announces new engineering changes and increased lifting capacity for the Marion 43-M truck crane. Formerly a 35-ton machine, the rubber mounted unit now has a rated lifting capacity of 40 tons at an operating radius of 12 ft. Among the new engineering features is an improvement of the power up-power down boom hoist, which lowers the boom at one half the raising speed at any given engine speed, and allows the operator to spot the load safely and accurately. The boom hoist is fully independent of other machine motions. The gantry has been re-designed to improve the lead on the cable to give straight line reeving and obtain smooth wrapping of cable on the drum. Carrier outriggers are on rollers for fast and easy setting. Lightweight aluminum floats have been

added as standard equipment. The 43-M can use up to a 100-ft. boom. For high lift crane service, 15- and 30-ft. boom jibs are available. Maximum boom and jib length is 130 ft.

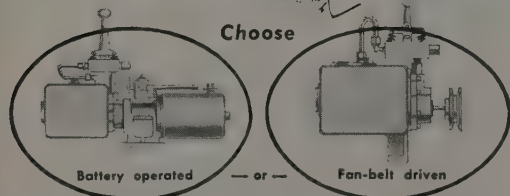
## Portable sand plant

Complete sand washing-classifying-dehydrating sections on wheels, for mobility, are now available from Eagle Iron Works, 203 Holcomb Ave., Des Moines, Iowa. The new units consist of a standard water scalping-classifying tank with automatic bleeder valves and 3-cell collecting-blending flume and



two single screw washer-classifier-dehydrators, compactly mounted on a chassis, for use with semi-tractor. Size and weight permit highway travel from pit to pit and the unit can be hauled right into the pit and positioned next to crushing and screening plant. Capacities range up to 200 tons per hour of specification material. Available with gasoline engine or electric power the plant can be used in dry pit or pumping operation. Literature available on request.

## Lift Snow Plows . . . automatically!

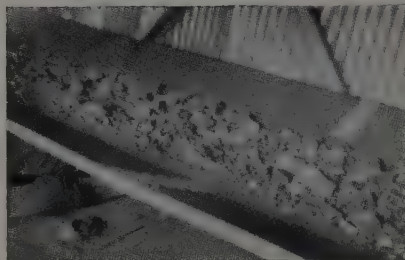


## MONARCH POWER HYDRAULIC CONTROLS

Snow removal is fast, dependable and safe with Monarch Power Hydraulic Controls. Cab-controlled for one-man instant action, the Monarch zips snow plows into operation with ease and speed. See your dealer or write for full details.

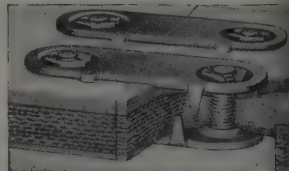
**MONARCH ROAD MACHINERY COMPANY**  
1331 MICHIGAN ST., N.E. — GRAND RAPIDS 3, MICHIGAN

## FLEXCO<sup>®</sup> BELT FASTENERS and RIP PLATES



**FOR HEAVY  
CONVEYOR  
AND  
ELEVATOR  
BELTS OF  
ANY WIDTH**

- ★ FLEXCO Fasteners make tight butt joints of great strength and durability.
- ★ Trough naturally, operate smoothly through take-up pulleys.
- ★ Distribute pull or tension uniformly.
- ★ Made of Steel, Monel, Stainless, Everdur.
- ★ Also Paomal top plates.



Compression Grip distributes strain over whole plate area

- ★ FLEXCO Rip Plates are for bridging soft spots and FLEXCO Fasteners for patching or joining clean straight rips.

Order From Your Supply House. Ask for Bulletin F-112

**FLEXIBLE STEEL LACING CO.**  
4704 Lexington St., Chicago 44, Ill.



# No crusher damage on overload or tramp iron . . .

## KUE-KEN<sup>®</sup> CRUSHER has exclusive safety device that instantly releases flywheel



4" x 12" Kue-Ken crushing perlite

able of tons per hour that will pass through crusher with jaws set at dimension shown when measured in the closed position.

| Kue-Ken crusher size | 3" | 1" | 1 1/2" | 2" | 2 1/2" | 3"  | 3 1/2" | 4"  | 5"  | 6"  | Horsepower range |
|----------------------|----|----|--------|----|--------|-----|--------|-----|-----|-----|------------------|
| 24" x 12"            | 22 | 26 | 32     | 36 | 43     | 50  | 56     |     |     |     | 15 to 30         |
| 30" x 12"            | 32 | 35 | 38     | 42 | 55     | 70  | 76     | 85  | 110 |     | 20 to 30         |
| 36" x 10"            | 38 | 47 | 57     | 67 | 80     | 91  | 105    |     |     |     | 25 to 40         |
| 36" x 20"            |    |    |        |    | 70     | 82  | 90     | 115 | 135 | 160 | 30 to 50         |
| 42" x 25"            |    |    |        |    | 90     | 120 | 150    | 165 | 180 | 215 | 40 to 60         |

able is based on crushing average hard, dry quartz or similar rock weighing at least 100 lbs. per cubic foot when crushed.

rite for catalog.

# KUE-KEN<sup>®</sup> CRUSHERS

'CRUSHING WITHOUT RUBBING'

STRAUB MFG. CO., INC., 8381 Baldwin, Oakland 21, Calif.

w Crushers    Gyratory Crushers    Overhead Eccentric Crushers    Revolving Screens  
 assifiers    Feeders    Rib Cone Ball Mills    Concentrating Tables    Vibrating Screens

ennsylvania Crusher Division, Exclusive Licensed Eastern Manufacturer and Distributor, 323 S. Matlack St., West Chester, Penn.  
 rmstrong Whitworth (Metal Industries) Ltd., Authorized Licensed Manufacturer and Distributor. Close Works, Gateshead-upon-Tyne 8, England

Kue-Ken has the one practical, efficient method to meet overloading and tramp iron . . . an automatic control that releases the flywheel and permits it to run free without ratcheting. Gone are the broken frames or toggles . . . the costly testimony to so-called safety toggles. Kue-Ken can be controlled to stop automatically on release of flywheel or to sound an alarm. Kue-Ken also eliminates the shutdowns common to conventional crushers that are caused by rapid wear through dirt and grit in the operating mechanism. Kue-Ken is the only crusher with a crankcase-type lubrication system that is sealed against outside grit with all mechanism operating in a breath of clean, filtered oil. In "crushing without rubbing" Kue-Ken gives at least 5 times longer jaw plate life. With higher operating speeds, it provides the capacity you need with a smaller, more inexpensive crusher. See the chart.



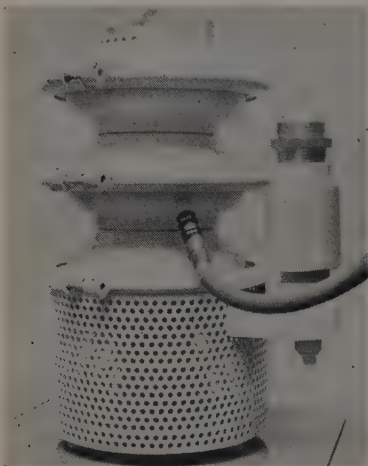
On correction of overload or tramp iron, the flywheel can be quickly reset and the Kue-Ken put back into operation without costly delays.

DEALERS:

SEATTLE, WASH. . . . . Washington Machinery Co.  
 SALT LAKE CITY, UTAH . . . . . Lund Machinery Co.  
 SAN ANTONIO, TEX. . . . . Closner Equipment Co.  
 PORTLAND, ORE. . . . . Contractors Equipment Co.  
 LOS ANGELES, CALIF. . . . . Garlinghouse, Fremont Co.  
 PHOENIX, ARIZ. . . . . Stapley's  
 DENVER, COLO. . . . . Union Supply Co.  
 CASPER, WYO. . . . . Moss Equipment & Supply Co.  
 VANCOUVER, B. C. . . . . Universal Equipment Co.

## High head pumping

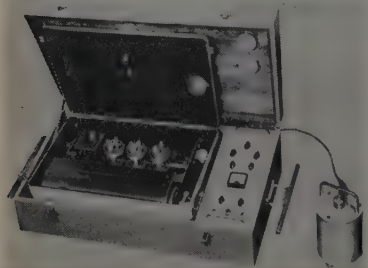
A new diaphragm-type, pneumatic pump for high head pumping has been announced by the **Layton Co., Inc.**, 4749 Whitnall, Cudahy, Wis. Built for construction, it is a good sump-pump for tunnel work to keep headings dry and can pump against a head of 100 ft. The



new pump can operate in a shallow trench and is well suited for operation and portability along the top of a trench. One man can move it as work progresses, without interference with routine duties. The pump ejects fluids with 60% solids and highly abrasive liquids. Fluids and materials are bypassed from suction line directly into discharge outlet and do not contact any working parts. It is 22 in. high, 12 in. in diameter, and weighs 65 lb.

## New British portable seismograph introduced in U.S.A.

A newly designed portable seismograph developed by the University of Cambridge, England, is now available in the United States. Produced by Hilger & Watts Ltd., British instrument manufacturer, the Watts Willmore Pattern Seismograph records for up to 24 hr. at

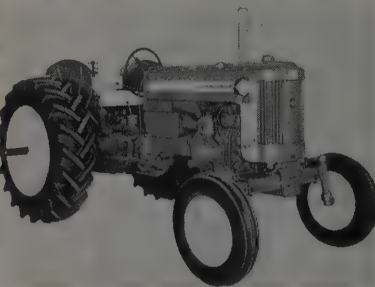


60 mm. per min. with needle-sharp definition, and is designed for a variety of applications within the construction industry. The seismograph's portability and simplicity of operation make it ideal for field use. A booklet containing further explanation, illustrations, and

specifications may be had by writing to **Jarrell-Ash Co.**, 26 Farwell St., Newtonville 60, Mass.

## New utility tractor by John Deere

A new wheel-type utility tractor, with power steering optional, is announced by **John Deere & Co.**, 1325 3rd Ave., Moline, Ill. The new tractor is called the "420" Special Utility (420-1). It handles a wide variety of front- and



rear-mounted working equipment, including backhoes, loaders, and trenchers. The 3-point hitch takes standard 3-point-hitch tools. This model delivers approximately 30 engine hp. and is designed for extra all-around stability under load. Regular equipment includes adjustable rear wheels and Dual Touch-o-matic hydraulic control.

## Better traction with new differential

The **Prime-Mover Co.**, Muscatine, Iowa, announces the addition of optional equipment to its Model M30 power truck for improved performance in mud or soft fill. A Powr-Lok no-spin differential is offered for maximum power delivery on unstable surfaces, along with dual drive wheels on heavy grip lug tread for extra traction. The differential delivers the major portion of engine power to the driving wheel with the better traction. It pulls out of spots where vehicles with conventional differentials spin their wheels. If one drive wheel goes off a runway onto soft fill, driving force is directed to the other wheel which has sure traction. Tire wear is also improved by positive traction under all operating conditions.

## Cable puller lightweight, tough

A lightweight cable puller, weighing only 10½ lb. and capable of unlimited cable travel, is available from **Griphoist, Inc.**, 424 Bryant St., San Francisco 7, Calif. Known as the Pul-Mite, the device can pull wire or wire rope up to 5/16 in. in diameter and has a 1,000-lb. pull capacity. Fast and easy to operate, Pul-Mite works in any position and can be used for a multitude of rigging jobs and pipe installations. An illustrated bulletin may be had by writing to the company.

## HEADQUARTERS FOR THE NEW LORAIN

**ANDREWS  
EQUIPMENT SERVICE**  
Spokane, Wash.

**ATLAS EQUIPMENT  
COMPANY**  
Salt Lake City, Utah

**CENTRAL MACHINERY CO.**  
Great Falls, Havre and Lewistown, Mont.

**COAST EQUIPMENT CO.**  
San Francisco 3, California

**A. H. COX & COMPANY**  
Seattle 4 and Tacoma, Wash.

**GENERAL EQUIPMENT CO.**  
Reno, Nevada

**INTERSTATE  
TRACTOR & EQUIPMENT CO.**  
Portland and Eugene, Ore.

**MCCOY COMPANY**  
Denver 17, Durango, Grand Junction,  
Pueblo and Sterling, Colo.

**MOUNTAIN TRACTOR CO.**  
Missoula and Kalispell, Mont.

**NASH-DAVIS MACHINERY**  
Billings and Bozeman, Mont., Greybull, Wyo.

**NEW MEXICO EQUIP. CO.**  
Albuquerque, New Mexico

**LEE REDMAN EQUIP. CO.**  
Phoenix, Arizona

**SANTA FE  
EQUIPMENT CO., INC.**  
Los Angeles and San Bernardino, Calif.

**SOUTHERN IDAHO  
EQUIPMENT CO.**  
Idaho Falls, Boise and Twin Falls, Idaho

**TRACTOR & EQUIPMENT**  
Sidney, Miles City and Glasgow, Mont.

**WORTHAM MACHINERY  
COMPANY**  
Cheyenne, Casper, Sheridan and Rock Springs

**YUKON EQUIPMENT  
INCORPORATED (for Alaska)**  
Seattle, Wash., Fairbanks and Anchorage

**SHOVELS • CRANES  
CLAMSHELLS • DRAGLINES  
HOES  
SALES • PARTS • SERVICE**



# *find the profits in the tough jobs* with a **BIG LORAIN-85A**



Vig-wagging a heavy-duty 3-yd. dragline bucket at the end of a 70-ft. boom, as shown in this picture, requires a machine with plenty of guts... lots of power, lots of endurance, lots of production... and that's why a Lorain-85A was chosen. Here are more reasons why Lorain-85A's measure up so well on all kinds of high-pressure, extra heavy-duty jobs — and why they can produce more profits for you!

**MORE POWER** — An abundance of power delivered through a torque converter that automatically adjusts engine torque to match exactly the machine needs... lots of "hang-on."

**EASIER CONTROLS** — Only 2 hand levers to actuate Lorain "Joy Stick" air power controls — reduce effort, motion and fatigue — increase speed, comfort and production.

**MODERN MOUNTINGS** — The new "Shear Ball" mounting that revolves the turntable on a huge, sealed "ball bearing" eliminates all rollers, exposed roller path, center pin and nut with their requirements of adjustment and maintenance. Proven 8 years of service, hundreds of installations.

**OPERATOR-DESIGNED CABS** — Just what the operators asked for... added comfort, convenience and efficiency. They look different — they are different.

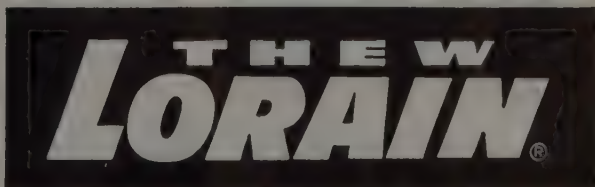
**MORE CRAWLER CHOICES** — 2 sizes — one 15' 6" long x 11' 10" wide for general-purpose service as shovel, crane, dragline, clamshell or hoe. One extra long and extra wide (18' 6" x 14' 2") for maximum crane lifting capacities and wide-radius dragline and clamshell work. Both full-air controlled, of course.

**LONGER SQUARE-TUBULAR-CRANE BOOMS** — Patent-applied-for square-tubular-chord crane booms. They're lighter, stronger. You can lift more, can reach out farther and can reach higher up, to 240 ft.

**HIGHER CAPACITIES** — Up to 60 tons as a lifting crane — 2½ yds. as a shovel or hoe.

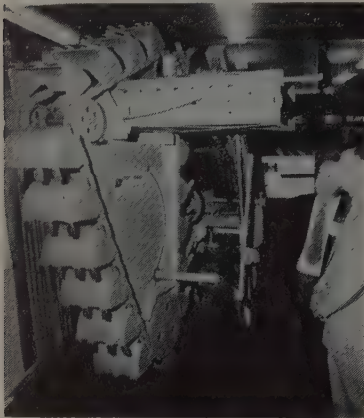
You won't find these features in any other comparable machine. That's why the Lorain-85A will do such a much better job for you. Your Thew-Lorain Distributor can give you the full story on this and other models in the Lorain line. See him today.

THE THEW SHOVEL CO., LORAIN, OHIO



### New trencher cuts backfill expense

An Everett high-capacity, vertical bucket-type trencher for exclusive use with IH's 350 utility tractor has been introduced by **Earth Equipment Corp.**, 2036 Sacramento St., Los Angeles 21, Calif. Designated the Super "S" 350, the



new trencher is equipped with hydraulic controls that permit disposal of dirt on either side of the trench, eliminating the expense of backfilling both sides. Capacity of the new model is established at 9 ft. per min. maximum, governed by solid conditions and depth of operation. Digging depth is 4 ft., cutting width 12 in. standard, 14 in., 16 in., and 18 in. with attachments. Complete information may be obtained by writing to the company.

### New wrench calibrator shock resistant

A new heavy duty hydraulic impact wrench calibrator, designed for measuring bolt tension and calibrating impact wrenches, has been announced by **Skidmore-Williams Manufacturing Co.**, 442 South Green Rd., Cleveland 21, Ohio.



The new unit, Model ML, is specifically built for use on heavy construction jobs. It measures bolt tension from 0 to 100,

000 lb., in bolt sizes ranging up to 1 1/4 in. Model ML is equipped with a special shock resistant gage saving unit, which through a spring mounting protects the gage against impact when calibrating power wrenches. The unit is portable, and can be attached readily to a girder or other outside structure for use. Further information may be obtained by writing to the company.

### Iron powder hard facing electrodes

Alloy Rods Co. has developed a new line of iron powder coated hard facing alloys. Tests with the new iron powder hard facing electrodes have shown that an average welder can now deposit 100 lb. of weld material in three-fourths the time it previously took him with conventional build-up and hard facing electrodes. The weld metal is dense and free of porosity and provides an excellent fusion bond with the base metal or build-up material to form a longer wearing deposit. Complete information and descriptive literature are available from the manufacturer, **Alloy Rods Co.**, 3535 Lincoln Highway West, York, Pa.

### LPG system available for heavy-duty IH engines

Liquefied-petroleum-gas fuel systems are now available for three International Harvester heavy-duty V-8 engines. These are the V-401, V-461, and V-549 models, and are offered as factory-installed, Underwriters-listed equipment. All heavy-duty IH trucks are offered with LPG fuel systems. Elimination of undesirable exhaust smoke and fumes as well as reduced maintenance costs and longer operating life are features of LPG engine operation. Horsepower and torque characteristics of the V-8 LPG engines are virtually the same as those of the gasoline version. To provide the ultimate in fuel economy and performance, all the new V-8 LPG engines include a new special combustion chamber specifically designed to use LPG fuel. Combustion chamber design permits high compression ratios. For further information contact your local IH dealer or **International Harvester Co.**, 180 N. Michigan Ave., Chicago, Ill.

