WESTERN CONSTRUCTION NEWS

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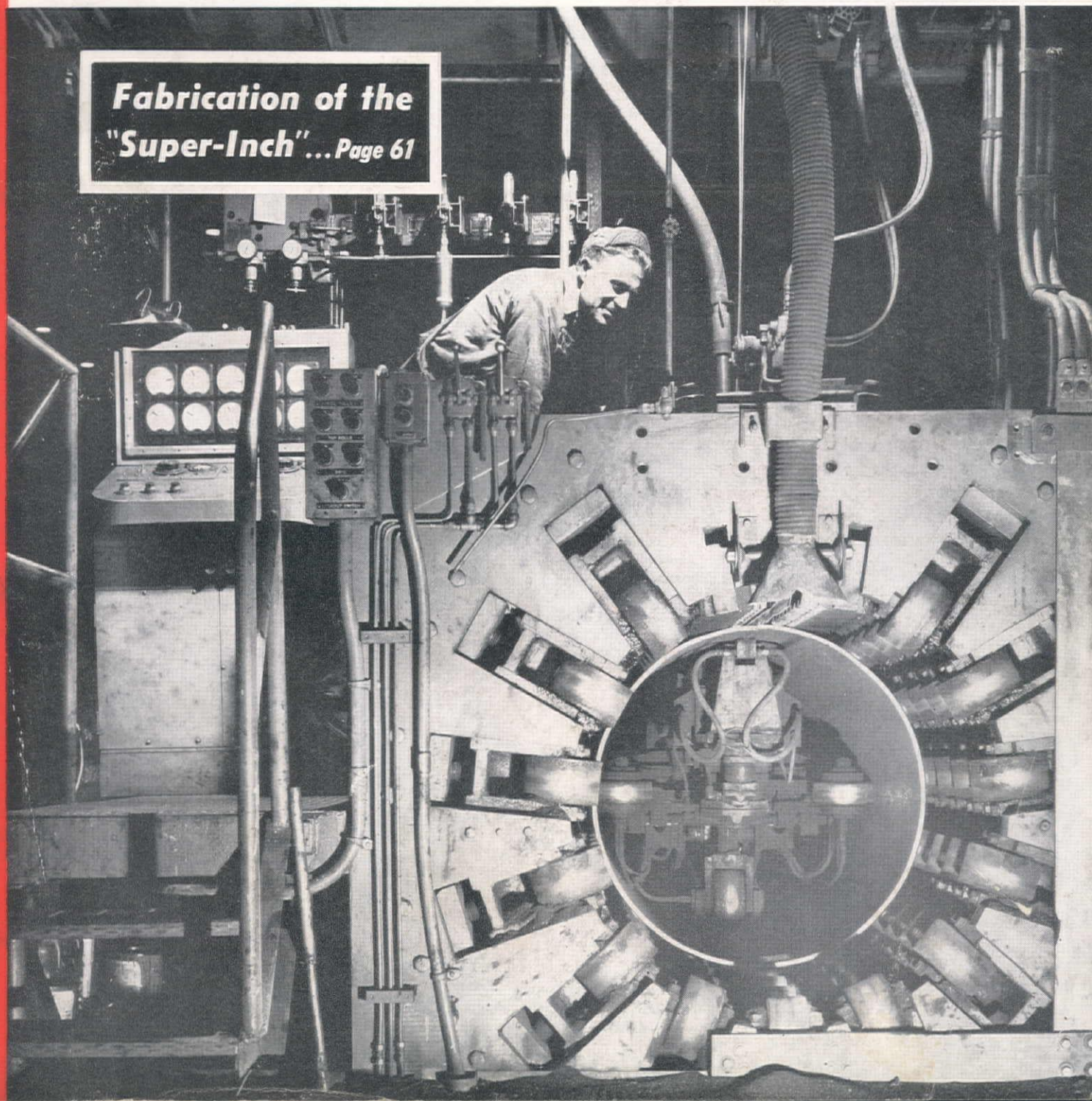


Fabrication of the "Super-Inch"... Page 61

MORE WORK AT LOWER COST

Keep engines clean and efficient with TEXACO URSA OIL X★★

ASSURE trouble-free engine performance, and you'll get more work and longer working life from your machines. Maintenance costs and fuel consumption will be less, too. Use *Texaco Ursa Oil X★★* – the fully detergent and dispersive oil that cleans as it lubricates. Ideal for both heavy-duty gasoline and Diesel engines.

Texaco Ursa Oil X★★ strongly resists oxidation. This means rings stay free, valves act properly because engines are cleaner. *Texaco Ursa Oil X★★* stands up under heat and pressure . . . gives full protection at all times . . . guards bearings against corrosion . . . assures longer life for moving parts.

Reduce Other Maintenance Costs

Use *Texaco Marfak* in chassis bearings – get extra hundreds of miles of protection, longer life for all chassis parts.

In wheel bearings, use *Texaco Marfak Heavy Duty*. It seals out dirt and moisture, requires no seasonal change.

Protect crawler track mechanisms with *Texaco Track Roll Lubricant*. It's remarkably long lasting, seals mechanisms against water and dirt, reduces wear.

Texaco has a Simplified Lubrication Plan that's a real money saver. Ask your Texaco Lubrication Engineer for full details. Just call the nearest of the more than 2,000 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

TUNE IN . . . TEXACO STAR THEATER starring MILTON BERLE on television every Tuesday night. See newspaper for time and station.

YOU BUY A DRAGLINE

...to make money!

Perhaps in no other business does the difference between profit and loss depend so heavily on the performance of one machine. Your dragline is the heart of your job and you can't afford anything but the best for the heart of the job.

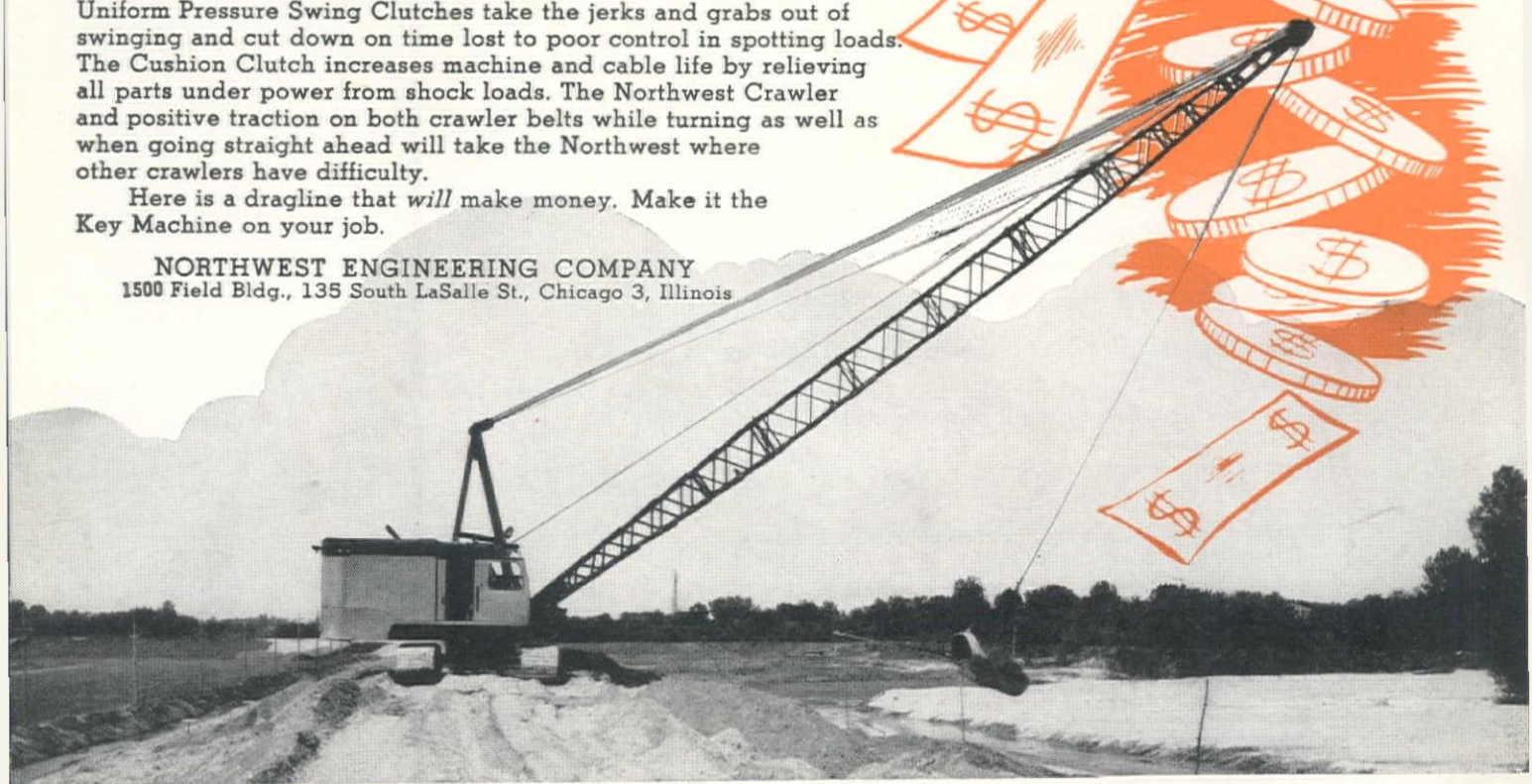
Northwest design brings you the stamina for dragline service — long travel and steady output.

Cast Steel Bases and Cast Steel Machinery Side Frames maintain shaft and bearing alignment in rough going. Simplicity assures easy upkeep and minimum down time. The "Feather-Touch" Clutch Control gives ease of operation without tubing, delicate valves or pumps (your Northwest can't be shut down because of control failure). Uniform Pressure Swing Clutches take the jerks and grabs out of swinging and cut down on time lost to poor control in spotting loads. The Cushion Clutch increases machine and cable life by relieving all parts under power from shock loads. The Northwest Crawler and positive traction on both crawler belts while turning as well as when going straight ahead will take the Northwest where other crawlers have difficulty.

Here is a dragline that *will* make money. Make it the Key Machine on your job.

NORTHWEST ENGINEERING COMPANY
1500 Field Bldg., 135 South LaSalle St., Chicago 3, Illinois

NORTHWEST ADVANTAGES MEAN MORE YARDAGE



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WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED WESTERN HIGHWAYS BUILDER

Volume 25 **MAY 15 • 1950** Number 5

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Covering Construction in the Western Half of the United States

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B.F.Goodrich

The Super Traction, Universal and Rock Logger Silvertowns shown at right are available in All-Nylon cord construction — ideal for tough construction projects.

ALL-NYLON tires offer terrific savings; no flex breaks, no bruise breaks, no blowouts!

YOU can judge for yourself the tremendous savings possible from tires that do not blow out or develop bruise and flex breaks. That's exactly the record run up by BFG ALL-NYLON tires . . . a record proved by more than 2 years' actual use by our customers. To date, not a single ALL-NYLON Silvertown has blown out or been found to have bruise or flex breaks!

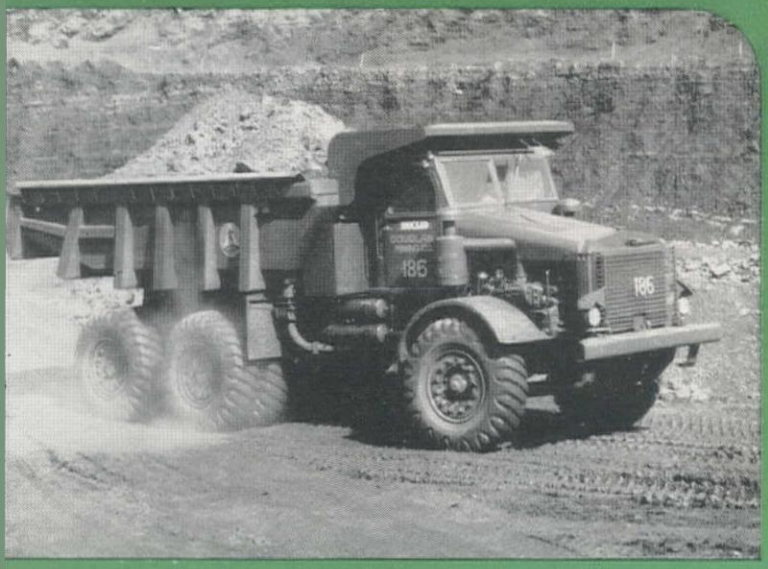
Strong, elastic nylon cord helps you make savings in other B. F. Goodrich truck tires, too. *All* truck tires with 8 or more plies have the popular *nylon shock shield*. This exclusive feature (U.S. Patent No. 2498859) is built in between tread rubber and the cord body of BFG tires. Under impact, the nylon shock shield distributes and absorbs the shock; shields the cord body. And there is a double shock shield for double protection in large, off-the-road tires.

Only B. F. Goodrich gives you the added protection of the nylon shock shield; the added savings from (1) longer tire life (2) increased bruise resistance (3) decreased danger of tread separation (4) more recappable tires. And nylon shock shield costs no extra —you pay no premium!

There's a specially designed BFG highway truck, off-the-road or grader tire for every need. Call your B. F. Goodrich Dealer or *The B. F. Goodrich Company, Akron, Ohio.*

RESEARCH KEEPS
B.F.Goodrich
FIRST IN RUBBER
Truck Tires

Euclid... Specialist IN OFF-THE-HIGHWAY HAULING EQUIPMENT

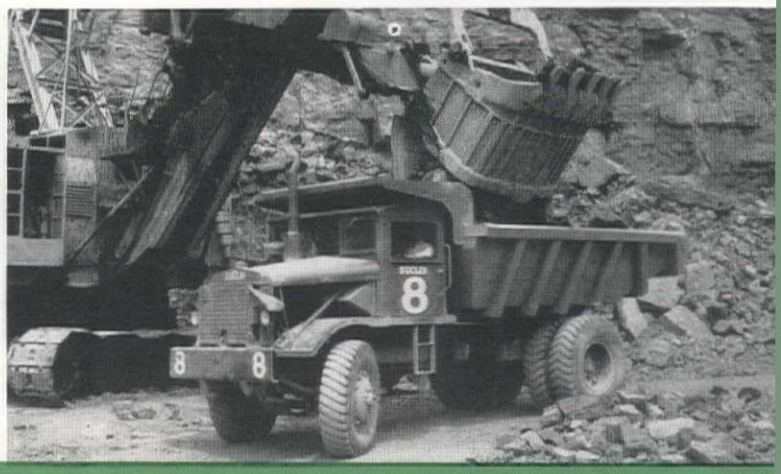


Built by a pioneer manufacturer of earth moving equipment, Euclids incorporate the know-how of years of experience. Every Euclid model is engineered specifically for off-the-highway work; all of the production and service facilities of Euclid are devoted to this type of equipment.

Heavy-duty design and construction throughout assure long life and dependable performance . . . more loads per hour and more profit per load on the toughest jobs. Some of the Euclid-built features are the planetary type drive axle, frame and body on all models, and double-acting hydraulic hoist for Rear-Dump and Side-Dump "Eucs".

Owners can depend on Euclid's world-wide distributor organization for parts and service when and where they are needed. Call or write your Euclid Distributor for complete information on models best suited for your job requirements.

Cable address: YUKLID. Code: BENTLEY

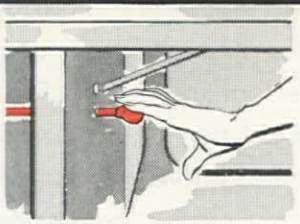


The EUCLID ROAD MACHINERY Co., Cleveland 17, Ohio

EUCLIDS *Move the Earth*

The New INTERNATIONAL TD-24

HERE'S WHAT THE



Positive all-weather starting on gasoline, with quick change-over to full diesel operation, all from the seat.

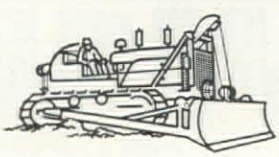
Separate reverse lever for quick change of direction. The tractor moves in the direction the lever is moved.

Self load and run with scrapers of 17-yard capacity—and shift gears on-the-go with the rolling load.

Cut waste shifting time out of work cycles; provide the best speed for every operation, 8 speeds in each direction!

INTERNATIONAL HARVESTER

INTERNATIONAL



CHAMPION of Crawlers

"The TD-24's work right along on slopes so steep we have to cut them down before other tractors can climb them even without loads," says Bob Rardin of Rardin Brothers, Akron, Ohio. "They are fast tractors, easy to shift and have plenty of power. This combination really moves dirt." His TD-24 was equipped with a bulldozer.

"It will out-buck any tractor I've ever run," says Harold Wooley's operator, Drain, Oregon, "and sure push dirt up hill—and climb steep grades." His TD-24 works regularly on 30% to 50% grades, building mountain roads.

"I wouldn't have anything else," says another Oregon operator. He works for V. R. Russell & Sons of Valsetz. "It's sure fine on bulldozing; best dirt mover I ever got hold of."

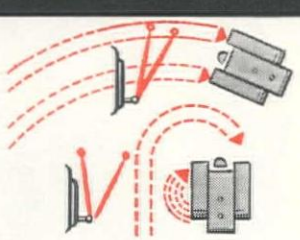
That's the way owners and operators talk about the International TD-24 Crawler. It has earned their praise, for it does everything any other big tractor can do, *plus many things that NO other tractor can do*. The TD-24's versatility makes it the most useful and profitable earth-mover in any equipment line-up.

Visit your International Industrial Power Distributor for a demonstration. Then ask yourself how long you can get along without this big red worker and the extra earnings it will produce.

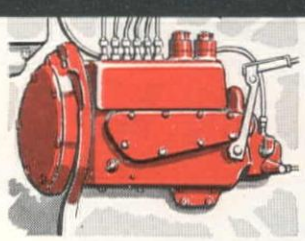
INTERNATIONAL HARVESTER COMPANY
Chicago

TD-24 CAN DO FOR YOU

Instant speed change up or down one speed, or stop, without declutching. Planet Power drive does it!

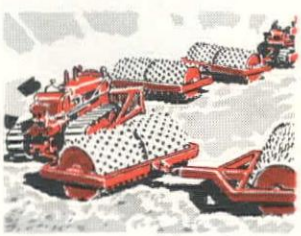


Planet Power steering puts turns with power on both tracks, feathered turns and pivot turns at your fingertips.



Torque Control feature of fuel injection pump increases engine torque when needed to overcome overloads.

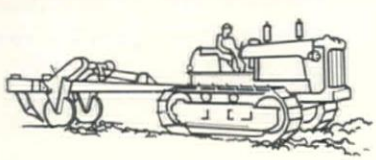
Work on grades up to 100%. Its power, ground contact, balance and lubrication are right for licking any grade.

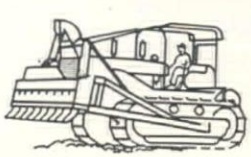


Handle heaviest loads on gradual turns as easily as straightaway because both tracks are powered in the turn!

Push or pull through tough going. The engine delivers extra "power" when its r.p.m. is pulled down by load.

INDUSTRIAL POWER





TANDEM DRIVE MOTOR GRADER

Here's a value that invites comparison

Compare **THE PRICE!**
Compare **THE FEATURES!**
Compare **THE PERFORMANCE!**

. . . and you will agree
THE ALLIS-CHALMERS MODEL D IS YOUR BEST BUY . . . BY A LONG WAY

only
$3,585

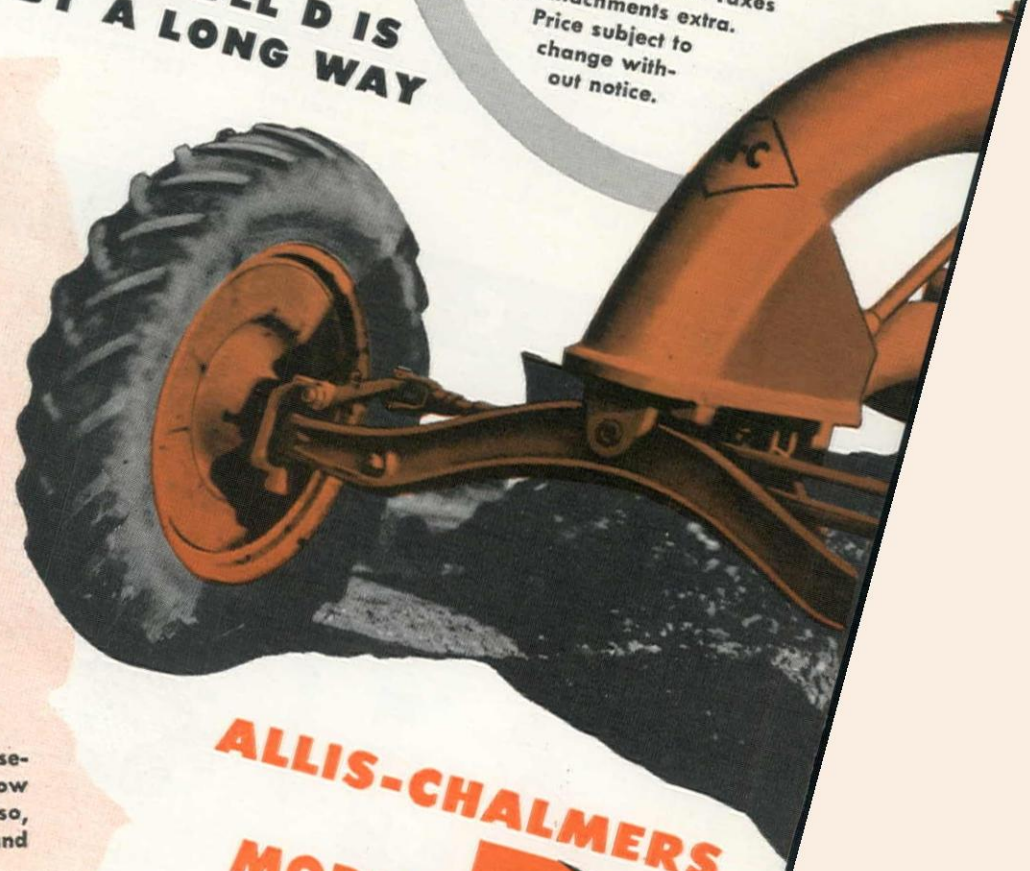
F. O. B. Springfield, Ill. Taxes and attachments extra. Price subject to change without notice.

Not a converted job . . . it's ENGINEERED NEW FROM THE GROUND UP — to bring you BIG grader design and performance advantages:

- ✓ Tandem Drive
- ✓ Tubular Frame
- ✓ Roll-Away Moldboard
- ✓ Power Hydraulic Controls
- ✓ Complete Operator Comfort
- ✓ Rear-Engine Design
- ✓ High Arch-Type Front Axle
- ✓ Drop Down Transmission
- ✓ Full Visibility
- ✓ Simplified Servicing

. . . Plus special attachments that widen its usefulness — Rear-End Loader, Scarifier, Windrow Eliminator, "V" or Blade-Type Snowplows. Also, various other accessories. Electric starter and lights standard equipment.

"Seeing is Believing." Ask Your Allis-Chalmers Dealer for a Demonstration.

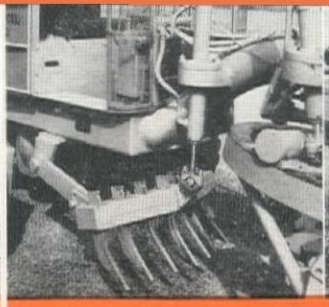


ALLIS-CHALMERS MODEL D

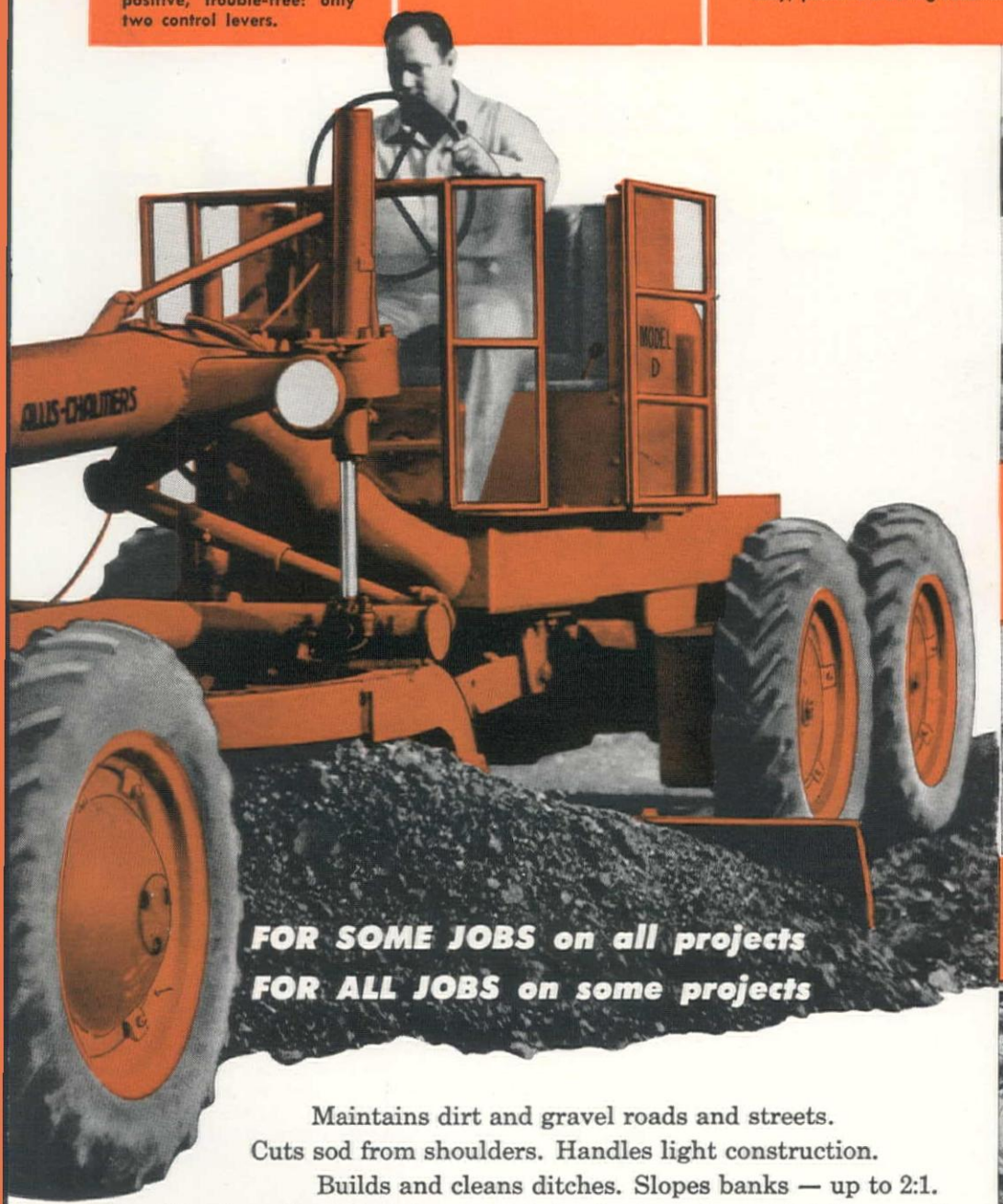
WEIGHT — 8,500 lb. (bare)
BRAKE HP. — 34.7 (famous Allis-Chalmers gasoline engine)
SPEEDS — four forward, 2.40 to 18.61 mph.; reverse to 2.9

BLADE ANGLE SET FROM OPERATOR'S PLATFORM. Hydraulic blade lift—fast, positive, trouble-free: only two control levers.

ALL-VIEW CAB — quickly lifted off or replaced.

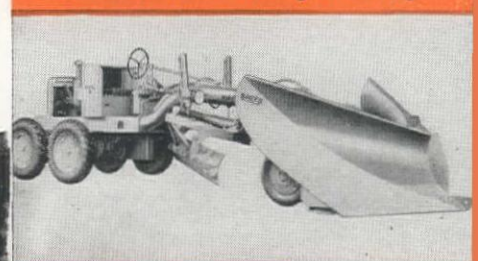


HYDRAULICALLY CONTROLLED SCARIFIER — Located back of circle for greater down pressure. Fast, accurate ripping, controlled penetration. Easy, positive steering resulting from greater front-end stability.