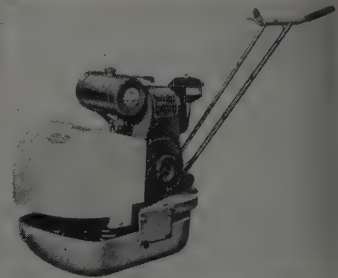
### Diamond T truck offers less weight, greater payloads

Diamond T's new Model 831, a light-weight truck, tips the scales slightly over 9,000 lb. and is designed to handle maximum legal payloads with no difficulty. Gross Vehicle Weight rating is upwards of 60,000 lb. with appropriate tandem rear axles, while Gross Combination Weight rating for tractor versions of 831 will range upwards of 76,000 lb. The new truck uses the Hall-Scott 590 engine with choice of either gasoline or LPG. The gasoline model, 590-GV-3, develops 239 brake hp. at governed speed

of 2,800 rpm., and 501 lb. ft. torque at 1,600 rpm. Compression ratio is 6.7 to 1. The LPG engine, 590-BV-1, develops 256 brake hp. at governed speed of 2,800 rpm., and 530 lb. ft. torque at 1,600 rpm. Compression ratio is 8.7 to 1. For complete information contact **Diamond T Motor Car Co.**, 4401 W. 26th St. Chicago 23, Ill.

### Self-propelled soil compactor

A self-propelled, one-man operated vibratory soil compactor known as the Model CM20 Terrapac has been announced by **Vibro-Plus Products, Inc.** This heavy-duty compactor delivers a 6,600-lb. impact, 2,000 times per min. Self-propelled speeds up to 75 ft. per min. are possible under normal working



conditions. A simple vibratory element is mounted in the 34 x 20-in. base plate with the gasoline engine mounted on a platform insulated from vibration by four springs. Power is delivered through a trouble-free V-belt drive. A centrifugal clutch permits the engine to idle without engaging the vibratory element. The throttle is on the steering handle which is mounted in "live" rubber for fast, easy handling. Total weight is 950 lb. and a tow bar and 2-rubber-tired wheels are provided for fast towing by truck or auto. For further information, contact **Vibro-Plus Products, Inc.**, Stanhope, N. J., or your local distributor.

### New cement finishers feature low height

Two new Superior Lo-Boy cement finishers capable of rapid finishing and offering stability and easier handling and loading have been introduced by **Superior Cement Tool Corp.**, 11616 Wright Rd., Lynwood, Calif. Known as Lo-Boy Senior and Lo-Boy Junior, both models measure only 16 1/2 in. from blades to top of engine, compared to approximately 32 in. for former models. This reduction in overall height is primarily the result of a new, completely-enclosed transmission with self-contained clutch. Due to the transmission's high efficiency, a 4-hp. engine on the Senior model now produces more usable torque than former 7 1/2-hp. engines and is equipped with a 44-in. ring. The Junior uses a 2 3/4-hp. engine and has a 35-in. ring.



# How Contractor Craft speeds grading of Oakland Street



Adams 660 is shown spreading heavy load in 3rd gear (4.7 mph), on street construction in Oakland, California. Adams' 15 speeds, including 3 optional extra-slow "creeper" gears, give this heavy-duty grader a big advantage for more efficient work in any kind of material.

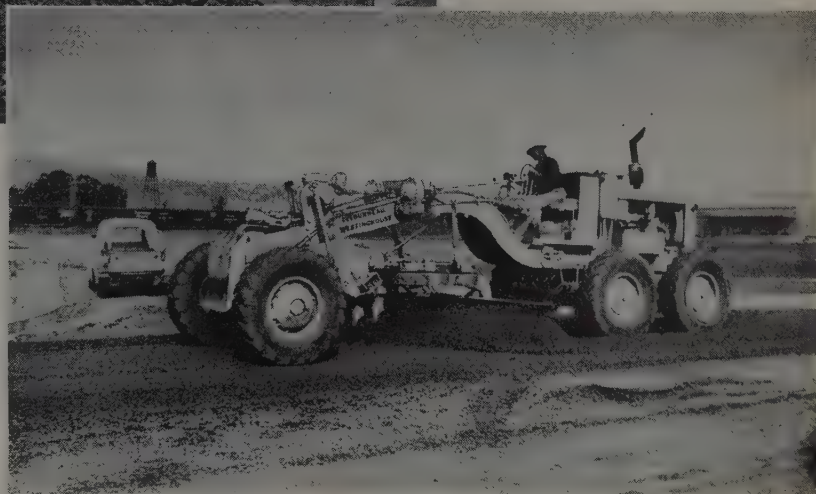
Adams 660 grader accurately spreads sub-base prior to surfacing. Owner-operator William Craft knows he can depend on his grader to build smooth, accurate grades — having recently completed a 270,000-sq. ft. building pad, built up with  $\frac{3}{4}$ " crusher-run gravel to a  $\frac{1}{4}$ " grade with 95% compaction.

The Independent Construction Co. contracted to build a 2 city-blocking, 35'-wide street in Oakland, California. The new section — on east 66th street — will serve industrial factories and warehouses in the area. To help speed construction and to handle all grading on the project, Independent Construction called on William E. Craft of El Sobrante, Calif. Craft used a heavy-duty 150 hp Adams\* 660 motor grader to handle the job.

Levels roadbed in 3rd gear with Adams' 12-speed transmission (optional "creeper" gears also available) Craft always has the right power-speed ratio to handle any job fast and accurately. First, operating the "660" in 3rd gear (4.7 mph), leveled roadbed. Next, operator read and leveled  $\frac{1}{4}$ " crusher-run back in 2nd gear (3.3 mph). Then, working motor grader in slow, steady low gear (1.3 mph), Craft handled final finishing prior to blacktopping.

## "Best 'blade' ever built"

Pleased with the performance of his Adams 660, owner William Craft said, "The '660' is the best 'blade'



ever put out by any company. It has plenty of power and excellent maneuverability. Grader blade lifts higher to clear curbs and obstructions, has good visibility, makes it easy to operate."

## Handles wide variety of jobs, drives job-to-job

Owner-operator Craft uses his rugged Adams grader on a wide variety of jobs — push-loading scrapers, constructing round bottom drain ditches, blacktopping, ditching, grading for curbs and spreading concrete. Craft makes good use of Adams' 26 mph travel speeds, too! He drove grader to Oakland street-

job from Alameda — a distance of 7 miles and through heavy downtown city traffic — in just a little over 20 minutes.

## Watch it speed-up your jobs

Why not find out what Adams graders can do to speed your road work? Ask for a demonstration. See how all LeTourneau-Westinghouse graders, with their wide range of speeds, help you do *more* work at lower cost. Six models, 190 hp to 60 hp. Choice of GM or Cummins engines on 5 larger models. 190 hp POWER-Flow\* model has torque-converter drive. Call or write for complete information.

\*Trademark G-1550-DCJ-1

**LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS**

*A Subsidiary of Westinghouse Air Brake Company*

**Where quality is a habit**



**EXTRA STRENGTH and  
DURABILITY...for Your  
Rock Drills and Other  
Heavy Duty Air Tools**

**"SUBWAY"**



*"Standard of Quality"*

"Subway" is built with that *extra* measure of strength and durability that assures uninterrupted delivery of maximum air power to the drills, even when the "going" is roughest. Light weight, flexible, easy to handle. Specifications include oilproof tube; highest quality wrapped duck carcass; wear- and weather-resistant red rubber cover, with new criss-cross yellow stripe for positive identification. Sizes  $\frac{1}{2}$ " to  $1\frac{1}{4}$ ", I.D., in maximum lengths of 50 feet.

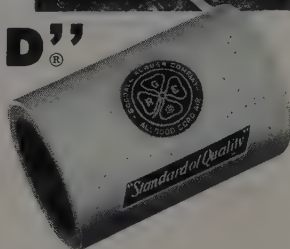
**EXTRA SAFETY...For Your  
Caissons and Manifolds**

*"Standard of Quality"*



**"ALLGOOD CORD"**

"Allgood Cord" ... long famous for its outstanding strength and safety for three most important air hose applications—supplying air to caissons where human lives are at stake; feeding air to Jumbos where a shutdown would affect not one but a battery of drills; and as a main air line to shovels in tunnel headings. Specifications include black synthetic tube; special kink-resistant wrapped duck carcass; wear-resistant white rubber cover.



"Allgood Cord" is made in sizes  $1\frac{1}{2}$ " to 4", inclusive, in maximum lengths of 50 feet.

**"If it's GOODALL, it MUST be Good!"**

**Contact Our Nearest Branch for Details and Prices**

Standard of Quality—Since 1870



HOSE • BELTING • FOOTWEAR • CLOTHING  
AND OTHER INDUSTRIAL RUBBER PRODUCTS

**GOODALL Rubber Company**

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.  
Branches and Distributors Throughout the United States and in Canada

### Combination 2-jaw or 3-jaw pullers

Two points for gripping or three points for gripping are now available in a single jaw puller being offered by the Owatonna Tool Co. The new combination pullers can be changed from two-jaw pullers by simply shifting one jaw and adding another. The customer



gets the advantage of six puller sizes with only three puller heads of the combination type. Jaws are designed so that when more pressure is applied the grip becomes tighter. They will not slip off the work. Available in sizes from 6-ton through 14-ton capacity. Complete details on the CTC combination pullers can be obtained from your jobber or from the Owatonna Tool Co. 389 Cedar St., Owatonna, Minn.

### Sherman crane mounts on $1\frac{1}{2}$ -ton truck

An all-new universal-fit crane that fits any new or used  $1\frac{1}{2}$ -ton truck has been introduced by Sherman Products, Inc., Royal Oak, Mich. The crane attaches to any  $1\frac{1}{2}$ -ton truck (or larger) having a minimum cab-to-rear axle measurement of 92 in., or more, with six "U" bolts and moves 30 yd. of dirt an hour a dragline. The Sherman crane unit travels at the truck's own speed and can do jobs as far as 200 mi. apart within a single working day. It has the power and reach to set steel, the positive control to operate as a dragline. It uses a standard industrial power unit and the principal wearing parts such as clutches and brakes are standard truck parts. The Sherman crane unit has a minimum of 20 ft., and a maximum of 40 ft. The standard boom is 25 ft. The hoist raises and lowers the boom independently of other functions.

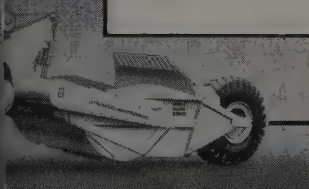


# Why new **27-yd. B FULLPAK\*** scraper

## is your best bet for low-cost dirtmoving

The all-new LeTourneau-Westinghouse 28 mph B Tournapull®, with 27-yd. Fullpak scraper, gets *big loads fast!* Lower, wider, bigger...

this giant dirtmover delivers more pay-yards at lower-net-cost than any scraper on the market. That means more profits for you...



### Job-proven design

The new low, wide B Fullpak scraper incorporates popular high-production features that have been job-proven in world-wide service — for over a year — on the modern 18-yd. C Fullpak. Shallow bowl design means Fullpak needs less force for lifting dirt... can apply more to cutting and pulling. Bowl bottom has only 1° rise when loading. With dirt flow nearly horizontal, quick-loading 27-yd. Fullpak packs full-capacity, low-void payloads fast!



### Better boiling

Tailgate has curved top, to roll material up and forward into a high heap. Side-sheets sweep higher in center, to reduce spillage and deflect material into corners of apron and tailgate. High, deeply curved apron adds bonus dirt-capacity... carries a big part of load forward in its "belly", for better weight distribution, lower center of gravity, and improved stability and traction.



### Faster loading... unloading

High apron lift (7'1" above blade) speeds loading and unloading. Smooth, streamlined side-arms and side-sheets prevent chunks from being trapped. Positive forward-ejection tailgate has plenty of power to force out sticky clay, mud, rocks — wipes bowl clean in a single pass.



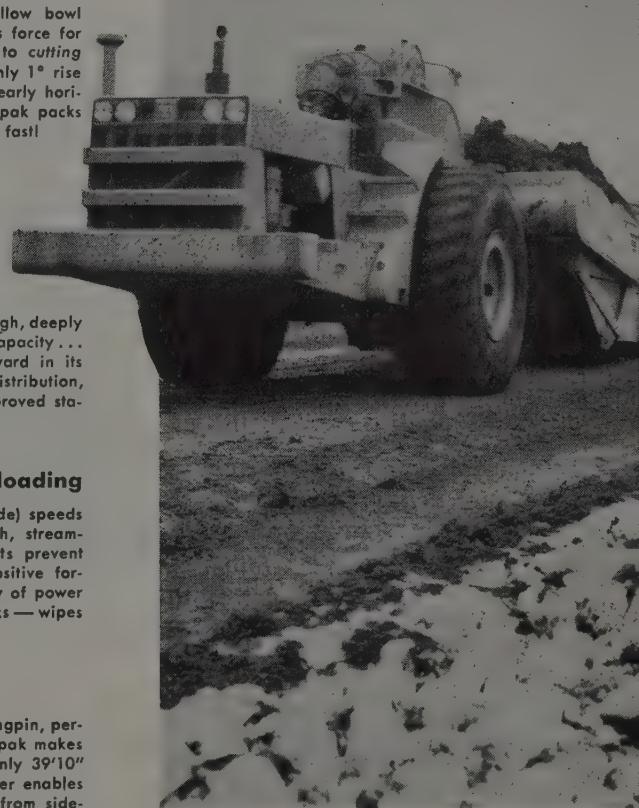
### 90° turns

Electric steer, through geared kingpin, permits short 90° turns. New B Fullpak makes continuous 180° turn in area only 39'10" wide. Also, positive kingpin steer enables operator to swing prime-mover from side-to-side in soft ground to let drive wheels find better footing and "walk" unit out of mud or loose sand.



### Better visibility

Cockpit is raised to give Tournapull operator clear view of blade, load, pusher. Road ahead is always in full view. Permits safe, high-speed cycles.



### Get all the facts

Get full details on the new B Fullpak — and on other job-tested LeTourneau-Westinghouse earthmovers. See why they'll help you move dirt faster, easier, at lowest-net-cost-per-yard. Write or phone for all the facts.

\*Trademark BP-1403-G-b

**LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS**

*A Subsidiary of Westinghouse Air Brake Company*

**Where quality is a habit**

## 24-in. long engine produces 45 hp.

A compact, lightweight industrial engine, reputed to provide more power per lb. than ordinary engines of comparable hp., is announced by Fageol Products Division, Twin Coach Co. Known as the Fageol 44, the engine produces up to 45 hp. at 5,500 rpm., with running engine weight as low as 160 lb. Power-to-weight ratio of 3.55 lb./hp. is attained. Extremely compact, the 44-cu. in. displacement engine measures only 23 $\frac{3}{8}$  in. long including SAE No. 5 bell-housing, 15 9/16 in. wide and 23 $\frac{3}{8}$  in. high. The Fageol 44 is a 4-cycle, 4-cylinder, water-cooled power plant, featuring 9:1 compression ratio and

overhead valves operated by a gear-driven overhead camshaft. For further information, write direct to Fageol Products Division, Twin Coach Co., 850 W. Main St., Kent, Ohio. Ask for catalog LL-4880.

## Plastic pipe extends pumping water level

A highly specialized plastic pipe has been developed by the Yardley Plastics Co. for use with deep jet pump installations. Marketed as Yardley K-150 Krallastic semi-rigid pipe, it features the use of pre-jointed sections in 10-ft. lengths to provide nominal pumping water levels in excess of 200 ft. or regulator

pressures on shallower settings up to 100 lb. In the past, plastic pipe for jet pump installations has been limited, for the most part, to 100-lb. flexible pipe. Under ordinary circumstances it would have a recommended pumping water level of 60 ft. regulator valve pressure of 133 ft. K-150 now extends this pumping water level to over 200 ft. with regulator valve pressures of 11 lb. and more. Weighing only 1/12 as much as standard weight steel pipe, K-150 deep-set installations can be made without use of a tripod. Complete specifications and instructions for use can be obtained from the Yardley Plastics Co., 138 Parsons Ave., Columbus 15, Ohio, or local distributors.

## Discover the difference



in this →

... and this →

## GET RID of OBSOLETE WIRE TYING METHODS

**Right on your own jobsite** you can test the difference in Ideal tie wire reel with whatever wire tying method you're now using. You'll discover it gives 6 to 8 more ties per man every minute your employees spend tying wire. You'll see how and why it pays for itself quickly—plus many times over, on job after job.

**You'll also prove** that Ideal reel's smooth, rapid dispensing of wire and easy to re-fill wire coils makes every pound of wire give you 33% more ties, on average—and eliminates wire waste. You'll learn how it increases employee efficiency, comfort and safety. Possessing unique patented design, Ideal reel gives versatile **Right** or **Left** hand use and provides other time saving benefits no other wire dispenser can match.

## Why Not Try IDEAL REEL On Your Job!

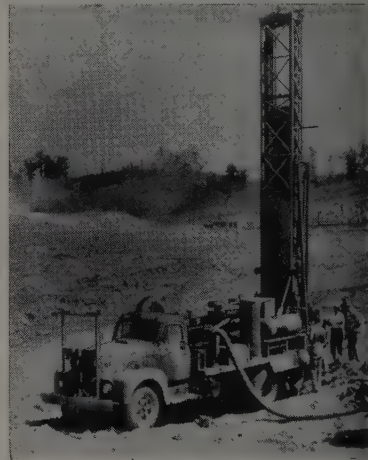
Ask your nearest dealer for an on-the-job demonstration, or write us direct. No obligation, of course.

**IDEAL**  
tie wire reel

*Ideal Reel Company*  
PADUCAH, KENTUCKY

## Schramm truck-mounted rotary drill makes hole up to 700% faster

A new truck-mounted rotary drill which features mobility and rapid set-up has been announced by Schramm, Inc., 900 East Virginia Ave., West Chester, Pa. Actual field reports show that this unit, known as the Schramm Truck



Mounted Rotadrill, makes hole 600 to 700% faster than is possible with the best churn drilling technique. Rotary air drilling is accomplished with the Rotadrill through a reversible hydraulic motor-driven head, mounted on a carriage that rides tracks mounted on the mast. This hydraulic head plus the special slip holders eliminates the need for a rotary table. This means that casing can be placed down a water well and hole can be easily inspected. Sticking of the bit will not damage the hydraulic drive. Maximum down pressure is 24,000 lb. and maximum lifting pressure is 19,000 lb. Holes can be drilled to 700 ft. with 44 $\frac{1}{2}$ -in. O.D. drill pipe, and to 1,500 ft. with 27 $\frac{1}{8}$ -in. O.D. drill pipe.

**New generator has vertical shaft**  
Thor Power Tool Co., 175 N. State St., Aurora, Ill., has entered the portable electric generator field with two 1,500-



# How ABRASIVE SAND problem was solved by rubber-tired tractor



**Y**ou've probably seen the damage sand can do to your equipment... grinding away at exposed parts of earthmoving units. One machine — rubber-tired Tournatractor® — resists abrasion so well, however, that it's now the standard tractor in any sand areas. If, in your dirt-moving, your tractors frequently work in sand, or other abrasive materials, read what a sandpit superintendent — Ira Kent, Auction Silica Mining Division of Portage-Manley Sand Co. at Fessenden, Mo. — has to say.

**Q.** "Mr. Kent, why did you choose Tournatractor?"

**A.** "There's a lot of sharp silica sand around here, and much of our work is on rocky surfaces. When we used crawlers, we had a major problem in track maintenance. Our sand and those tracks worked just like a grinding compound. We had continuous pad and roller trouble. So we bought a Model C-2 Tournatractor in 1950, and liked it so much we bought our present improved Tournatractor in '52."

**Q.** "What sort of work does your Tournatractor do?"

**A.** "We use it for just about everything. Its main jobs are stripping overburden and cleaning up around our shovels. It also builds and maintains haul roads, takes out trees, pulls heavy equipment, and does a lot of clean-up after blasting. Actually, we've found that we don't have any tractor jobs that our Tournatractor can't do."

**Q.** "...and what has the maintenance record been, Mr. Kent?"

**A.** "Well, we've worked our Tournatractor 45 hours a week for almost 5 years, without any real trouble. Our one and only major repair expense in all that time has been replacement of the torque-converter oil-seal and bearings. We've never done anything to the engine... not even replacing an injector or anything. We never broke an axle, chipped a gear, or had a single major thing go wrong."

**Q.** "What about the electrical system and its maintenance?"

**A.** "We like this electric control system... and it's never given us any trouble. In all this time, we have put in only one set of discs in the motor brakes, and two little switches. But that's it, so far as repairs are concerned."

**Q.** "And the tires?"

**A.** "Our present Tournatractor front tires are still the originals. We replaced the two back ones last spring, after better than 4 years of service. We've never had a blow-out, on any of the four. As to changing or repairing tires — you know that on Tournatractor, changing a tire is as easy as changing an 8.25 truck tire. That's another thing we like about this dozer. Lots easier than fixing track troubles."



Tournatractor's wide, low-pressure tires flex easily over sharp rocks without cutting... end age-old problem of rocks, sand, and dust clogging up track assembly.



One of many spare-time jobs handled by Tournatractor is building new haul road. Operator takes overburden dirt, drifts it on down to bottom, building up road grade.



Pit Mgr. Kent says: "Main reason we like our rubber-tired Tournatractor is its go-anywhere ability. It's quick on its feet... handles easier... maneuvers easier."

This owner-verified work report indicates how Tournatractor can solve your costly abrasion problem. Rolling on big rubber tires... with all parts sealed and protected against damage by rocks, sand, and other harmful materials... it gives you years of low-cost, trouble-free service. See your nearby LeTourneau-Westinghouse Distributor for full details and a working demonstration.

CT-1501-DC-1

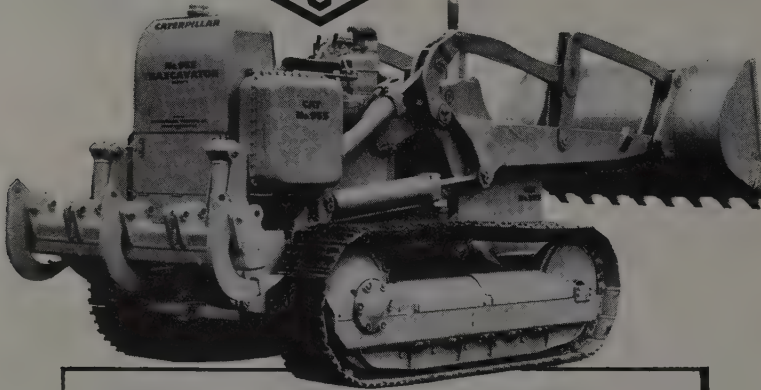
**LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS**

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

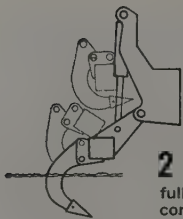
# Boost Loader Profits 3 WAYS

## WITH RIPPERS

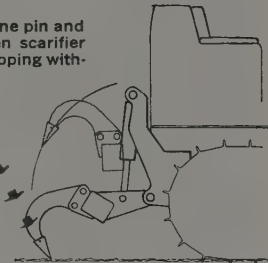


1. Get bigger payloads, faster
2. Handle jobs you never could before
3. Save loader wear and tear

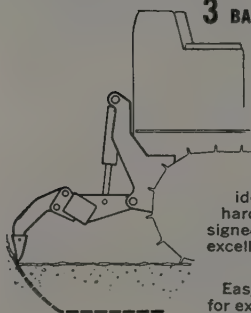
Only ATECO Offers All These Profit Making Features:



**1 HINGE-AWAY SHANKS . . .** Pull one pin and shanks automatically retract when scarifier is lifted, yet are instantly ready for ripping without replacing the pin!



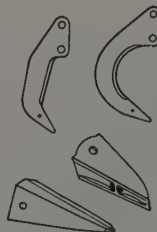
**2 INSTANT PENETRATION . . .** Exclusive hinge action "knives" the points to full working depth instantly, even in corners . . . and even without forward tractor motion!



**3 BANK AND FLOOR RIPPING . . .**

With straight forged shank, your ATECO ripper rips the bank as well as the floor. Ideal for finishing work, preparing radius corners for swimming pools, terraces, etc.

**4 CHOICE OF SHANKS AND POINTS TO FIT YOUR JOB . . .** Curved shank is ideal for lifting and breaking pavement, hardpan, etc. Straight shank (optional) is designed for slitting, bank and floor trimming . . . excellent penetration for tough work.



Easy-penetrating dagger point is reversible for extra life; new "Holo-ground" point (in standard and heavy duty types) is self-sharpening, and extra-rugged for the tough-to-"impossible" jobs.

ATECO Profit-Builder RIPPERS are available now for Caterpillar TRAXCAVATOR Models 933, 955 and 977. Write today for literature, prices.

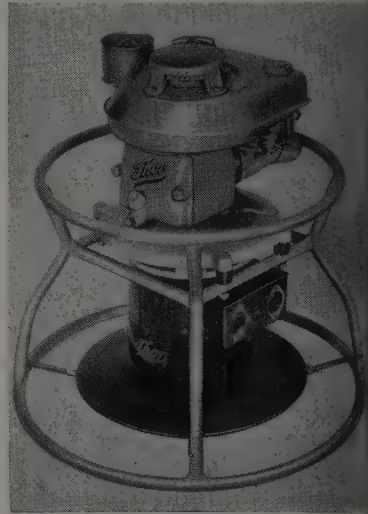


**American  
TRACTOR EQUIPMENT  
Corporation**

Designers and Manufacturers  
Since 1920

9131 SAN LEANDRO BOULEVARD • OAKLAND 3, CALIFORNIA

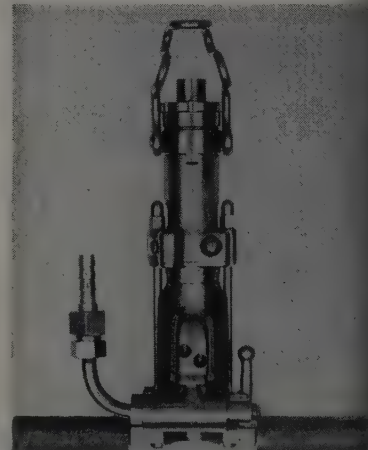
watt models featuring vertical shaft design and tubular framework support. Weight loads normally imposed on the



main bearing shaft in conventional horizontal designs are shifted completely to the framework. Since the engine main bearing and shaft only has to turn the armature, not support it as well, longer life and more efficient service is expected from the new generators. Powered by gasoline engines, the two new models, EG-1.5A for a-c. and EG-1.5D for d-c., provide 13 amp. of 115-volt current. Compact and easily portable, the new Thor generators weigh 95 lb., are 23 3/4 in. high and 23 in. in diameter. Each has a four-cycle, single cylinder, air-cooled engine with automatic rewind starter.

### Lightweight rock drill has many uses

A new lightweight, flexible-purpose rock drill designated the BBD-11LH has been developed by the Atlas Copco companies. Weighing only 23 lb. total and utilizing Copco's light 3/4-in. drill steels







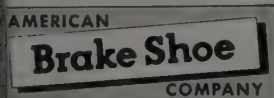
## BEAUTY...OR BEAST?

We'd be the last to claim that Amsco® Dippers have any inherent glamour. That's why we induced the pert 115-pound\* blond to pose in one of our 7-yd. dippers at a recent trade show. Got a lot of attention, too!

But we know that experienced operators *specify* these all-cast Manganese Steel Dippers because they're real "beasts"—when it comes to strength and ruggedness. By way of proof, glance at the other photo. It shows a 9-yd. Amsco Dipper hoisting a 60 to 70-ton\* rock out of the St. Lawrence Seaway Channel. There's plenty more proof available, too—on the extra strength, digging ability and long life of Amsco Dippers. That's why they're the number one original-equipment choice on most leading makes of power shovels!

Consult your equipment manufacturer, or write us direct for new booklet on *Amsco Power Shovel Equipment*, giving detailed reasons why Amsco Dippers are real "beasts" when it comes to rugged digging work.

\*Estimated

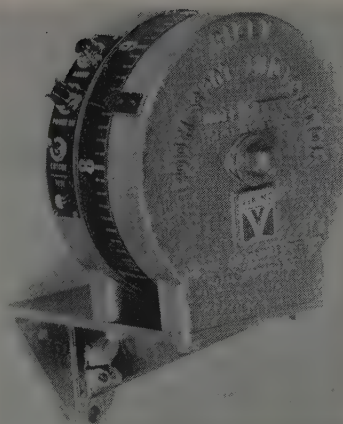


# AMSCO

American Manganese Steel Division • Chicago Heights, Ill.

OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DEL., OAKLAND, CAL., ST. LOUIS, JOLIETTE, QUEBEC

the new machine is suited for a wide range of construction assignments such as plugging boulders, short hole drilling, scaling, bolt hole drilling, etc. Quick addition of a standard model Atlas Copco BMK-51 pusher leg converts the unit for light drifting work as well. Chuck rotation is extremely fast, and air consumption is a minimum 53 cfm. In operation, the starting sequence triggered by the throttle flushes the steel prior to impacting to prevent dry collaring. A water-flushed model available with the same features is designed BBD-11 WH. Both drills have front exhaust and "T" handles. Illustrated literature on the twin BBD-11 models is available from **Atlas Copco Pacific, Inc.**, 930 Brittan Ave., San Carlos, Calif.



### Boom spot indicator gives added safety

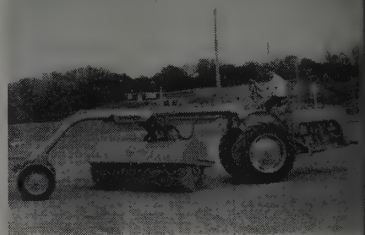
A boom spot indicator which gives boom rig operators increased effectiveness in all phases of boom rig operations and is an added safety factor as well as an instrument for increasing production has been announced by **Viking Instruments**, East Haddam, Conn. The indicator eliminates manual multi-handling operations predominate in such work as sheet setting, casing work, blind sighting, loading and unloading. Rugged and compact, the indicator is adaptable to all types of boom rig cranes. Mounted in the cab house, it is easily read by the

operator and is controlled by a cable attached to the boom which gives the operator a numerical reading of the boom angle at all times. An integral signal light unit provides a red flasher warning when the boom is about to enter the danger zone. For further information ask for bulletin 357.

### Self-propelled road broom

Lull Engineering Co. has announced a self-propelled road broom called the **Lull Cyclone Broom**. Many new features have been designed into this new broom to reduce operating and maintenance costs and to simplify and speed

up brooming operations. A single engine is used to propel the unit and provide power to both the hydraulic system. All controls are hydraulically operated. The control levers have been conven-



ently placed to allow the single operator to control all broom movements and adjustments without leaving the operator seat. The broom is driven hydraulically and can be rotated in either direction, permitting sweeping while the unit is moving either forward or backward. Many turn-arounds and deadheading can be eliminated because of the reversible rotation. The Lull Cyclone self-propelled broom is available with either 8- or 10-ft. brooms. For further information write **Lull Engineering Co.** 3045 Highway 13, St. Paul 11, Minn.

### Compressor has single free-floating rotor

A 125-cfm. rotary compressor, reputed to have greater operating effi-

## SCOOPMOBILE...

### the construction man's loader



LD-5 Scoopmobile loading boulders for fill.

If all loaders were bought by the men who operate them, it would be hard to find anything but Scoopmobile. The picture shows why:

- 1 ♦ Easily accessible from either side.** Built-in steps and absence of obstructions make it easy to get on and off the machine.
- 2 ♦ Excellent visibility.** Operator has a clear view of his work at all times.
- 3 ♦ Easy, precision steering.** Power-actuated center pin steering takes little effort, makes precision spotting

of the bucket easy and enables the operator to "squirm" his way out of sand or mud.

**4 ♦ Full oscillation.** The rougher the going the more you'll like Scoopmobile. All four wheels are on the ground at all times with full four-wheel drive.

Add these features to massive construction and 100% break-out action, and you get the answer to more work and lower loading costs. See your Scoopmobile dealer for information and demonstration on your own work.



Manufactured by **MIXERMOBILE MANUFACTURERS, INC.**

8027 N. E. KILLINGSWORTH STREET • PORTLAND 20, OREGON

Dealers in principal cities of the United States and Canada




**LIMA**


Lima Type 604 Dragline excavating trench for storm sewer pipe in Miami, Florida. This machine and the other Lima Type 604 in the background are owned and operated by R. H. Wright & Son of Fort Lauderdale and are both equipped with 45-ft. booms.

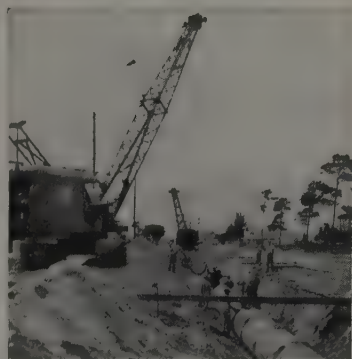
## Fast-working team of LIMAS leads the way on Miami project

Work really moves along at top speed on this storm sewer job in Miami, Florida, where R. H. Wright & Son is using two LIMA Type 604's. The dragline excavates the trench while the crane follows closely behind laying the pipe—sewer jobs of all kinds are completed fast and economically when you have LIMAS on the job.

Speed, stamina and economy on the job are assured by LIMA's built-in quality extras—such as piston-ring-type dirt seals and re-

tainers in crawler rollers; flame or induction-hardened moving parts for longer life; properly balanced weight for maximum efficiency; anti-friction bearings at all important points; oversize drums and sheaves for long cable life, and long crawler mounting for greater stability.

Get the full story on profit-building LIMAS from your nearby distributor . . . or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.



Lima Type 604 lowering concrete sewer pipe into position on the same project.

**DISTRIBUTORS:** Our Seattle Office, 1932 First Avenue South, Seattle 4, Washington; Our La Mirada Office, 14120 E. Rosecrans Avenue, La Mirada, California; Feenaghy Machinery Co., 112 S.E. Belmont Street, Portland 14, Oregon; Feenaghy Machinery Co., 600 Front Street, Boise, Idaho; Smith Booth Usher Company, 2001 Santa Fe Avenue, Los Angeles 54, California; Modern Machinery Co., 4412 Trent Avenue, Spokane 10, Washington; Acme Iron Works, 540 Culebra Avenue, San Antonio, Texas; Shriver Machinery Company, 1756 Grand Avenue, Phoenix, Arizona; N. C. Ribble Co., 1304 North Fourth Street, Albuquerque, New Mexico; Bay Cities Equipment, Inc., 2792 Cypress Street, Oakland 7, California; Bay Cities Equipment, Inc., 1178 West San Carlos Street, San Jose, California; McGaraghan Supply Company, 429 Broadway, Eureka, California; Evans Engine & Equipment Company, 4300 11th Avenue Northwest, Seattle, Washington; Heiner Equipment & Supply Co., 501 West 7th South, Salt Lake City, Utah; Hall-Perry Machinery Company, 902 Central Avenue, Billings, Montana; Hall-Perry Machinery Company, 1116 15th Street North, Great Falls, Montana; Hall-Perry Machinery Company, 812 East Iron Street, Butte, Montana; Hall-Perry Machinery Company, 127 East Main Street, Missoula, Montana; Reno Equipment Sales Company, 1700 West Street, Reno, Nevada; Faris-Moritz Equipment Co., 1554 Wazee Street, Denver, Colorado; Evans Engine & Equipment Co., Inc., Post Road—Box 894, Anchorage, Alaska; Shasta Truck & Equipment Sales, South 99 Highway, Redding, California

**LIMA**

SHOVELS • CRANES  
DRAGLINES • PULLSHOVELS



**BALDWIN-LIMA-HAMILTON**  
Construction Equipment Division — LIMA WORKS



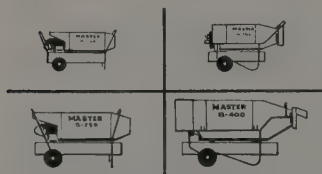
# BOSS... GET THIS HEATER !

**We'll forget the cold weather  
and keep your winter profits high**

"We won't be slowed down by cold weather. And we'll be a lot more comfortable, too, with a Master heater on the job.

"It puts out a steady stream of warm air wherever you want it. You can plaster, pour concrete, thaw and dry materials, spot heat outside, etc. It's portable, just wheel it around, plug it in and flip the switch. It'll run for 16

hours or more on a tank of kerosene or fuel oil. And for only 30¢ an hour it puts out enough heat to warm the biggest jobs. It's perfectly safe, too, boss . . . doesn't need a vent. So see your Master distributor, or write for all the facts on the new Master B-250 and other models. You'll see that only Master has all the features you want. No obligation."



100,000; 160,000; 250,000 and 400,000 BTU/hr. units available.

## MASTER

**MASTER VIBRATOR COMPANY**  
1752 Stanley Ave., Dayton 1, Ohio

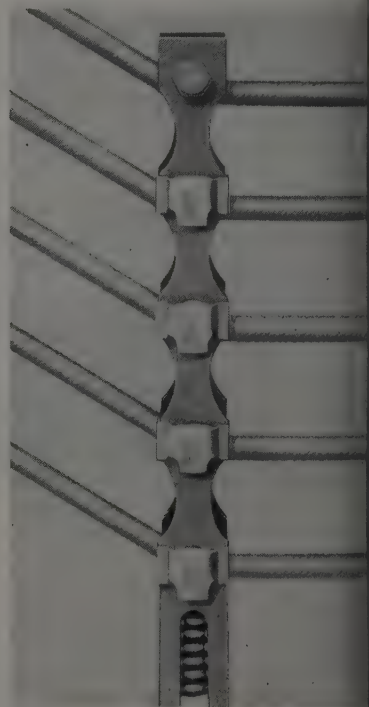
### DISTRIBUTORS

**ANDREWS EQUIPMENT COMPANY**.....Spokane, Washington  
**ANDREWS MACHINERY OF WASHINGTON, INC.**.....Seattle, Washington  
**POWER EQUIPMENT COMPANY**.....Denver, Colorado  
**SHRIVER MACHINERY COMPANY**.....Phoenix, Arizona  
**SIERRA INDUSTRIAL CO., INC.**.....Reno, Nevada  
**THE SAWTOOTH CO.**.....Boise, Idaho  
**WEST COAST MASTER, INC.**.....Los Angeles, California

ciency and less than one half as many working parts as other current models is announced by **Davey Compressor Co.**, 600 Franklin Ave., Kent, Ohio. Known as the Davey Hydrovane Rotary 125, the unit has a multi-stage rotary compressor with a single free-floating rotor. The latter is so located that it is constantly concentric with one side only of the stator. Its blades are of the segmented type, inserted radially in longitudinal slots. They move continuously in a straight line from the stator center and cannot "cock" or bind. While rotor turns and compression continues, cooling oil is injected by means of 2 multi-stage cooling oil injection chambers. This produces continuous cooling action that lowers air discharge temperatures as much as 100-deg. below other compressors. Multi-staging is also said to reduce the engine hp. required to operate the compressor, thus delivering more air from less fuel.