FOR SOME JOBS on all projects
FOR ALL JOBS on some projects

LOADS MATERIAL into trucks with Tractomotive Loader — from windrows and stockpiles . . . surplus dirt or snow. Hydraulically operated, simple to mount 5/8 cu. yd. bucket — available with bucket teeth. Note carrying position of loader—no interference with steering or blading.



PLOWS SNOW with specially designed Baker snowplows — "V" or Blade-Type. Hydraulically controlled. Interchangeable blade plow may be used for backfilling and light 'dozer work.

WINDROW ELIMINATOR SAVES TIME. This rear blade saves extra pass by feathering out windrow from grader blade. Means safer traffic conditions, too. Specially designed for the Model D.

Maintains dirt and gravel roads and streets.
Cuts sod from shoulders. Handles light construction.
Builds and cleans ditches. Slopes banks — up to 2:1.
Levels sub-grades. Ideal for maintaining haul roads and finishing work.
Plows snow. Loads all types of materials. Scarifies.
Does outstanding work on every job — the year around, at big savings.

see your ALLIS-CHALMERS dealer

ARIZONA
Phoenix—Neil B. McGinnis

NORTHERN CALIFORNIA
Oakland and Eureka—Buran Equipment Company
Modesto—J. M. Equipment Company
Fresno—Peerless Tractor and Equipment
Food Machinery and Chemical Corp.
Salinas and King City—Livingston Bros. Tractor Company
No. Sacramento, Stockton, Redding—Moore Equipment Company, Inc.
Mountain View—Redwine Tractor Co.
Visalia—Tulare County Tractor Co.

SOUTHERN CALIFORNIA
Bakersfield—San Joaquin Tractor Co.
Los Angeles, San Diego and Santa Barbara—Shaw Sales & Service Company

IDAHO
Idaho Falls and Boise—Southern Idaho Equipment Company
Lewiston—Fred M. Viles and Company, Inc.

MONTANA
Missoula—Mountain Tractor Company
Sidney—Northland Machinery Company
Billings—Seitz Machinery Company, Inc.

NEVADA
Elko—C. W. Paul Hardware and Machinery
Reno—Moore Equipment Company, Inc.

OREGON
Eugene, Roseburg and North Bend—Farm and Industrial Equipment Co.
The Dalles—Dielschneider Equip. Oreg. Ltd.
La Grande—Oregon Tractor Company
Medford—Tractor Sales and Service, Inc.
Klamath Falls—West Hitchcock Corp.
Portland—Wood Tractor Company

UTAH
Salt Lake City—Cate Equipment Co., Inc.

WASHINGTON
Seattle, Tacoma and Wenatchee—A. H. Cox & Company
Walla Walla—Northern Harris
Spokane—Fred M. Viles and Company, Inc.

WYOMING
Casper—Studer Tractor & Equipment Co.

PAY LOADS THAT PAY OFF

★ **New Mexico,** near Silver City. Two "Caterpillar" D8 Tractors push-and-pull-loading a "Caterpillar" No. 80 Scraper with 11½ yards of tough rock in a trifle over a minute—thanks to matched equipment and 130 honest drawbar horsepower. On 800-ft. one-way hauls the hauling team averaged 8 trips and 90 pay yards an hour. Total excavation (5.6 miles) 130,000 yards—about 60% rock. Two other "Caterpillar" Diesel Tractors, with Scrapers and Bulldozers, were also used on this work.

QUICK, big, constant loads . . . they spell SPEED, VOLUME, PRODUCTION. And it's the tractor that plays the biggest part in the pay-off. You get the very tops in results when you sign up the *power, capacity,* and *dependability* that "Caterpillar" Diesel Tractors offer – the kind you see working on the state highway construction project pictured and described above.★

Says Contractor O. D. Cowart: "From my experience, 'Caterpillar' Diesel Tractors are unbeatable. Their ability to take punishment with a minimum of repairs makes them unquestionably the leader in the construction field."

That's putting it broadly. It's *sustained slugging power* that counts. Like the prize fighter who can stay on his feet round after round, it's the tractor which day after day can "take it and give it" that's the real profit-maker in the long run. "Caterpillar" Diesel Tractors are made of that kind of stuff. They're tough! They don't need "long counts" (down time). They're quick on the comeback . . . should a new part or fix-up be in order, there's an efficient and quick-acting dealer service standing by. "Caterpillar" leaves nothing undone toward building – and keeping – 60-second minutes, 60-minute hours, 24-hour days of *fighting performance* into every unit that bears its name. *Ask your "Caterpillar" dealer for the proof – in mechanical evidence, in user experiences, in demonstrations.*

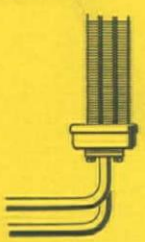
Caterpillar Tractor Co. • San Leandro, Calif.; Peoria, Ill.

LOOK UNDER THE HIDE *for the qualities that pay off in tractor performance and long life... you'll find them in every "Caterpillar" detail. For example:*

Hard Chrome-Faced Compression Rings are standard on all models of "Caterpillar" Diesel Tractor Engines —increasing life and performance at critical point of engine design.

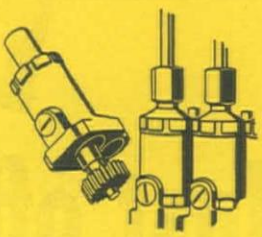
Alloy Iron Wet Type Cylinder Liners are "Hi-Electro" hardened — giving exceptionally long life. Wearing surface is chemically treated for proper break-in.

Solid Aluminum Alloy Connecting Rod and Main Bearings are exclusively "Caterpillar." Advantages: low rate of wear; fine heat-transfer characteristics; high corrosion resistance.



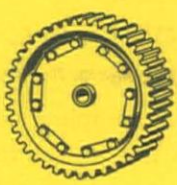
Air-Cooled "Lube" Oil. Air cooling lowers oil temperatures — reducing carbon, minimizing gum formations, and adding to the efficient serviceable life of working parts.

Independent Starting Engine of exclusive "Caterpillar" design gives safe-and-sure starts at all times, and allows the Diesel to build up full oil pressure before starting.

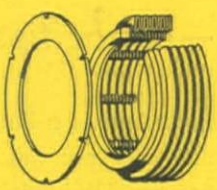


"Caterpillar"-Built Fuel Injection System is perfectly matched for "Cat" Engines. Pumps and valves require no adjustments, and are replaceable in the field—like spark plugs.

Tapered Splines—specially developed by "Caterpillar"— lock sprockets securely to shafts. So effective have they proved that the principle is similarly applied to other vital parts.

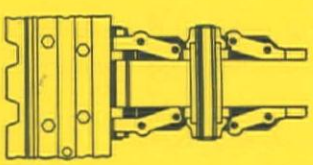


"Hi-Electro" Hardened Final Drive Gears. Teeth are three times harder after treatment and gear life is further boosted by the favorable compressive stress this process supplies.

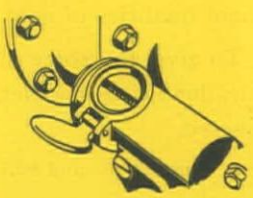


Bellows Seals are self-aligning, self-adjusting and self-lubricating—keep oil in, dirt and water out without need for take-up adjustment or periodic attention.

Correct Track Alignment, both vertically and laterally, is assured with this rigid roller frame. Heavy diagonal brace and widely spaced bearings add life to tracks and rollers.



Counterbored Track Links — to provide a tighter, better sealed joint and greater bearing surface between bushings and track pins. Extra assurance of long life in abrasive soils!

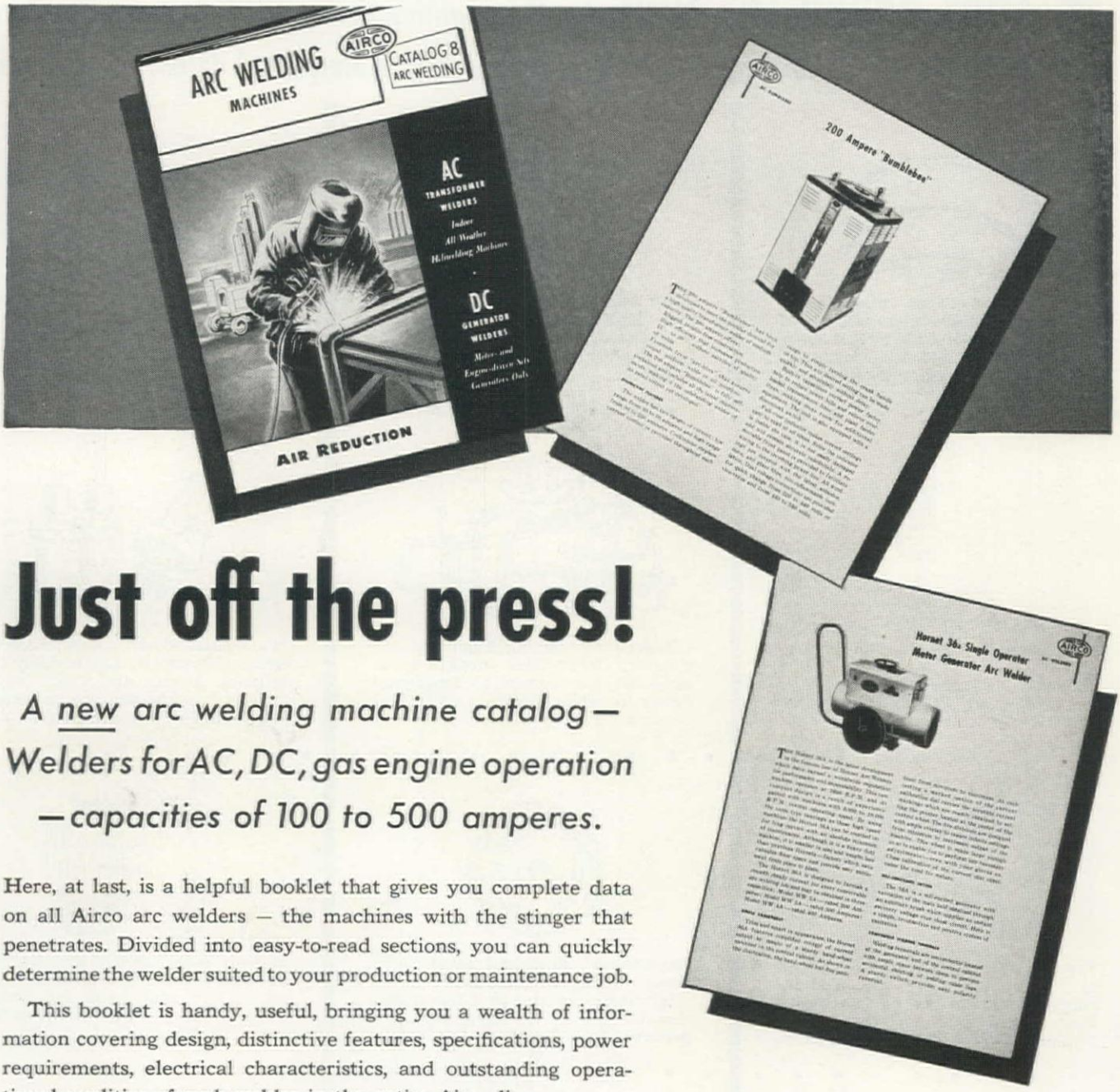


Hour Meter to give user the facts on tractor performance and life. Hour meters have always been standard on "Cat" Engines because "Caterpillar" has nothing to hide.

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES • TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT



Just off the press!

A new arc welding machine catalog— Welders for AC, DC, gas engine operation —capacities of 100 to 500 amperes.

Here, at last, is a helpful booklet that gives you complete data on all Airco arc welders — the machines with the stinger that penetrates. Divided into easy-to-read sections, you can quickly determine the welder suited to your production or maintenance job.

This booklet is handy, useful, bringing you a wealth of information covering design, distinctive features, specifications, power requirements, electrical characteristics, and outstanding operational qualities of each welder in the entire Airco line.

To give you some idea of the amount of material covered by this definitive booklet, here are a few of the many welders covered.

- "Bumblebee" and MCT — Transformer AC Arc Welding Machines
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BG UTILITY Bituminous Mixing Plant

This new Barber-Greene Bituminous Mixing Plant was developed to meet specifically the need for a more completely portable, easier-to-erect plant with a capacity in the 60-ton per hour range. Here is a plant that makes the most of manpower — that minimizes the time required for setting up or dismantling — yet retains all the basic B-G advantages of accurate volumetric measurement and proportioning of aggregate and bitumen. The Utility Plant is all this and more, for it can be adapted to produce a constant flow of all types of mixes including the highest types. Each of its basic units incorporates new improvements in design to achieve the maximum in portability, simplicity in erection and operation.

Before bidding on any bituminous job, get full information on this new, advanced design Utility Plant. Use the coupon or see your Barber-Greene distributor for your copy of Bulletin 845.

SOME OF MANY REVOLUTIONARY FEATURES!

- ***True portability*** in every unit
  Faster erection without cranes or heavy equipment
- ***No cribbing*** necessary
- ***Adaptability*** to widest variety of jobs and mixes
- ***Built-in*** Gradation Control
- ***Built-in*** Elevators on Dryer and Mixer
- ***High Discharge Dryer***—eliminates hot elevator pit
- ***Two, three*** or ***four-bin*** aggregate gradation

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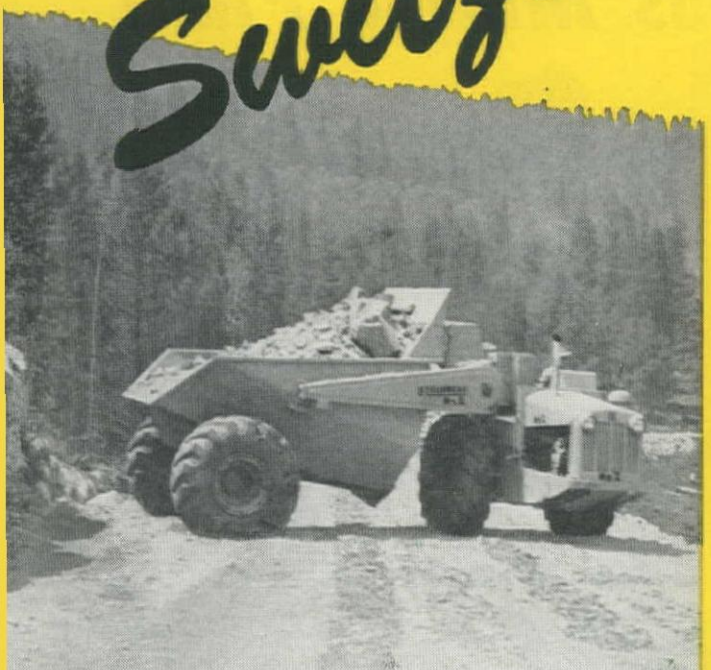
FOR SALE BY: Brown-Bevis Equipment Co., Los Angeles 11, Calif.; Columbia Equipment Co., Spokane, Wash., Seattle, Wash., Boise, Ida., Portland 14, Ore.; Wilson Equipment & Supply Co., Cheyenne, Wyo., Casper, Wyo.; Contractors' Equip. & Supply Co., Albuquerque, N. Mex.; Ray Corson Machinery Co., Denver 9, Colo.; Jenison Machy. Co., San Francisco 7, Calif.; Western Construction Equipment Co., Billings, Mont., Missoula, Mont.; Kimball Equipment Company, Salt Lake City 10, Utah; State Tractor & Equipment Co., Phoenix, Ariz.

Horner and Switzer move 220,000 with 3 rear-dump



On this mountainous highway job, Tournarocker's quick, easy maneuvering cut important seconds off every haul cycle. Ability of the 2-wheel prime mover to make 90° turns gives the big Tournarocker a short turning radius of 12'6" . . . and it really paid off here.

220,000 yards of mountain-top granite . . . altitudes up to 8300 feet . . . narrow, precipitous haul trails . . . and continual heavy rains, almost every other day. Those were the conditions which Contractors Horner & Switzer tackled on relocation of U. S. Hwy. 280, from Granby Dam to Monarch Lake, Colorado. They drove in a fleet of 3 LeTourneau rear-dump Tournarockers, teamed them up with a 2½-yard rock shovel, and got the following big-yardage results:

Contractor's crew estimated the rock wagons carried 10½ bank yards of granite each trip. They were loaded in an average of 7 passes from the 2½-yard dipper. In extreme hard digging, it often took the shovel 4½ minutes to load each rig. Haul cycles were so fast that on most haul distances only 2 of the Tournarockers were needed to keep the shovel busy. For example:

1240′ haul, dump, return in 4¼ min.

Hauls on the job ranged from a few feet up to a half-mile. Checked on a 1240-foot, one-way haul, including a 170-foot stretch of 13% adverse grade, each Tournarocker took only 4¼ minutes to travel, dump, and return to the shovel.

These fast cycles on the mountain-side trails were possible because Tournarocker's 4-wheel air brakes let operators haul

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2750 Grand Avenue, P. O. Box 1472, PHOENIX

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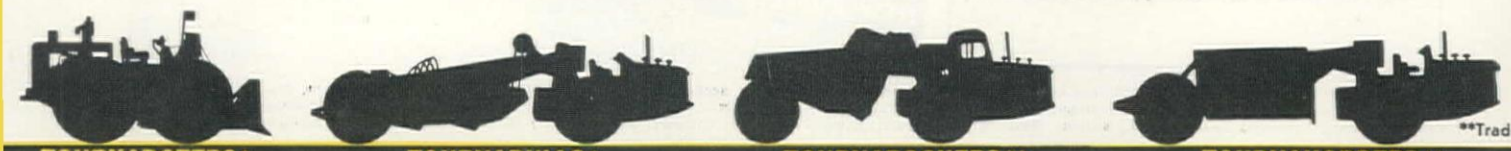


TOURNADOZERS* TOURNAPULLS* TOURNAROCKERS** TOURNAHOPPERS** **Trademark

MORE YARDS PER HOUR WITH RUBBER-TIRED POWER

Yds. MOUNTAIN GRANITE
TOURNAROCKERS

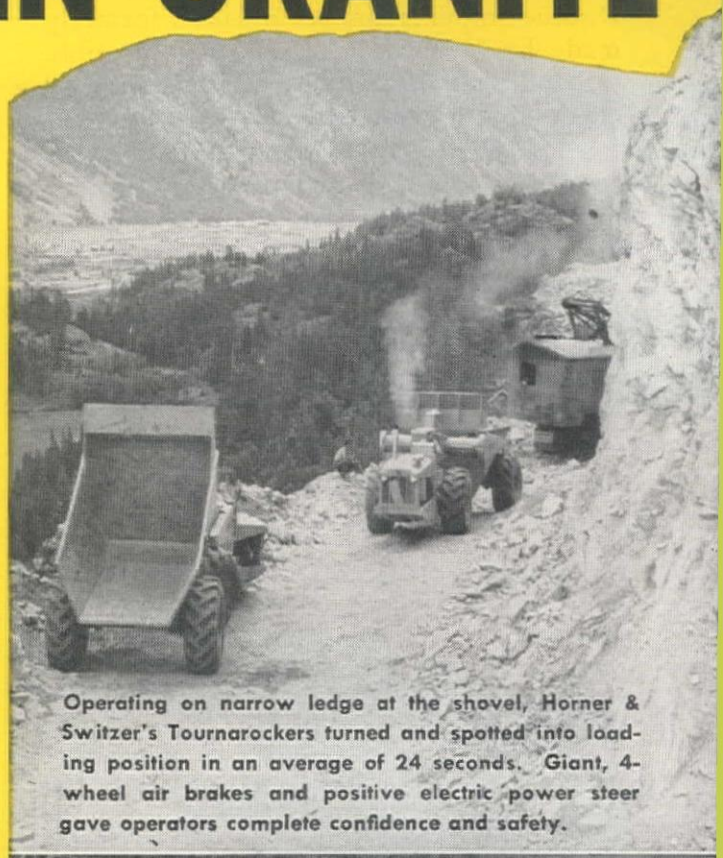
heavy loads at maximum speeds with complete safety. 4,108 square inches of braking surface . . . *more on one wheel than most haulers have on all four wheels* . . . gave sure, safe stops every time. Short, 90° turns, and positive electric steer by push-button control, permitted quick turning and spotting on the dump and at the shovel.

8-second dump

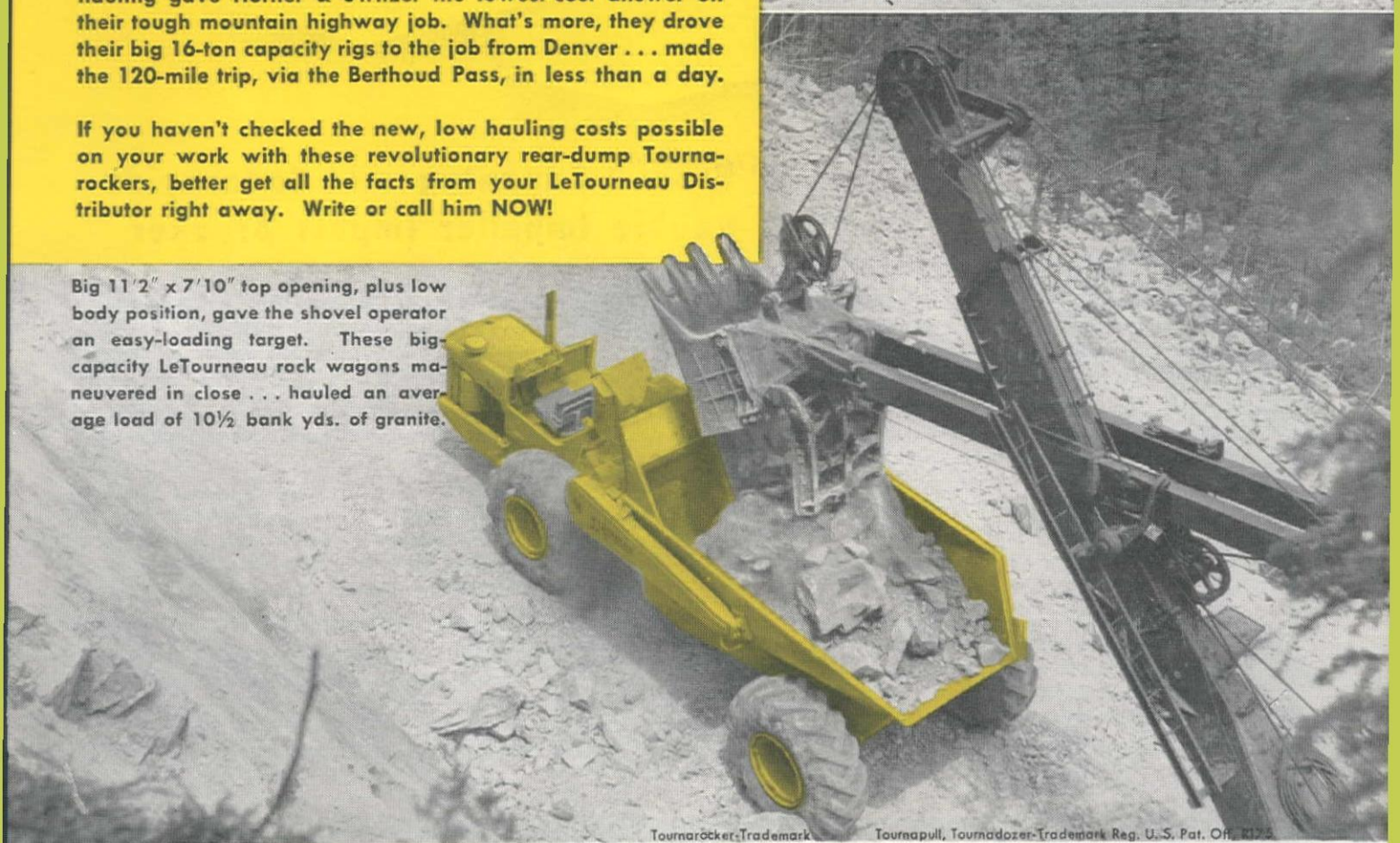
Dump was fast . . . simple, electric body hoist tilted the wide, streamlined body to vertical position . . . cleared the 10½-yard loads in just 8 seconds, total hoist and dump time. Because of their front-wheel drive, and holding action of powerful 4-wheel brakes, the Tournarockers safely backed up to edge of bank, and dumped loads over the bank eliminating rehandling . . . saving dozer clean-up.

All these Tournarocker advantages for big-payload, fast-cycle hauling gave Horner & Switzer the lowest-cost answer on their tough mountain highway job. What's more, they drove their big 16-ton capacity rigs to the job from Denver . . . made the 120-mile trip, via the Berthoud Pass, in less than a day.

If you haven't checked the new, low hauling costs possible on your work with these revolutionary rear-dump Tournarockers, better get all the facts from your LeTourneau Distributor right away. Write or call him NOW!



Operating on narrow ledge at the shovel, Horner & Switzer's Tournarockers turned and spotted into loading position in an average of 24 seconds. Giant, 4-wheel air brakes and positive electric power steer gave operators complete confidence and safety.



Big 11'2" x 7'10" top opening, plus low body position, gave the shovel operator an easy-loading target. These big-capacity LeTourneau rock wagons maneuvered in close . . . hauled an average load of 10½ bank yds. of granite.

Tournarocker-Trademark Tournapull, Tournadozer-Trademark Reg. U. S. Pat. Off.

LeT

Send to: **R. G. LeTOURNEAU, Inc., Peoria, Illinois,** or to your local LeT Distributor listed on opposite page, for complete information on new, 35 m.p.h. C Tournapull prime mover for use with:

NAME ..... TITLE .....
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- ☐ 17 cu. yd. rear-dump Tournarocker
- ☐ 13.5 cu. yd. Carryall Scraper
- ☐ 15 cu. yd. bottom-dump Tournahopper

NOW A DOUBLE

HERE'S the latest addition to the already broad line of Cedarapids crushers! The Double Impeller Impact Breaker, formerly made by New Holland, makes it possible to handle almost *any* primary or secondary crushing job with Cedarapids equipment.

The Impact Breaking principle, which produces cubical shaped particles required in so many specifications, reaches its greatest development in the Double Impeller Impact Breaker. It will give you greater capacities of better aggregate without excessive power or maintenance cost.

U. S. Patent No. 2373691
2486421
Canadian Patent No. 439371

Proved Advantages of Cedarapids Double Impeller Impact Breaker

EXTREMELY high ratio of reduction means less accessory equipment such as conveyors, hoppers, screens, elevators and secondary crushers.

PRODUCES ideal cubical product even in slabby material. In eastern quarries where conventional types of crushers broke the stone up into high percentages of flats and elongated particles the Impact Breaker reduced the percentage from 24% to 6%.

ELIMINATES most soft stone from the finished product.

Can be operated in contaminated material where most other types of equipment would clog, because a greater number of large pieces of stone or gravel bombarding the cage bars help to keep the breaker clean.

LESS horsepower required per ton of material in most all cases because the massive impellers statically balanced, have a flywheel effect and a great percentage of stone is broken in mid-air by stone hitting stone resulting in a greater reduction in milling and crushing action.

BIG volume production. In a dolomite installation in Ohio the operator claimed 720 tons per hour using two 150 h. p. motors.

APPROXIMATELY 50% less contact of stone on metal because a high percentage of the material is broken by impact against other material rather than against the breaker bars. Also attrition minimized as entire discharge opening is free of grates, etc.

BIG production and high reduction ratio mean lower plant investment.

CHOICE of four sizes from Model 5050, which will take 50" rock up to 400 tons per hour and reduce it to 4" minus in one operation, down to the Model 2020 with its 20" square feed opening.

Cedarapids
Built by IOWA

THE IOWA LINE *of Material Handling Equipment Includes:*

ROCK AND GRAVEL CRUSHERS • BELT CONVEYORS • STEEL BINS • BUCKET ELEVATORS
VIBRATOR AND REVOLVING SCREENS • UNITIZED ROCK AND GRAVEL PLANTS • FEEDERS
TRAPS • PORTABLE POWER CONVEYORS • PORTABLE STONE AND GRAVEL PLANTS
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HAMMERMILLS • DRAG SCRAPER TANKS • WASHING PLANTS • SOIL COMPACTION UNITS
STEEL TRUCKS AND TRAILERS • KUBIT IMPACT BREAKERS

Cedarapids

Built by IOWA

PRODUCT!