### "Hold-Down" for restraining cables

A specially designed "Hold-Down" for restraining wires and cables in prestressed beams and girders has been announced by **Superior Concrete Accessories, Inc.** These Hold-Downs restrain and hold the strands in the approximate



path or position of a catenary curve for maximum efficiency of the over-all design. One- to seven-strand Hold-Downs are available as required. Unit is held in position by 3/4-in. high tensile coil bolt. Safe load on a 7-strand Hold-Down is approximately 14,700 lb. For details request a copy of the new Bulletin PS-1 from **Superior Concrete Accessories, Inc.**, 9301 King St., Franklin Park, Ill.





OWL ROCK PRODUCTS CO., SANTA FE PLANT, MONROVIA, CALIF.

## DESIGNS AND MANUFACTURES AGGREGATE PLANTS TO MEET ALL SPECIFICATIONS



OWL SERVICE ROCK CO., LYTLE CREEK PLANT, RIALTO CALIF.



HARTMAN CONCRETE MATERIALS CO., SAN EMIDIO PLANT, BAKERSFIELD, CALIF.



PIT HOPPER FEEDER, PENDULUM CONVEYOR, CRUSHER CAR AND FIELD CONVEYOR

*The adaptability needed to meet variations in aggregate specifications . . . is engineered into Conveyco commercial or contractor-type rock producing plants. Change-over from one size and type of aggregate to another can be accomplished without shut-down or loss in production. Maintenance costs for Conveyco designed plants are low. All components that require regular service are placed in easily accessible locations.*

*Whether your requirement is a single unit or a complete plant . . . Conveyco's many years' experience serving the rock products industry assures you of a well integrated producing plant for commercial or contractor requirements. A few of Conveyco's more recent installations are shown in adjoining photos.*

*Call or write for full details on Conveyco engineering and plant equipment manufacturing. Conveyco also designs and manufactures Batch plants in capacities from 75 to 500 tons.*



"ESTABLISHED 1919"

ENGINEERS • MANUFACTURERS

THE **CONVEYOR** CO.

3260 EAST SLAUSON AVENUE  
LOS ANGELES 58, CALIFORNIA

# BETTER LUBRICATION



## FOR BALL AND ROLLER BEARINGS

### BALL BEARING LUBRIPLATE

... a most effective grease type lubricant that also protects ball and roller bearings against rust and corrosion. Highly recommended for speeds up to 5,000 RPM and temperatures up to 300° F.

### LUBRIPLATE No. 205

... an unusually light consistency, grease type lubricant made for use in anti-friction bearings operating at speeds in excess of 5,000 RPM.

### LUBRIPLATE Nos. 1, 2, 4 and 8

are fluid type lubricants of various viscosities that have given outstanding results in anti-friction oil type bearings. Nos. 1 and 2 are recommended for high speed applications; nos. 4 and 8 are recommended for slow speed, heavy load applications.

REGARDLESS OF THE  
SIZE AND TYPE OF  
YOUR MACHINERY,  
LUBRIPLATE  
LUBRICANTS WILL  
IMPROVE ITS OPERA-  
TION AND REDUCE  
MAINTENANCE



LUBRIPLATE DIVISION, Fiske Brothers Refining Co  
Newark 5, N. J. or Toledo 5, Ohio

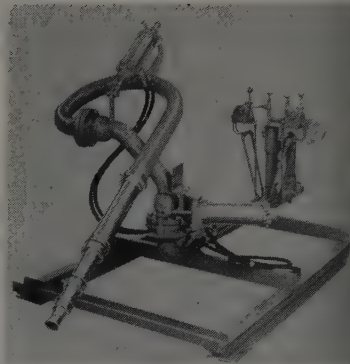
#### DISTRIBUTED BY

L. A. Rubber & Asbestos Works, Los Angeles, Calif.;  
Carlinghouse Brothers, Los Angeles, Calif.; Degen-  
Flege Co., Los Angeles, Calif.; Kanton Equipment Co.,  
San Diego, Calif.; Miller & Stern Supply Co., San  
Francisco, Calif.; Hendrie & Bolthoff Co., Denver,  
Colo.; Sawtooth Company, Boise, Ida.; Paul Roberts  
Co., Pocatello, Idaho; Moty & Van Dyke, Inc., Klam-  
ath Falls, Ore.; Goodyear Rubber & Asbestos Co.,  
Portland, Ore.; Industrial Supply Co., Billings, Mont.;  
Utah Bit & Steel Service Co., Midvale, Utah; West-  
ern Sales Engineering Co., Salt Lake City, Utah;  
Campbell Industrial Supply Co., Seattle, Wash.; Nott-  
Atwater Company, Spokane, Wash.; Campbell Industrial  
Supply Co., Tacoma, Wash.; Dodge-Yakima Supply  
Co., Yakima, Wash.; Yukon Equipment Co., Seattle,  
Wash.; Fleck Brothers Ltd., Vancouver, B. C., Canada;  
Flury Supply, Roseburg, Oregon; George Myrmo & Sons,  
Eugene, Oregon; Wilkinson & McClean, Ltd., Calgary,  
Alberta, Can.

**LUBRIPLATE**  
THE MODERN LUBRICANT

### Concrete cure is resin-free

An economical concrete curing agent that contains no resins or waxes has been announced by the Walter Maguire Co., Inc. Emeri-Crete Kure is a non-resinous sodium silicate compound that cures newly laid concrete and hardens it by converting the free lime to calcium silicate at the same time it prevents excessive air drying. The new product is ideal as a curing agent for areas that must be covered with resilient floor coverings, since standard resin or wax membrane cures interfere with proper mastic adhesion. The curing agent contains a powerful detergent that penetrates the floor surface to seal the porous concrete against evaporation. For more information about Emeri-Crete Kure, write to the Walter Maguire Co., Inc., 60 East 42nd St., New York 17, N. Y.



### Chiksan adds 3-in. monitor

Chiksan's line of Intelli-Giant hydraulic monitors has been augmented by a 3-in. monitor which possesses all the design features of the company's 4- and 6-in. models. The patented barrel design with its single full diameter smooth interior flow sharply checks friction loss and provides ease of handling. It also neutralizes forces which ordinarily cause "whipping." Even when operated manually this new monitor may be easily controlled with one hand

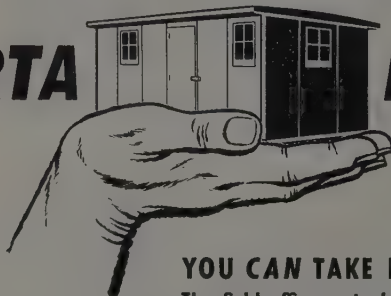
at pressures of 30 to 300 lb. psi. It is ideally suited for use in the construction field for slurring, tunneling, scaling of dam walls and settling of pipeline fills. The 3-in. hydraulic monitor has a 270-deg. horizontal traverse and 120-deg. vertical sweep. The hydraulic controls require no power source other than water pressure diverted from the main stream intake. For detailed literature and prices write Chiksan Co., Brea, Calif.

### Hydraulic hoist

for ¾- and 1-ton trucks

A conversion hydraulic hoist, designed for installation on ¾- and 1-ton trucks is announced by Galion Allsteel Body

# PORTA



# HOUSE

## YOU CAN TAKE IT WITH YOU!

The field office or tool shed that you can move on a pick-up truck. Pays for itself on the first job.

Quickly assembled and disassembled by unskilled labor.

SIZES: 9' or 12' widths—to any length (in 3' modules)  
(9x6, 9x9, 9x12, 9x15, 9x18, etc.—to any length)  
(12x12, 12x15, 12x18, 12x24, etc.—to any length)

Light, watertight, strong.

Mass produced cheaper than you can build it!

Rental arrangements if you wish.

Write or phone collect.

**PORTA HOUSE**

Manufactured and Distributed by

RIDGELY K. DODGE

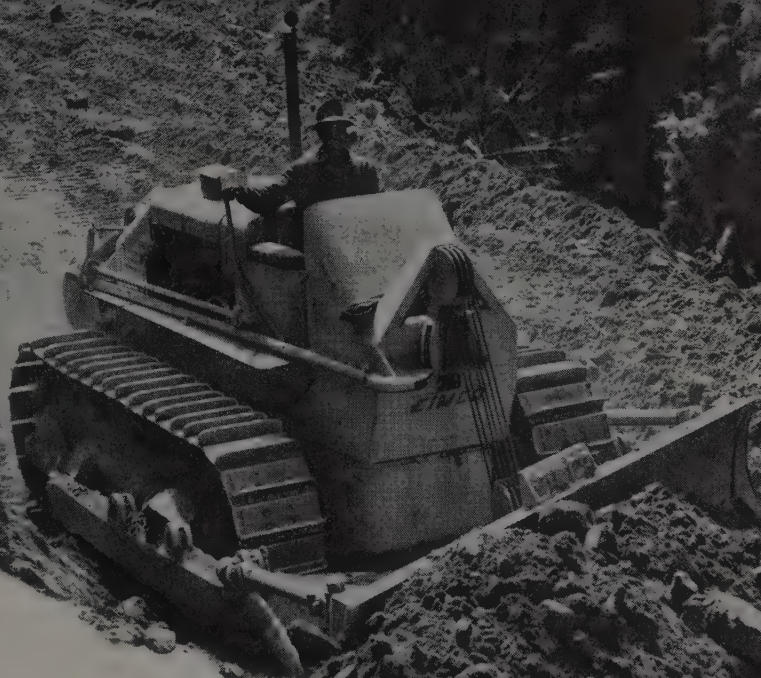
6767 Broadway Terrace • Oakland 11, Calif.  
Olympic 2-7237

AVAILABLE  
IMMEDIATELY  
Plan to include  
Porta Houses in  
all future jobs.





**NEW EARTHMOVING CONCEPT**



Eimco selects

Torqmatic

Converter

for new "105"

Tractor-Dozer

IN THE "105" Tractor-Dozer Eimco introduces a new concept in earthmoving equipment. Advanced design and engineering features—such as *up-front* operator position, *two* independent final drives and *center-mounted* power unit—provide a new high in efficiency, maneuverability and traction.

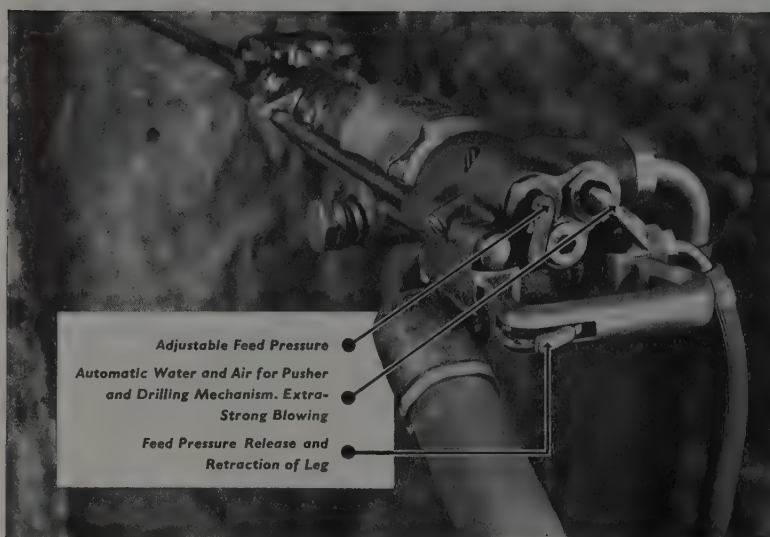
And, when it comes to power, the "105" is a beautifully engineered matched team—from fan to final drives. Its Allison TC-530 TORQMATIC Converter delivers engine power instantly and smoothly—gives the "105" nimbleness and brute strength that adds up to greater push and faster work on every job.

Eimco selected a TORQMATIC Converter because the engineering facts—backed by years of experience in the most demanding applications—prove beyond question the greater efficiency and versatility inherent to the TORQMATIC design. Bring a new high in performance and efficiency to your equipment, with such cost-saving features as integral engine mounting which eliminates troublesome universal adapters—cast converter elements for longer service life and full-range horsepower—available only with TORQMATIC. Take a tip from Eimco and more than 80 other manufacturers of 122 types of road-building and construction equipment. Get the TORQMATIC story.

ALLISON DIVISION OF GENERAL MOTORS, Indianapolis, Indiana

*Allison* 

**TORQMATIC DRIVES**



Adjustable Feed Pressure  
Automatic Water and Air for Pusher  
and Drilling Mechanism. Extra-  
Strong Blowing  
Feed Pressure Release and  
Retraction of Leg

## THE NEW ATLAS COPCO LION

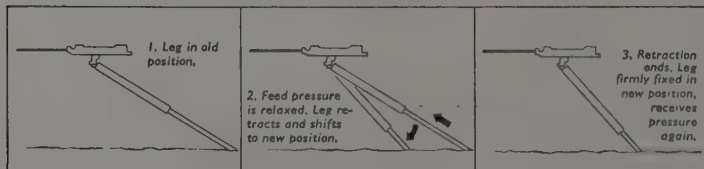
### the most remarkable heavy-duty pusher-leg drill on the market

The Lion is the only rock drill with retractable leg operated from the back-head, which means quicker repositioning. It is also one of the very few drills on the market with all the operating valves controlled by one hand. Both these features make for great savings in time and manpower; in addition, the Lion has an especially high drilling speed compared with other drills in the same class.

#### THE RIGHT STEELS FOR THE LION

With the Lion choose Sandvik Coromant tungsten-carbide-tipped integral steels—the most widely used in the world—or Sandvik Coromant detachable bits and extension steel equipment.

#### PUSHER LEG ADVANCES WITH DRILL IN ACTION



Write, phone or cable today for further details to any of the addresses below:—

## *Atlas Copco*

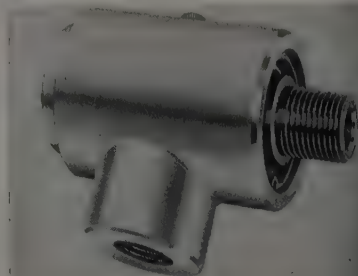
ATLAS COPCO EASTERN, INC., P.O. Box 2568, Paterson 25, N.J. Phone Armory 4-3310  
ATLAS COPCO PACIFIC INC., 930 Brittan Ave., San Carlos, Calif. Phone Lytell 1-0375  
ATLAS COPCO CANADA LTD., Montreal Airport, Quebec. Phone Melrose 1-5571  
ATLAS COPCO MEXICANA S.A., Apartado Postal 56, Torreon, Coahuila. Phone 39-07



Co. Designated Model 443, the new Class 6 hoist is suitable for mounting under 6½- to 9½-ft. pick-up bodies, platform bodies up to 10 ft., or light duty Galion Allsteel dump bodies up to 8 ft. long. Hoist capacity rating is up to 6 tons, depending on body length and pivot, the manufacturer states. Designed for installation on trucks, with either straight or kick-up frames, having cab-to-axle dimensions from 46 to 60 in., Model 443 provides a 45-deg. dumping angle. Tank, pump, manifold and control valve are mounted as a unit. A high efficiency, double shaft pump and leak-free rotary control valve are reputed to provide fast dumping action and positive hoist control. For further information, contact local Galion Allsteel distributors or write direct to Galion Allsteel Body Co., 605 S. Market St., Galion, Ohio.

#### High pressure, low torque union

A new compact rotating union for the introduction of air or hydraulic oil under pressure into clutches of power shovels, cranes, draglines, drilling rigs, logging equipment and the like has been announced by the Deublin Co., Glenview, Ill. This new design Model No. 1300 embodies several features such as



the use of a hexagon socket in the end of the rotor to shorten overhang and make installation in tight quarters easier. By removing a pipe in the rear of the housing a hexagon socket or Allen wrench may be engaged into the socket of the rotor for installation. The pipe plug is then replaced to close the housing. Operating specifications are 1,500 rpm., 2,000 psi. for hydraulic service, 150 psi. for air service. The housing is forged aluminum alloy, the coil spring is stainless steel and the out-rigger bearing is fabricated of self-lubricating bronze. Ask for bulletin D657 for specifications.



Most complete line  
of standard  
structural shapes  
produced in the West!



**Kaiser Steel**  
built to serve the growing West

specifications write: KAISER STEEL CORPORATION • Los Angeles • Oakland • Seattle • Portland • Phoenix • Denver • Tulsa • New York

November 1957—WESTERN CONSTRUCTION

# News of DISTRIBUTORS



## DISPLAY OF DRAINAGE PRODUCTS TOURING THE WEST IN A PIPE

The Armco "Steelmobile," only stainless steel sewer pipe on wheels, is touring the West. The Steelmobile contains full scale exhibits of municipal and highway construction products made by Armco Drainage & Metal Products, Inc. This company, a subsidiary of Armco Steel Corp., is the world's largest fabricator and distributor of steel drainage products for the municipal market. Sixteen products are displayed inside, including water supply and sewer pipes, drainage pipe, tunnel liner plate, water control gates, highway guardrail, foundation piling, retaining walls and prefabricated steel buildings.

The exhibit, costing more than \$50,000 and taking nine months to build, is scheduled to be in 25 Northern California and Nevada cities during November and December. Exact dates may be obtained from **Howard Blower**, Northern California and Nevada district sales manager at Armco Drainage & Metal Products, Inc., 2180 Milvia St., Berkeley, Calif. Southern California and Arizona, in the Armco sales district headed by **Jerry Evans**, is next on the schedule, followed by New Mexico and southern Utah. The Steelmobile has already toured the Pacific Northwest.

## New Bailey bridge distributor

Bailey Bridge Equipment Co., San Luis Obispo, Calif., is now sales representative for Contractors Service Limited, Toronto, Canada, for the distribution of Bailey bridges in the Western states and in Hawaii. Bailey Bridge Equipment Co., operator of a unique bridge rental service since 1947, will

continue with both rentals and sales of Bailey bridges under the management of C. F. Hamlin, civil engineer, and formerly a senior bridge engineer with the California Division of Highways.

New Getman Scoot-Crete truck dealer Industrial Engine Service, Los Angeles, Calif., has been appointed an au-

thorized dealer of Getman Scoot-Crete trucks in that area, as announced by Getman Brothers of South Haven, Mich. According to the manufacturer the Getman Scoot-Crete is a new truck for the construction industry which one man can load, drive and dump. It can carry loads up to 3,500 lb. at speeds to 15 mph. and is priced from \$865 to \$1899.

## Bros Inc. appoints distributor

Blakemore Equipment Co., Oakland, Calif., has been appointed exclusive distributor for the Bros road machinery line manufactured by Bros Incorporated, of Minneapolis, Minn. Sales territory includes all of Northern California. A. O. Williamson, manager at Bros, announced. The franchise includes the complete line of self-propelled and tow-type rubber-tire compaction equipment; vibratory and tamping roller units, the new Preparator, an in-place materials reducer, and the new Roto-Mixer, soil stabilization machine.

## Western Machinery appoints Foster

Appointment of H. Jay Foster to handle sales, rentals and service for Western Machinery Co.'s Idaho Falls branch office has been announced by L. T. McGuire, manager of the Salt Lake City district office. Foster has been in the construction business for more than seven years and has spent five and a half years of this time in the distribution of construction and industrial equipment in the Idaho Falls, Idaho, area.

## Blaw-Knox Colorado selling rights

MacDonald Equipment Co., Denver, Colo., has been appointed a bituminous

## Notice to publisher of CHANGE OF ADDRESS

NAME \_\_\_\_\_ Date \_\_\_\_\_

**FROM**  
(Old address)

Street or P. O. Box Number

City

Zone

State

**TO**  
(New address)

Street or P. O. Box Number

City

Zone

State

Company \_\_\_\_\_

Position \_\_\_\_\_

Mail to: **WESTERN CONSTRUCTION**  
609 Mission St.  
San Francisco 5, California  
Attn: Circulation Department



# Blaw-Knox Heavy Steel Forms save J. A. Jones Construction Company 40% over Wood on Power House Project!



Backwall and counterfort form being placed. Handling time is cut to the bone by special form design. Form at right is ready for stripping and re-setting at new location.

Down along the banks of McKellar Lake at Memphis, one of the world's largest Steam Generating Stations is under construction. The J. A. Jones Construction Company, builder of the huge concrete substructure is using custom-built Blaw-Knox Heavy Steel Forms on a retaining wall that is 1,684 feet long and 41 feet high. They also are using Blaw-Knox Heavy forms for water intake, circulating and discharge tunnels.

Experience with more than 700 feet of wall shows that re-use of two sets of Blaw-Knox Steel Forms has actually saved 40% over the use of wood. Beyond this too, are the indirect advantages—safety, labor cost, uniformity of construction and salvage.

Advantages of custom-built Blaw-Knox Heavy Steel Forms have been proven on many construction projects of world wide interest. Where there is a concreting problem, the speed, flexibility, and salvageability of Blaw-Knox Steel Forms makes them the number one construction tool. They're backed by more than 40 years of experience on wide range of big projects.

Put the Blaw-Knox Steel Forms Consultation Service to work for you, whether your job is a dam, tunnel, sewer, or bridge. You'll get fast, simplified planning, custom-built forms tailored to the exact requirements of your project.



## BLAW-KNOX COMPANY

*Blaw-Knox Equipment Division*  
Steel Forms Department, Pittsburgh 38, Pa. • Phone STerling 1-2700



## How to bail out fast!

When rain, springs or seepage is clobbering construction, it's good to have Gorman-Rupp "80" Series Pumps ready in the equipment pool.

These new pumps prime and reprime at lifts of up to 30 feet. They move easily because of their lightweight, aluminum construction. (The Midget weighs only 48 pounds.)

*Straight-in suction* delivers liquid directly to the impeller's eye. Capacity, efficiency and suction lift are increased. *No check valve.*

Four models:

*Midget*, 1½", 6,500 GPH, 2.25 HP;

*Pelican*, 2", 8,500 GPH, 2.75 HP;

*Hawk*, 2", 12,000 GPH, 5.5 HP;

*Eagle*, 3", 18,000 GPH, 6.8 HP.

You saw them at the Road Show. Buy them now at your Gorman-Rupp Distributor.

## THE GORMAN-RUPP COMPANY

305 Bowman Street • Mansfield, Ohio

See listing below for your Gorman-Rupp Distributor

Andrews Equipment Service of  
Washington, Inc.  
Spokane

Bay Cities Equipment, Inc.  
Oakland, San Jose

Delta Tractor Co.  
Stockton

Elliott Equipment Co.  
Wenatchee

Flaherty Equipment Company  
Pocatello

Harron, Rickard and McCone of Southern  
California  
Los Angeles

Industrial Tractor Sales  
North Sacramento

Logger's and Mill Supply Co.  
Arcata, Calif.

Pacific Hoist and Derrick Company  
Seattle

Shastra Truck & Equipment Sales  
Redding

Studer Tractor and Equipment Co.  
Casper

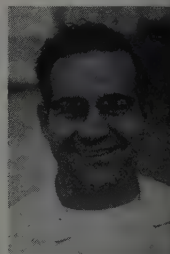
equipment distributor for the Construction Equipment Division of Blaw-Knox Co., according to Paul J. Wolfert, general sales manager for the division which has its headquarters at Mattoon, Ill. Included among the major items of equipment which will be sold throughout the state of Colorado by MacDonald are the Blaw-Knox PF-90 bituminous paver finisher, the PF-45 black top paver, Model 95 road widener, the P-150 base paver, and the dual compression trench and shoulder roller.

### Lang promotes two

H. A. Christiansen, general manager of The Lang Company, Salt Lake City, Utah, announces the promotion of Darrel Brady from the sales department to



Brady



Curia

the position of parts manager, bringing to his new post a vast amount of knowledge and experience. Charlie Curia, who also has a background of valuable experience in the Lang organization, is the new assistant parts manager.

### Gunderson Taylor new lines

Gunderson Taylor Machinery Co. of Denver, Colo., has recently established a Snow Removal Division, and an Engineering Design Division, having acquired the account of Oehler aerial tramway, ski lift and allied equipment manufactured in Aarau, Switzerland, and the Snowblast line of rotary snow plows of 500 to 5,000-ton per hr. capacity. Edward F. Taylor, president of Gunderson Taylor, has announced that John J. Tucker, mechanical engineer and an authority on equipment design and snow removal formerly of Zurich, Switzerland, has joined the organization. Bob Manzer, civil engineer of Denver, is his assistant.

### Truck Equipment Co. progress

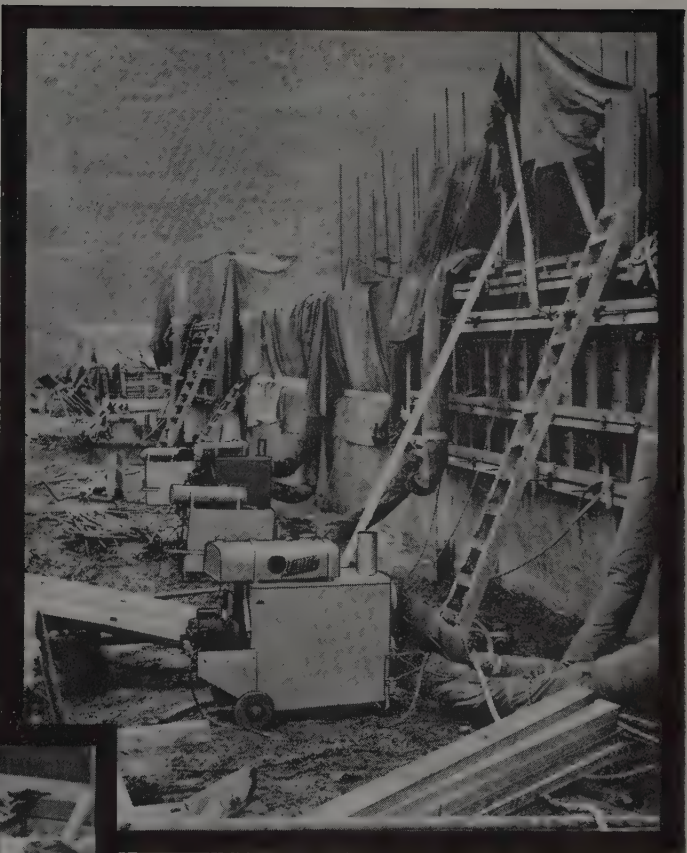
Jack Goodman joined Truck Equipment Co. of Denver, Colo., as salesman on Oct. 1. His former connection was with GMC Truck & Coach Division as sales engineer in factory branch for 7 years. Truck Equipment Co. recently acquired distributorship on Perfection line of dump bodies, trailers and equipment. By mid-November a new paint



Curing 103,000 yards  
of concrete for  
giant Cochrane Dam...



or a 30-yard  
bridge foundation...



count on ...

# HERMAN NELSON

## PORTABLE AIR HEATERS

everybody else does!

Whether it's portable heat for concrete pouring at Cochrane Dam—or heat for bridge building, earth-moving projects, highway or industrial construction ... get safe heat from Herman Nelson Portable Heaters! They give you the safety of indirect firing, with smoke and fumes vented away from working area. Efficient combustion gives you more usable heat, and canvas ducts spot heat right where you need it.

Get set for winter now. See the complete line of Herman Nelson Portable Heaters at your dealer. Get his liberal offer on trade-ins, and start out with a brand-new Herman Nelson!



**"Utility" Model**  
Interchangeable power plants — gasoline engine or electric motor. Gasoline or oil fired. Up to 425,000 BTU capacity.

**"De Luxe" Model**  
Oil Fired. Electric motor powered. Up to 450,000 BTU capacity. The finest of all portable heaters—completely automatic.

**"Thrifty" Model**  
Oil Fired. Electric motor powered. Easily portable, light weight, only 24" wide. Up to 165,000 BTU capacity. Low price!

- BOISE, IDAHO.....Arnold Machinery Co.
- CASPER, WYO.....Studer Tractor & Equipment Co.
- DENVER, COLO.....Western Machinery Co.
- EUGENE, ORE.....Loggers & Contractors Machinery Co.
- FRESNO, CALIF.....Edward R. Bacon Co.
- GRAND JUNCTION, COLO.....Western Machinery Co.
- IDAHO FALLS, IDAHO.....Arnold Machinery Co.
- OAKLAND, CALIF.....Edward R. Bacon Co.

- PORTLAND, ORE.....Loggers & Contractors Machinery Co.
- SACRAMENTO, CALIF.....Edward R. Bacon Co.
- SALT LAKE CITY, UTAH.....Arnold Machinery Co.
- SAN FRANCISCO, CALIF.....Edward R. Bacon Co.
- SEATTLE, WASH.....A. H. Cox & Co.
- SPOKANE, WASH.....Western Machinery Co.
- TACOMA, WASH.....A. H. Cox & Co.

shop with complete facilities for furnishing the most modern painting services will be completed, as announced by E. V. Garnett, president of the firm.

#### New Northwest supply house

Marine Specialties of Oregon, Inc., is the name of a new marine supply house in Portland, Ore., serving the Northwest with Capitol gears, American Bosch fuel pumps, Marine Aeroquip hose and fittings, and American Marc marine diesel engines. Four salesmen will cover Oregon, southern Washington and adjacent territory. Headed by Gordon Kalk, president, headquarters are located at 2580 N.W. Upshur St., Portland, Ore.

#### A. H. Cox handles Duncan Roc-Jaks

K. O. Duncan Co., Boulder, Colo., appoints A. H. Cox & Co., Seattle, Wash., for representation of Duncan Roc-Jaks in the nineteen western counties of Washington.

#### Wymont Tractor appoints Al Anderson

D. I. Persons, sales manager, Wymont Tractor & Equipment Co., distributor of Ford tractors and industrial equip-



**NEW BUILDING** at Eugene, Ore., located at 1175 Pacific Highway, North. Here the operations of Howard Cooper Corp. that were formerly carried on at Albany are now consolidated with those at Eugene. **Ralph McKernan** is manager of the Eugene branch, having succeeded **M. L. White** who was transferred to Seattle to assist **M. R. Aitken**, Seattle branch manager, and recently named a vice president of the corporation. **W. M. Wallace, Sr.**, has been appointed auditor at Portland.

ment for Montana and northern Wyoming, announces the appointment of Al Anderson as industrial representative for the territory covered. Headquarters of Wymont Tractor & Equipment Co. are in Billings, Mont.

#### Pacific Northwest Trojan outlets

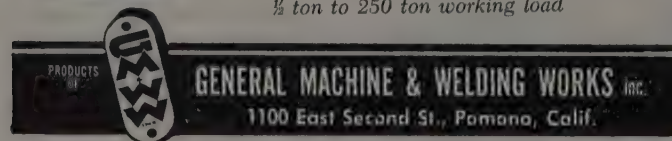
The Yale & Towne Manufacturing Co., Contractors Machinery Division, has appointed the Inland Diesel & Machinery Co., Spokane, Wash., and Clyde Equipment Co., of Portland.



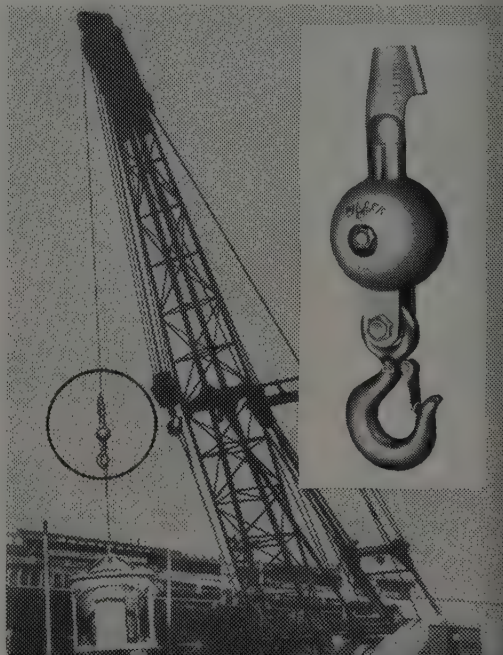
## Maximum SAFETY plus SAVINGS

1. Matched set of angular contact bearings.
2. Practically friction free.
3. Seal keeps grease in, foreign matter out.
4. Faster hoisting due to non-spinning loads.
5. Faster load placement due to easy load turning.
6. Faster rigging due to elimination of cranky wire rope performance.
7. Elimination of twists and kinks means longer wire rope life.
8. Safer load placements due to non-spinning loads.

21 standard types available from  
½ ton to 250 ton working load



**GENERAL MACHINE & WELDING WORKS INC.**  
1100 East Second St., Pomona, Calif.



#### MILLER SWIVELLING HEADACHE BALL

Swivel properly located to absorb twisting effect of wire rope and eliminates spinning loads. Available in four types: Clevis, Eye, Wedge and Thimble. 65-450 pounds; 5-30 Ton Capacity.



P. C. A.'s new GMC FW556 transit mix is powered by a 232-h. p. V8 engine—has a 14,000-lb. front axle; 34,000-lb. dual rear. It's rated for 46,000 GVW work.



GMC Money-Makers from 1/2 to 45 tons

## ***900 lbs. extra payload every trip***

**T**HERE'S no mystery about Pacific Cement and Aggregates, Inc.'s selection of 10 GMC FW556's like this as the newest additions to their huge fleet working the San Francisco-Oakland area.

In addition to GMC's normal "fat-free" ruggedness, a special rear-axle mounting\*—plus special heat-treated frame rails\* that eliminate the need for reinforcement—shave 900 "free-loading" pounds from the vehicle's weight. Result: *they carry almost a half-ton extra payload every time they go to work.*

Power to move these king-size loads comes

from GMC's big 370-cubic-inch V8. Its 232 h. p. is not only more than ample for the toughest on-and-off-the-road work—but also drives the 7-yard barrels through a factory-installed front-end power take-off!

GMC's new extra-stamina-engineered tandems are made to order for construction work. There's one for your job—all the way up to 63,000 GVW-90,000 GCW.

See your GMC dealer.

*\*Optional at extra cost*

**GMC TRUCK & COACH**  
*A General Motors Division*

# ***GMC-America's Ablest Trucks***

## DIGS STRAIGHT



## DIGS CLOSE



## DIGS FAST

Etowah Construction Company uses its Cleveland 95's compactness and shiftable conveyor to advantage on this utilities job in Franklin, Tennessee.

The Cleveland 95 "Baby Digger"—built by the Pioneers of the Modern Trencher, originators of *every* important trencher design feature—makes money for its owners because it . . .

- **fits more jobs**—digs to 5½' deep x 24" wide.
- **digs all soils**—full-size engine, over 30 graduated power and speed combinations.
- **digs faster**—more bucket capacity, more wheel-and-crawler combinations.
- **saves property damage**—full crawlers, easy on lawns and sidewalks.
- **lasts longer**—quality construction and materials mean longer life—it's in the records.

### THE CLEVELAND TRENCHER CO.

20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO



Ore., and Seattle, Wash., as distributors of the Trojan line of tractor shovels for the Pacific Northwest, according to John E. Becker, Western regional sales manager. Inland's territory covers the eastern half of Washington, northeastern Idaho and northwestern Montana. Clyde will serve as distributor for the western half of Washington and the entire state of Oregon.

#### New name, new management, new lines

Following the death of C. D. Roeder earlier this year, the firm of C. D. Roeder Equipment Co., Reno, Nev., was sold to Fred P. Meagher who had been associated with Roeder for the past twelve years and prior to that was in the construction business in the East. Now operated as The Roeder Equipment Co. (TRECo), and under the active management of Meagher, the road and street construction supply firm continues to offer the same good service at the same location, 860 W. Third St. Recently added to its lines are two new ones: McGowan pumps manufactured by the McGowan Division of Leyman Manufacturing Co., Cincinnati, Ohio, and the Lull Engineering Co., St. Paul, Minn.

#### Kenneth Ross appointed sales manager

Kenneth Ross is the newly appointed sales manager for Kyle Equipment Co., La Puente, Calif. Kyle is distributor for Marion Power Shovel Co., of which Robert B. Falck is the newly appointed district sales manager of the Western sales district in South San Francisco.

#### Hall-Perry personnel changes

M. B. Appino has been appointed branch manager at Great Falls, Mont., and D. T. "Pat" Kloeckner has been named service manager for Hall-Perry Machinery Co., according to announcement by R. M. Bowen, president, at Butte.

#### Cal-Ore takes on new account

Cal-Ore Machinery Co., which is now located in its new building at 1105 Court St., Medford, Ore., announces the addition of the Diamond Iron Works line of crushers, in addition to accounts already handled, such as Browning Manufacturing Co., Collins Company, Columbia-Geneva Steel Division of U. S. Steel Corp., Creative Metals Corp., Engineered Equipment Co., Kohler Company, Viber Company, and Willard Concrete Machinery Co. John Garner is president and manager of Cal-Ore, and Walter Garner is vice president.





## How Allis-Chalmers engines bring out the best in any equipment

**YOUR EQUIPMENT DOES MORE** when powered by Allis-Chalmers high-torque, high-usable-horsepower engines. There is a minimum of pull down due to sudden loads, with quick recovery of engine speed — and real lugging power at slow speeds.

**KEEPS WORKING DAY AFTER DAY.** There is unusual simplicity in rugged Allis-Chalmers engines. Diesel models, for instance, have 30 to 50 percent fewer wearing parts than competitive engines. Less can go wrong when parts are fewer and stronger.

**GETS BACK TO WORK FASTER.** Simplicity means easier servicing, too, for Allis-Chalmers engines. They are back to work quickly because you are close to fast parts and service, wherever you are.