IMPELLER IMPACT BREAKER

(formerly New Holland)

DOUBLE IMPACT ACTION GIVES YOU ALL THESE ADVANTAGES

- MATERIAL entering the breaking chamber falls directly onto the rotating impellers. Rotating upward and outward at speeds up to 1000 rpm., these Double Impellers smash the material in mid-air. Up to 6000 smashing blows a minute crash against the material in the breaking chamber.
- High percentage of fines can be obtained by operating the impellers up to 1000 rpm. with close bar settings, thereby eliminating need for secondary reduction equipment in many instances.
- These breakers can be used for primary and secondary reduction depending upon the application and the model used.
- Only two moving parts—the impellers—both easily accessible. Minimum down time for repairs or replacements because of simplicity of design.

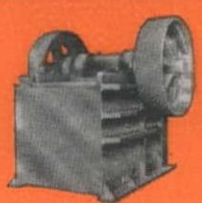
Sectional view of Cedarapids Double Impeller Impact Breaker showing simplicity of construction and operation. Material falls directly onto impellers and is hurled against the breaker bars and other material in the breaking chamber.

- The product size is controlled by the speed of the impellers and the adjustment of the breaker bars. No mechanical change is necessary to change the size of product but simply increase or decrease the rpm.
- Only Cedarapids Double Impeller Impact Breakers give you all these features. No imitation can equal their performance. Protected fully by patents. Beware of imitations.

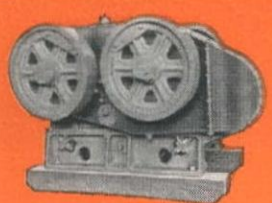
To Present Owners of New Holland Double Impeller Impact Breakers

When you need new equipment or replacement parts on your present machine address your inquiries to Cedar Rapids or call your nearest Cedarapids distributor.

OTHER CEDARAPIDS CRUSHERS

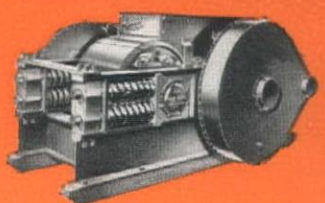


JAW CRUSHERS
in sizes from
32" x 40" to 6" x 12"



TWIN JAW CRUSHERS
in four sizes from
1836 to 1216

HAMMER MILLS
in three sizes from
4033 to 2033



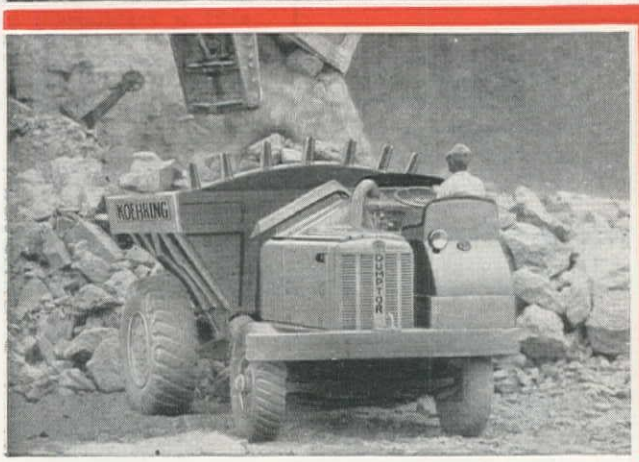
ROLL CRUSHERS
in six sizes from
4024 to 1616

KUBIT IMPACT BREAKERS
in four sizes
Nos. 0, 1, 3, and 4

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U. S. A.

NO time-out for CLUTCH ADJUSTMENTS



KOEHRING DUMPTORS* have the same heavy-duty qualities and big-production ability as Koehring excavators . . . combined, they give you matched excavating-hauling efficiency. Rugged 6-yard rock body . . . plus a ton of Dumptor strength for every ton of payload, withstand severest shocks of shovel loading and roughest off-road hauling. Constant-mesh transmission and 3 fast speeds, forward and reverse, provide no-turn shuttle hauling. 1-second gravity dump saves more time every trip.

*Trademark Reg. U. S. Pat. Off.

Bay Cities Equipment, Inc., *Oakland*
Columbia Equipment Co., *Portland, Boise*
Harron, Rickard & McCone Co. of Southern California, *Los Angeles*
Kimball Equipment Co., *Salt Lake City*
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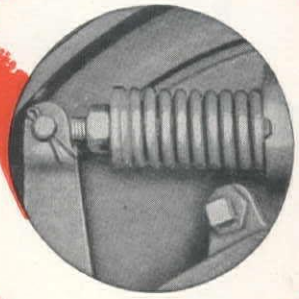
McKelvy Machinery Co., *Denver*
Moore Equipment Co., *Stockton*
Neil B. McGinnis Co., *Phoenix*
Pacific Hoist & Derrick Co., *Seattle*
The Harry Cornelius Co., *Albuquerque*
San Joaquin Tractor Co., *Bakersfield*

with KOEHRING HALF-YARD 205

HEAT COMPENSATOR SPRING CHANGES TENSION . . . *Automatically!*

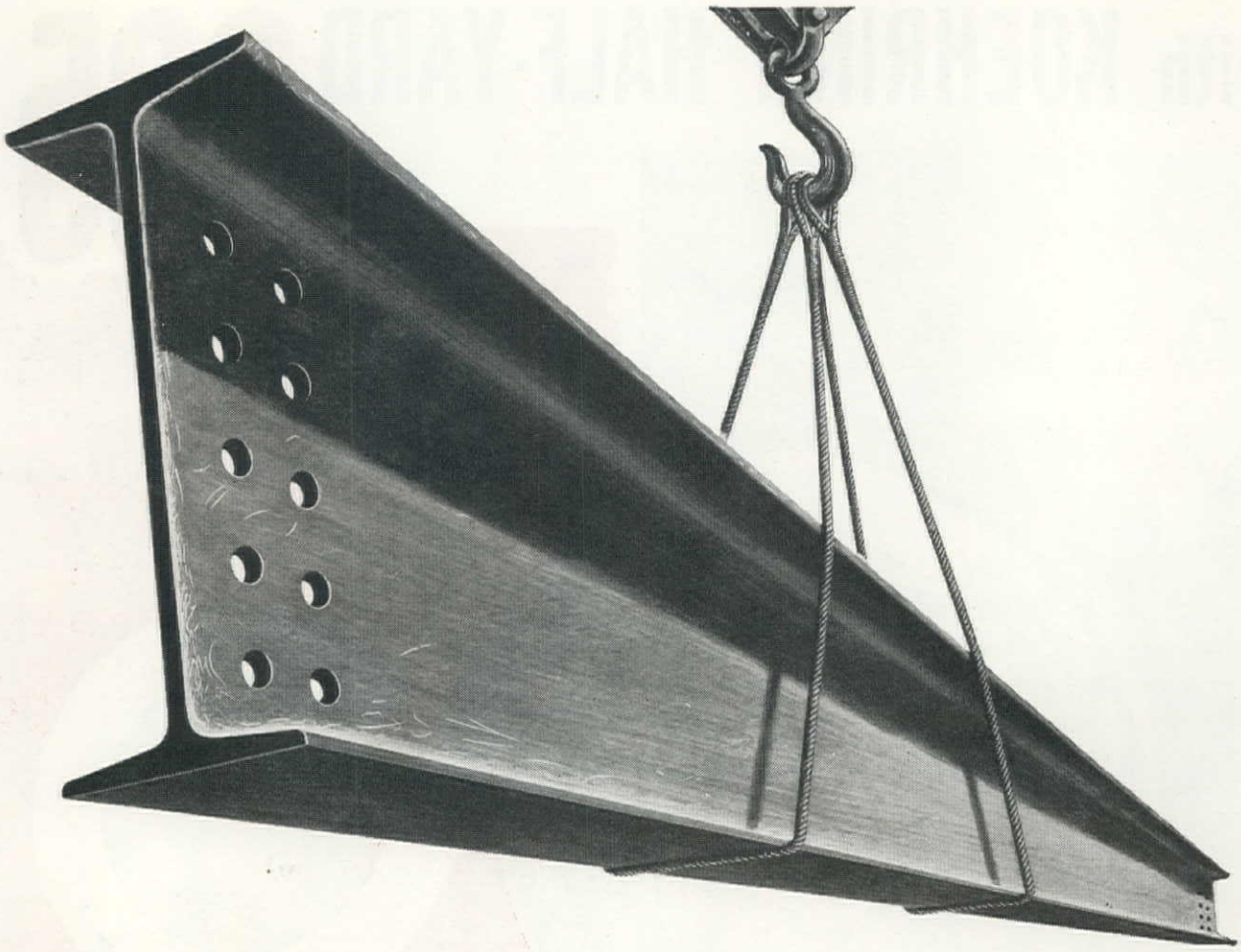


With Koehring ½-yard 205, there's no time-out for continuous manual clutch adjustments. It's no longer necessary for operator to tighten cold clutches when he starts in the morning, or between shifts . . . then loosen them again when clutches warm up. Large compensator springs on the 205's main drum (above), swing and traction clutches automatically make all tension changes . . . maintain full clutch efficiency. No "compromise" settings . . . you get top production all through the shift . . . have accurate, smooth control at all times. Gives you bigger daily yardage as shovel, dragline or pull shovel . . . is equally important on clamshell and heavy lift crane service, where you have intermittent usage.

Also, with Koehring 205 you get double-fulcrum control linkage on crowd-retract and traction that eliminates overtravel, drag and chatter . . . independent traction, to travel, swing and operate boom all at same time. Choice of crawler or truck mounting, whichever best fits your operating requirements. Your local Koehring distributor can show you many other 205 features that will save time and assure more production at lower cost on *your* work. See him *today*.

K900

OTHER KOEHRING EXCAVATOR SIZES: ¾ yd. 304 • 1½ yd. 605 • 2½ yd. 1005



No other Western source offers all these advantages!

Before you specify structural shapes for heavy construction, consider *all* the advantages offered by Kaiser Steel, the only integrated independent steel plant in the West . . .

Complete control of quality at every step, from the mining of coal and iron ore to finished product.

The most modern mill facilities, operated by experienced, highly skilled personnel, producing a wide range of structural shapes.

Nearby shipping point, cutting delivery time by as much as one half.

Prompt engineering and mill service, due to Kaiser Steel's strategic location.

Add to this Kaiser Steel's consistent record of dependability—unsurpassed in the industry—and the answer is clear . . .

It's good business to do business with

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built to serve the West

PROMPT, DEPENDABLE DELIVERY AT COMPETITIVE PRICES • plates • continuous weld pipe • electric weld pipe • hot rolled strip • hot rolled sheet • alloy bars carbon bars • structural shapes • cold rolled strip • cold rolled sheet • special bar sections • semi-finished steels • pig iron • coke oven by-products
For details and specifications, write: **KAISER STEEL CORPORATION, LOS ANGELES, OAKLAND, SEATTLE, PORTLAND, HOUSTON, TULSA, NEW YORK**

Cut Your Costs On Every Type Of Construction Job... With BLUE BRUTES!

Here are typical examples of the up-to-the-minute design, long-lasting construction and smooth, dependable performance now proving to contractors all over the world that there's more worth in a Blue Brute. Your nearby Worthington-Ransome Dealer has the complete line of Blue Brute Construction Equipment. Write for his name.

WORTHINGTON PUMP AND MACHINERY CORPORATION
Construction Equipment Department
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Concrete Costs Less!

Count on Blue Brute Portable Mixers for lower-cost concrete on every job. Quickly spotted and towed, and with such features as smooth, positive gear-and-pinion drive . . . high-carbon, Timken-equipped drum rollers . . . and Ransome's famous mixing action, they're sure bets for speedier, better mixing.

Water-Handling Cheaper!

You'll move *more* water — faster, farther, easier with a Blue Brute Self-Priming Centrifugal Pump. Rugged in every detail, with fast pickup, extra reserve power and high resistance to rust, corrosion and ordinary wear. Built in A.G.C. sizes to A.G.C. standards.

More Air For Less Money!

Get *all* the air-power out of every drop of fuel with a Blue Brute 60′ Portable Air Compressor. Strong, light and efficient, it provides constant, dependable, economical air supply through its easy-breathing Worthington Feather* Valves. Other Blue Brute Compressors, from 105′ to 500′.

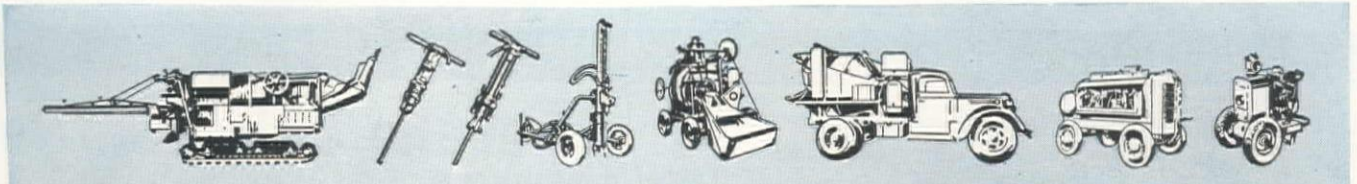
*REG. U.S. PAT. OFF.

Construction Expenses at Rock Bottom!

Team up these fast, hard-hitting Blue Brute Air Tools with Blue Brute Compressors — and watch your daily expenses go down. Though tough and powerful, they have the lightness and compactness to keep your workers more satisfied—and more productive.

H9-3

BUY BLUE BRUTES



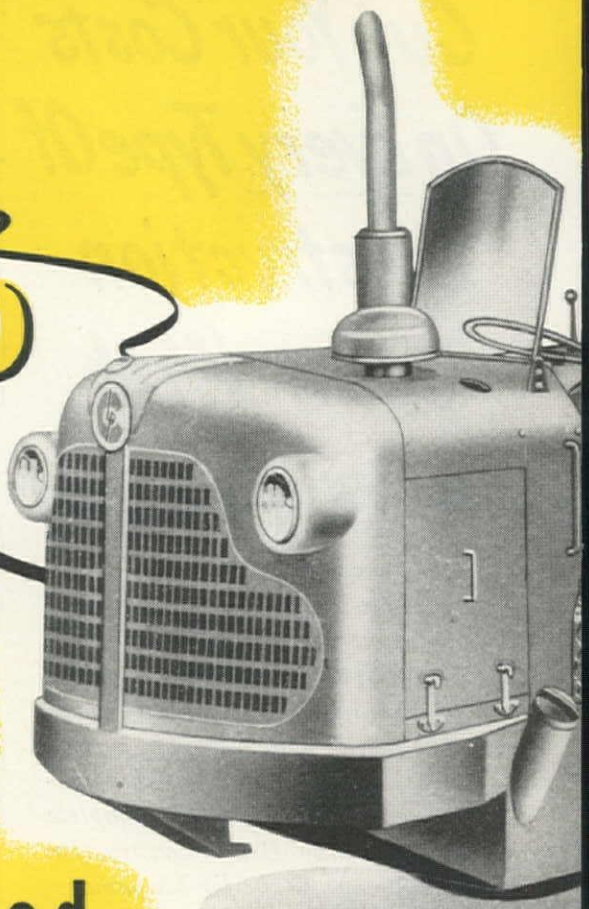
IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB

Another addition to

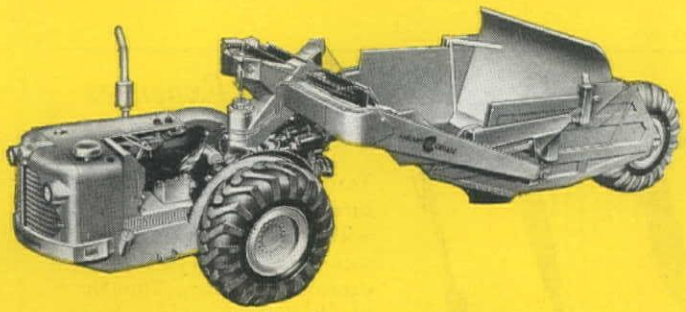
the **NEW**

TW-300

MOTOR WAGON



. . . Joins the LPC Line of High Speed Earthmoving Equipment



MODEL TS-300—A 14 to 17.5 cu. yd. high speed earthmoving powerhouse for the big tough jobs. Fast loading ability cuts seconds off loading time, makes possible an extra trip or two each hour. Positive forced ejection plus high apron lift assures complete ejection of the load on every trip.

MODEL TS-200—A 9 to 12 cu. yd. hydraulically controlled earthmover that is speedy, agile and powerful. It is small enough for small yardage odd jobs and utility work, yet has all the capacity and speed necessary for those long haul jobs.

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ENGINEERING SALES SERVICE, INC.
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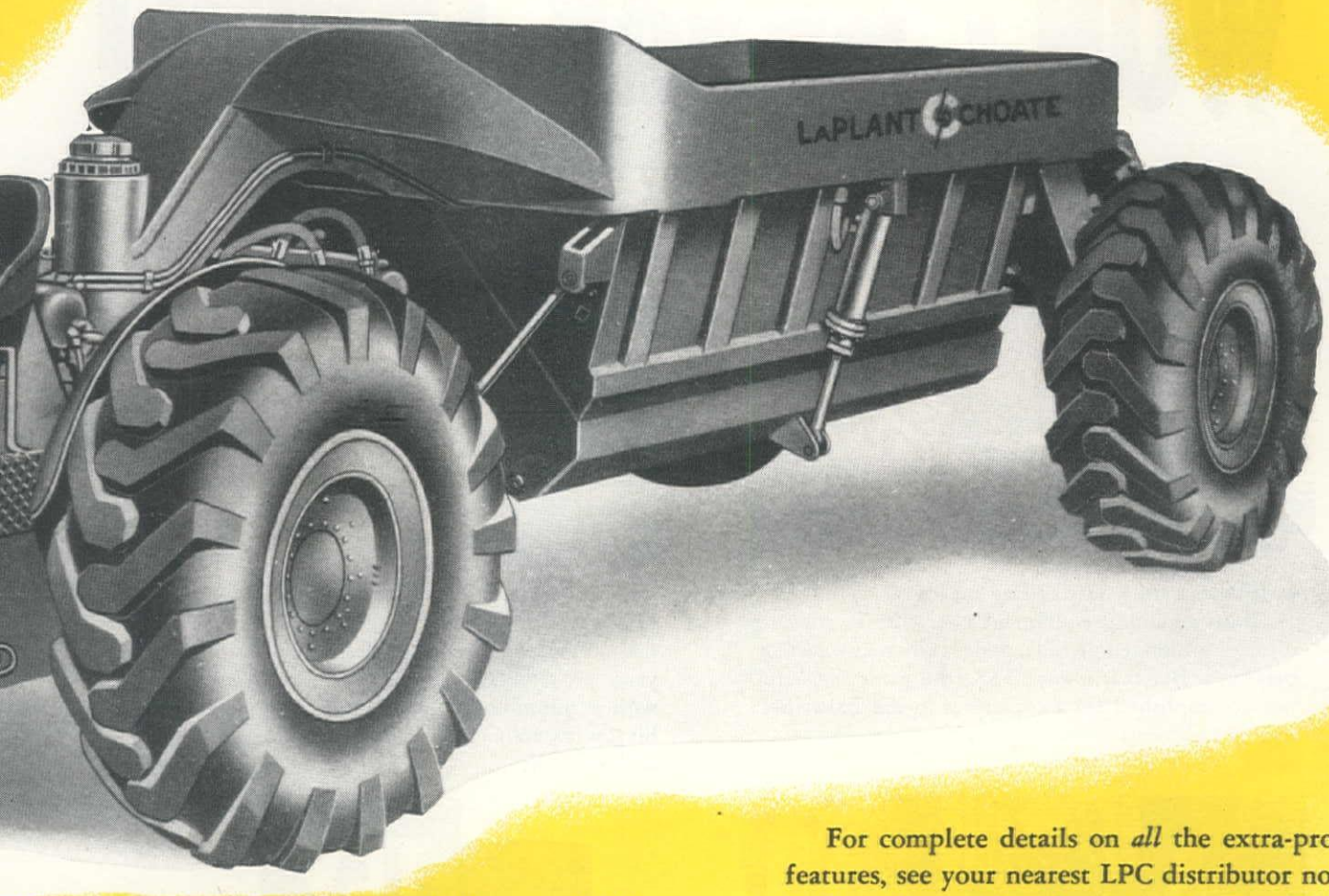
the LaPLANT-CHOATE FAMILY



HERE'S the new job-tested and job-proved LPC TW-300 Motor Wagon — a hydraulically controlled bottom dump wagon flexibly joined to the same big rubber-tired tractor so popular on the TS-300 Motor Scraper.

Here again is the successful profit-making combination of big, rugged power (225 H.P.), big capacity (14 yd. struck, 19 heaped), high speed (21.2 MPH). Big 24.00 x 29 24-ply tires to carry the largest loads—Double-acting hydraulic steering and hydraulic door control for easy, effortless operation—Large 4-wheel air brakes, and a host of other features that make this unit outstanding in its field.

For complete details on *all* the extra-profit features, see your nearest LPC distributor now. LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa—LaPlant-Choate Sales and Service, 1022 77th Ave., Oakland, Calif.

FAMOUS LaPLANT-CHOATE DOZERS — both angling and straight blade — are again available in either hydraulic or cable-operated types. See your LPC distributor NOW!

LaPLANT CHOATE

nearest LPC distributor

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T5X THE AMAZING PURPLE OIL WON'T BREAK DOWN!

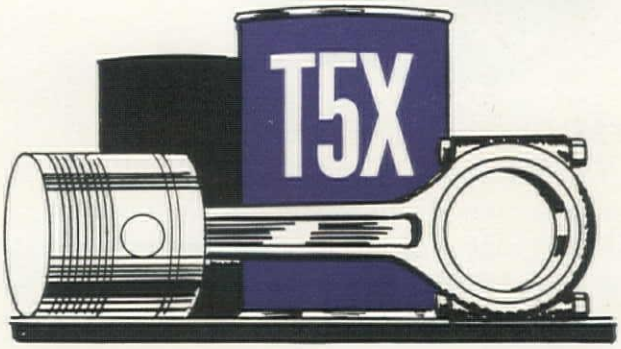
Proved by contractors operating under critical conditions

1. It takes a truly outstanding motor oil to fully protect heavy grading equipment operating in choking dust for prolonged periods, under extremely *high* temperatures. But that's what T5X, the great *purple* oil, has accomplished for a contractor in the Bakersfield area of California.

2. This contractor uses T5X exclusively in all types of heavy-duty Diesel power units and in a Hercules natural gas engine. A complete inspection after three years proved these engines to be *exceptionally* clean, with a minimum of wear. And this owner* credits his low maintenance costs to the outstanding performance of T5X.

**Name available upon request.*

3. How can T5X stand up under such critical operating conditions? Because this great oil is made by blending a 100% paraffin-base stock with an outstanding combination of *fortifying compounds*. And it was from these powerful additives that T5X got its famous purple color.

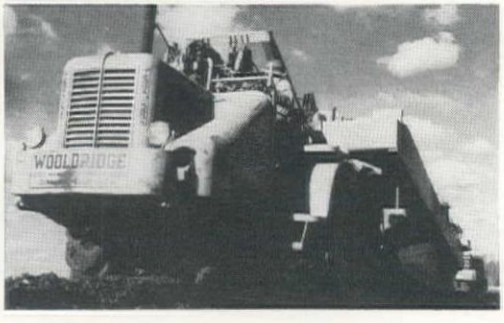


4. The answer to your *severe* lubricating problems, T5X cleans your engine as it lubricates; keeps the rings free; halts the formation of harmful carbon and sludge; and keeps the precision-fitted moving parts covered with a protective film of oil under all operating conditions.

For full information on T5X, call your Union Oil Representative. Or write Sales Department, Union Oil Company, Los Angeles 17, California.

76 UNION OIL COMPANY OF CALIFORNIA

Ten Terra Cobras Lick Alaska Mud



Over two million yards of earth to be moved under near-flood conditions—that's the nutshell story of the Fairbanks International Airport job. Ten big Wooldridge Terra Cobras were brought in to carry the bulk of the load. To reach the job, they travelled 300 miles of barely passable roads under their own power from the Valdez docks. Good organization and round-the-clock Cobra dependability kept operations on schedule with remarkable records for yardage output during the abnormally wet, short 1949 season. They'll help bring the job to completion in 1950. Performance under tough job conditions like these keeps users "sold" on profit-making qualities of the Terra Cobra. Ask your distributor or write today for Bulletin TC-705. See how the new Model TC-S142 can boost your profits. It's *proved* for dependability, *improved* for even greater production, *approved* for easier maintenance.

WOOLDRIDGE MANUFACTURING COMPANY
Sunnyvale, Calif. • 4710 W. Division St., Chicago 51, Ill.

WOOLDRIDGE *EARTH MOVING EQUIPMENT*

PROVED AND APPROVED FOR EVERY TYPE OF EARTH-MOVING JOB

Paying for too many engine overhauls?

YOU MAY NEED SHELL RIMULA OIL

HOW TO TELL IF YOU NEED SHELL RIMULA OIL

Engines operated under these conditions and lubricated with regular heavy duty oils frequently develop excessive wear and deposits. They must be overhauled often to keep them efficient. They are *expensive* to operate. Shell Rimula Oil was developed to overcome these very conditions—singly or any combination of them. If any of these conditions apply to your operation, better talk to your Shell representative about Shell Rimula Oil. It may save you real money.

DIESEL

	For example
EXTREME HEAVY LOAD	TRUCKS OR TRACTORS IN CONSTANT USE AT PEAK LOAD
LOW JACKET TEMPERATURE	PUMPING ENGINES
CONSTANT LIGHT LOADS	MARINE AUXILIARY UNITS
LOWER GRADE FUELS	STANDBY ENGINES

GASOLINE

	For example
LOW TEMPERATURE, LIGHT LOAD	Door-to-door delivery service . . . or similar operation
HEAVY LOAD	Trucks or stationary and marine engines

In certain extreme conditions that even the best of the regular heavy duty oils couldn't cope with, Shell Rimula Oil cut engine wear as much as 90%. That means longer service . . . more efficient service . . . fewer overhauls. All told, Shell Rimula Oil has saved owners thousands of dollars in operating costs

SHELL RIMULA OIL is a *super* heavy duty oil. It is the first engine lubricant that effectively counteracts high wear under *both* extremes — heavy loads and light loads. And the first to permit operation *without penalty* on lower-grade fuels.

In addition, it has extra detergent-dispersant action . . . to keep valves and rings free . . . to keep lacquer and carbon deposits down to the point of harmlessness.

Your engines may not need Shell Rimula Oil. But find out now. Check your overhaul records, study the chart above, and talk to your Shell representative. Because if you do need Shell Rimula Oil, the sooner you switch to it, the more money you're going to save.

Cheaper by the Yard

...or why contractors use ESCO Dipper Buckets

3-yard ESCO Cast-Welded dipper on Lima 1201, working on Cuyuna range stripping operation of S. J. Groves & Son.

GREATER PAYLOAD CAPACITY per pound of bucket; fast loading; quick, complete discharge; ability to stand up under punishment—these are some of the qualities of *ESCO* Cast-Welded general purpose dipper buckets that give the operator more passes a day and more payload with each pass. They are the qualities that reduce the cost per yard of material moved.

Here are some of the jobs on which the built-in performance of *ESCO* buckets has been fully demonstrated: Neversink Dam; Garrison Dam; Pennsylvania Turnpike extensions; Merriam Dam; Washington-Baltimore Express Highway; Wautauga Dam; Beveridge Parkway; Pittsburgh Express Highway.

The records of sustained service made by *ESCO* dipper buckets under severe digging conditions are possible only because of their rugged construction. Details of construction and full information on sizes, dimensions and weights are contained in *ESCO* catalog 156-B. Get a copy from the *ESCO* office nearest you, or fill in and mail the coupon. Dealers in all major cities.

ESCO

DIPPER, DRAGLINE AND COAL LOADING BUCKETS

ELECTRIC STEEL FOUNDRY

2163 N. W. 25th Avenue, Portland 10, Oregon

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Honolulu, T. H.	Seattle, Wash.	San Francisco, Calif.

In Canada—ESCO Limited, Vancouver, B. C.

ELECTRIC STEEL FOUNDRY
2163 N. W. 25th Avenue, Portland 10, Oregon
Please air mail catalog 156-B on your Cast-Welded Dipper Buckets to

Name_____

Company_____

Address_____

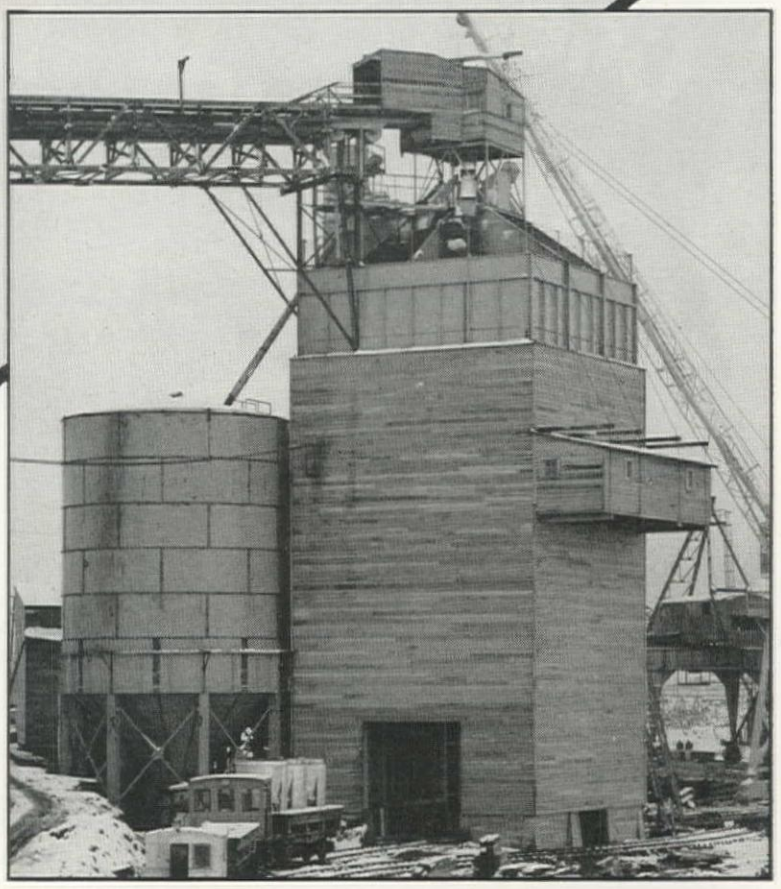
City_____

Zone_____ State_____

Make and model of machine used_____

MORE DAM PROOF

McNary Dam Contractors Chose Noble Batching Plant



This NOBLE batching plant at McNary Dam consists of a 900-ton, 6-compartment bin holding 750 tons of aggregate and 750 bbls. of cement; two 7500-bbl. cement storage silos, a 14"x7" bucket elevator for cement, and a NOBLE full-automatic batching system.

To build the first section of McNary Dam on the Columbia River, approximately 761,000 cu. yds. of concrete and 663,000 bbls. cement were used. There can be no guess-work in the pour; where U. S. Engineers fix rigid specifications they must be met. NOBLE batching equipment met these tough specifications so successfully during a year of continuous operation, that the contractors are moving the plant across the river to handle the pour on the second section.

As a further result of experience on McNary Dam, a NOBLE batching and mixing plant will be used in constructing Pine Flat Dam on the King's River in California. This is a joint-venture, which is under the same contractor sponsorship as McNary Dam.

Here's why so many successful contractors use NOBLE batching plants:

Shop-fitted . . . . . ALL NOBLE equipment is shop assembled before shipping, to ensure quick, easy, low-cost erection on your job.

Accurate . . . . . . NOBLE's automatic controls weigh cement and aggregates accurately. There is no guesswork — every batch meets specifications.

Easy to Operate . . NOBLE design centralizes all batching controls, enables operator to handle heavy pours all day long without undue fatigue.

Quick Service . . . . NOBLE parts and service engineers are within a few hours of any Western job, ready to help you with erection, batching and repair problems.

SIZES TO FIT YOUR NEEDS

NOBLE aggregate bin capacities range from 80 to 1500 tons; cement silos from 500 cu. ft. to 7500 bbls.; weigh hoppers from 1 to 4 yds. From these standard units, our engineers can design a plant "custom-built" to your exact needs, frequently at stock model prices. Wire, write or phone NOW.

DESIGNERS AND BUILDERS OF

CEMENT AND AGGREGATE BATCHING PLANTS . . BULK CEMENT PLANTS . . . AGGREGATE BINS AND CEMENT SILOS . . STEEL FORMS FOR CONCRETE CONSTRUCTION JOBS . . TUNNEL AND DRILL JUMBOS CONVEYORS AND ELEVATORS . . WEIGH METERING DEVICES

NOBLE CO.

1860-7th STREET • OAKLAND 20, CALIFORNIA • TEMPLEBAR 2-5785

Los Angeles Office: 411 WEST FIFTH STREET • PHONE MUTUAL 8314

STAR MACHINERY COMPANY, Seattle; ENGINEERED SALES, San Antonio; HALL-PERRY MACHINERY COMPANY, Butte; RAY L. HARRISON CO., Albuquerque; LOGGERS & CONTRACTORS MACHINERY CO., Portland; EQUIPMENT SALES CORP., Oklahoma City, Okla.; TRI-STATE EQUIPMENT CO., El Paso; TRI-STATE EQUIPMENT CO., Spokane; J. K. WHEELER MACHINERY CO., Salt Lake City; CONNELL BROS., LTD., San Francisco; SIERRA MACHINERY CO., Reno, Nevada

Looking for a Needle ?

WE'LL FIND IT

When "needles" are needed in industry, they must be located quickly. The Republic Supply Company of California has been called on to secure many critical products, for many services, in many phases of industry and has made fast friends and steady customers with just such a "plus" service.

Seventeen convenient, completely stocked stores, located throughout California, form a chain of service and supply second to none, first in hard-to-find items that can keep your production on schedule.

Remember, the products you buy are no better than the Company that sells and services them, so rely on REPUBLIC for all your requirements in Piping—Tools—Wire rope—Rubber—Industrial supplies—and Machinery.

CALL REPUBLIC

THE REPUBLIC SUPPLY COMPANY OF CALIFORNIA

AN INDEPENDENTLY OWNED AND OPERATED COMPANY SERVING WESTERN INDUSTRY

Piping • Tools • Rubber • Wire Rope • Industrial Supplies • Machinery

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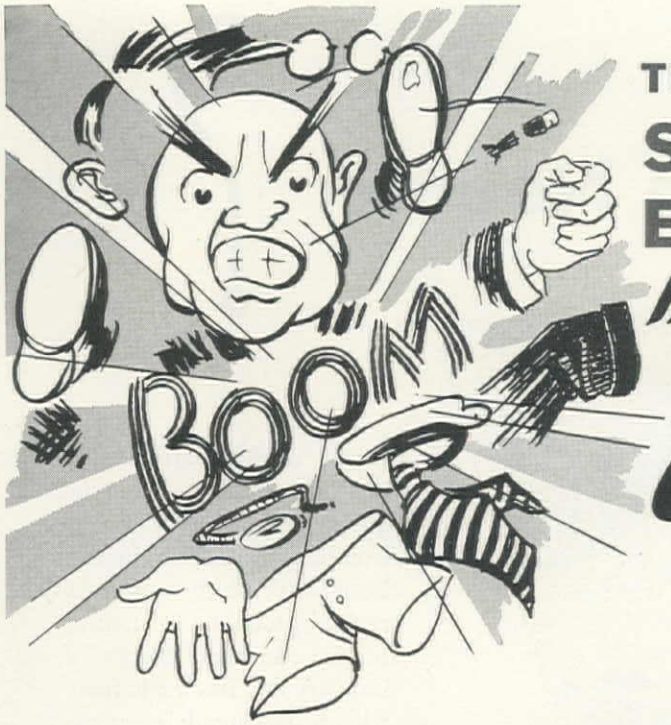
LONG BEACH STOCKTON SAN JOSE VENTURA GARDENA AVENAL

FRESNO SANTA MARIA CUYAMA NEWHALL TAFT



THE BUTLER SALES MANAGER EXPLODES:

"HOW COME! WE GOT ONLY 10 OUT OF 12?"

"Listen you! I'll repeat it! How come we got only 10 out of 12 of the Batching Plants on that big Detroit-Wayne Major Airport job?

Butler Salesman: "Well, ah—you see—ah—

Butler Salesmanager: "Yeah! I see alright . . . Where were you when those two other plants were bought? Playing marbles, maybe?

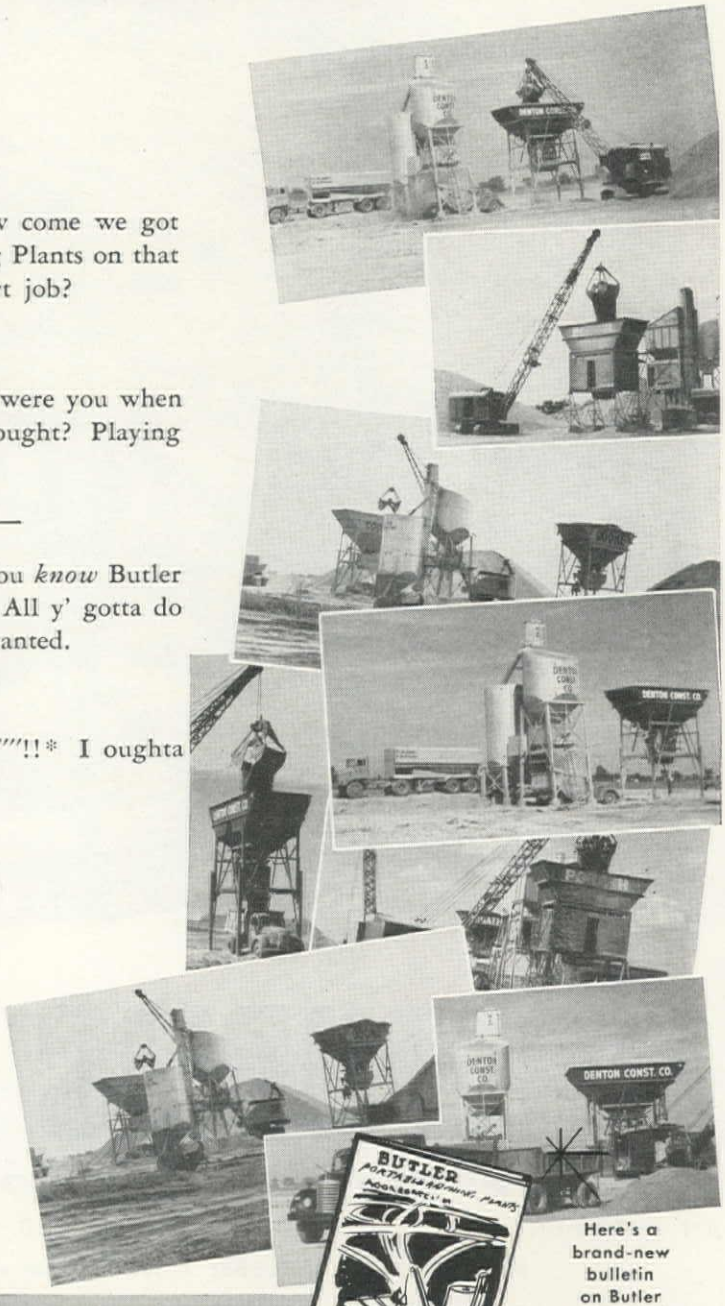
Butler Salesman: "Oh, no sir. You,—well, I mean—

Butler Salesmanager: "Shut up! I'll do the talking. You *know* Butler Batching Plants sell themselves. All y' gotta do is just be there to know what's wanted.

Butler Salesman: "Yessir. I—ah—well,—

Butler Salesmanager: "Only 10 out of 12! —?%$*#""!!* I oughta shoot myself!

Yes, it's true alright. Out of 12 Bulk Cement and Aggregate Batching Plants used by the three-contractor Team that built the Detroit-Wayne Major Airport, only 10 were built by BUTLER. We just don't understand it!



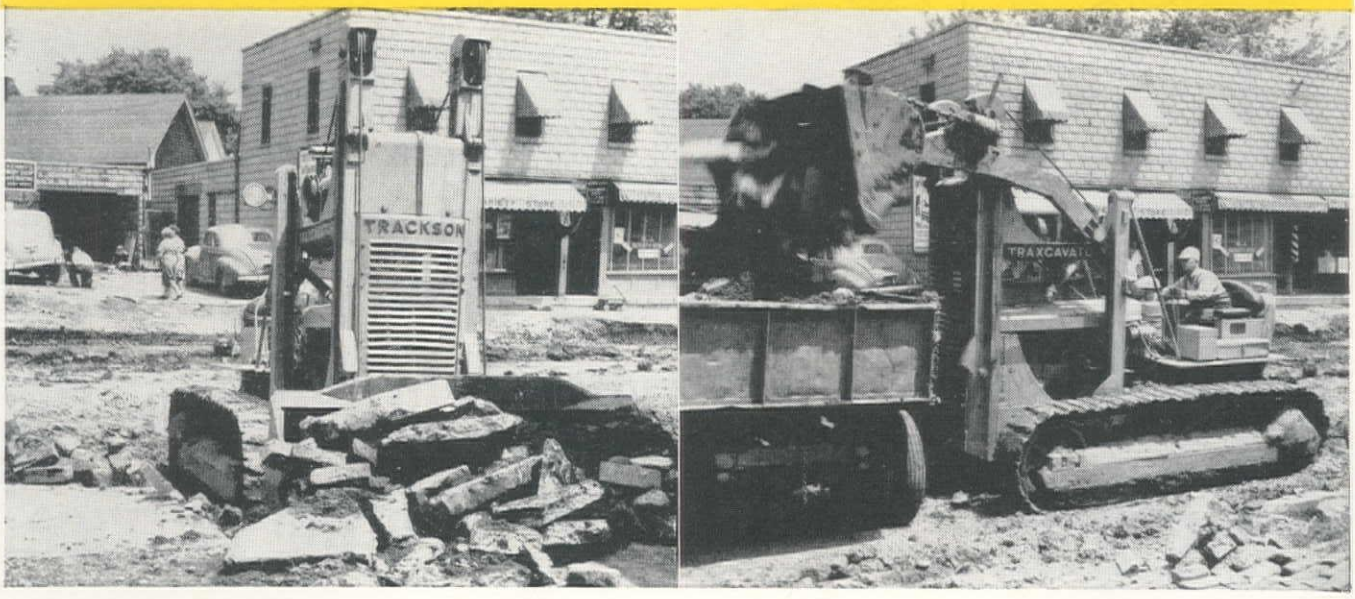
Here's a brand-new bulletin on Butler Roadbuilders Plants. Ask for Bulletin No. 205.

BUTLER BIN COMPANY

963 BLACKSTONE AVE., WAUKESHA, WISCONSIN

Big TRAXCAVATOR ADVANTAGES

RANGE FROM COST TO PRODUCTION



This T6 TRAXCAVATOR concentrates its traction-harnessed 65 horsepower of "crowd" on the bucket and crumbles thick concrete sidewalk like a cookie! Note, too, that the 5-gaited T6 pivot-turns, and carries its load at the speed that suits the situation.

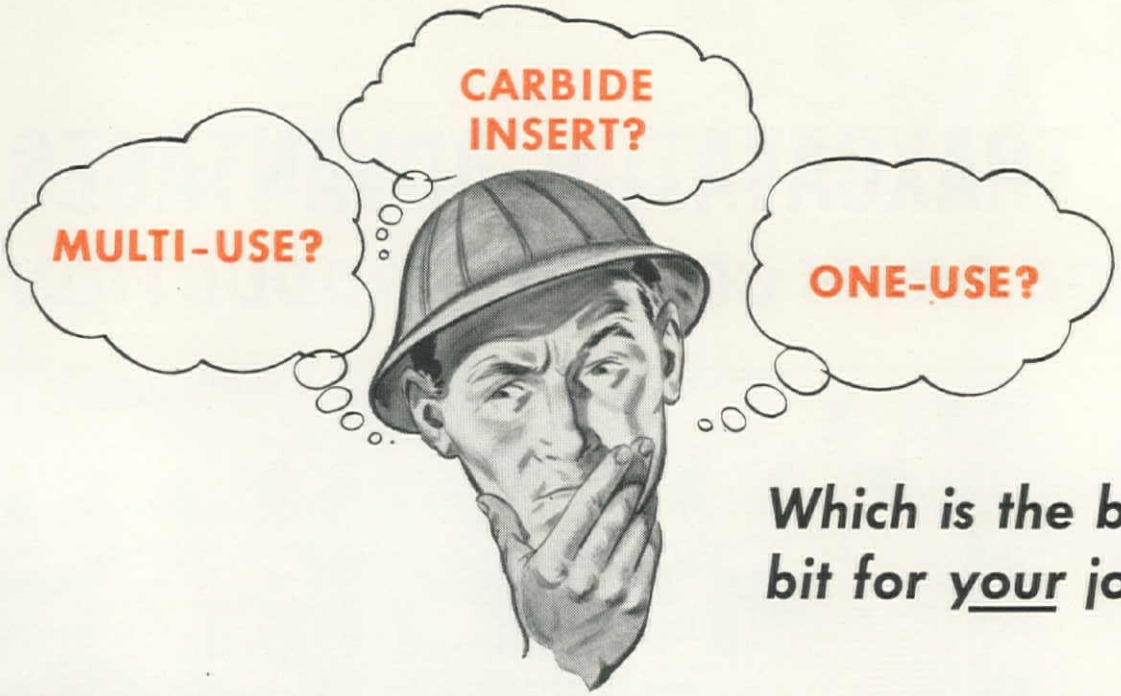
There's nothing else like T6 and T7 TRAXCAVATORS in the heavy-duty equipment field for multi-purpose usefulness and big production. Nothing less than a fleet of assorted, limited-use machines can match a big TRAXCAVATOR at digging, stripping and loading broken pavement and soils as tough as they come!

That tells you why big TRAXCAVATORS get the call to strip and load thousands of tons of brick, blacktop and concrete pavement.

It shows, too, why these big units perform the functions of various specialized equipment on other road and street jobs. They prepare sub-grade; widen shoulders; charge crushers and mixers; help produce surfacing materials, dig, grade, carry and load. All at record low cost!

Besides their production advantages, TRAXCAVATORS are ***unit-engineered*** with their matching "Caterpillar" Diesel Tractors, for long life and low upkeep. Built in 5 models (1/2 to 4 cubic yards capacity), the TRAXCAVATOR line offers you the greatest range of sizes — providing a size for every job and purpose. See your TRACKSON-"Caterpillar" Dealer for full information. Or write TRACKSON COMPANY Dept. WC-50, Milwaukee 1, Wisconsin.

TRAXCAVATOR® ***The Original Tractor Excavator***



Which is the best bit for your job?

TIMKEN® offers all 3 types—brings you the only complete Rock Bit Engineering Service!

TIMKEN® makes all three rock bit types—multi-use, carbide insert, and one-use. And to help you select the one best bit for *your* job, Timken offers the services of the world's largest field engineering organization devoted exclusively to rock bit problems. With all three types of rock bits to draw upon, the Timken Rock Bit Engineering Service can help you get the bit performance you're after—whether it be lowest bit cost, lowest cost per foot, greatest possible drilling speed or other desired advantages.

This is the only service of its kind, because only Timken makes *all three* rock bit types and only Timken has had so many year's experience with all kinds of rock drilling problems. The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".

1. MULTI-USE Basic removable rock bit for 18 years. Gives lowest cost per foot when full increments can be drilled and control and reconditioning of bits are correct. Low cost. Requires less policing than carbide insert bits.

2. CARBIDE INSERT For extremely hard and abrasive ground, small holes, extra deep holes. Lets drillers spend more time drilling — less time changing bits. Holes go down faster. Bit reconditioning is simplified.

3. ONE-USE "SPIRALOCK" For use where reconditioning is impractical or undesirable. Offers lowest unit bit cost. New "Spiralock" union holds bit on dependably—permits easy removal. Simplifies steel preparation, makes steels last longer.

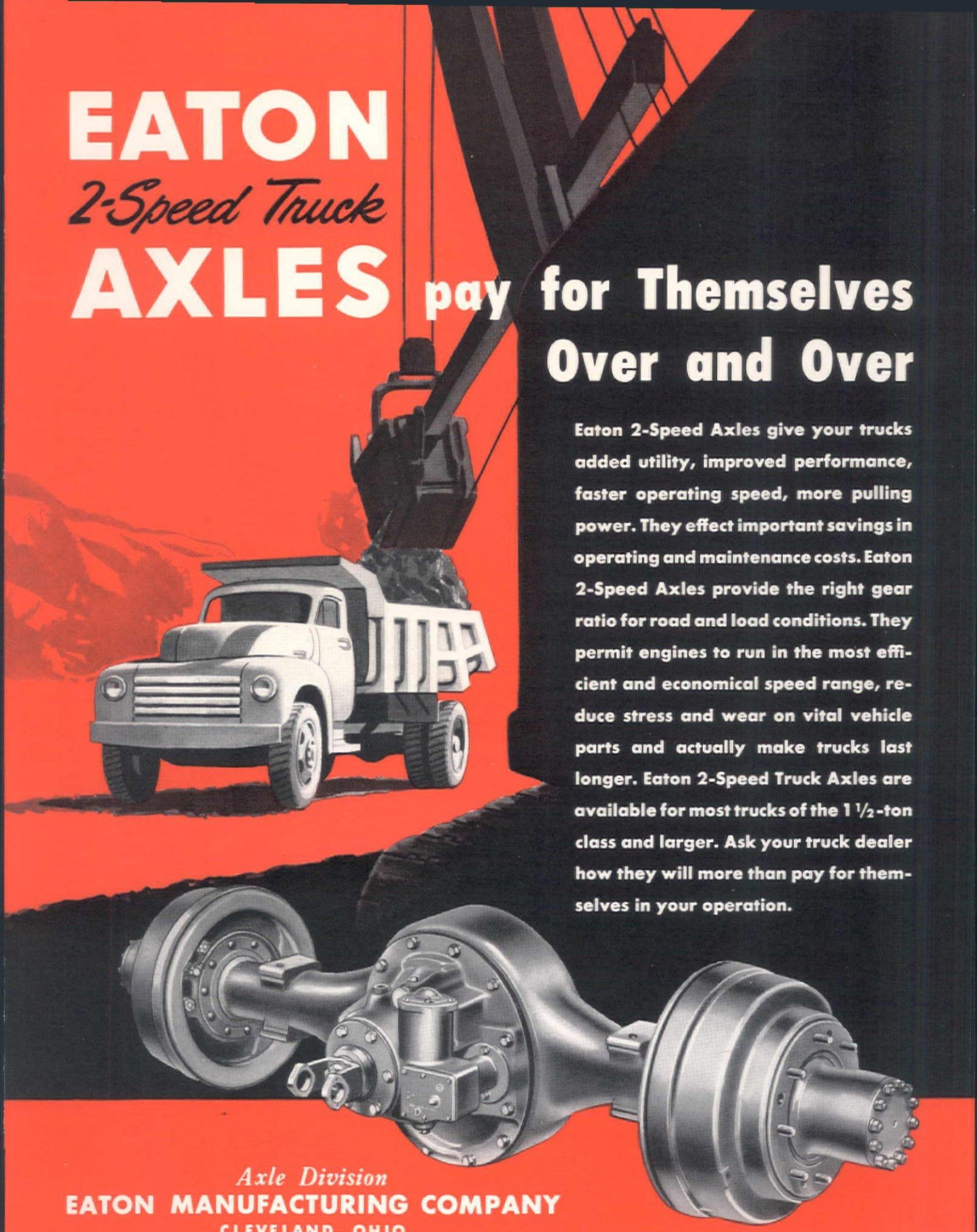
TIMKEN

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

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

FREE BOOKLET! Everyone who buys rock bits should have a copy. Gives full information on all three types of Timken rock bits and the Timken Rock Bit Engineering Service. Shows full line of bits in actual-size photographs, with detailed descriptions. Write The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".

EATON
2-Speed Truck
AXLES pay for Themselves Over and Over



Eaton 2-Speed Axles give your trucks added utility, improved performance, faster operating speed, more pulling power. They effect important savings in operating and maintenance costs. Eaton 2-Speed Axles provide the right gear ratio for road and load conditions. They permit engines to run in the most efficient and economical speed range, reduce stress and wear on vital vehicle parts and actually make trucks last longer. Eaton 2-Speed Truck Axles are available for most trucks of the 1 ½-ton class and larger. Ask your truck dealer how they will more than pay for themselves in your operation.

Axle Division

EATON MANUFACTURING COMPANY

CLEVELAND, OHIO

PRODUCTS: SODIUM COOLED, POPPET, AND FREE VALVES • TAPPETS • HYDRAULIC VALVE LIFTERS • VALVE SEAT INSERTS • ROTOR PUMPS • MOTOR TRUCK AXLES • PERMANENT MOLD GRAY IRON CASTINGS • HEATER-DEFROSTER UNITS • SNAP RINGS • SPRINGTITES SPRING WASHERS • COLD DRAWN STEEL • STAMPINGS • LEAF AND COIL SPRINGS • DYNAMATIC DRIVES, BRAKES, DYNAMOMETERS

"Where efficiency and economy are 'musts'..."

experienced contractors choose 'MS' Delay Electric Blasting Caps!"

"When the job demands careful blasting with maximum efficiency and economy... you really appreciate Du Pont 'MS' Delay Electric Blasting Caps.*

"There are several reasons. For one thing, these caps pull rounds clean . . . leave no dynamite in the muck. There's no mistaking delays in hook-up, either. For every delay period is clearly printed, easy to read in even the poorest light.

"What's more, blasting with 'MS' Delay Caps greatly reduces concussion and vibration, yet gives excellent fragmentation in hard or soft rock work. They're easy to handle, easy to work with."

They save on dynamite costs, too. Dynamite charges can usually be reduced when Du Pont "MS" Caps are substituted for regular delays!

In outside work, Du Pont "MS" Delays cut down vibration, greatly reduce backbreak and so improve fragmentation that a lot less secondary blasting is needed.

Why not do as many experienced contracting men have done—switch to Du Pont "MS" Delay Electric Blasting Caps for your next job?

ASK ANY Du Pont Explosives representative for complete information about "MS" (Millisecond) Delay Electric Blasting Caps. He'll be glad to help you with any blasting problem you may have. E. I. du Pont de Nemours & Co. (Inc.), Hoge Bldg., Seattle, Wash.—Midland Savings Bldg., Denver, Colo.—111 Sutter St., San Francisco, Calif.

**Available in fourteen millisecond intervals of delay: MS-25, -50, -75, -100, -125, -150, -175, -200, -250, -300, -350, -400, -450, and -500.*

DU PONT EXPLOSIVES

Blasting Supplies and Accessories

DU PONT

REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

P&H REMOTE CONTROL — with this unit you can control all functions (even the horn!) by electric push-buttons — from the operator's position inside the crane cab. All changes back and forth between conventional and remote control are instantaneous . . . no mechanical changes required.

P&H TRUCK CRANES

GIVE YOU MORE STABILITY!

How much can you put on the hook? That's the real measure of work-ability in your truck crane. And that's why you'll like P&H Truck Cranes best.

Stability is the answer. And P&H Truck Cranes have it with lower center of gravity — proper weight distribution — the exclusive torsion bar-mounted front axle — more lifting capacity per pound of machine weight.

What's more, P&H Truck Cranes are *dual powered* — not a one-engine compromise. Both engines are designed for their specific jobs — work and travel.

P&H Truck Cranes are convertible for six types of service — crane, clamshell, dragline, shovel, trench hoe and pile driver. Write for literature.

SIZE FOR SIZE NO P&H TRUCK CRANE HAS EVER BEEN OUTLIFTED

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Warehouses Service Stations: **SEATTLE, LOS ANGELES, SAN FRANCISCO**
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P&H

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CRAWLER and TRUCK CRANES • EXCAVATORS • OVERHEAD CRANES • HOISTS • ARC WELDERS and ELECTRODES • SOIL STABILIZERS • DIESEL ENGINES • CANE LOADERS • PREASSEMBLED HOMES

Strong enough EMPTY to support a 100-ton rig!

MONOTUBE
tapered steel piles
cut costs, speeded construction of Nueces Bay Causeway

THIS special pile driver was designed and built to overcome the hazards of gulf storms and delay as well as to reduce the use of costly water equipment. By spanning three driven bents, it could overhang sufficiently to drive the Monotube piles in the next bent, fifty feet away. Monotubes 90 to 125 feet in length were driven in record time.