See your Allis-Chalmers dealer for full information on engines that will get the most out of *your* equipment — *any* type or size, 9 to 516 hp; *any* fuel, LP or natural gas, gasoline or diesel; for *any* application. Allis-Chalmers, Buda Division, Milwaukee 1, Wisconsin.

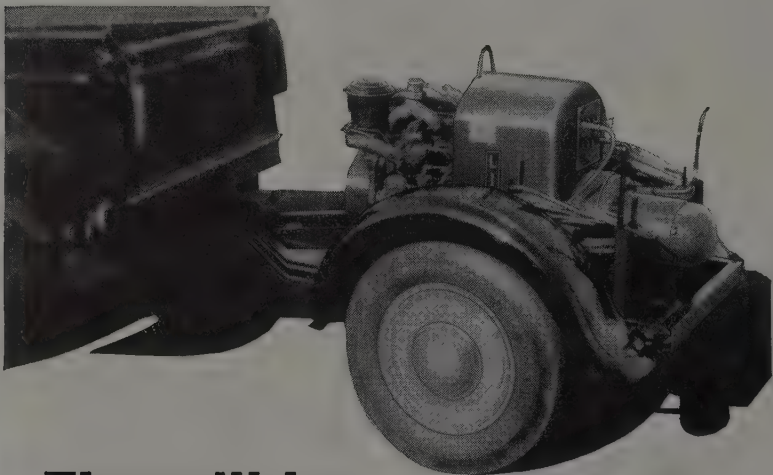
BC-10

# ALLIS-CHALMERS

*Engineering in Action*



ARCHITECT'S sketch of new \$250,000 home of Murphy-Campbell Co., southwest Washington Caterpillar dealer. The unique 30,000-sq. ft. contemporary building will be located on a 10-ac. tract on Highway 99 in Tacoma. Groundbreaking is scheduled for early fall. Murphy-Campbell Co. officers are *Frank Murphy*, president; *Robert L. Brown*, vice president and treasurer, and *Charlotte K. Brown*, corporate secretary.

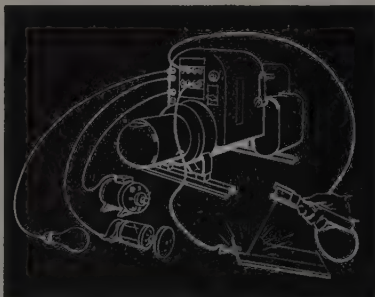


## There'll be no lost time on this job

This contractor takes his own power with him. Whether he needs electricity for lights, power tools, pumps, or to weld a broken piece of equipment, Weldanpower will furnish the electric power he needs—when he needs it.

### WELDANPOWER

Gasoline engine-driven 5000 watt, 115/230 volt power generator and 200 amp. welder combined. Powers lights, tools, motors, heaters and other electrical equipment and welds, simultaneously if necessary! Write for Bulletin SB-1339 for full details.



**THE LINCOLN ELECTRIC COMPANY**

Dept. 4318 • Cleveland 17, Ohio

*The World's Largest Manufacturer of Arc Welding Equipment*

### New sales manager; new line

Gordon Kalk has been appointed manager of Hamilton Engine Sales, Inc., Portland, Ore. He formerly worked as a salesman for Marshall Wells Co.'s Portland branch. Hamilton Engine Sales recently acquired the Schramm air compressor for Oregon and surrounding area.

### Five exclusive distributors appointed

Clark Industries, Construction Equipment Division, announces the appointment of the following exclusive distributors in the West for its new and completely engineered road and airport paving forms, marketed nationally under the trademark "Clark Wedge-Lok," Edward R. Bacon Co., with offices in San Francisco, Oakland, Sacramento and Fresno, Calif., will cover Northern California, while Smith Booth Usher, Los Angeles, will cover the southern portion of the state. Tractor & Equipment Co., Sidney, Mont., will serve eastern Montana. Western Machinery Co. of Salt Lake City will distribute Clark equipment throughout the state of Utah, southern Idaho, and the eastern portion of Nevada. Western Machinery Co. of Phoenix received appointment for the entire state of Arizona.

### New tract renewing plant being built

"Most modern in the country," is the way Howard Peterson, president of Peterson Tractor & Equipment Co., describes the new track renewing plant being constructed at a cost of \$125,000 and 8,000 sq. ft. of floor space at the Peterson facilities in San Leandro, Calif. Designed to bring mass production methods to the renewing process, the entire layout will materially reduce the cost of renewing tracks, rollers, and related parts for Caterpillar-built tractors. Says Peterson, "The finest and latest in track renewing equipment and modern methods will enable us to better serve owners of Caterpillar-built tractors and keep up with the continually growing demand for modern precision service procedures."

### Rasmussen takes on three new lines

Rasmussen Equipment & Supply Co., Salt Lake City, has been appointed by Barnes Manufacturing Co., Mansfield, Ohio, as its distributor in the Salt Lake area for construction equipment pumps. Barnes Manufacturing Co., headed by Fred B. Hout, president, is a leading manufacturer of pumps since 1861, with more than a hundred different pump models in its equipment line.

Beside the Barnes pump, Rasmussen also recently acquired the Brunner & Lay drill steel and drill bit line, and rubber tired tractors and scrapers manufactured by the M-R-S Manufacturing Co.





# **JAEGER'S 50 CFM MORE AIR SPEEDS RUSH WORK**

By producing 365, not 315, cfm of 100 lb. air, this Jaeger Rotary is operating six 80 lb. breakers at full efficiency to

finish a rush job in busy Benjamin Franklin Parkway, Philadelphia. Full load speed only 1700 rpm.



# **FULL AIR PRESSURE AT 5200' ELEVATION**

Installing cable for Denver, Colorado utility, this Jaeger 125" Rotary is holding full pressure in two Thor heavy

duty breakers. Full load speed is only 1700 rpm. Jaeger originated the 125 cfm compressor rating.



# **JAEGER'S 125 AND 250 CFM SIZES ON 2-WHEELS**

Jaeger 125 and 250 rotaries give you the advantages of Jaeger's higher efficiency (1700 rpm full load speed instead of 1800-1950), plus full size tool boxes, retractable

pneumatic-tired dolly wheel and 8-hour fuel tanks, with 2-wheel mounting. Four-wheel units are available in 365 and 600 cfm sizes.

*Your Jaeger distributor will gladly give you full details and demonstration — or let us send you Catalog JCR-5.*

- Sold and Serviced by:**
- EDWARD R. BACON CO.....San Francisco 10
  - NELSON EQUIPMENT CO.....Portland 14
  - WESTERN MACHINERY CO.....Salt Lake City, Denver 4, Spokane 2 and Idaho Falls
  - WESTERN MACHINERY COMPANY.....Phoenix, Arizona
  - D. COGGINS & CO.....Albuquerque

- CASHMAN EQUIPMENT COMPANY.....Las Vegas, Nevada
- SMITH BOOTH USHER CO.....Los Angeles 54
- A. H. COX & CO.....Seattle 4 and Tacoma
- THE SAWTOOTH CO.....Boise and Twin Falls, Idaho
- TRACTOR & EQUIPMENT CO.....Sidney, Miles City, Glasgow
- CENTRAL MACHINERY CO.....Great Falls and Havre
- WORTHAM MACHINERY CO.....Cheyenne, Wyo.



## LIGHTWEIGHT PILING

Foster Lightweight Piling is the best, low-cost steel sheeting for light load excavations. Offers greater strength, pound for pound than any other lightweight piling. No special rigs required—easy to drive and recover—new interlock cannot jam, locks rigidly. Rent or Buy from Foster's nation-wide warehouses—Write for catalogs.

STEEL-SHEET PILING • PIPE PILES  
H-BEARING PILE • STEEL PIPE • RAILS  
ALUMINUM PIPE • BRIDGE RAILING

**LB FOSTER co.**

3460 Wilshire Blvd., Los Angeles 5, Cal.

PITTSBURGH • NEW YORK • ATLANTA  
CHICAGO • HOUSTON • LOS ANGELES

### Davey names Truck Equipment Co.

Appointment of Truck Equipment Co., Denver, as Colorado distributor of Davey Auto-Air truck-mounted compressors, is announced by Davey Compressor Co., Kent, Ohio. In addition to Auto-Air, Truck Equipment Co. will sell Davey power take-offs for use with other equipment, and the full line of Davey air tools.

## MANUFACTURERS

### LeT-WESCO appoints sales aide

C. L. "Chuck" Petersen has been named assistant to the Western area sales manager at LeTourneau-Westinghouse Co., according to W. E. Hendricks, the firm's domestic sales manager. In his new position, Petersen will handle inside sales work and field assignments for F. W. Duke, Western sales manager.

### Kellogg-Little opens new outlet

Kellogg-Little Co., California distributor of McCulloch chain saws, Rottotiller equipment and allied products, has opened a branch outlet in Fresno, according to Edward Little, president of

the San Francisco firm. The Fresno KLCO branch, located at 2608 Tulare St., will make available to the Central Valley area products distributed by Kellogg-Little, featuring complete service facilities. Robert Kendall, a partner in the San Francisco firm, has been appointed manager of the new branch.

### New parts and service head at Thew

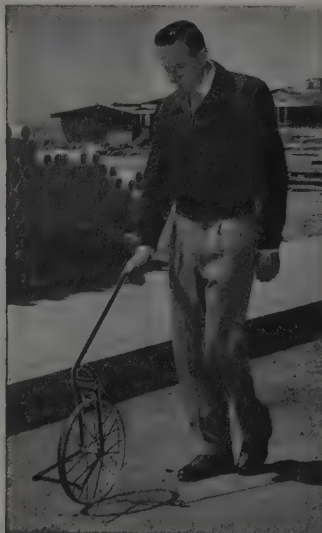
D. L. Douglass, since January 1957 manager of parts and service of The Thew Shovel Co., Lorain, Ohio, has been advanced to director of parts and service for the company, as announced by Alan Smythe, vice president and general manager. Carrol G. Turk assumes the position of assistant to director of parts and service. R. G. Thibaut, who has been manager of the service department for the past four years, continues as the active head in charge of detailed operations of that department.

### Changes in top management

Changes in the top management of Hercules Motor Corp., a leading manufacturer of gasoline and diesel engines, is announced. William L. Pringle has been elected president to succeed John C. Keplinger who is retiring from the

*When you need  
to MEASURE—  
do it the fast  
easy way  
with  
Rolatape*

Cut your estimating and layout time in *half* by using the ROLATAPE Model 400 Measuring Wheel. ONE MAN can measure accurately at normal walking speed . . . and the total measurement is recorded automatically in full view of the operator. And you can measure with complete confidence, since *accuracy* is assured by its scientifically calibrated counting mechanism.



Construction men all over the country are turning to ROLATAPE for speed, convenience and efficiency in their measuring work . . . Why not see for yourself?

See your nearest ROLATAPE dealer or write today for complete information.

**Rolatape Inc.**

1741 Fourteenth  
Street

Santa Monica,  
California

William L.  
Pringle



top post but will retain his position as a director and continue as an executive consultant. Pringle, who was also elected a director, has been serving as director of engineering with the Long Manufacturing Division of Borg-Warner Corp. Henry H. Timken, Jr., chairman of the board of Timken Roller Bearing Co., was elected Hercules board chairman, succeeding Charles Balough, one of the founders of the company, who is severing his connection with the firm. Another top-flight industrialist elected to the board is Walter F. Rockwell of Detroit who takes the place of Raymond W. Loichot, resigned.

### Executive changes at Standard Steel

New responsibilities and changes in position for top management officials of Standard Steel Corp. of Los Angeles, Calif., and Decatur, Ill., are announced by C. N. Rees, executive vice president. Walter J. Kalmeyer, vice president in charge of manufacturing, was appointed

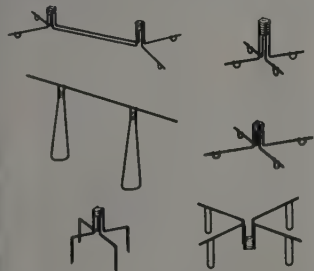




**PRECAST PANEL 32 ft. high by 18½ ft. wide has two large window areas.**



**SUPERIOR ADJUSTABLE BRACES** with exclusive pivoting action, permit quick and easy alignment of panels.



SUPERIOR accessories for tilt-up construction are designed for fast and efficient handling of all types of precast panels and structural members.

SUPERIOR "Pick-Up" Inserts, Brace Anchors, and Adjustable Braces have been used and proven on literally thousands of projects, not a few of which were unique in design. With a background of such experience, the recommendation of our engineers as to location and types of Inserts and Anchors is valuable and reliable.

For details request copy of Bulletin TU-3

# Superior leads again!

## NEW!

### STRESS EQUALIZER SYSTEM REDUCES LIFTING STRESS IN HIGH TILT-UP PANELS

## Saves

reinforcing steel  
used in the  
concrete for the  
stresses which  
occur at time  
of lift.



On any tilt-up job the critical time is, of course, at the point where the load is being transferred from tension to shear, and especially so on panels over 20 ft. high. SUPERIOR Stress Equalizer System was developed to provide the most efficient method of handling these larger tilt-up panels.

Two advantages of this system are: (1) Less concrete reinforcing steel is required for stresses at time of lift; (2) Permits use of simplified crane operation instead of vertical three point lift which requires a rather elaborate system of rigging and which slows down crane operations considerably.

SUPERIOR Stress Equalizer Beams (shown in inset photo above) are now available on a nominal rental basis. For details request a copy of TYPICAL ANALYSIS OF PANEL STRESS using this system on 30 and 35 ft. high panels.

# SUPERIOR CONCRETE ACCESSORIES, INC.

9301 King St., Franklin Park, Ill. (A Suburb of Chicago)

Pacific Coast Plant  
2100 Williams St., San Leandro, Calif.

New York Office  
1775 Broadway, N. Y. 19, N. Y.

a director; Robert R. Johnson, vice president and general manager of Leader Iron Works Division, Decatur, was elected a vice president of Standard Steel; Norman Pitt, chief engineer, was named a director.

Clay C. Hopper, assistant general manager, was made secretary of the corporation; K. G. Thiese, sales manager, was appointed contract administrator; Webb L. Nimick was named general sales manager in charge of the process equipment and special fabrication division; and Wesley V. Davidson, assistant sales manager of the road machinery division, was advanced to general sales manager of that division.

#### New chief engineer for Soule Steel

Appointment of L. M. Elmburg to chief engineer for all Soule Steel Co. products is announced by Edward L. Soule, Jr., president. He is being promoted from his position as Los Angeles district engineer and assistant sales manager. Elmburg's new duties in San Francisco include supervision of all engineering phases of the company's operations.

#### Allis-Chalmers laboratory under way

Allis-Chalmers Manufacturing Co. broke ground recently for a new \$3-

250,000 engineering and research laboratory at its Harvey (Ill.) Works. The multi-million dollar program represents a major expansion of Harvey's engineering facilities. It will provide a central engineering building, an engine and material handling product development laboratory, and an engine test wing.

#### Link-Belt names assistant sales mgr.

Appointment of Dave Van de Roovaart to the position of assistant sales manager in the Link-Belt Speeder Corp. is announced by C. M. Basile, vice president of manufacturing and sales for the Cedar Rapids, Iowa, shovel-crane manufacturer. In his new duties in Cedar Rapids, Van de Roovaart will aid Sales Manager Gordon W. Rowand in marketing the Link-Belt's complete line of crawler and rubber tired shovel-crane.

#### S. F. Beatty dies

S. F. Beatty, 79, retired past president of Austin-Western Manufacturing Co. (now Austin-Western, Construction Equipment Division, Baldwin-Lima-Hamilton Corp., Aurora, Ill.) died at his home in Hinsdale, Ill., after a lengthy illness. A well known and respected pioneer in the road construction equipment field for more than half a

century, Beatty joined Austin-Western in the early "dirt road" days of 1899. As a young man Beatty helped found Highway Industries Inc., predecessor to CIMA, and was also instrumental in the development and early growth of ARBA.



**HOWARD F. BARROWS**, advertising and sales promotion manager of Austin-Western, Construction Equipment Division, Baldwin-Lima-Hamilton Corp., Aurora, Ill., who is retiring following one of the most illustrious careers in the history of industrial advertising. A veteran of 46 years, Barrows witnessed and made major personal contributions to the tremendous progress of construction equipment. Long active in soil conservation circles and national treasurer of the Soil Conservation Society of America, Barrows intends to pursue this avocation vigorously in his retirement.

#### Shattuck Denn acquires control

Majority control of Richmond Anchor Screw Co., Brooklyn, N. Y., manufacturer of concrete form tying and anchoring devices, has been acquired by the Shattuck Denn Mining Co., a leading producer of non-ferrous metals. In making the announcement, Charles A. Snyder, president of Richmond, said Richmond's base of operations has been broadened by the move which will enable them to further expand, develop and promote their products. No change in Richmond personnel is planned.

#### C. E. Martin succeeds Bollwinkel

Cummins Engine Co., Inc., of Columbus, Ind., discloses the appointment of Charles E. Martin as general service manager and member of the executive committee. A member of the Cummins organization since 1943, Martin now assumes over-all responsibilities for the service division, succeeding H. E. Bollwinkel, resigned.

(Advertisement)



#### Symons Steel-Ply Forms Speed Circular Tank Job

R. C. R. Corporation, El Monte, California, used Symons Steel-Ply Forms when building additions to the Delta Booster Plant, part of the water works system improvements for the City of Monterey Park, California.

Footling walls were poured to grade with specially designed wood forms. These forms remained in place to support the Symons Steel-Ply Forms which formed the two 60 ft. diameter tanks and the 20 ft. diameter inner settling tanks.

Symons Scaffold Brackets provided support for a safe working platform for the concrete crew during pouring operations as well as during the erection and stripping of the forms.

Symon Forms may be rented with purchase option. Contact your nearest Symons representative for further information and help in figuring the most economical method of forming your next concrete job. Symons Clamp & Mfg. Co., 634 Williams Street, San Leandro, California. Phone: Lockhaven 9-9159.



# NOW U.S. SAVINGS BONDS PAY YOU HIGHER INTEREST FASTER!

If you've always bought U.S. Savings Bonds for their rock-ribbed safety, their guaranteed return, the way they make saving easier—you've got one more reason now!

*Every Series E United States Savings Bond you've bought since February 1, 1957 pays you a new, higher interest—3¼% when held to maturity! It reaches maturity faster—in only 8 years and 11 months. And redemption values are higher, too, especially in the earlier years.*

About your older Bonds? Easy. Just hold onto them. As you know, the rate of interest a Savings Bond pays increases with each year you own it, until maturity. Therefore, the best idea is to *buy the new—and hold the old!*

The main thing about E Bonds, of course, is their complete safety. Principal and interest are fully guaranteed. They are loss-proof, fire-proof, theft-proof—because the Treasury will replace them without charge in case of mishap. Your Savings Bonds are as solid as a rock—backed by the full faith and credit of the United States.

Maybe you already know about Savings Bonds—as one of the 40 million Americans who own them today, or as one of the other millions who have used Bond savings to help pay for new homes, cars, or college educations, or to make retirement financially easier. If so, this is familiar territory to you—you *know* there's no better way to save.