The striking feature of this ingenious operation was the way light, *empty* Monotube steel piles, without any added lateral bracing, easily supported the 100-ton driver. Monotube's additional strength gave them the extra ability to withstand the weight, vibration and pulling action of the rig . . . in other words, loads in excess of those for which they were designed. *In fact, the entire foundation was thus completely pre-tested long before the Causeway's completion and use.*

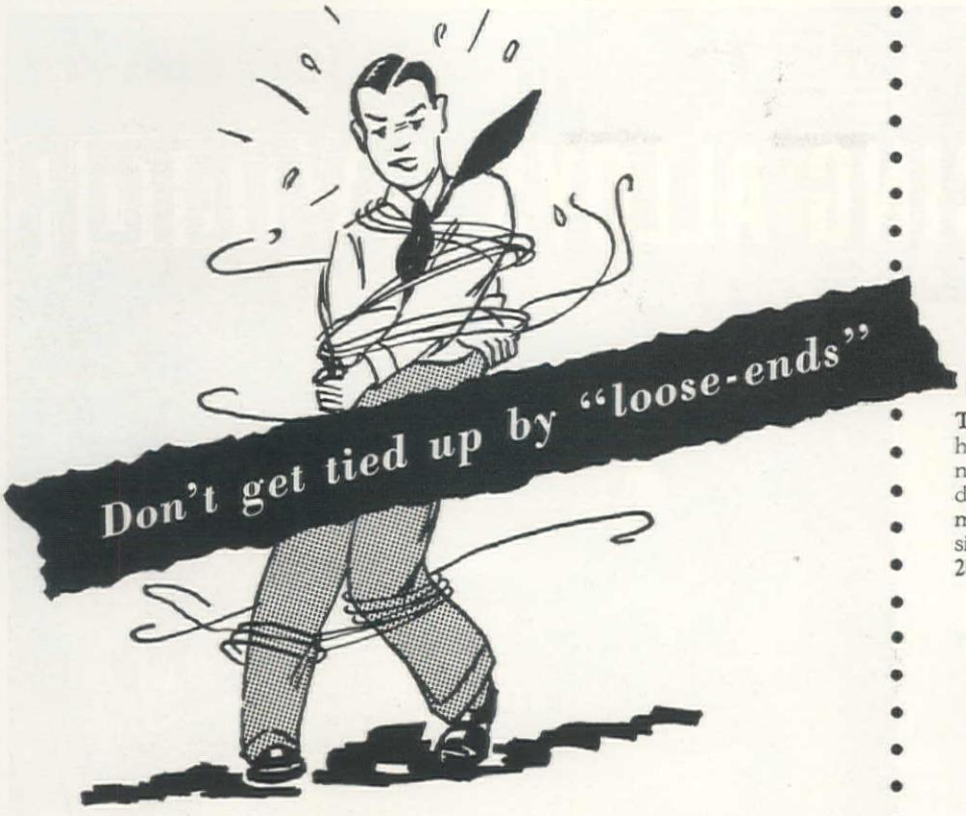
Here again Monotubes' strength, flexibility, and economy features helped solve construction problems—and reduced costs. Strong, yet light in weight, they're easy to handle. Monotubes have a range of lengths, gauges, tapers and diameters for varying soil conditions and different types of structures. There's minimum cut-off waste . . . they're easily extendible. Jobs started with Monotubes can be *completed* with them.

On foundation work of all types, Monotubes offer extra savings from start to finish. For complete information, write The Union Metal Manufacturing Company, Canton 5, Ohio.

Nueces Bay Causeway, Corpus Christi, Texas. Built by Texas Highway Dept., in cooperation with Bureau of Public Roads, under direction of D. C. Greer, State Highway Engineer. Contractors, Austin Bridge Co.

UNION METAL

Monotube Foundation Piles



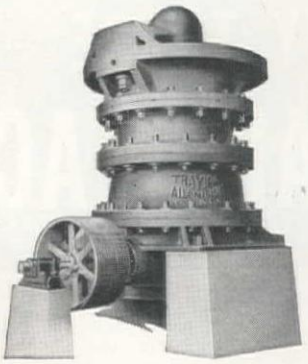
SAVE TIME AND TROUBLE

...Have Traylor Build ALL Your Crushers

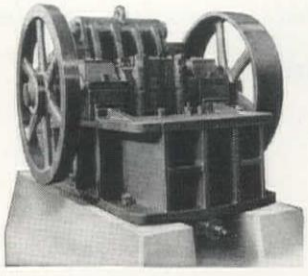
Your completed plant will be more **efficient** . . . more **economical** to operate. The same basic principles of design will be employed by each "Traylor-made" machine to insure **balanced** production, trouble-free operation. For example, the curved crushing surfaces used in both Traylor Gyratory and Jaw crushers will eliminate choking and packing . . . reduce waste fines, slabs and discs to a minimum through each stage of **primary** and **secondary** reduction. The result will be a **steady** supply of **uniform, cubical** aggregate that will meet the most exacting specifications.

Traylor Engineers Can Help You

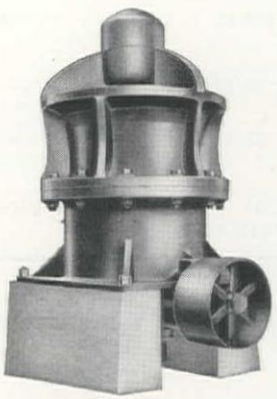
Because Traylor builds a complete line of stone crushing machinery . . . our sales-engineers are able to make an unbiased recommendation, influenced **only** by our **half century of experience.** If your aggregate plant is in the early planning stage, **now's** the best time to get a Traylor engineer on the job. He can save you time and money by tying up the "loose-ends" that so often result in delay and disappointment when working with **more** than **one** supplier. Write to us today.



Traylor Gyratory Crushers are highly recommended by their economical operation for use wherever daily capacities of 8,000 tons or more are desired. Available in 7 sizes with feed opening ranging from 20" to 60".



Traylor Jaw Crushers are equipped with Traylor's famous non-chokable, smooth-faced, **curved** jaw plates for greater capacities at smaller settings and longer plate life. Available in a wide range of sizes and capacities to meet every requirement.



Traylor Reduction Crushers are compactly designed . . . require a minimum of floor space and head room. Cast steel frame. Non-chokable, bell-head and **curved** concaves. Made in 6 sizes, maximum feed opening 22".

TRAYLOR ENGINEERING & MANUFACTURING CO.
341 Mill St., Allentown, Pa.

Sales Offices: New York, N.Y., Chicago, Ill., Los Angeles, Calif.
Canadian Mfrs: Canadian Vickers, Ltd., Montreal, P. Q.

Traylor

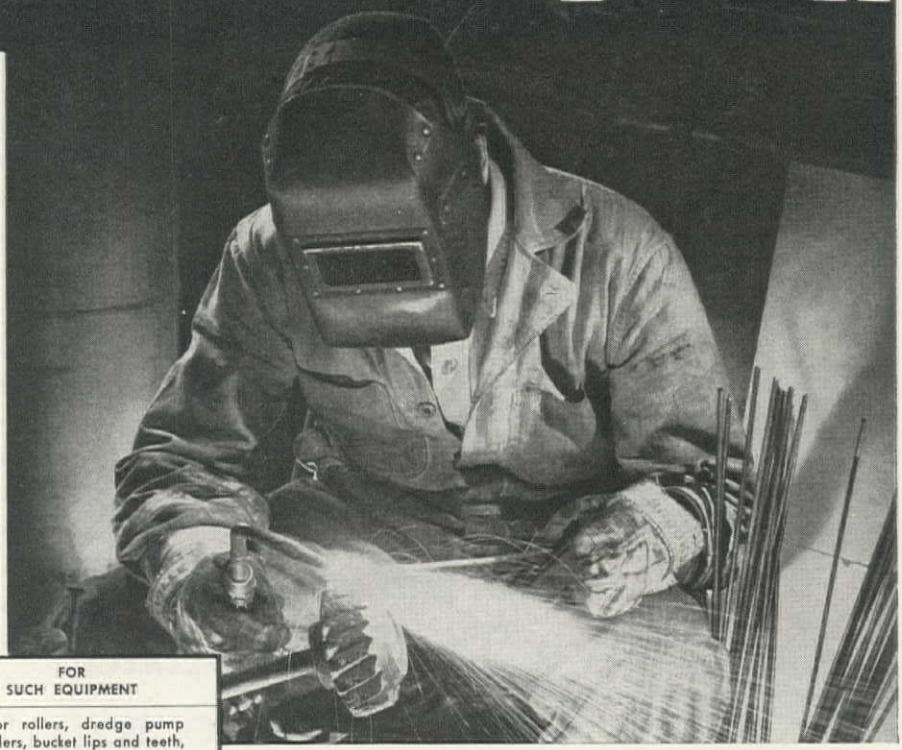
Jaw, Reduction and Gyratory Crushers
Rod Mills · Crushing Rolls
Apron and Grizzley Feeders

A "TRAYLOR" LEADS TO GREATER PROFITS

TRY THESE HARD-FACING ALLOYS BY VICTOR

Made to *stretch working life* of cutting, drilling, and crushing equipment wherever *abrasion, impact, corrosion* and *heat* are encountered.

THEY ARE FASTER AND SMOOTHER!



	FOR THESE CONDITIONS	FOR SUCH EQUIPMENT
VICTORALLOY	Abrasion and severe impact	Tractor rollers, dredge pump impellers, bucket lips and teeth, rock crushers, steel mill wobblers
VICTORTUBE	Severe abrasion	Scarifier teeth, dredge cutter blades, posthole augers, oil field tools, ditcher teeth
VICTORITE	Earth abrasion or sliding friction	Plowshares, cultivators, steel mill guides, cement chutes, shaft bearings, rolling mill guides
VICTOR HS 1	Corrosion, heat and abrasion	Saw-teeth, carbon scrapers, wire guides, rocker arms
VICTOR HS 6	Red heat, impact, corrosion and abrasion	Blanking, forming and trimming dies; cams, hot punches, pump shafts
VICTOR TUNGSMOOTH	Thin cutting edges	Coal cutter bits, brick augers, pug-mill knives, screw conveyors

Available in a full range of sizes for both acetylene and electric AC and DC application. Try VICTOR hard-facing rods on your own job NOW. Save money two ways; (a) in time . . . application is faster and smoother; and (b) by stretching the life of equipment used under severe operating conditions. Order a supply from your dealer TODAY.

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VICTOR's line of welding and cutting equipment is complete. For data on items you are interested in, just fill in coupon.

VICTOR

Welding & Cutting Equipment

SINCE 1910

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VICTOR EQUIPMENT COMPANY, 844 Folsom St., San Francisco 7, Calif.

We want to know more about these items:

- ☐ Hard-facing alloys.
- ☐ Welding and cutting units. ☐ Portable flame cutting machines.
- ☐ Gas regulators. ☐ Air filter-regulator-lubricator units.
- ☐ Blasting nozzles. ☐ Positioning power units. ☐ Fluxes.

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There's a Branch or Distributor to serve you in Portland, Spokane, Seattle, Salt Lake City, Casper, Great Falls, Anchorage, Boise, Denver, Tucson, Phoenix, Albuquerque, Oakland, San Diego, Fresno, Ventura, Sacramento.

as a reporter . . .

I'm going to travel and tell you about Link-Belt Speeder machines, jobs and owners in all parts of this great country.

I like to write about Link-Belt Speeder Shovel-Cranes because I know the complete line is engineered and built to contractors' specifications.

I have already learned that owners appreciate Link-Belt Speeder ruggedness; they know how well they stand up under high pressure road building conditions, digging earth and rock everywhere. And they tell me Link-Belt Speeder distributors are always ready and willing to help with service and maintenance problems RIGHT NOW.

Operators say: "Speed-o-Matic hydraulic controls are wonderful: We can get the speed and steady production that makes the Boss smile — for a change."

This job of reporting on Link-Belt Speeder operations promises to be a cinch. I just tell them where I'm from and owners and operators tell me plenty of good things about their Link-Belt Speeders. And when they're happy and proud to boost their machines, Brother, it's always a pleasure to write this good news to the folks back home.

"They" say the New LS-51 is a Honey!

The true word is spreading fast that the new LS-51 is the fastest, easiest operating, most dependable machine in the ½ yard field.

The LS-51 above, equipped with ⅝ yard bucket is the fifth Link-Belt Speeder owned and operated by Lloyd Vandegrift of Minerva, Ohio. He's been operating shovels for 26 years and he says: "Sure I like my new LS-51, especially the easy operation of Speed-o-Matic controls. I keep the trucks humming all day, and you know what that means."

11,865

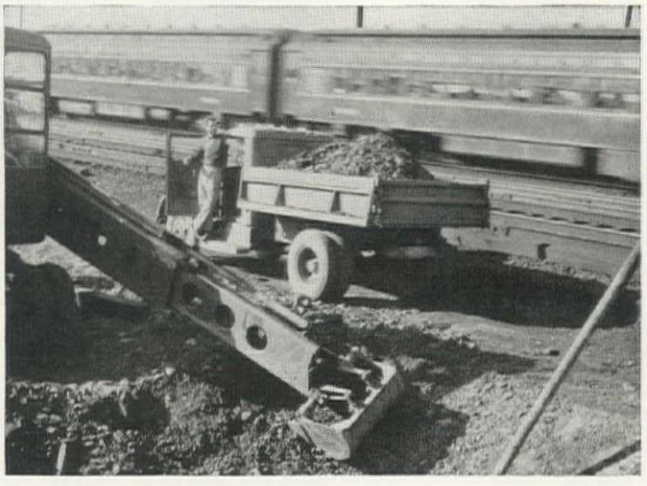
LINK-BELT SPEEDER

LINK-BELT SPEEDER CORPORATION, CEDAR RAPIDS, IOWA

Builders of the Most Complete Line of
SHOVELS-CRANES-DRAGLINES

The Gradall stretches far to do a fast, neat clean-out job on ditches.

"Arm action" tilts the bucket laterally to dress side slopes of drainage ditch.



A Gradall grooms the busiest stretch of track in the world

EACH DAY about 400 passenger trains and 45 freight trains travel the high speed four-track electrified line between New York and Philadelphia. An elaborate system of right-of-way ditches with lead off canals has the effect of turning the entire 91 mile stretch into a fill, for better roadbed stability and improved riding.

Gradalls, with their mobility and versatility, are used for earth moving and many other construction and maintenance jobs.

Wherever Gradalls are used... by contractors, utilities, municipalities... actual cost figures prove that a Gradall pays and pays big!

In this restricted location working under low-hanging power lines the Gradall widens bottom and does a precision job following contours of this ditch.

SALES AND SERVICE

Columbia Epuipment Company,
Portland, Ore., Boise, Idaho, Seattle, Wash.
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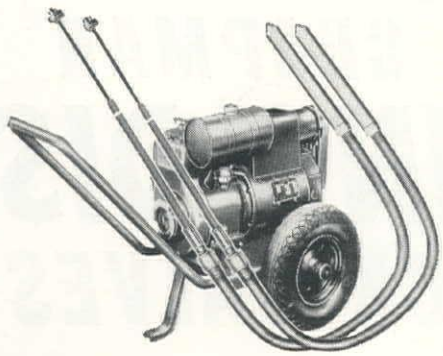
Gradall®
DIVISION OF
WARNER & SWASEY
Cleveland

GRADALL—THE MULTI-PURPOSE CONSTRUCTION MACHINE

the Vibrator with the 400-foot cable

CP-220 Hicycle Electric Vibrators can be operated anywhere in a 400-foot radius, without stopping to move power unit.

- Built for one-man operation; has easily handled electric cable.
- Designed for concretes of 2″ slump and over; walls, footings, columns, floor and roof slabs; precast piles and similar products.
- Capacity of 30 to 40 cubic yards an hour.
- Operates at constant speed, at most suitable frequency for concrete placement.
- Extension hose handle permits use in forms 25 feet deep.
- Equipped with waterproof switch.



Two CP-220 Vibrators are powered with a CP-2KW gasoline-driven Generator, 220-volt, 3-phase, 180-cycle. Generator can also be used for portable lighting plants.

The complete CP line of electric and pneumatic vibrators provides just the right model for every concrete job. Write for full information.

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General Offices: 8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
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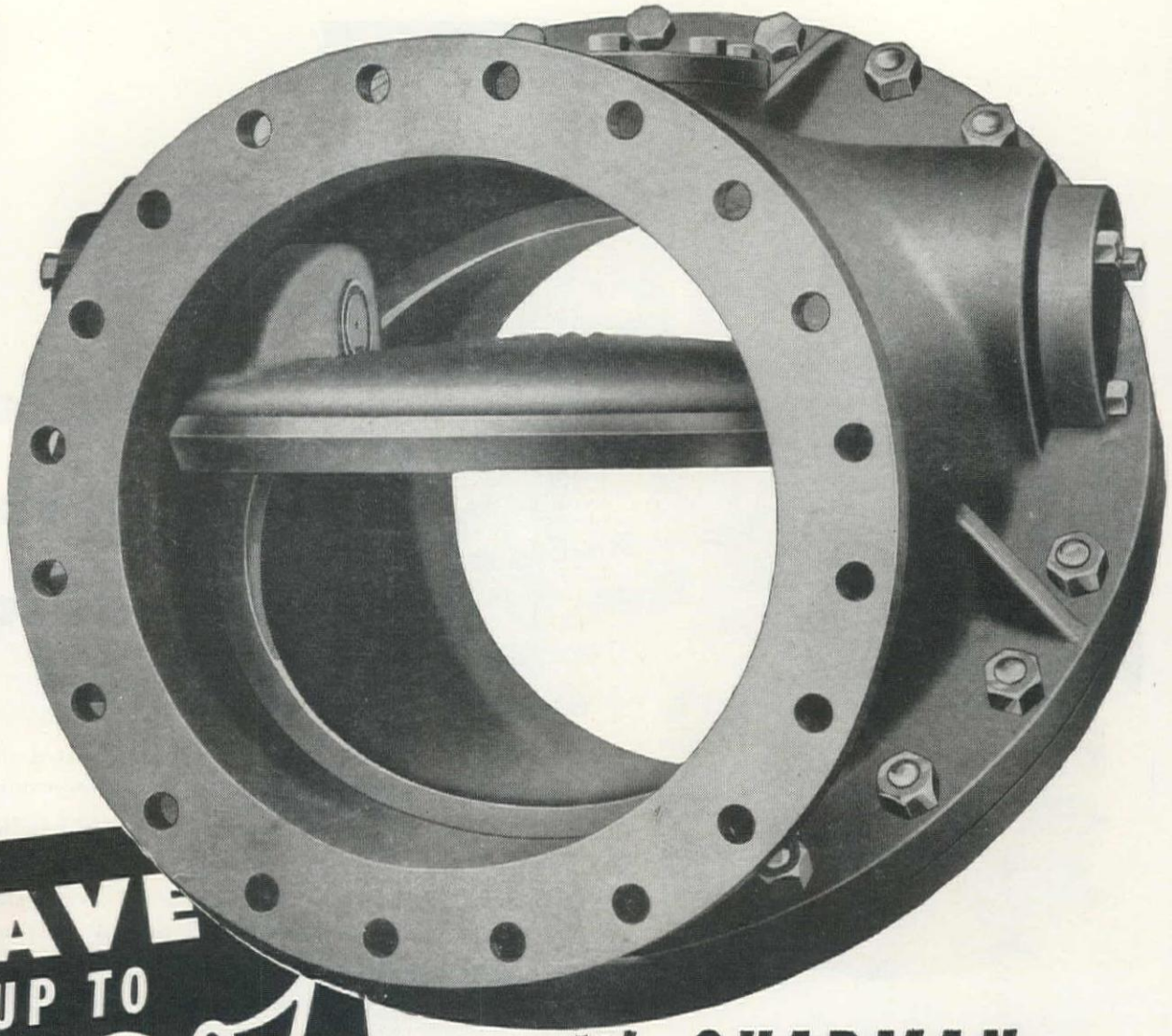
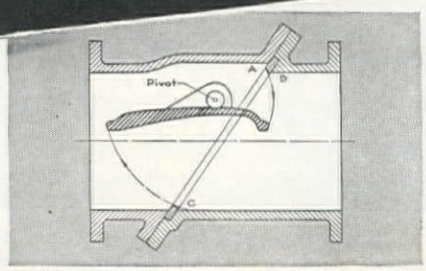


SAVE UP TO 80% IN HEAD LOSSES

with CHAPMAN TILTING-DISC CHECK VALVES



Cross-section of the Chapman Tilting Disc Check Valve illustrating the way that the balanced disc is supported on the pivot, with arrows showing the travel of the disc. A feature of the design is that the disc seat lifts away from the body seat when opening, and drops into contact when closing, with no sliding or wearing of the seats.

That's right! With Chapman Tilting-Disc Valves, head losses are 65% to 80% lower than for conventional type check valves.

But no wonder head losses are lower. Chapman Check Valves work with . . . not against . . . the stream. The balanced disc rides smoothly on the flow . . . lifts away easily in opening and closes quickly and quietly. There's no slamming to cause destructive pipe line stresses . . . minimum wear on seats, hinge pins and bearings.

All these features mean lower maintenance costs for you. So write *today* for additional information.

The Chapman Valve Mfg. Co.
INDIAN ORCHARD, MASSACHUSETTS

DIVIDE BY TWO—
and GET MORE than you had before

FUEL consumption was cut in half and production doubled when a 4-cylinder GM Series 71 Diesel replaced gasoline power in this Northwest one-yard shovel.

The machine handles 1200 tons of limestone and uses only 35 gallons of fuel oil in an 8-hour day, as compared to 600 tons using 75 gallons of gasoline with the old engine. R. W. Meyer, president of Riverview Stone & Material Co., St. Louis, reports moving 400,000 tons of rock without engine overhaul.

"Not only did the General Motors Diesel engine drastically reduce fuel costs," says Mr. Meyer "but operating speed stepped up considerably. This 15-year-old machine walks right through in tight rock now."

Taking jobs like this in stride is everyday work for GM Diesel-powered equipment. The 2-cycle GM Diesel gives lightning response to power demands, operates on low-cost fuel, and delivers long, economical service.

You'll find it pays to specify GM Diesels for repowering old equipment or when buying new. Write us or ask your distributor for details.

DETROIT DIESEL ENGINE DIVISION

SINGLE ENGINES . . . *Up to 275 H. P.* **DETROIT 28, MICHIGAN** MULTIPLE UNITS . . . *Up to 800 H. P.*

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DIESEL BRAWN WITHOUT THE BULK

GM GENERAL MOTORS DIESEL POWER

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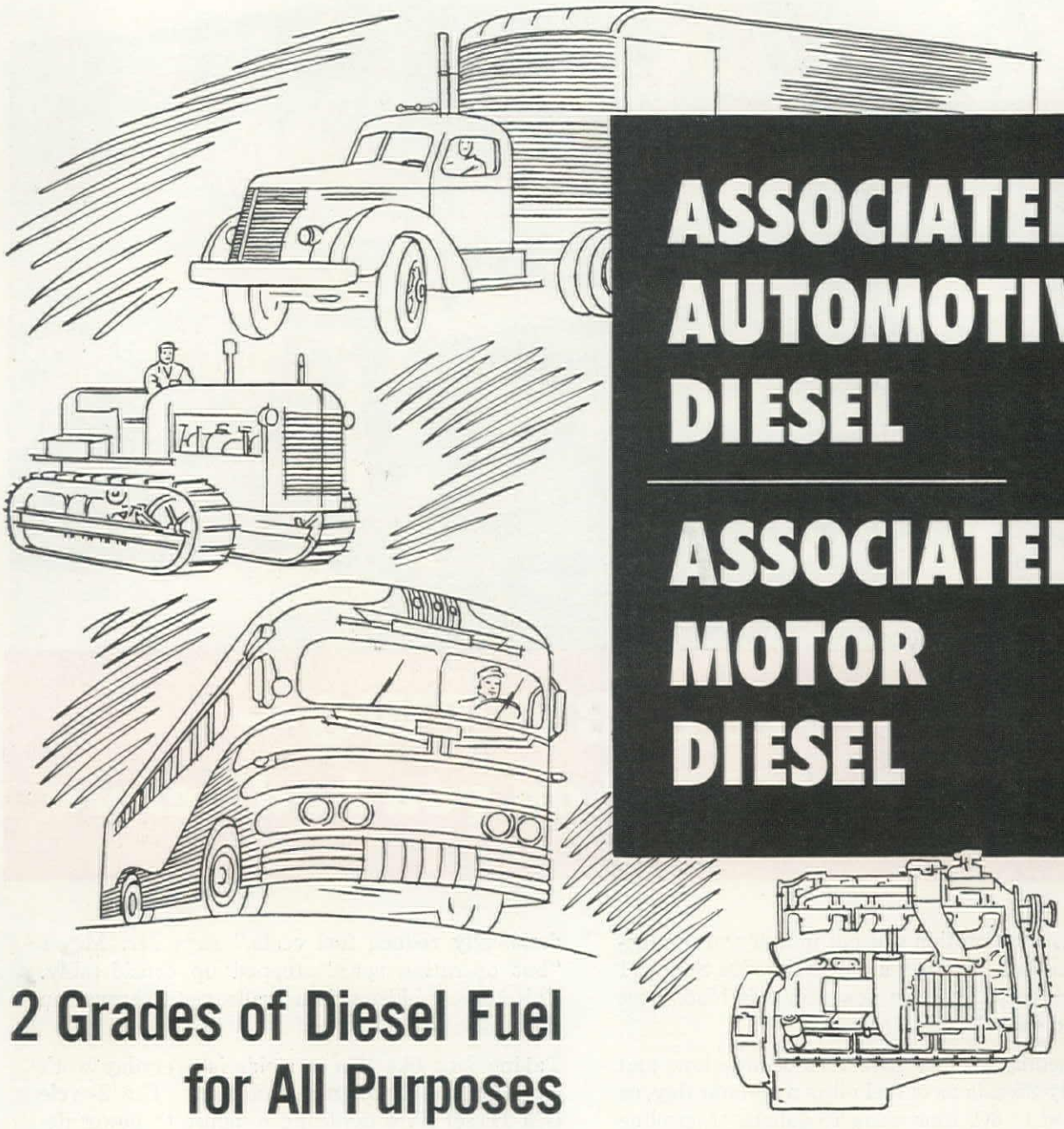


ASSOCIATED AUTOMOTIVE DIESEL

ASSOCIATED MOTOR DIESEL

2 Grades of Diesel Fuel for All Purposes

ASSOCIATED AUTOMOTIVE DIESEL FUEL is a distilled, highly refined, light colored product made from selected crudes. It is a more volatile fuel than Associated Motor Diesel Fuel and has excellent ignition quality and high cetane. It is especially recommended for General Motors Diesel engines, series 71, Allis Chalmers tractor engines and Gray Marine Diesel engines.

ASSOCIATED MOTOR DIESEL FUEL is an outstanding fuel for high speed diesels. It is totally distilled from selected crude, and specially treated for diesel quality. It is free of suspended contaminants and free-flowing with carefully controlled pour point and flash point—gives complete burning for a cleaner engine—more power. Check its easier starting and smoother idling. Its power will prove itself in better performance. It is ideal fuel for such popular engines as Buda, Caterpillar and Cummins.

Order your trial supply of Associated Automotive Diesel Fuel or Motor Diesel Fuel *now*. They are tops for all diesel uses. Let's Get Associated!

Call your Associated Representative for expert help on any lubrication or fuel problem

TIDE WATER ASSOCIATED OIL COMPANY

HYDROPEL®

Another Product Pioneered By **Bitumuls**

The Integral Waterproofing Admix for Concrete That "Tops" Them All.

Portland Cement Concrete—accepted world-wide—receives its greatest modern improvement when HYDROPEL is added. We invite your appraisal.

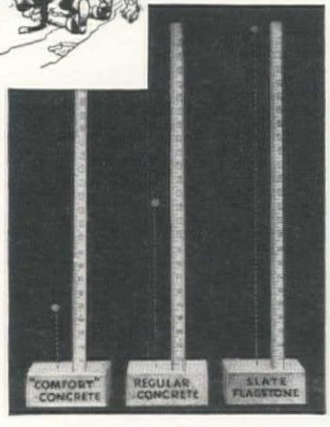
Resists FREEZE-THAW

(Expansion & Contraction)

In combating freeze-thaw action, 4½-sack Hydropel Concrete outperforms 7-sack plain concrete. New England cities specify Hydropel Concrete in curbs and sidewalks where de-icing salts are used.