But if you're new to the game, find out about Savings Bonds and what they can do for your future. Ask your banker, or check with your employer about the automatic Payroll Savings Plan that makes saving painless and easy.

PART OF EVERY AMERICAN'S SAVINGS  
BELONGS IN U. S. SAVINGS BONDS

*The U.S. Government does not pay for this advertisement. It is donated by this publication in cooperation with the Advertising Council and the Magazine Publishers of America.*



# UNIT PRICES

## Selected abstracts for Western projects

### HIGHWAY—Construction of 1.3 mi. of highway in Washington

Washington—Asotin County—State. A \$212,317 contract for the construction of 1.3 mi. of highway and Asotin Creek bridge approaches was awarded to United Paving Co.

|                               |           |
|-------------------------------|-----------|
| (1) United Paving Co., .....  | \$212,317 |
| (2) Inland Asphalt Co., ..... | 233,495   |
| Morrison & Co., .....         | 234,426   |
| De Atley-Vall, .....          | 235,973   |

#### HIGHWAY

|                                                                       | (1)      | (2)        |
|-----------------------------------------------------------------------|----------|------------|
| Lump sum                                                              | \$300.00 | \$5,500.00 |
| 10,960 cu. yd. Clearing & grubbing .....                              | 1.0      | 1.25       |
| 1,792 cu. yd. Common excavation incl. haul .....                      | 1.50     | 2.00       |
| 132 hr. Smooth-wheeled power roller .....                             | 7.00     | 6.00       |
| 100 hr. Pneumatic-tired roller .....                                  | 7.00     | 5.50       |
| 445 hr. Mechanical tamper .....                                       | 8.00     | 7.00       |
| 45.8 sta. Finishing roadway .....                                     | 15.00    | 20.00      |
| 1,590 M gal. Water .....                                              | 2.00     | 1.75       |
| 2,190 ton Crushed stone surfacing top course .....                    | 1.50     | 1.35       |
| 3,500 ton Crushed stone surfacing base course .....                   | 1.50     | 1.33       |
| 6,969 ton Ballast .....                                               | 1.25     | 1.33       |
| 1,000 ton Maintenance rock 1/2 in. minus in stkl. ....                | 1.25     | 1.12       |
| 3,000 ton Sand 1/2 in. to 6 in stkl. ....                             | .75      | .50        |
| 5,200 ton Course crushed screenings 1/2 in. to #4 sieve in stkl. .... | 1.35     | 1.35       |
| 1,450 ton Fine crushed screenings #4 sieve to 6 in stkl. ....         | 1.35     | 1.25       |
| 2,800 ton Class A type 1-1 asphaltic concrete pavement .....          | 7.50     | 8.50       |
| 1,400 ton Class B type 1-1 asphaltic concrete pavement .....          | 7.50     | 8.60       |
| 7 ton Asphalt cement for tack coat .....                              | 70.00    | 90.00      |
| 0.9 mi. Preparation of untreated roadway .....                        | 200.00   | 600.00     |
| 185 cu. yd. New fine mineral aggregate .....                          | 3.00     | 4.00       |
| 30 ton Asphalt cement MC-3 prime coat .....                           | 60.00    | 70.00      |
| 140 cu. yd. Furnishing blending sand .....                            | 1.00     | 2.00       |
| 20 ton Furnishing mineral filler .....                                | 30.00    | 30.00      |
| 6,862 lin. ft. Cement concrete curb & gutter .....                    | 1.80     | 2.10       |
| 308 lin. ft. Type A precast traffic curb .....                        | 2.50     | 2.50       |
| 27 ea. Precast traffic buttons .....                                  | 3.00     | 2.50       |
| 2 ea. Illuminated terminal nosings type No. 1 .....                   | 300.00   | 220.00     |
| 2 ea. Signal pole base .....                                          | 50.00    | 100.00     |
| 818 lin. ft. Plain concrete or V.C. sewer pipe 6 in.-diam. ....       | 1.20     | 1.50       |
| 63 lin. ft. Plain concrete or V.C. sewer pipe 8 in.-diam. ....        | 1.65     | 1.90       |
| 2,016 lin. ft. Plain concrete or V.C. sewer pipe 10 in.-diam. ....    | 2.00     | 2.10       |
| 2,022 lin. ft. Plain concrete or V.C. sewer pipe 12 in.-diam. ....    | 2.30     | 2.70       |
| 24 ea. Arcade drains .....                                            | 30.00    | 15.00      |
| 8 ea. Manholes .....                                                  | 160.00   | 150.00     |
| 20 ea. Catch basins .....                                             | 100.00   | 150.00     |
| 5 ea. Monument cases & covers .....                                   | 30.00    | 50.00      |
| 4,996 sq. yd. One course portland cement conc. sidewalk .....         | 3.50     | 3.25       |
| 304 sq. yd. Cement conc. driveway 3-day mix 6 in. section .....       | 4.20     | 5.00       |
| 4 ea. Adjusting monument cases to grade .....                         | 10.00    | 25.00      |
| 17 ea. Adjusting water valve boxes to grade .....                     | 10.00    | 10.00      |
| 2 ea. Removing and replacing loading grates .....                     | 25.00    | 100.00     |
| 4,264 lin. ft. Removing concrete curb .....                           | 30       | 50         |
| 5 ea. Removing catch basins .....                                     | 20.00    | 50.00      |
| 2 ea. Removing curb inlets .....                                      | 20.00    | 50.00      |

|                                                |     |      |
|------------------------------------------------|-----|------|
| 4,265 sq. yd. Removing concrete sidewalk ..... | .55 | .75  |
| 304 sq. yd. Removing concrete driveway .....   | .40 | 1.00 |
| Estimate Flagging est. \$600.00 .....          |     |      |

#### ASOTIN CREEK BRIDGE APPROACHES

|                                                                    |                           |        |        |
|--------------------------------------------------------------------|---------------------------|--------|--------|
| Lump sum                                                           | Clearing & grubbing ..... | 200.00 | 302.50 |
| 4,110 cu. yd. Common excavation incl. haul .....                   |                           | .85    | 1.25   |
| 415 cu. yd. Structure excavation .....                             |                           | 1.10   | 2.00   |
| 1,320 cu. yd. Embankment compaction method B .....                 |                           | .20    | .20    |
| 67 hr. Smooth-wheeled power roller .....                           |                           | 7.00   | 6.00   |
| 55 hr. Pneumatic-tired roller .....                                |                           | 7.00   | 5.50   |
| 141 hr. Mechanical tamper .....                                    |                           | 8.00   | 7.00   |
| 26 sta. Finishing roadway .....                                    |                           | 15.00  | 20.00  |
| 500 M gal. Water .....                                             |                           | 2.00   | 2.00   |
| 3,050 ton Crushed stone surfacing top course .....                 |                           | 1.50   | 1.35   |
| 7,250 ton Ballast .....                                            |                           | 1.35   | 1.30   |
| 1,060 ton Class A type 1-1 asphaltic concrete pavement .....       |                           | 7.50   | 8.70   |
| 1,020 ton Class B type 1-1 asphaltic concrete pavement .....       |                           | 7.50   | 8.80   |
| 4 ton Asphalt cement for tack coat .....                           |                           | 70.00  | 90.00  |
| 5 ml. Preparation of untreated roadway .....                       |                           | 200.00 | 600.00 |
| 90 cu. yd. New fine mineral aggregate .....                        |                           | 4.00   | 4.00   |
| 15 ton Asphalt cement MC-3 prime coat .....                        |                           | 70.00  | 70.00  |
| 70 cu. yd. Furnishing blending sand .....                          |                           | 1.00   | 2.00   |
| 10 ton Furnishing mineral filler .....                             |                           | 30.00  | 30.00  |
| 2,798 lin. ft. Cement concrete curb & gutter .....                 |                           | 1.90   | 2.16   |
| 46 cu. yd. Concrete class E .....                                  |                           | 30.00  | 34.00  |
| 10,320 lb. Steel reinforcing bars .....                            |                           | .20    | .16    |
| 18 lin. ft. Bit. ctd. corr. metal pipe 8 in. #16 ga. type #2 ..... |                           | 4.00   | 5.00   |
| 325 lin. ft. Plain concrete or V.C. sewer pipe 6 in.-diam. ....    |                           | 1.20   | 1.50   |
| 920 lin. ft. Plain concrete or V.C. sewer pipe 10 in.-diam. ....   |                           | 2.00   | 2.10   |
| 3 ea. Manholes .....                                               |                           | 160.00 | 150.00 |
| 9 ea. Catch basins .....                                           |                           | 100.00 | 150.00 |
| 2 ea. Monument cases & covers .....                                |                           | 30.00  | 50.00  |
| 150 lin. ft. Beam guard rail .....                                 |                           | 6.00   | 4.00   |
| 18 ea. Guide posts .....                                           |                           | 4.00   | 6.00   |
| 32 sq. yd. One course portland cement conc. sidewalk .....         |                           | 3.50   | 5.00   |
| 390 cu. yd. Special riprap .....                                   |                           | 3.00   | 5.00   |
| 3 ea. Adjusting monument cases to grade .....                      |                           | 20.00  | 20.00  |
| 1 ea. Adjusting water meter box to grade .....                     |                           | 10.00  | 50.00  |
| 129 sq. yd. Removing concrete sidewalk .....                       |                           | 50     | 1.00   |
| 3 ea. Removing drop inlets .....                                   |                           | 30.00  | 50.00  |
| 6 ea. Removing concrete traffic buttons .....                      |                           | 1.00   | 1.00   |
| 87 lin. ft. Removing concrete traffic curb .....                   |                           | .50    | 1.00   |
| Estimate Flagging est. \$200.00 .....                              |                           |        |        |

### HIGHWAY—Construction of 2 mi. of road in Idaho

Idaho—Clearwater County—State. A low bid of \$165,043 was submitted by Goodfellow Bros., Inc., for the construction of 2.27 mi. of roadway and a crushed rock base.

|                                 |           |
|---------------------------------|-----------|
| (1) Goodfellow Bros., Inc. .... | \$165,043 |
| (2) Carl Holmer .....           | 183,992   |
| Carbon Bros. ....               | 301,693   |
| James Crick & Sons .....        | 305,418   |

Space is sold as advertisers' inches  
All advertisements in this section are  
1/4 in. short of contracted space to  
allow for borders and composition.

# CLASSIFIED

Rates are \$15.50 a column inch. Copy  
should be sent in by the 15th of month  
preceding publication date.

## EMPLOYMENT

### BRIDGE DESIGNERS STRUCTURAL ENGINEERS

You may qualify for one of the present openings in the Wyoming Highway Department! Permanent positions—5 day week—paid vacations—sick leave—retirement program—optional hospitalization. Employee rating system with periodic advancement based on merit. Opportunity to work on all phases of structure design. Starting salary \$5100 and up. Write for details:

Thomas E. Kilty  
Personnel Director  
Wyoming Highway Department  
Cheyenne, Wyoming

### CONTRACTORS & DEALERS

Used equipment sells fast and easy  
when you use the Classified Columns of  
WESTERN CONSTRUCTION

## ADVERTISEMENT AUSTRALIA

### Snowy Mountains Hydro-Electric Authority

Tenders are invited for Schedule of Rates contracts for furnishing labour and materials and performing all work for the construction in New South Wales, Australia, of the following works:

#### CONTRACT NO. 20,025—

#### TOOMA DAM, TOOMA-TUMUT TUNNEL AND APPURTENANT WORKS

Tooma Dam will be an earth and rockfill structure approximately 225-feet in height and containing some 1.8 million cubic yards of fill, with spillway channel and outlet works.

The Tooma-Tumut Tunnel will be approximately 47,000-feet in length and 12.5-feet in diameter. It will be unlined for a large proportion of its length, the remainder being lined with plain or reinforced concrete. Also included in the contract will be the construction of a control gate shaft, two underground control structures, four small concrete diversion dams and four intermediate intake shafts varying in depth from 200-feet to 400-feet. For the purpose of this contract the Tooma-Tumut Tunnel excludes the outlet into Tumut Pond Reservoir.

#### CONTRACT NO. 20,033—

#### T.2 DIVERSION DAM T.2 POWER STATION AND APPURTENANT WORKS

The works include a concrete gravity dam about 150 feet high with a crest length of about 390 feet, about 7 miles of concrete lined tunnels 21 feet in diameter, headrace and tailrace surge tanks, two inclined partially steel lined pressure shafts each 11.5 feet in diameter and about 1,000 feet long, an access tunnel about 4,000 feet long and an underground power station with a machine hall 320 feet long, and 51 feet wide by 104 feet high and an underground transformer hall. The power station will contain 4 hydraulic turbine and generator sets each of 70,000 kilowatts. The supply and installation of hydraulic turbines and generators with appurtenant electrical equipment is not part of this contract.

#### LOCATION

The sites of the works for these contracts are in the Snowy Mountains Area in the southern part of the State of New South Wales, Australia, at approximately longitude 148° 30' E and latitude 36° S. The elevation of the works varies between 1,500 feet and 4,200 feet above sea level.

#### TENDER DOCUMENTS

Tender documents, for each contract, comprising Form of Tender, Conditions of Tender, Gen-



eral Conditions of Contract, Draft Form of Agreement, Schedule of Rates, Table of Estimated Quantities and Amounts, Specification and Drawings may be obtained by prospective Tenderers on or after 5th October, 1957, on application to:—

Australian High Commissioner,  
Fifth Floor,  
Royal Bank Chambers,  
100 Sparks Street,  
OTTAWA, Canada.

Australian Consulate-General,  
Fourth Floor,  
International Building,  
Rockefeller Center,  
636 Fifth Avenue,  
NEW YORK, U.S.A.

Australian Consulate-General,  
153 Kearny Street  
SAN FRANCISCO,  
California,  
U.S.A.

Liaison Officer,  
Snowy Mountains Hydro-electric Authority,  
c/o United States Bureau of Reclamation,  
Federal Center,  
DENVER, Colorado, U.S.A.

Tender documents may be obtained on the payment of Twenty-two Dollars Fifty Cents (U.S.) for each set of documents for each Contract. Four additional sets of documents for

purposes of tendering will be provided free of charge at the time of inspection of the site.

#### PRELIMINARY DEPOSITS

A preliminary deposit of £A10,000 payable at Sydney, New South Wales, Australia, must be lodged with each tender.

#### INSPECTION OF SITE

Tenderers are required to inspect the site of the works and should communicate with the Snowy Mountains Authority, Cooma, New South Wales, Australia, regarding detailed arrangements.

#### GENERAL INFORMATION

For its own purposes the Authority has compiled certain information regarding the geology, hydrology and meteorology of the region and general information concerning local conditions. The information is not part of the tender documents. It will be made available to Tenderers when they inspect the site.

#### SPECIAL QUALIFICATIONS REQUIRED OF TENDERERS

Consideration of tenders is dependent upon Tenderers having a background of successful achievement in the execution of similar large civil engineering works and possessing technical and other resources necessary to complete the work successfully within the contract period.

#### ALTERNATIVE TENDERS

Within four weeks the Authority will be in-

viting tenders for the construction of:—

CONTRACT NO. 20,034—

#### MURRUMBIDGE-EUCUMBENE TUNNEL TANTANGARA DAM AND APPURTENANT WORKS

and the closing date for the receipt of tenders for Contract No. 20,034 will coincide with the closing date for Contracts Nos. 20,025 and 20,033.

Tenderers are invited to submit alternative tenders conditional on the Authority accepting their tenders for more than one contract.

#### SUBMISSION OF TENDERS

Tenders for the contracts must be submitted in duplicate in accordance with the Conditions of Tendering, enclosed in sealed envelopes appropriately endorsed with the contract number and name of the work tendered for, and addressed to:—

The Business Manager,  
Snowy Mountains Hydro-electric Authority,  
Post Office Box 332,  
COOMA NORTH, N.S.W., Australia.

The tenders must be lodged in the Tender Box at Head Office of the Authority at Cooma or be sent by pre-paid post in time to be delivered in the ordinary course of mail by 12:00 noon on Monday, 3rd February, 1958.

K. See,  
Business Manager.

## USED EQUIPMENT

Equipment and Small Tools,  
Rigging Supplies, Diving  
Equipment from heavy  
construction project. Soon  
available for sale at bargain  
prices. List available.

Mason & Hanger-Rolandi  
P. O. Box 518  
Crockett, California

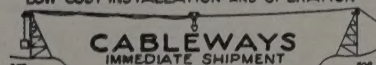
#### LIMA, TYPE 1201—3½ CU. YD. SHOVEL

Like new—Originally delivered in May 1957

18'—11" overall length crawlers, 44" treads,  
worm driven boom hoist, 6 cyl. 7¼x10, type  
LR Cummins Diesel engine, 2000 watt "DC"  
Kohler light plant with wiring & reflectors,  
17,300# counter-weight, 32'6" boom, 22' dip-  
per handle. Contact K. P. Heiner Sr. or Jr.

HEINER EQUIPMENT & SUPPLY CO.  
501 W. 7th So. Ph. EM 3-3979 Salt Lake City

#### LOW COST INSTALLATION AND OPERATION



**CABLEWAYS**  
IMMEDIATE SHIPMENT

ELECTRIC, STEAM OR DIESEL  
CAPACITY 5 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

## FOR RENT OR SALE

### BAILEY BRIDGES

Sectional Steel Truss Type  
Portable—Fully Prefabricated  
Variable Span and Capacity  
Cantilever Erection  
Expert Engineering Supervision

### RENTALS or SALES

BAILEY BRIDGE EQUIPMENT COMPANY  
1767 Conejo Ave., San Luis Obispo, Calif.

#### FOR SALE

- 4 Euclid Rear-end Dumps Model 36TD Cummins NRT Diesel. New June, 1957. 700 hours.
- 2 International Payhauers "Model 95," Turbocharged Diesel Engine. New June, 1957. 500 hours.
- 4 DW-21 Caterpillar Tractors Series "C." 29.5 x 29-34 Ply Tires. New June, 1957. 600 hours, and
- 4 PR-21 Athey Rear Dump Trailers. 600 hours.
- 1 4500 Manitowoc 5 Yd. Shovel Cummins VT12 Diesel Engine with Torque Converter, 1000 hours.

#### DONALD M. DRAKE COMPANY

1600 N. W. Sylvan St.  
Portland 9, Oregon  
CA 6-3991

#### IHC UD-18A Power Units

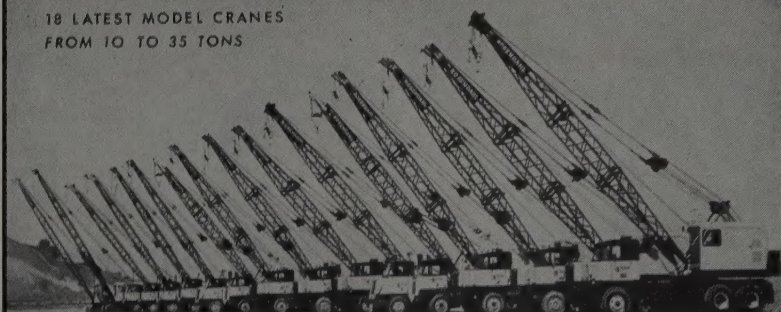
Seven Diesel Power Units used for School instruction purposes only. Practically new condition. Never run under load. Low Hours. Can be used as replacement engine in TD-18A tractors, crushers, sawmills, oil rigs. New price almost \$5000.00. Our price only \$1750.00 each.

#### WILSON EQUIPMENT & SUPPLY CO.

730 S. Greeley Hwy., Box 218  
Phone 38075 Cheyenne, Wyoming

## CRANE RENTALS

18 LATEST MODEL CRANES  
FROM 10 TO 35 TONS



RIGGING  
SERVICES  
EQUIPMENT  
INSTALLATION

# ROSENDahl

## CORPORATION

101 OHIO AVE., RICHMOND • BEACON 4-5386



|                                                               | (1)     | (2)     |
|---------------------------------------------------------------|---------|---------|
| 131,000 cu. yd. Unclassified excavation.....                  | \$65.00 | \$70.00 |
| 540 cu. yd. Excavation for structures.....                    | 2.50    | 3.00    |
| 1,600 y. u. Haul.....                                         | 60.00   | 1.00    |
| 2,700 M gal. Watering embankments.....                        | 10.00   | 1.00    |
| 770 M gal. Watering base and surface courses.....             | 1.50    | 1.00    |
| 1,085 hr. Rolling, tamping roller.....                        | 10.00   | 8.00    |
| 310 hr.- Rolling, pneumatic tire roller.....                  | 7.00    | 6.00    |
| 650 cu. yd. Mechanical tamping.....                           | 2.00    | 3.00    |
| 35 lin. ft. Small ditches.....                                | 10.00   | 50.00   |
| 16,500 ton Crushed rock base course 2 in. max.....            | 1.75    | 1.90    |
| 7,850 ton Cr. rock base course, Type "A", ¾ in. max.....      | 1.85    | 1.90    |
| 6,300 ton Cr. rock base course, Type "B", ¾ in. max.....      | 1.95    | 1.90    |
| 930 lin. ft.- 18 in. pipe culvert.....                        | 5.00    | 4.25    |
| 240 lin. ft. 24 in. pipe culvert.....                         | 8.00    | 6.50    |
| 50 lin. ft. 30 in. pipe culvert.....                          | 10.00   | 7.00    |
| 55 lin. ft. 36 in. pipe culvert.....                          | 15.00   | 12.00   |
| 236 lin. ft. Salvage 12 in.-24 in. corrugated metal pipe..... | 2.00    | 2.00    |
| 2,650 lin. ft. Loose riprap.....                              | 2.00    | 2.00    |
| 100 lin. ft. 6 in. corrugated metal pipe u. d.....            | 3.00    | 2.00    |
| 200 ea. Guide posts, Type 3.....                              | 9.00    | 6.00    |
| 1 ea. Project markers.....                                    | 20.00   | 25.00   |
| 95 ea. Right-of-way markers.....                              | 8.00    | 12.00   |

|                                                        |            |            |
|--------------------------------------------------------|------------|------------|
| 1,900 ton Mineral aggr. (P.M.S.).....                  | 6.75       | 6.00       |
| 2,510 lin. ft. Placing P.M.S. dikes.....               | .30        | .25        |
| 210 cu. yd. Class "A" conc. (tooting block).....       | 30.00      | 34.00      |
| Cont. sum Class "A" conc. (bridge)(1,770 cu. yd.)..... | 120,000.00 | 110,000.00 |
| 1,510 lin. ft. Conc. rail.....                         | 7.00       | 7.90       |
| Cont. sum Bar reinf. steel (bridge)(312,000 lb.).....  | 52,825.00  | 50,000.00  |
| 4,610 lin. ft. Furn. conc. piling.....                 | 4.00       | 5.75       |
| 128 ea. Driving piles.....                             | 135.00     | 175.00     |
| Cont. sum Struct. steel (\$58,000 lb.).....            | 115,000.00 | 116,980.00 |
| 700 lb. Miscell. iron & steel.....                     | 1.00       | .60        |
| Lump sum Clean & paint, struct. steel.....             | 8,660.00   | 7,875.00   |
| 6 ea. Right-of-way monuments.....                      | 10.00      | 7.00       |
| 76 lin. ft. Metal plate guard rail.....                | 6.00       | 5.00       |
| 103 lin. ft. Remov. & reconstr. guard rail.....        | 3.50       | 3.00       |
| 125 ea. Guide posts, culvrt. mrkrs. & cl. mrkrs.....   | 8.00       | 7.00       |
| 2,600 lin. ft. New prop. fence.....                    | .85        | .75        |
| 88 lin. ft. 36 in. R.C.P. (std. str.).....             | 13.00      | 12.00      |
| 2 ea. Entrance tapers.....                             | 58.00      | 50.00      |
| 16 lin. ft. 8 in. C.M.P. downdrains.....               | 3.00       | 3.00       |
| Lump sum Finish, roadway.....                          | 2,000.00   | 500.00     |
| 810 lin. ft. Raised traffic bars.....                  | 2.50       | 2.00       |

## HIGHWAY—Approaches and bridge construction in California

California—Humboldt County—State. A \$459,955 contract has been awarded to Mercer, Fraser Co., Inc., and Mercer, Fraser Gas Co., Inc., for 0.6 mi. of bridge approaches to be graded and surfaced and a bridge to be constructed across Mad River.

|                                                                 |           |
|-----------------------------------------------------------------|-----------|
| (1) Mercer, Fraser Co., Inc. & Mercer, Fraser Gas Co., Inc..... | \$459,955 |
| (2) Arthur B. Siri, Inc.....                                    | 467,381   |
| Bos Construction Co.....                                        | 469,728   |
| Peter Kiewit Sons'.....                                         | 478,000   |

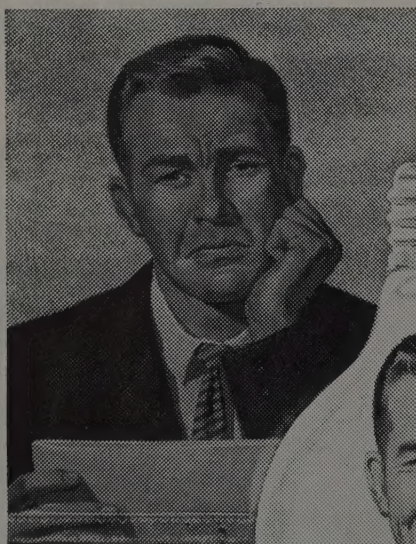
|                                                      | (1)       | (2)       |
|------------------------------------------------------|-----------|-----------|
| 7 ac. Clearing and grubbing.....                     | \$ 500.00 | \$ 350.00 |
| Lump sum Dev. wat. sup. & furn. wat. equip.....      | 1,700.00  | 17,500.00 |
| 300 M gal. Applying water.....                       | 3.00      | 2.00      |
| 800 cu. yd. Roadway excavation.....                  | 1.00      | .55       |
| 925 cu. yd. Struct. excav., Type "A".....            | 28.00     | 19.50     |
| 141 cu. yd. Struct. excav.....                       | 5.00      | 5.00      |
| 66 cu. yd. Struct. backfill.....                     | 6.00      | 5.00      |
| 35,600 cu. yd. Imported borrow.....                  | .87       | 1.00      |
| 5,800 ton Imp. subb. mat.....                        | 1.50      | .95       |
| 7,000 ton Untrea. base.....                          | 1.70      | 1.80      |
| 5 ton Asph. emulsion (pnt. bndr. & fog sl. ct.)..... | 75.00     | 60.00     |
| 11 ton Liq. asph., SC-2 (pr. ct.).....               | 60.00     | 50.00     |
| 100 ton Paving asph. (P.M.S.).....                   | 6.75      | 6.00      |

## CLAMSHELL DREDGING

The following is a tabulation of a sole bid received in the office of U. S. Army Engineer District, Sacramento, Corps of Engineers, Sacramento, Calif., for furnishing and operating clamshell dredging plant at hourly rates for use in Suisun Bay and the San Joaquin and Sacramento Rivers, and tributary channels in Calif. Channels in which dredging will be done may vary in width from about 200 ft. to about 3,000 ft. Original depths of the channels to be dredged may vary from 0 to 25 ft. or more. The character of the materials to be removed is peat, river sediment or sand, or river sediment and sand mixed with not over 50% of gravel.

|                              |          |
|------------------------------|----------|
| 1) Olympian Dredging Co..... | \$43,900 |
|------------------------------|----------|

|                                                                   | (1)      |
|-------------------------------------------------------------------|----------|
| <b>Schedule I (Working Time)</b>                                  |          |
| 650 hr. (a) Three (8 hr.) shifts.....                             | \$ 42.00 |
| 80 hr. (b) Two (8 hr.) shifts.....                                | 47.00    |
| 110 hr. (c) One (8 hr.) shift.....                                | 60.00    |
| <b>Schedule II (Idle Time)</b>                                    |          |
| 50 hr. (a) Three (8 hr.) shifts.....                              | 42.00    |
| 20 hr. (b) Two (8 hr.) shifts.....                                | 47.00    |
| 30 hr. (c) One (8 hr.) shift.....                                 | 60.00    |
| 4 ea. <b>Schedule III (Mobilization and Demobilization)</b> ..... | 350.00   |



In the dark about who sells

the **BRAND** you want?

Enlighten yourself in the...  
**YELLOW PAGES!**

Just open the Yellow Pages to the product heading you want. Like *tools*, for instance. There you'll find Brand Names listed alphabetically—each with the local dealers who sell them. That's all there is to it... takes just seconds.

You'll find it fast in the...



**Pacific Telephone**





# ADVERTISERS in this issue

## A

aktiebolaget Atlas Copco/Sweden...136  
Allis-Chalmers Mfg. Company  
Buda Division.....145  
Construction Machinery  
Division.....6 & 7  
Allison Division  
General Motors Corporation...135  
American Air Filter Co.....141  
American Bitumuls and Asphalt  
Company.....75  
American Manganese Steel Division  
American Brake Shoe Company...129  
American Mare Inc.....116  
American Pipe & Construction  
Company.....Cover 3  
American Tractor Equipment  
Corp.....128  
they Products Corporation...96 & 97  
Austin-Western Works  
Division of Baldwin-Lima-  
Hamilton Corp.....24

## B

Baldwin-Lima-Hamilton Corp.  
Construction Equipment Div.  
Austin-Western Works.....24  
Lima Works.....131  
Barnes Manufacturing Company..84  
Baw-Knox Company  
Construction Equipment  
Division.....93 & 139  
Bos Incorporated.....39  
Bucyrus-Erie Company.....35 & 36  
Buda Division  
Allis-Chalmers Mfg. Company..145

## C

Caterpillar Tractor Company  
...17, 33, 85, 104, 105, 112 & 113  
Capman Valve Mfg. Company...94  
Chevrolet Motor Division  
General Motors Corporation...59  
Clark Equipment Company...18 & 19  
Cleveland Trencher Co., The....144  
East Manufacturing & Supply  
Company.....84  
Colorado Fuel and Iron Corp., The  
Grader Blades.....73  
Conveyor Co., The.....133

## D

Drott Manufacturing Company...53

## E

Easton Mfg. Co., Axle Division...65  
Electric Division  
General Motors Corp...14, 15 & 22

## F

Frestone Tire & Rubber Company 5  
Fiske Brothers Refining Co.  
Lubriplate Division.....134

Flexible Road Joint Machine  
Co., The.....62 & 63  
Flexible Steel Lacing Co.....118  
Foster, L. B., Company.....148  
Fruehauf Trailer Company...78 & 79  
Fuller Manufacturing  
Company.....Cover 2

## G

Galion Iron Works & Mfg.  
Company, The.....51  
Gardner-Denver Company.....10  
General Machine & Welding  
Works, Inc.....142  
General Motors Corporation  
Allison Division.....135  
Chevrolet Motor Division.....59  
Euclid Division.....14, 15 & 22  
Truck & Coach Division.....143  
General Petroleum Corporation...16  
General Tire and Rubber  
Company, The.....60  
Goodall Rubber Company.....124  
Gorman-Rupp Company.....140

## H

Homelite Corporation.....86 & 87

## I

Ideal Reel Company.....126  
Ingersoll-Rand Company.....109  
International Harvester Co.  
Construction Equipment  
Division.....56, 57 & 76  
Motor Truck Division.....13  
Iowa Manufacturing Company...101

## J

Jaeger Machine Co., The.....147  
Johnson, C. S., Co.....45  
Johnston, A. P., Company, Inc...155

## K

Kaiser Steel Corporation.....137  
Keasbey & Mattison Company...83  
Koehring Company.....41 & 43  
Kolman Company.....49  
Kwik-Mix Company.....44

## L

LeTourneau-Westinghouse  
Company.....123, 125 & 127  
Lima Works, Construction  
Equipment Div., Baldwin-Lima-  
Hamilton Corporation.....131  
Lincoln Electric Co.....146  
Link-Belt Speeder Corporation...91  
Lubriplate Division  
Fiske Brothers Refining Co...134

## M

Mack Trucks, Inc.....69  
Master Vibrator Company.....132

Mixermobile Manufacturers Inc...130  
Monarch Road Machinery Co....118

## N

Northwest Engineering Company. 3

## O

Owen Bucket Co., The.....81

## P

Pacific Telephone & Telegraph  
Co., The.....154  
Parsons Company.....42  
Permanente Cement Company.Cover 4  
Pittsburgh-Des Moines Steel  
Company.....99  
Porta House.....134

## R

Rotatape, Inc.....148

## S

Screen Equipment Co., Inc.....8  
Shell Oil Company.....9  
Southwest Welding &  
Manufacturing Co.....12  
Stanco Manufacturers and  
Sales, Inc.....54  
Standard Oil Company  
of California.....21  
Straub Mfg. Co.....119  
Superior Concrete Accessories,  
Inc.....149  
Superior-Lidgerwood-Mundy  
Corporation.....116  
Symons Clamp and Mfg.  
Company.....150

## T

Techkote Company, The.....117  
Thew Shovel Company,  
The.....120 & 121  
Timken Roller Bearing Company  
Rock Bit Division.....47  
Tractomotive Corporation.....107

## U

United States Rubber Company  
Mechanical Goods Division...20  
Universal Form Clamp Co.....110

## W

Waukesha Motor Company.....11  
Western Construction.....138

## Y

Yale & Towne Mfg. Company  
Contractors Machinery Div...88 & 89

# 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



## Help stamp out road engineers

"Shut up, or I'll build a freeway over your house!" That's typical talk for a highway engineer, if you know only what you read in the newspapers. In the public eye the highway engineer seems to be a man feeding greedily at the public till, totally blind to the needs of the people, and with the artistic sensitivity of a codfish. Worst of all, he has the power of eminent domain to force his sick plans into reality, and anybody who objects finds himself under a sheepsfoot roller and 8 in. of cement-treated base. ("How can we stop the highway engineers?" asked a recent letter to the editor of a Western newspaper.)

Part of the reason for the public view is the newspaper accounts of the hearing held to determine the people's feelings about a proposed highway location. The engineers (unaided by the many civic groups which should be taking an interest and supporting them) are pitted against the handful of people living on the proposed centerline, who squawk noisily about having to move over for the public good. The facts are, as anyone reading these columns knows, that highway engineering is not noticeably different from any other professional group in the percentage of members who are narrow-minded clods and selfish dimwits. Consider the following examples of tact and self-sacrifice:

Two months ago we described how Crosby Holden, Right-of-Way agent for the Arizona Highway Department, humored an eccentric citizen by moving his ghosts along with his furniture. For that we nominated him to receive this year's Merit Button for Psychological Engineering. Another of his adroit exploits has come to light.

One evening he visited a couple to talk over the idea of building a freeway through their living room and kitchen. But they were in no mood to discuss business. It was their wedding anniversary and they were complaining that they couldn't go out and celebrate because they couldn't find a baby-sitter. Holden volunteered for the job. When the couple returned from a night on the town they were in a wonderful mood and

they signed the necessary papers immediately.

One of the things highway engineers are accused of is building fine highways and streets leading to their homes, and maintaining them in perfect condition, while adjoining roads are left in a state of shameful disrepair. The case of Francis Hveem refutes that idea in a startling manner. Now Materials and Research Engineer, he has been with the California Division of Highways since World War I. He was born in the town of Lamoine, California. Lamoine is now completely covered by a single highway fill.

### Construction—4000 B.C.

"Know, O mighty Pharaoh, that I have made inspection of the works of the upper Nile. I found the builders to be a most strange breed. First cometh men with a three-legged prop with which they make diverse observations. When they approach a village the maidens fleeth and the villagers bewail exceedingly because they always aim the prop at a house, saying 'It must be moved,' although the desert stretcheth for miles around desolate. Sometimes they drive little stakes in the ground. They play a game and wait until someone knocks down one of the stakes, and then they jump in the air and shout and tear their hair and call on Ra and Osiris and Isis and Set and Horos and all the lesser gods, and they become exceedingly wroth. They also make many hieroglyphics, many of which they do not themselves understand.

"Then cometh the contractors. They are a class that have many possessions and ride in fine chariots, but they easily run to bitter tears, and they runneth down the work to be done, to each other, that they may make the other afraid and he add much expense to his calculations.

"Then cometh the sellers of goods clad in fine raiment and the maidens meet them with gleeful smiles, as they have something magic called an 'expense account.' They are all worshippers of the Sacred Bull. Every

morning they chant 'O Sacred Bull, keep us full of thy substance because only with thee can we make our living.'

"Then cometh the letting of the contract. Whereat one contractor draws the prize, and the rest of the contractors beat their breast and pour ashes on their heads, and say with a mighty shout, 'He can't do it for the money.'

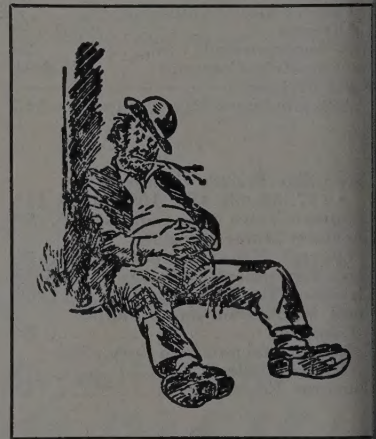
"But the low bidder he smiles and is pleased with himself, wise in his own conceit, and he hunteth up the prop men and many maidens and taketh them to dine and handeth the check to a prop seller of goods."

Author unknown

### Department of funny signs on fogroom doors

This sign is on the fogroom door of the concrete testing lab at the Kings River Project:

*ACHTUNG! Pfortzen im nebelzimmer strengst verboten!*



"Yeah, I always used to be low bidder."

### Cats on poles

Seattle City Light is doing other things in addition to building Gorge Dam and enlarging their central office building. For instance, last year they removed 114 cats from light poles. This does not include a large number of cats which jumped down, leaving their grins behind, before the linemen arrived. Any cat on a light pole, regardless of its pedigree or reasons, must be removed by a City Light lineman. They are the only people authorized to climb official poles. The cats seem to know this

... The Editors