WARM & RESILIENT

(Comfort Concrete)

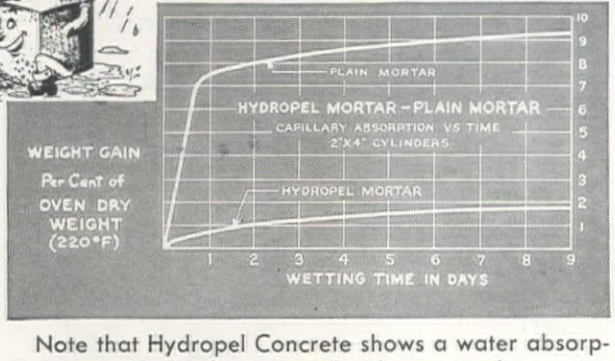


The rebound of steel balls shows how Hydropel "Comfort" Concrete absorbs impact. Humans and animals like its resilience and dry warmth.

(Photo — courtesy John B. Pierce Foundation.)

IMPERMEABILITY

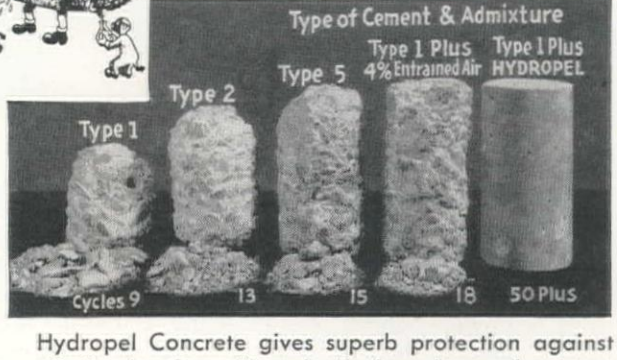
(Water Resistance)



Note that Hydropel Concrete shows a water absorption of only 15% compared with untreated concrete. Absorption with Hydropel is less than ⅓ that of any other "waterproofing" additive. Hydropel Concrete is now used for hydraulic structures.

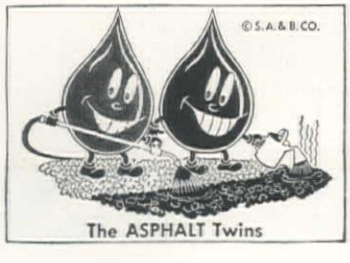
Resists CHEMICALS

(Solids—Liquids—Gases)



Hydropel Concrete gives superb protection against alkali salts. Over 50 cycles in the salt soundness test do NOT damage Hydropel cylinders—all others fail in relatively few cycles. Chemical plants prefer Hydropel Concrete.

HYDROPEL, perfected in over ten years of engineering research, offers you many exclusive advantages. Try it on a "tough" job NOW.



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Velvetouch All-Metal Clutch Facings and Brake Linings

on the New Model C Tournadozer

Power control unit brake band lining.

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Fast, highly maneuverable, and extremely powerful . . . LeTourneau relies on Genuine Velvetouch all-metal clutch facings and brake linings for accurate, economical power control. Because the scientific mixture of powdered metals, used in making Velvetouch, minimizes chattering and slipping . . . insures smooth, positive operation. You'll find Genuine Velvetouch lasts longer, too . . . for being all-metal, it won't rot in oil or "burn" like conventional friction material. *Send for details today.*

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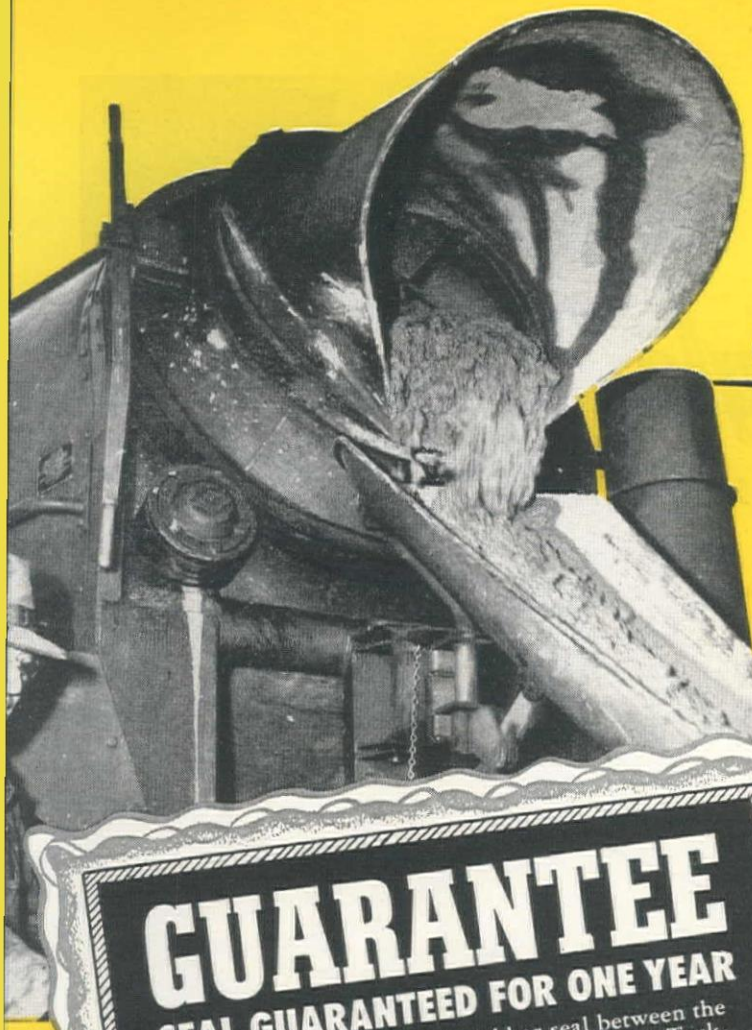
WORLD'S LARGEST MANUFACTURERS OF ALL-METAL CLUTCH FACINGS AND BRAKE LININGS

DON'T STRAIN YOUR CONCRETE *through a door!*



The BLAW-KNOX Hi-Boy Trukmixer
has no discharge door! Discharge is Easily Controlled Without Any Possibility of Segregation

ON a Blaw-Knox Hi-Boy Trukmixer the unrestricted 32″ drum opening plus the wide flanged discharge blades extending past the end of the drum opening give a high-speed, uniform discharge even with zero slump concrete. The speed of concrete discharging is controlled by the rotation of the mixing drum—a handful at a time or the entire load *without segregation.*

Any truck mixer equipped with a discharge door provides a means of segregating concrete during discharge.

GUARANTEE

SEAL GUARANTEED FOR ONE YEAR

Blaw-Knox guarantees the rubber seal between the revolving hopper and drum of the Hi-Boy Trukmixer for one year, providing it is greased daily. That's the guarantee that means an end to tailgate troubles and seal maintenance headaches. And, when a worn seal does have to be replaced it can be done easily in 30 or 40 minutes! The seal between the mixing drum and hopper is never broken and is the only one that operates safely while submerged in concrete.

BLAW KNOX

AND IN ADDITION

The revolving Hopper provides unequalled ease and speed of operation. A flick of the latch automatically inverts the hopper for discharge. Another flick and the hopper is upright for charging. Three seconds from one position to the other. No gates to open and close. No climbing around to reach gate mechanisms. Only a rear end hopper gives you faster charging, an initial mix while charging, instantaneous shrinkage of the batch and greater capacity.

- Polished steel reversible seal wear ring bolted to inner race of 32″ bearing.
- Molded synthetic rubber seal ring between revolving hopper and wear ring.
- Four Alemite fittings to lubricate seal ring.
- Hopper and seal ring can be taken off by removing total of six bolts from four lugs.

See the Hi-Boy Trukmixer in operation, talk to the owner. You'll be convinced it's the best on the market. Write for details on the Blaw-Knox Ready Mix Complete Package—Trukmixers, aggregate and cement batching plants, and the complete line of clamshell buckets.

A COMPLETE READY-MIX OUTFIT IN ONE PACKAGE from BLAW-KNOX *Material Handling and Storage, Batching Truck Mixers*

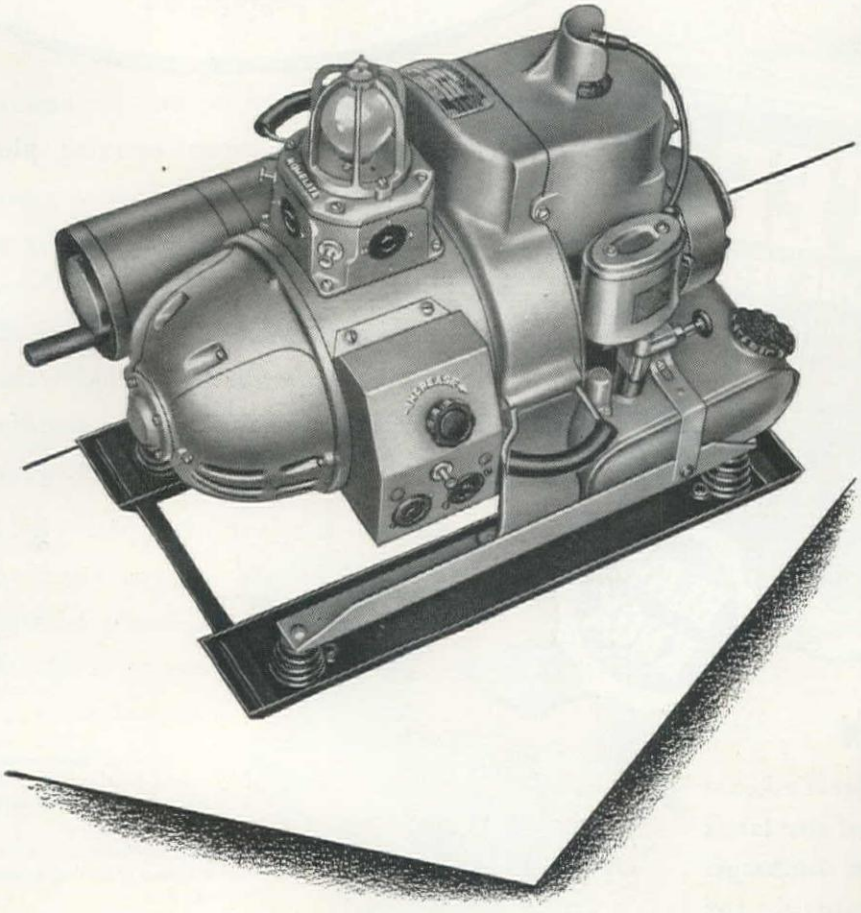
BLAW-KNOX

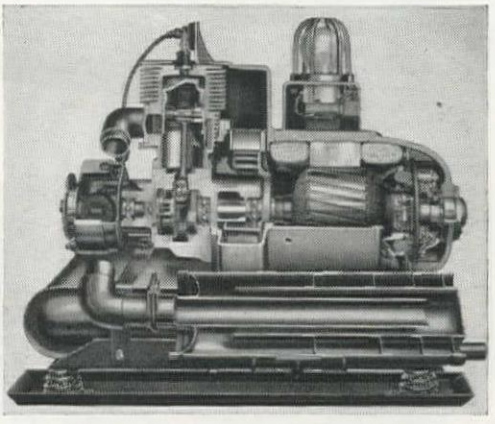
BLAW-KNOX DIVISION of Blaw-Knox Company
Farmers Bank Bldg., Pittsburgh 22, Pa.

From Every Angle

A Homelite Carryable Generator Is the Power Unit for You...

1. PERFORMANCE. Once you begin to use a Homelite . . . yes, even when you see it demonstrated . . . you immediately appreciate its outstanding performance. Light enough for one man to carry, a Homelite packs the power needed to keep hand tools running at full productive capacity . . . and floodlights burning at full brightness . . . at any time at any place in all kinds of weather.





2. DEPENDABILITY. Every Homelite Generator though light in weight is a *heavy duty* unit. No baby stuff about it. For more than a quarter century Homelite engineers have specialized in building carryable gasoline engine units . . . close to three hundred thousand of them . . . and they know that to keep a generator going on the job they have to use the finest materials and apply the highest engineering skill.

3. SERVICE. Like all pieces of machinery, a Homelite Generator needs, in the long run, a certain amount of servicing . . . a minimum to be sure. But the availability of Homelite service by nationwide exclusive service shops . . . completely stocked and manned by experts who can service your Homelite *right at your door* . . . makes a whale of a difference when it comes to having a generator that will give you instant power not only where you want it, but also *when* you want it.

STICK TO THE RULE OF THREE 1. Performance 2. Dependability 3. Service, and you'll always stick to a Homelite.

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profit-wise Contractors buy MICHIGAN ½ yd. Crawler Cranes!

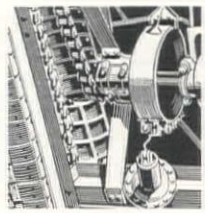
There's no other half-yard crawler crane excavator as good . . . dollar for dollar . . . as the MICHIGAN! Why? Because only MICHIGAN gives you these job-proved, "big-machine" features:

Independent travel to save minutes on every move, hours on every job. Tractor-ease steering to enable faster, easier maneuvering. Automatic, self-locking crawler brakes to give complete safety when working on grades. Smooth fingertip air control to eliminate operator fatigue and that "afternoon let-down."

But, that's not all. There's the oversize internal-tooth circle gear . . . the hook rollers and independent drum assemblies . . . and there are many more. Compare MICHIGAN with any other half-yard crawler crane . . . then you, too, will agree it's your best buy! Take the first step in getting more for your money . . . write, wire or 'phone for complete details.

MICHIGAN POWER SHOVEL COMPANY
430 Second Street, Benton Harbor, Michigan, U. S. A.

INDEPENDENT TRAVEL — Standard equipment. Crawler mechanism powered through intermediate shaft's forward and reverse gears — *not* through swing gears.

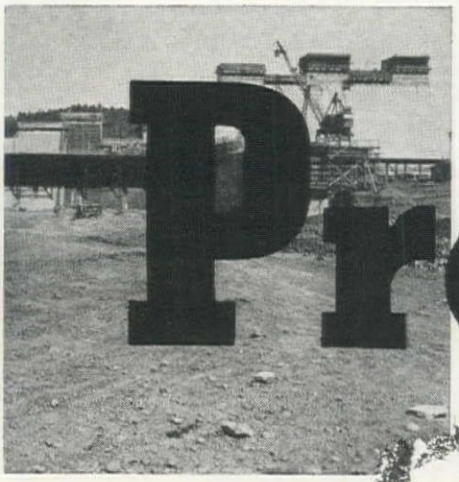


AUTOMATIC-LOCKING BRAKES — Hold crawlers against downhill movement when working on grades, a feature operators appreciate. Brakes lock instantly, are re'eased by air rams.

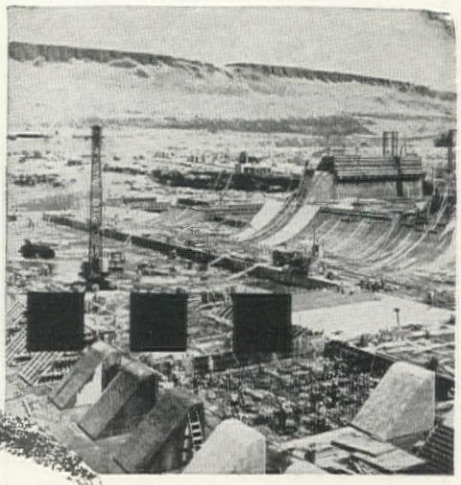
TRACTOR-EASE STEERING — Operator can maneuver a Michigan accurately and fast because it steers like a tractor — steering *brakes* are used instead of conventional jaw-clutches.

FINGERTIP AIR CONTROL — Air pressure to a clutch ram is regulated instantly as operator desires, thus giving him complete control and "feel of the load" at all times.

Proof...



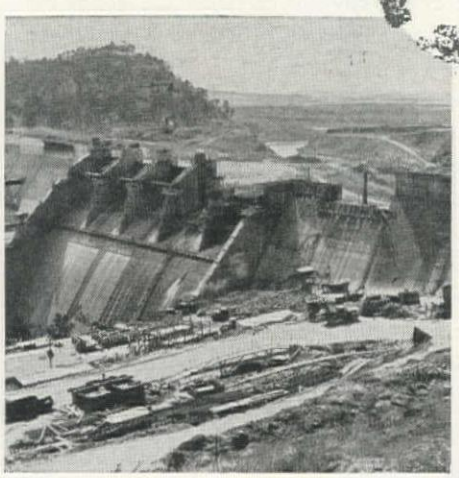
Dorena Dam
U. S. Corps of Engineers
Dorena, Oregon
Proof . . . that you use less Protex!



Walla Walla Dist. Corps of Eng. Photo

McNary Dam
U. S. Corps of Engineers
Plymouth, Washington
Proof . . . that the larger projects specify Protex!

...that Protex AIR ENTRAINING AGENT costs less to use!



Angostura Dam
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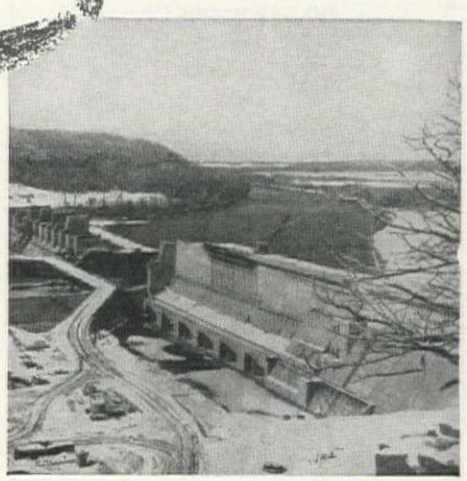
When you're pouring millions of yards of concrete, every penny saved means a lot. That's why Protex Air Entraining Agent is used in so many large dam projects . . . proof of the quality of Protex . . . proof that it actually takes less Protex AEA than other admixtures! Protex AEA meets the requirements of Specifications SS-C-192, ASTM Spec. C-175-48T, is widely used by Bureau of Reclamation, U. S. Corps of Engineers, Bureau of Public Roads. Write, wire or phone for complete information!



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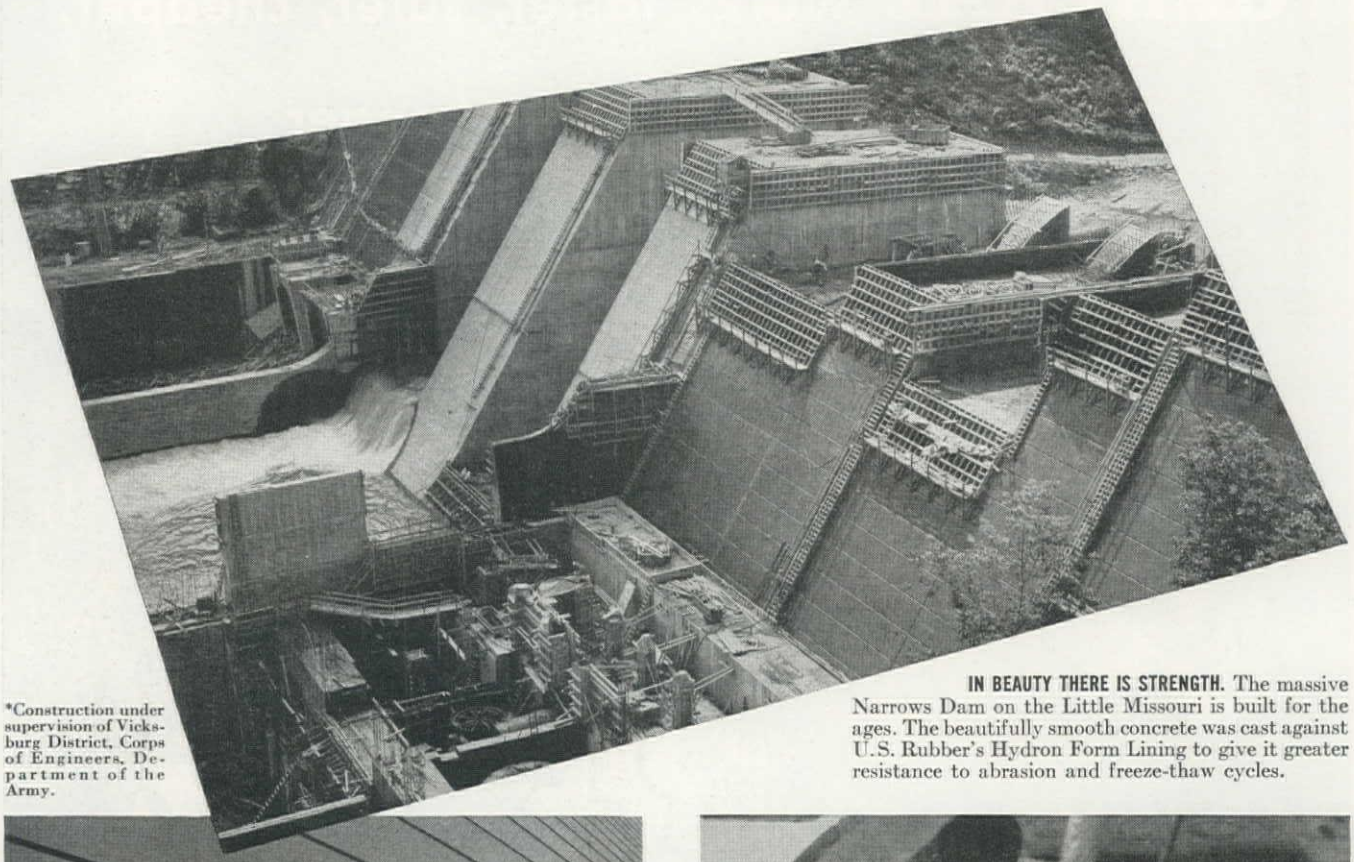
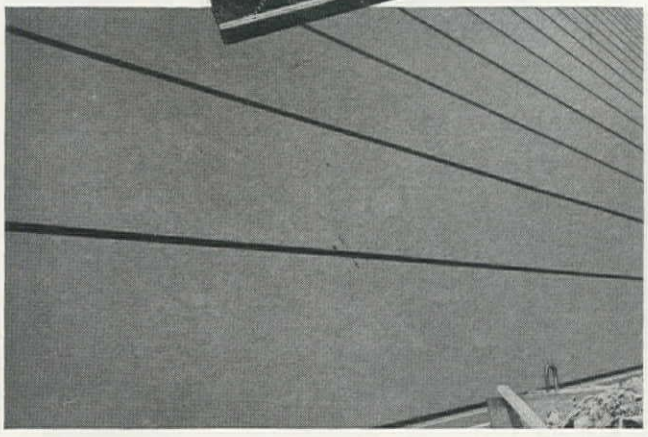
PERFECT COMPLEXION FOR A CONCRETE FACE

Arkansas Narrows Dam* gets a smooth, super-strong concrete face with U. S. Hydron® Form Lining

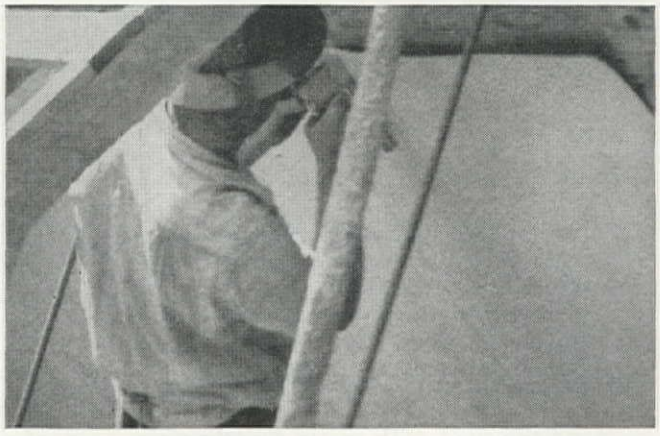


*Construction under supervision of Vicksburg District, Corps of Engineers, Department of the Army.

IN BEAUTY THERE IS STRENGTH. The massive Narrows Dam on the Little Missouri is built for the ages. The beautifully smooth concrete was cast against U.S. Rubber's Hydron Form Lining to give it greater resistance to abrasion and freeze-thaw cycles.



BILLIARD-BALL SLIPPERY is the downstream surface of the dam. Hydron absorbs the excess water and eliminates trapped air from the concrete, greatly reduces surface pits. This great "U. S." development comes in flexible sheets only 0.08 inch thick.



300,000 SQUARE FEET of Hydron were mounted to wooden forms quickly and easily with rapid-fire staple guns. Hydron is inexpensive, easy to ship, store, cut or trim. It can be used on big or small jobs, gives longer life, lower maintenance costs.

The engineers and contractors who use Hydron Form Linings report Hydron adds *years* to the life of concrete. Yet the total costs, including a satisfactory profit, is only 12¢ to 16¢ per square foot. The use of Hydron eliminates expensive hand rubbing. For more information write to address below.

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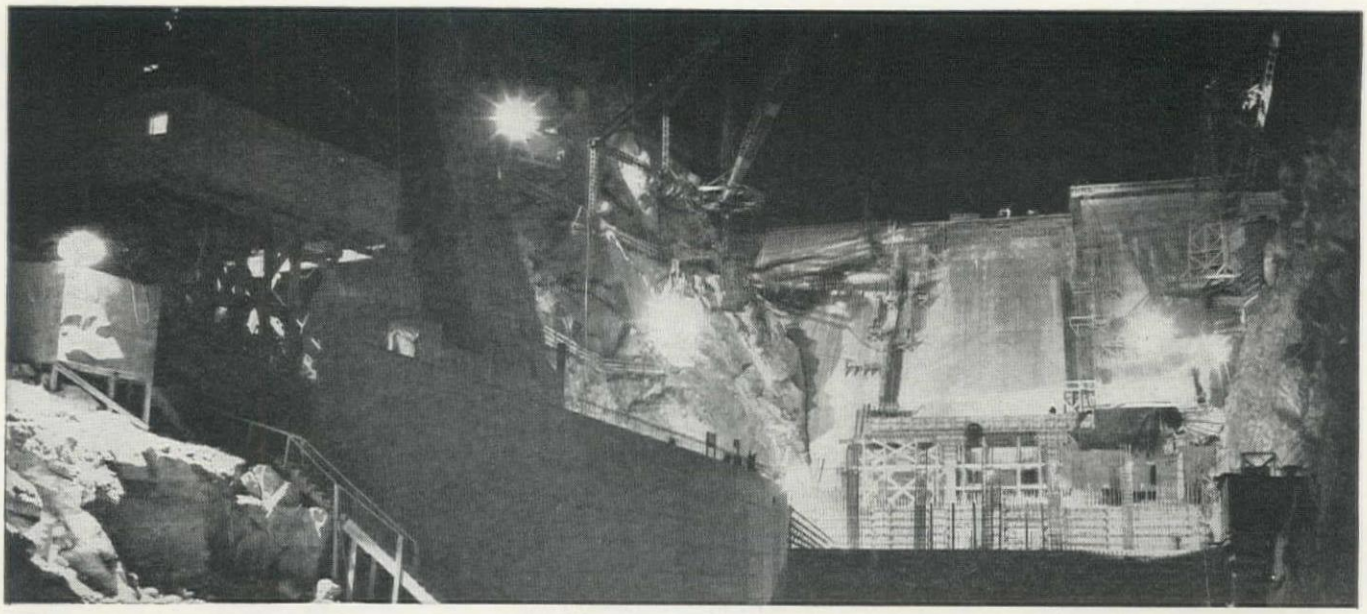
Quarry and mine owners all over the world know from experience that a Bucyrus-Erie excavator is their best assurance of dependable high output combined with on-the-job reliability through years of service. The 5 cu. yd. 120-B is a typical example of Bucyrus-Erie *years ahead* design, from its hard-digging dipper with tough manganese steel lip to its ground-gripping treads, heat-treated to withstand wear. Its smooth Ward Leonard control and careful balance of speeds and power give the operator complete mastery of every function for a speedy, output-boosting cycle.

With capacities from ⅜ to 36 cu. yds., there is a Bucyrus-Erie to fit any quarry or mine requirement, and to meet production demands with fast, smooth, economical operation.

105L50

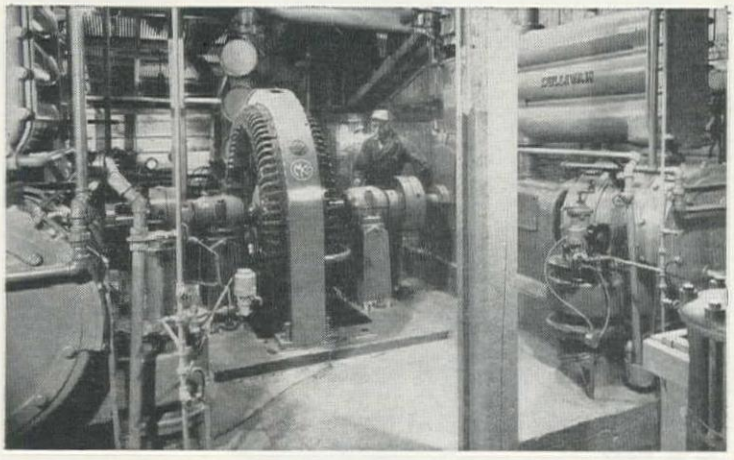
BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

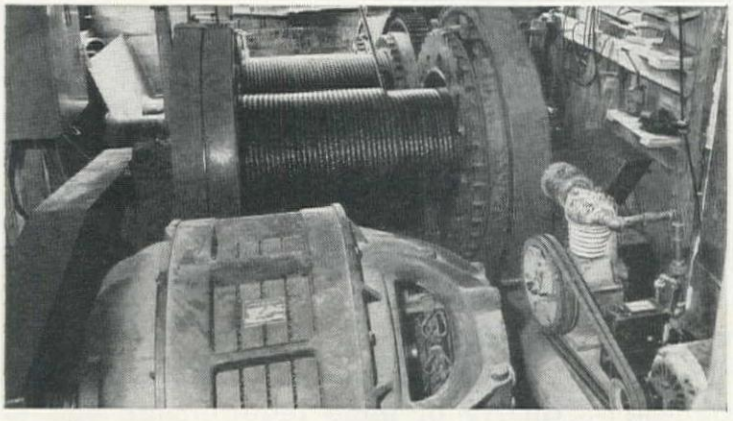


speeding construction at Kortes Dam

... Electrically



All air pressure for job comes from compressors driven by a 500-hp G-E motor.



The 185-foot boom hoist is driven by a 200-hp General Electric induction motor.

G-E Equipment Operates Around the Clock to Meet Schedule

To maintain their rigorous work schedule at the Bureau of Reclamation's Missouri-Basin Kortes Dam project (Kortes, Wyoming), Morrison-Knudsen Co., contractors, must keep on the job 24 hours a day. Thanks to modern machinery *electrified by General Electric*, work proceeds at this accelerated pace without the periodic shutdowns usually expected in this kind of job.

When you electrify with G-E motors and control supplied from G-E power distribution systems, you get safer, faster, more efficient operation. You'll also have the added advantage of engineering assistance in application, installation, and service—regardless of job location. *Apparatus Dept., General Electric Co., Schenectady 5, N. Y.*

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Whether you buy or build construction equipment, your G-E representative can show you how to do a better job—at lower cost—by complete electrification. Write him now, and he'll call on you at your convenience.

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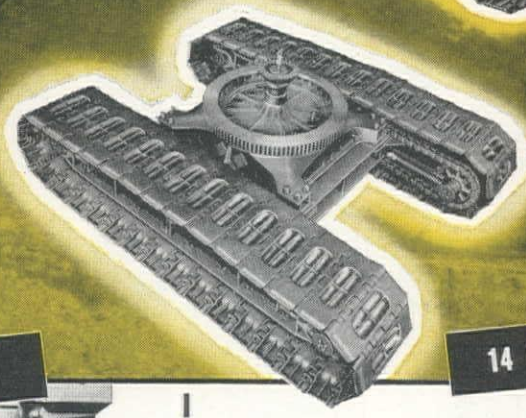
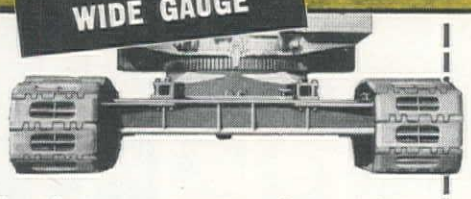


14 FEET LONG

WIDE GAUGE



For jobs requiring greater clearance between treads, Lorain presents a new 13 ft. wide mounting — for hoe, crane, clamshell, dragline, or shovel work. Provides increased crane lifting capacities, too. Ideally suited for cross-country pipe line construction and other jobs where ditches must be straddled!

▶ The Lorain-50 Series now offers another exclusive performance advantage in the 1-yard class! You may *select* just the size and type of Crawler best suited to your work, ground or travel conditions. For instance, the 14-foot-long crawler is ideal for dragline, clamshell or crane service — it reduces ground pressure, improves soft ground flotation, eliminates "nosing-in". Get the full story on all of the advantages of the Lorain-50 — today!

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THE LORAIN-50 IS THE ONLY MACHINE IN THE ONE-YARD CLASS WITH HYDRAULIC COUPLING AS STANDARD

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THE MACHINE OF THE YEAR

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For Facts About the "50" See Your LORAIN Distributor

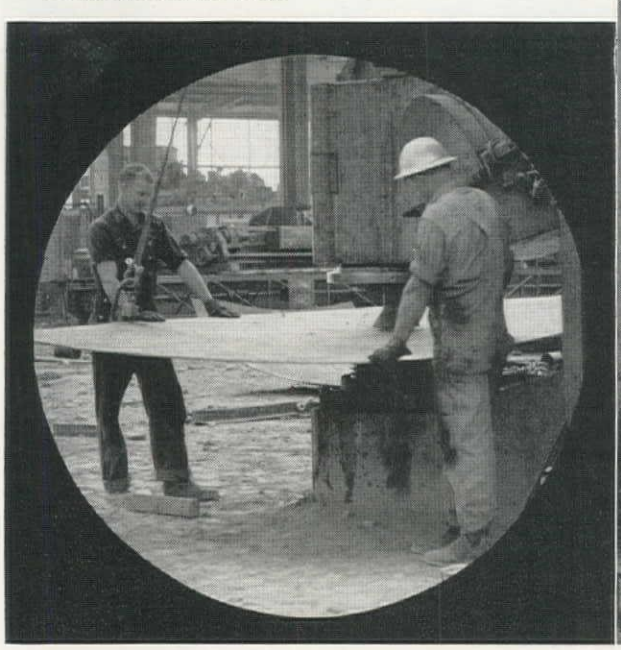
This Tank Saves 50 per cent

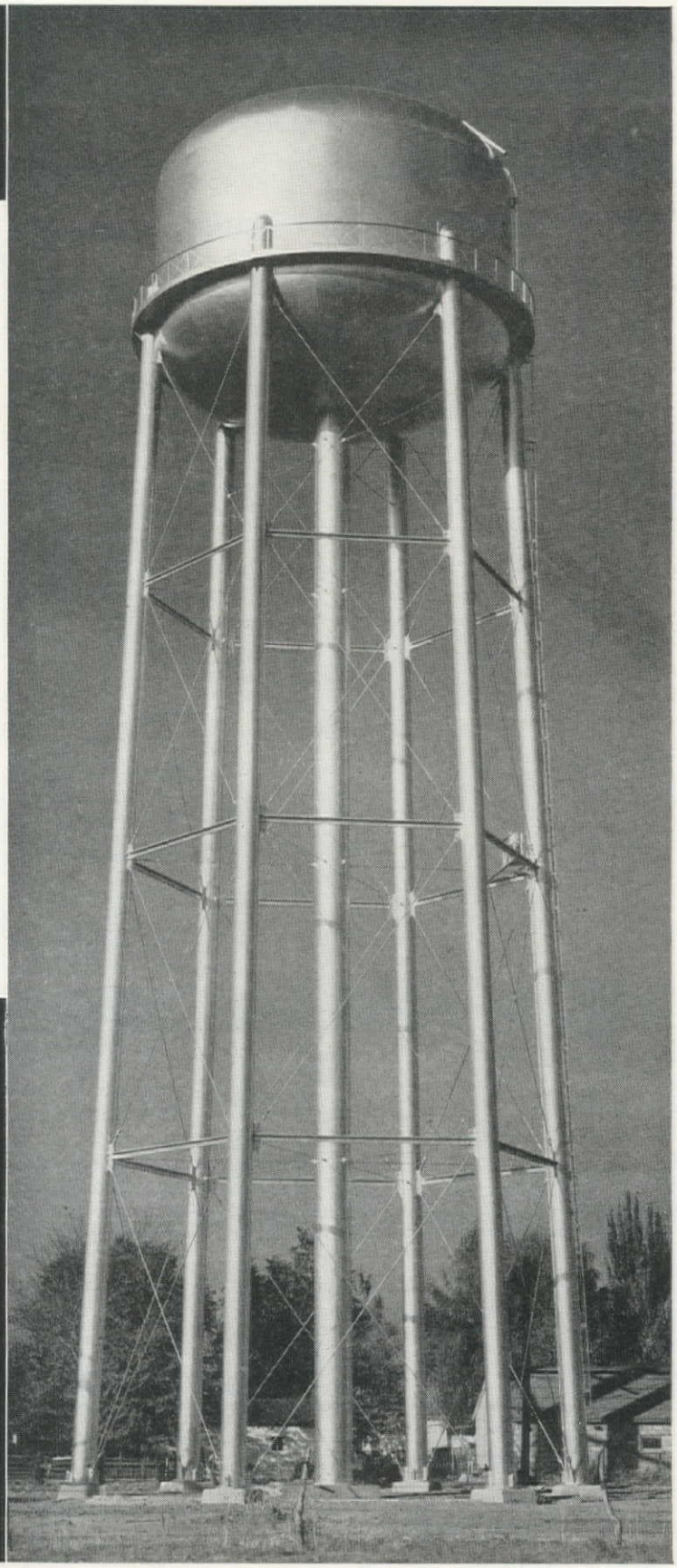
...of the power and operating costs at South Salt Lake

This 300,000-gal. Horton elevated tank provides gravity water pressure in the distribution system at South Salt Lake, Utah. Before the tank was installed, purchased water was pumped directly into the lines. Then, a 950-gpm pump was delivering 50 to 550 gals. per minute and was running 24 hours per day. Now, the pumping equipment operates only about 25 per cent of the time and when it is running it is operating at full capacity. The city manager says this about the effectiveness of the elevated tank: "I feel that the tank will effect a savings of *close to 50 per cent* in our operating and power costs over a period of 20 years as it will have an effect on the life of the pumps as well as direct savings on power costs."

The savings effected at South Salt Lake emphasize why you should investigate elevated storage for your distribution system. Write the nearest office for full details.

Below: A bottom plate for the South Salt Lake tank about to be dished at our Salt Lake City plant. This new plant enables us to provide prompt, complete service throughout the West.





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WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED WESTERN HIGHWAYS BUILDER

May 15, 1950 — Vol. 25, No. 5

Highways Need Basic Study

BEHIND the day-to-day problems relating to highway development in the West is the all-inclusive question of basic economy and finance. Sources of revenue and allocation of funds have assumed a fairly well channeled regional pattern, but this pattern may be entirely inadequate and out of balance for the coming years of accelerating demands. The East is already actively studying and experimenting with various ideas in highway finance. Among Western considerations as to the ratio of revenues from direct users, as compared to the possible assessing of indirect benefits, will be the study of truck transportation.

What is the predicted volume of this traffic, its effect on passenger car travel, its physical effect on the highways, the possibility of establishing separate routes or lanes? These are questions of common and pressing concern for Western highway departments. They are elements in the over-all problem of economics and finance. As an aid in organizing factual material on this subject, a group of articles will be presented in the next number—the Annual Highway Issue.

In the Field It's Different

COMPACTION of earth is one thing in the laboratory and something entirely different in the field. The nature of this universal engineering material makes it extremely difficult to translate results and characteristics from the "lab" sample to the truck load. Obviously, the soil compaction techniques of the laboratory will always provide the objective and guide for the operations of the construction engineer and contractor. But, the laboratory will show the more consistent progress and advance the fastest, for ideas and tests developed in one laboratory are readily duplicated by other testing engineers. This tends to develop a large fund of well studied and usable laboratory information.

Not so the operations in the field, where all jobs and conditions are different, and the emphasis must be on speed and volume. Personnel is usually available only in sufficient number to see that the instructions from the laboratory are followed, without regard to exploring interesting new ideas. Heavy equipment must be kept on the routine which has been specified, as a matter of contracting economy, rather than vary procedure in the interest of testing any of these new ideas. Cost and time usually rule out any effective large scale tests of compacting.

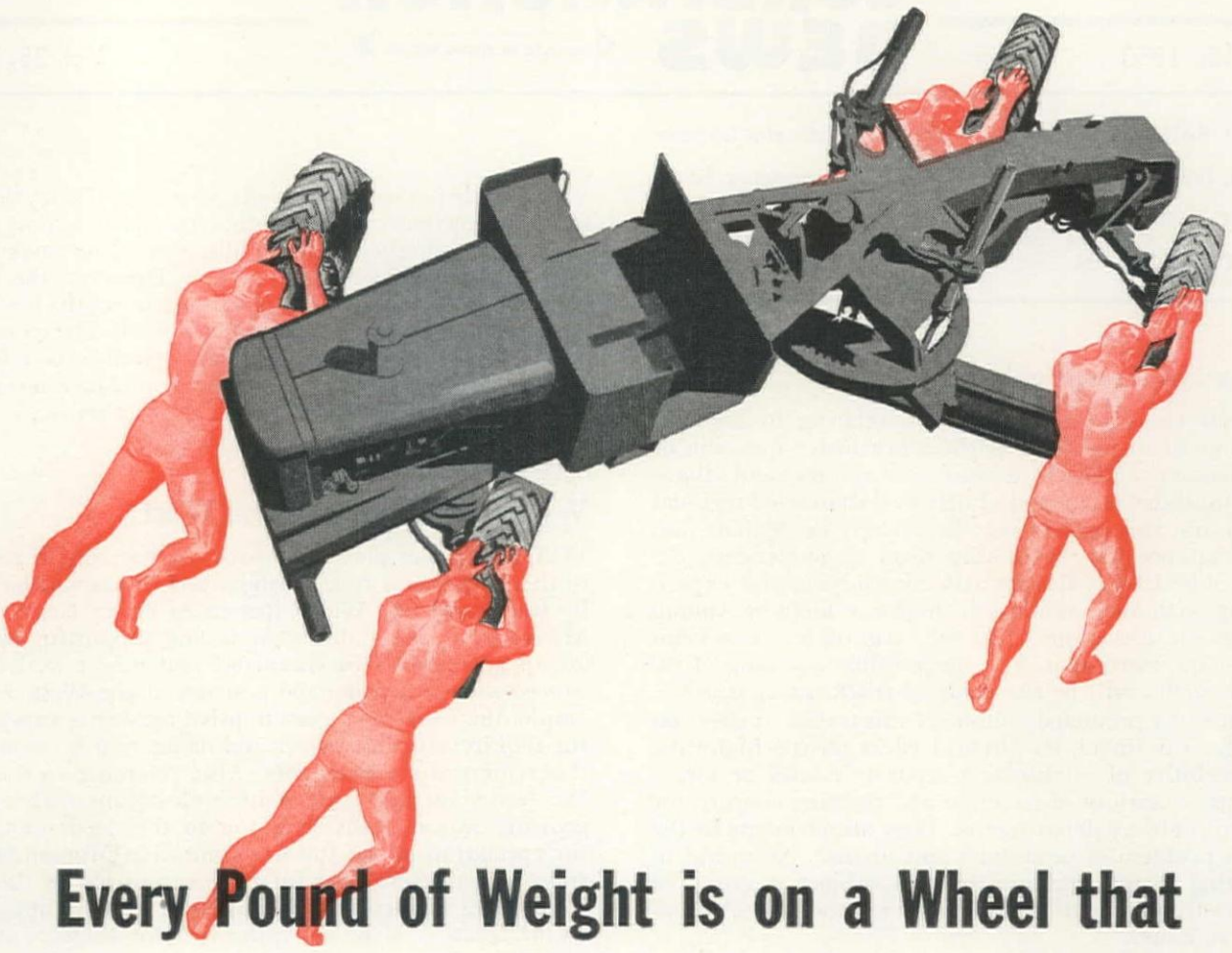
Only at long intervals is it possible to report results which add constructive data to the available knowledge of field compaction. This makes the article beginning on page 64 of unusual interest to engineers and contractors alike. It comes directly from the field, and it discusses practical operating problems and results.

Earth is being used by designers for larger dams, to make more impervious embankments, to support heavier structures and for higher highway fills. Soil science makes possible the reliability of these designs. However, the key to construction economy and consistency of results lies in the equipment and procedures used on the job. The contractor and construction engineer remain handicapped by the scarcity of field-developed information. More large-scale testing, like that reviewed in the current article, is badly needed.

Wyoming Speaks for the West

WYOMING has placed its cards on the table in relation to the studies and recommendations which will be made by the President's Water Resources Policy Commission. Many of the state's observations, and supporting reasons, are quite regional in character, and might well be advanced as representing the position of the West. For example, the concept of consumptive use being superior to the requirements for power and navigation is common to this region of water scarcity. Also, reference to the need for "water on hay land at high elevations with a short growing season" calls attention to the need for careful interpretation of the 160-acre limitation in mountainous states. A preference for inter-state compacts as the basis for dealing with river problems and a positive opposition to the creation of Basin Authorities for Western streams completes the recommendations and outlines the position of Wyoming in its open letter to Morris L. Cooke, chairman of the commission. In addition there is the logical request made for the formulating of a national policy for the allocation of costs on multi-purpose projects. In all, Wyoming has rather accurately outlined the position and requirements of the West.

88-H . . . 99-H . . . MASTER 99



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DRIVES and STEERS

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Go Places where ordinary graders cannot go.

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Outperform ordinary graders on every job.

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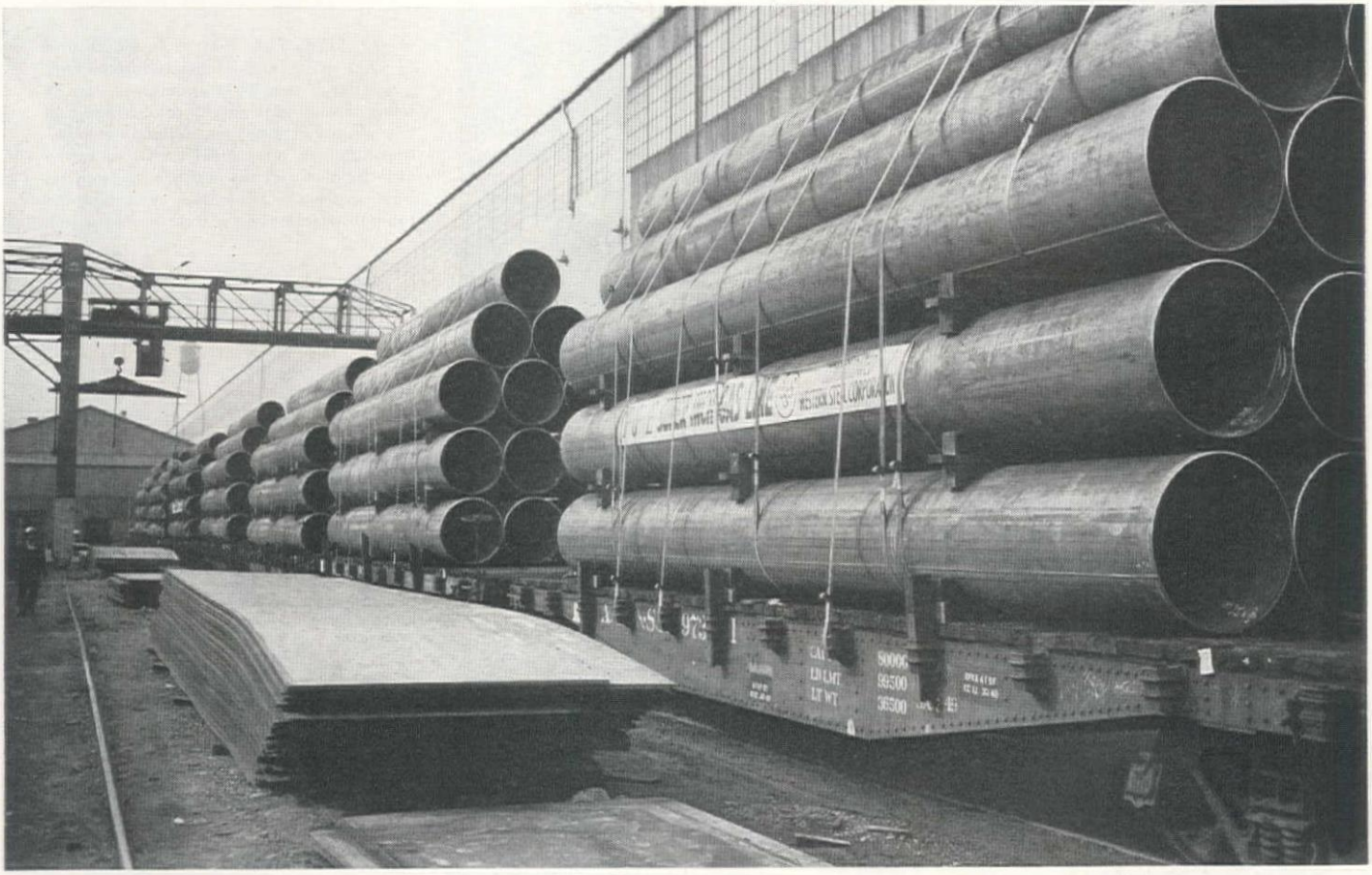
WESTERN CONSTRUCTION NEWS
MAY 15 · 1950



Hydraulic Stretching Reduces Wall Thickness (and Costs) for—

Fabricating Record-Size Gas Pipe

Hydraulic expanding of welded pipe to 34-in. finished diameter increases strength of steel and permits reduction of pipe wall thickness for fabrication of the "Super-Inch" gas line by Consolidated Western Steel Corp.

MOVING ALONG at the rate of 350 per day, steel plates for a record-size gas transmission line are being fabricated into 34-in. pipe at the South San Francisco plant of Consolidated Western Steel Corp., a U. S. Steel subsidiary. When welded into a 32-ft. length of pipe, each section is expanded to the final diameter by hydraulic stretching which results in increasing the strength of the steel. This relatively new process permits a reduction in the thickness of the pipe wall with substantial economies in the cost of a project of large size.

The equipment used in the manufacture of the expanded pipe was built in the Maywood, Calif., plant of the Consolidated Western Steel Corp., and has subsequently been introduced into eastern plants of U. S. Steel Corp. Another feature of the shop operations is the complete system of materials handling which moves the 5,300-lb. sheets of steel down the 1,000-ft. length of the fabricating line with hardly a human shove.

This record size pipe is being made for Pacific Gas and Electric Company's "Super-Inch" gas line, a 1,600-mi. transmission project which will bring natural gas from producing fields in Texas and New Mexico to the San Francisco Bay Area where it will go into the P. G. and E. gas system. The project, a joint undertaking of P. G. and E. and the El Paso Natural Gas Co., will cost more than $150,000,000 and eventually will deliver up to half a billion cubic feet of gas per day.

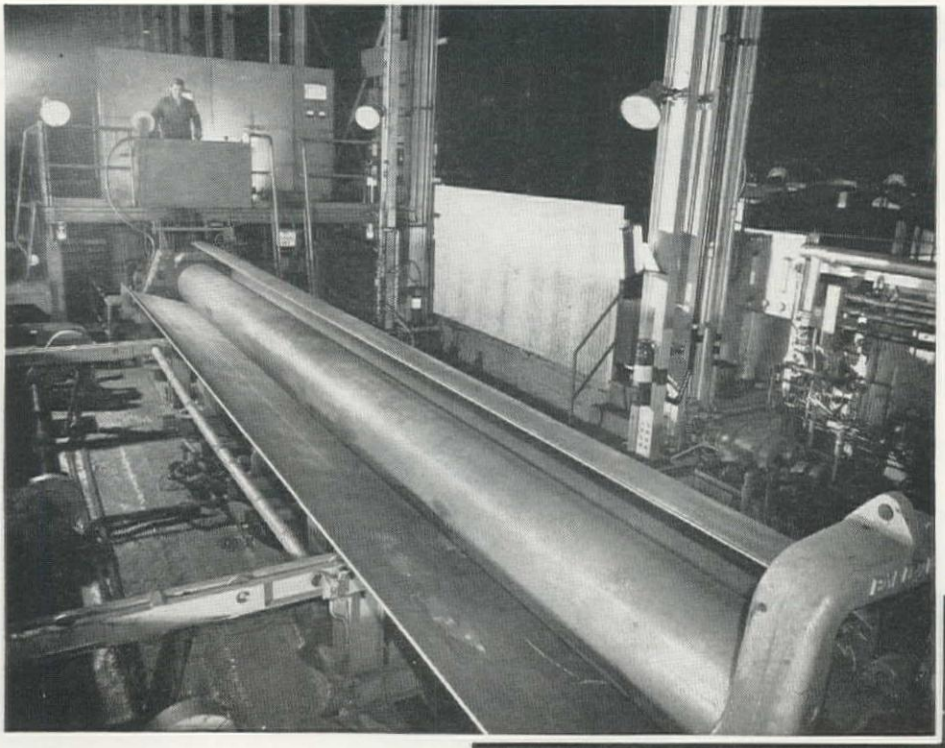
The El Paso company is building the line to the California-Arizona border near Needles where P. G. and E. will take delivery. The P. G. and E. section of line will be 506 mi. long, travelling through the Mojave Desert, across the Tehachapi Mountains, north across the floor of the San Joaquin Valley, over the Coast Range Mountains to Hollister and thence to the key metering station of the company's gas system at Milpitas.

Bechtel-Price-Conyes is constructing the California section of the line. (Field operations of the contractor will be described in a later article.)

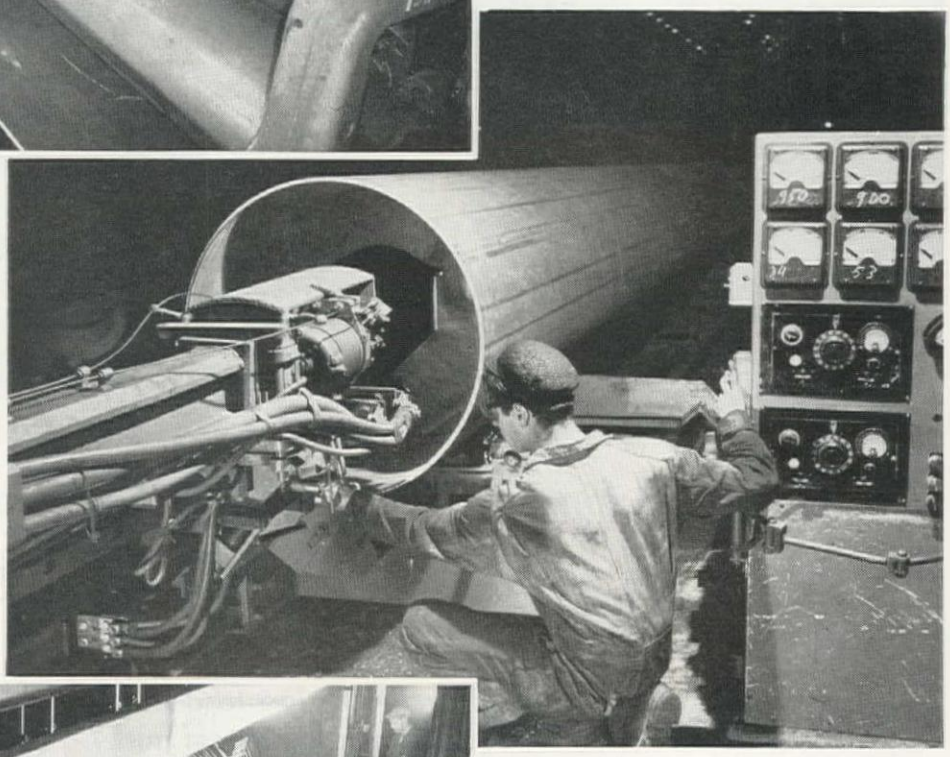
The methods used in fabricating the pipe are outlined in the following:

From sheet to tube

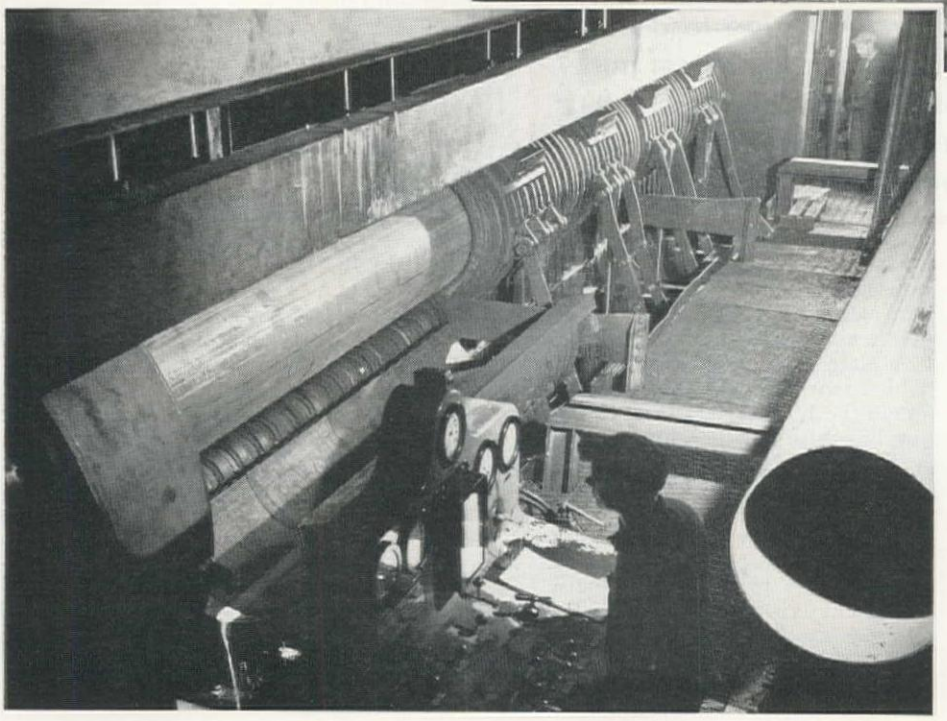
Special high manganese steel plates arrive at the plant by flat-car from another U. S. Steel subsidiary, the Geneva Steel Co., of Geneva, Utah. Incidentally, this makes the project "all Western" from raw materials to the finished line. The plates varying in thickness from 5/16 in. for the lightest sections to ½ in. for the heaviest sections



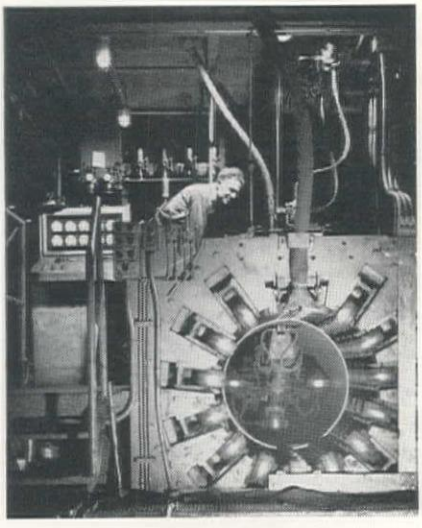
←//// STEEL PLATE 32 ft. in length and of 5/16 to ½-in. thickness is formed into a cylinder of near 34-in. diameter by being rolled through one way and back again in this plate roll machine. Automatic materials-handling equipment then speeds the cylinder along for the next process, which is welding. Chester Walczak is controlling the rolling operation via a push button panel.



INSIDE WELDING of the pipe assures a firm bonding of the two edges of steel plate after it has been formed into a cylinder. After the seam has been welded half-way through from the exterior, the pipe moves on to the inside welding machines. Here, Joseph Brignarello is shown adjusting the cantilever arm carrying a welding head, which allows the pipe seam to pass under the point of welding. The pipe moves by means of a movable car. As in the case of outside welding, the submerged arc process is used for inside welding. ////→



←//// HYDRAULIC EXPANSION flexes the steel a fraction of an inch and permits use of lighter gauge steel. The pipe is shown in the expander machine, where it is placed between a stationary head and a movable head and surrounded by a cylindrical die. The pipe section is filled with water containing a soluble oil, and sufficient hydraulic pressure is applied to stretch the pipe until it makes contact with the die, which restrains it from further stretching. Donald Haynie is shown in the foreground at the control panel.



THE FRONT COVER—

EMERGING from the automatic outside welding machine is a 32-ft. long section of pipe destined for the "Super-Inch" gas line. Steel plate formed into a cylinder is fed continuously into the longitudinal seam welder, in which the abutting edges are properly aligned, firmly pressed together and fed at controlled speed under welding electrodes. Equipment seen inside the pipe is a water-cooled back-up shoe which is supported tightly against the interior seam. This chill bar permits outside welding about half-way down the beveled edges. The entire welding action takes place beneath the flux without visible evidence such as flash or sparks. Weld metal has a chemical composition very similar to that of the plate material. Frank Passarella is in the control pulpit.

are almost 9 ft. wide and 32 ft. long.

From stock piles at the head end of the production line the plates are moved with an electro-magnet to the end shears. This quick operation trues the ends and brings the plate to the exact length. Next the plates are planed to the exact width with right angle edges and a slight bevel on one side which forms a shallow "V" on the outside of the pipe after it is rolled.

In this correct dimensional size, the plates are moved through the edge breaking rolls that puts the first bend in each edge of the plate. This preliminary operation causes about 8 in. of each edge to be formed to the proper curvature, otherwise they would tend to remain flat during the rolling process. Also this step takes the strain off the first action of the plate rolls.

Rolled through one way and back again in the plate roll, the plate comes out a cylinder to near 34-in. diameter, ready for welding. The first weld is on the outside. Sections are fed into the automatic machine from a form which holds the square edges of the cylinder in perfect alignment for the down-weld. The arc is submerged in flux deposited in a continuous stream just ahead of the rod. Penetration of this first weld is about 90% through plate.

Moved along to the inside welders the pipe is rotated half way so that the second pass is also a down-weld. The rotation of the pipe at this point is about the only bit of manual effort required in the entire fabricating process. A cantilever arm carries the welding head inside the length of pipe. The flux is placed and the weld is made as the carriage moves the pipe along under the head. This second weld extends the fusion of the steel through the plate thickness.

Immediately behind each welding head is a unit which breaks off the fused flux along the seam and removes it by vacuum.

As welded, the sections have an external diameter of about 33½ in., as compared to a finished diameter of 34 in. The difference is made up during the next operation that is a special feature of the fabricating process.

Expansion

The pipe is smaller than the finished diameter when entering the "expander" which is provided to cold work the steel by expanding the pipe section to a larger diameter; this produces a higher yield point in the steel as a result of the stretching action. The pipe is rolled into the expander where the ends of the pipe section are closed and a restraining die form closes over the outside of the pipe. Ends of pipe sections are expanded by dies that enlarge or swedge the ends.

The section itself is expanded by hydraulic action, a pressure of about 2,000 p.s.i. being applied to the pipe interior. The pressure causes the elastic limit of the steel to be exceeded, but the restraining die forms prevent the actual rupture or blow up of the pipe. Following this expansion the pressure is reduced to required hydrostatic test pressure, and the die forms lowered away. The pipe can then be inspected, removed from the expander and is then conveyed to the end trimmer. The end trimmer trues both ends and cuts a bevel for the "V"-weld used for the circumferential joints in the field.

Finally, the section is spun with a wire brush moving in and out of the section on a cantilever arm. This removes the loose scale and foreign material from the inside of the pipe. No coating is applied on either the inside or outside.

The pipe is picked up by crane and swung onto flat cars. Twelve lengths form a load. Between 29 and 30 carloads (about 1,000 tons of steel) roll out of the plant each day of three-shift operations. At 165 sections per mile of line, this output represents roughly two miles of pipe. Field operations are geared to this production.

Alden G. Roach is President of Consolidated Western Steel Corp., and T. R. Rooney is Vice President—Production, San Francisco Division. G. D. Williams is General Superintendent of the South San Francisco plant.

Alaska Construction Program Heads For a Peacetime Peak During 1950

CONSTRUCTION contracts totaling about $105,000,000 will be awarded by the Alaska District office of the Corps of Engineers during the 1950 calendar year, representing the largest peacetime program in Alaska's history, according to Colonel O. E. Walsh, North Pacific Division Engineer.

More than twice as large as that for 1949 when 48 separate contracts were awarded aggregating $46,000,000, this year's construction program in Alaska will mark the second year in which competitive bidding has been in effect. The previous method of cost-plus-fixed-fee was replaced at the start of the 1949 construction season after having been used throughout the war and continued in the immediate post-war years.

This year's huge program, consisting entirely of military construction, includes a variety of projects. Ten major contracts are to be awarded for the defense establishment at Fort Richardson near Anchorage, nine at Eielson Air Force Base near Fairbanks, and three at Whittier Army Post near Anchorage. Projects are scheduled at various other locations, all in the interest of national defense.

Among the contracts to be awarded at Fort Richardson are the following: 400 units of row-type family quarters; two 20-man bachelor officers' quarters; barracks for 2,400 enlisted men; ordnance repair shop (80,000 sq. ft.); warehouse, 200 by 600 ft.; enlisted men's service club; water supply dam and pipeline; vehicle warm storage building; utilities systems — sewer, power, and water; central heating and power plant.

At Eielson Air Force Base the following projects will go out for bids: bulk oil storage system; two 20-man bachelor officers' quarters; 100 family quarters, row type; central power and heating plant; telephone exchange; 500-seat theater; refrigeration building, 10,000 sq. ft.; barracks for 750 enlisted men; utilities systems—sewer, power and water.

Proposed construction work at Whittier Army Post includes a central heating and power plant, a composite building providing officers' quarters, enlisted men's barracks, mess, and recreation facilities, and utilities systems.

Among projects planned for other locations are communications facilities and other construction for the Air Force.

In changing from the cost-plus-fixed-fee system to the competitive bidding procedure it was necessary to take certain steps to encourage prospective bidders. The Government, for example, decided to eliminate several of the major capital costs which experience had shown were difficult to estimate. Equipment was made available at the job site and large quantities of materials of the type most in demand were provided to successful bidders from Government stocks. Facilities for feeding and housing workers were provided in camps operated at the principal job sites on a fixed price per man-day basis.

The single most critical item among construction materials—concrete—was

Concluded on page 122

Solving the Day-to-Day Problems of Earth Compaction . . . *in the field*

An important phase of compaction operations on earth dams, embankments and base courses—the solution of everyday problems encountered in the field—is dealt with in this article. It concludes with reports on investigations made of several new types of compacting equipment which show considerable promise.

ROOT MAXWELL

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THE NECESSITY for thorough compaction of earth dams, embankments and base courses is widely recognized and the usual construction compacting methods and control testing procedures are generally known.

Many informative and comprehensive articles have been written on the subject of compaction; however, most of these articles have pertained to laboratory investigations or to field studies conducted in conjunction with prearranged test sections involving accurate control of materials, moisture content and compactive effort.

This article deals with a different, but perhaps equally important, phase of compaction operations — namely, the day-to-day problems which have been encountered on construction projects, and the methods used to solve such problems where neither time nor facilities were available for elaborate, carefully controlled test sections.

Four typical problems

Usually these problems fall in one of the following four categories:

(a) A contractor elects to adopt a compaction procedure other than that specified, and desires approval of the proposed change.

(b) The specified compaction is not being obtained, and it is desired to ascertain the reason for the substandard compaction and to determine the proper corrective measures.

(c) The contractor wishes to use compaction equipment other than the approved types designated in the Standard Specifications, and it is desired to determine the effectiveness of the new equipment.

(d) Miscellaneous studies involving special or unusual compaction requirements or controls.

The material for this article has been derived largely from field reports and illustrates the experience acquired through a number of years, during which time the importance of compacting soils to their optimum density has been stressed persistently. An attempt has been made to select reports of typical studies conducted during the past year by the Materials and Research Department of the California Division of Highways and to present at least one example of each of the above four types of problems.

THE MATERIALS and Research Department of the California Division of Highways, working in close cooperation with the Construction Department, is often called upon to assist in the investigation and solution of compaction problems.

This article describes briefly several recent studies of various phases of compaction attainment and control on construction projects, including—proposed changes in compaction procedures on specific projects; failure to achieve the required compaction on certain projects, and determination of the necessary corrective measures; observation and evaluation of new types of compactors. It is an expanded version of a paper originally presented before the First Pacific Meeting of the American Society for Testing Materials.

The conclusions reached are applicable only to the specific project in question and the data obtained must be correlated with more comprehensive long-time studies now in progress before any general conclusions can be drawn.

The expanded postwar construction programs of various agencies have apparently stimulated the design and production of new compacting equipment. Several new units now in use on California highway projects are discussed, and limited data are presented to indicate their efficiency in comparison with conventional equipment . . . *Authors.*

Layers eliminated for very wet imported borrow . . .

The first compaction problem to be considered involves a proposed change of procedure.

The design of a freeway near Sacramento required the placing of 16 in. of imported borrow over a clay subgrade to serve as the base for Portland cement concrete pavement. The imported material, consisting of clean, cohesionless sand from a nearby borrow pit was being spread by bulldozers and blades to the specified 4-in. thickness loose layers after which it was compacted by wobble-wheel type pneumatic-tired rollers.

The sand as excavated was very wet so that when first spread and rolled it was stable and shaped up well. As the moisture evaporated from the surface, the sand shifted and displaced under the construction haul traffic until the area became simply a mass of loose sand that hampered the operation of equipment. Obviously, it was useless to continue placing and compacting the material in 4-in. layers which could not be maintained under the haul traffic without the continued application of water and possible subsequent damage to the clay subgrade.

To remedy this condition it was proposed to place the full 16-in. thickness in one layer, thereby eliminating the haul traffic required by the 4-in. layer procedure.

To determine the effect of this proposed change of procedure on the relative compaction, a test section 40 ft. wide and 1,200 ft. long was set up with sufficient sand spread to provide the full 16-in. compacted thickness layer. Following a period of rolling with small pneumatic-tired rollers, five compaction tests were performed at various locations in the area. All tests showed relative compaction in excess of the 95% specified for this particular project. Furthermore, the average in-place dry density on the test section was 112 lb./cu. ft. compared with an average of 110 lb./cu. ft. for the material previously placed in 4-in. layers.

As a result of this compaction study, a contract change order was approved

for placing the imported borrow in one 16-in. layer, thereby expediting the construction and improving the quality of the work. It should be pointed out, however, that had the imported borrow material been other than clean sand such a change would not have been necessary or desirable.

"Spotty" results eliminated by use of heavier rollers . . .

On a recent project in Santa Barbara County, difficulty was experienced in obtaining the specified 90% relative compaction in embankments, and at several locations it was necessary to remove and recompact portions of embankments which were not properly compacted. As the contractor contended that due to the character of the soil it was impossible to achieve the specified compaction with conventional equipment, the Materials and Research Department was called on to investigate.

The 5.5-mi. project involved the compaction of 16 embankments ranging from 1 to 17 ft. in height, and one embankment with a maximum height of 28 ft. The embankment material was obtained from a number of cuts, with considerable variation in the character of soil encountered in the different cuts, and within individual cuts. Sands, loams and clays were all present.

At the commencement of the grading work, the compacting equipment consisted of several units of 40-in. diameter drum-size sheepsfoot tampers, which units were later replaced by sheepsfoot tampers of 54- and 60-in. diameter. In addition to these tampers, a wobble-wheel pneumatic-tired roller and a three-wheel roller were in use.

The compaction study on this project included an analysis of some 123 compaction tests performed by the resident engineer's inspectors; observation of compacting operations in progress at two locations; a check on the number of yards placed per unit of compacting equipment, and testing of the compaction being obtained under the observed conditions.

Study of the job records revealed that, almost without exception, where areas of low compaction were removed and recompacted the required 90% relative compaction had been attained. Furthermore, these areas of low compaction were scattered throughout the project and not confined to a specific fill location or type of soil. In several instances the original field moisture was above optimum.

During the course of the field study embankments were under construction at two locations. At one of these locations a volume of 230 cu. yd. per hour of brown sandy clay was being compacted by a sheepsfoot roller and pneumatic-tired wobble-wheel roller. The moisture content was 16% compared with an optimum of 13% and the relative compaction attained was 90%.

At the second location the movement of equipment was restricted by the shape and size of the embankment being constructed. Compacting units consisting of a sheepsfoot roller and a three-wheel roller were obtaining the specified 90% relative compaction on a black sandy loam with a field moisture content of 13% which was also the optimum for this material.

The fact that practically all of the originally low compaction areas were recompacted to meet specification requirements indicated the soil could be satisfactorily compacted with conventional methods and reasonable effort. The low compactions occurred during the time the small lightweight sheepsfoot rollers were being used. Also, as already mentioned, the moisture content of the material was in several instances considerably above optimum. The removal and recompaction of these areas with the heavier rollers provided both aeration to reduce the moisture content and increased compactive effort as compared with the original conditions.

It was concluded that specified compaction could be attained with sufficiently heavy rollers, reasonable effort and proper moisture control; therefore, no changes in specifications or methods of payment to the contractor were warranted. The contractor cooperated in careful control of the compaction operations on the remainder of the project and no further difficulties were experienced.

Explanation of Terms and Testing Methods

TO ASSIST in the evaluation of data presented in the accompanying article, the specification compaction requirements and control testing procedure of the California Division of Highways are described as follows.

California Standard Specifications stipulate that the relative compaction shall be 90% or more, and also designate the minimum amount of compacting equipment and the maximum thickness of layers. The purpose of specifying methods as well as end results is to assure that all soils are compacted to the maximum extent practicable rather than merely meeting the 90% relative compaction requirement, using the specified methods and equipment, many granular materials are readily compacted to 95% or 100% relative compaction.

The term "relative compaction" is defined as the ratio of the density of material in place to that of the same material compacted in accordance with a specified test procedure, both densities being based on dry weights. The sand volume apparatus (Figure 2) designed and adopted as standard equipment by the California Division of Highways in 1941 is used in measuring the volume of the test hole in the determination of in-place density.

For determination of "optimum moisture" and "maximum density" the California Impact Method apparatus and test procedures developed by the Materials and Research Department in 1929 is used in lieu of the Proctor, AASHO or modified AASHO tests used by many agencies. This test procedure is described in "Compaction of Earth Embankments," T. E. Stanton, Proceedings, Highway Research Board, 1938; the test apparatus is illustrated in Figure 1. Densities obtained with the California method are generally higher than those obtained with the AASHO Method T-99-38.

Control testing is carried on continuously by field personnel under supervision of the resident engineer. With the exception of projects within close proximity of the ten District laboratories, each construction project has a field laboratory, usually adjacent to the resident engineer's field office. The completeness of this project laboratory and the number of personnel assigned to the testing operations are determined by the size of the project and volume of testing work.

Figure 1—
Compaction Test Apparatus

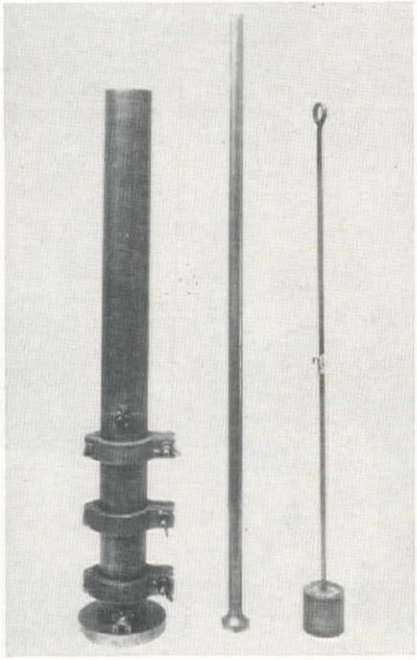
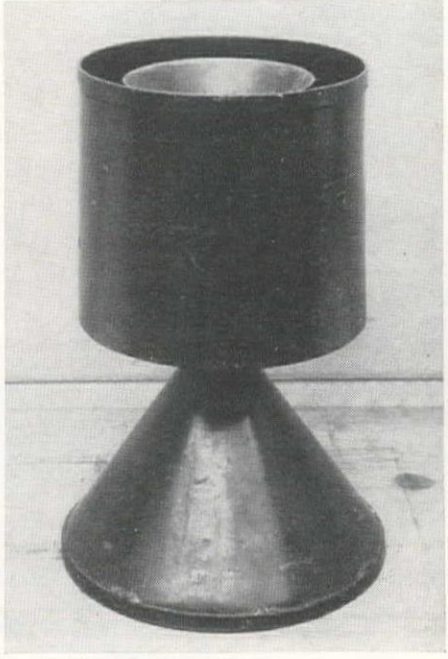


Figure 2—
Sand Volume Apparatus



A few passes more or less can make a difference . . .

In some instances in localities where water is costly and it is believed the natural moisture content of the soil material will permit satisfactory embankment compaction without additional water, a watering item is not included in the contract.

A project of this nature involving construction of embankments up to 75 ft. in height was constucted last year, in Southern California. The major portion of the material encountered in roadway excavation was of a granular nature, mostly decomposed granite, with a natural moisture content range of 6 to 15%. The usual 90% relative compaction was required and no special compaction procedure was stipulated other than the maximum loose spread layer thickness should be 4 in. instead of the 8 in. commonly specified for embankment construction.

During the early stages of the grading, difficulty was encountered in attaining the specified compaction, and it was the belief of the contractor that the lack of water was in many instances responsible for the failure to meet specification requirements. Both sheepsfoot and pneumatic-tired rollers were in use.

An analysis of the results of 54 routine control tests showed the relative compaction ranged from a low of 82% to a high of 96% and that there was apparently no correlation between moisture contents and attained degree of compaction. Furthermore, in 85% of the reported tests the natural moisture content of the material was within 3%± of the control test optimum moisture. Tests indicated the material was not extremely critical to water content; therefore, it was concluded that insufficient and nonuniform compactive effort was probably the principal reason for the unsatisfactory compaction.

To verify this conclusion a test section was constructed in conjunction with the routine grading operations in progress on a large embankment. Decomposed granite roadway excavation material with a moisture content of approximately 8% as compared to the optimum moisture content of 11% was placed in 4-in. loose spread layers and compacted by a single-axle two-wheeled pneumatic-tired compactor with approximately 50,000 lb. total load on the axle and a tire inflation pressure of 90 p.s.i. Tire tracks indicated the compactor covered a total linear width of approximately 3 ft. per pass; therefore, it was considered that 15 passes per layer over the test lane width of 22 ft. would be equivalent to 2 passes over any given spot. Accordingly, each layer was subjected to 15 passes of the compactor. Relative compactions of 92% and 93% resulting from this procedure indicated that even with a moisture content 3% below optimum the specified compaction could be obtained with pneumatic-tired rolling. It is interesting to note that, following the above outlined field study, no further difficulty was encountered on this project and satisfactory compaction was consistently obtained.

Tuff in cement-treated base complicates compaction . . .

A laboratory study was requested on another project where the specified relative compaction was not being attained —a recent contract for the construction of a four-lane divided highway in Solano County. On this project the cement-treated subgrade consisted of volcanic tuff to which was added and mixed on the roadbed 2.5% to 4.1% by weight, of Portland cement.

The special provisions of the contract stipulated that the cement-treated material be compacted to a density of not less than 95% of that determined as the maximum compaction for the material when tested in accordance with laboratory methods; the laboratory method for compaction of cement-treated soil is a 2,000-p.s.i. static compression procedure and not the impact method used for compaction control of untreated soils. Fourteen compaction tests performed by field personnel showed that in every instance the relative compaction was less than the required 95%.

To ascertain the degree of compaction attainable on this job with varying amounts of compactive effort, a test section was laid out for compaction with controlled rolling; in other respects the construction of the test section was identical with the routine procedure being used throughout the project. After completion of the processing and spreading operation, three portions of the test section were compacted by 15, 25 and 35 passes respectively, of the 12-ton, 3-wheel roller used for compaction of the cement-treated subgrade on the project. Following is a tabulation of these test data:

Roller Passes	In Place % Moist.	In Place Density	*% Relative Compaction
15	27	72	84
25	29	72	84
35	36	65	76

*Relative Compaction based on 86 lb./cu. ft. density attained in 2,000 p.s.i. static test at optimum moisture content of 19%.

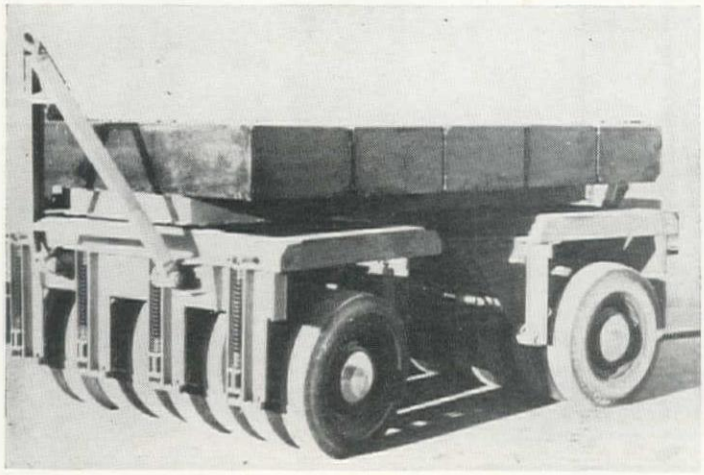
The moisture content of the imported borrow material as delivered on the road was above optimum; previous compaction tests indicated, however, that even at optimum moisture this material could not be compacted to the specified density with the equipment in use, and air drying of the material on the grade would have necessitated delaying the construction until weather was warmer and fog was less prevalent.

It was concluded from the results of this study that compaction of this particular type of material to the usual density specified for cement-treated soils was not practicable. The purpose of the cement treatment of subgrade under Portland cement concrete pavement is to prevent erosion and pumping; the tuff used on this project has good stability, and by increasing the cement content the desired hardness and resistance to erosion can be obtained at densities obtainable with construction equipment.

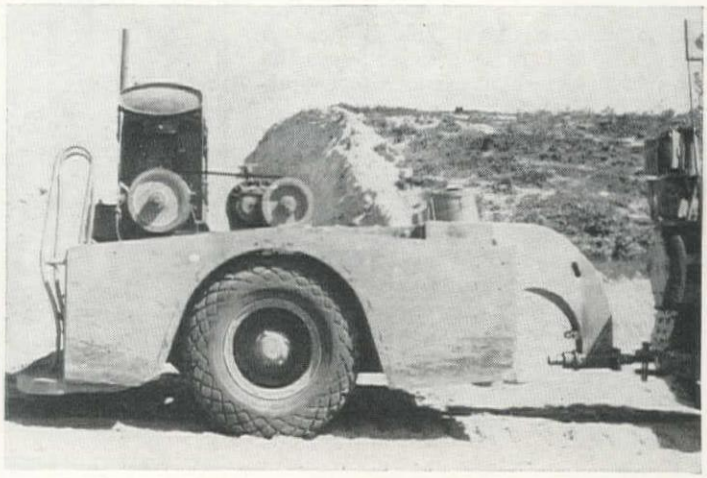
More passes on tuff base fails to help compaction . . .

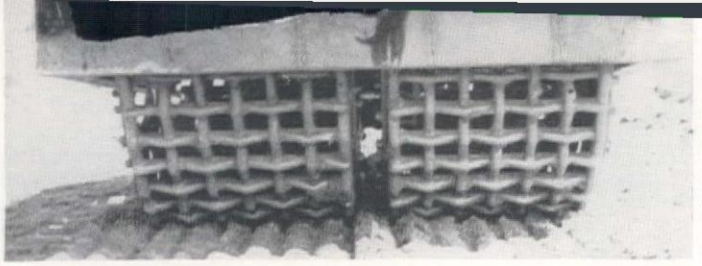
Volcanic tuff has been used in several instances in the past, but would not be classified as a commonly used material in California. Therefore, it is somewhat coincidental that at the same time the compaction difficulty was being encountered on the above discussed project, similar difficulty was reported from

Unit "A"

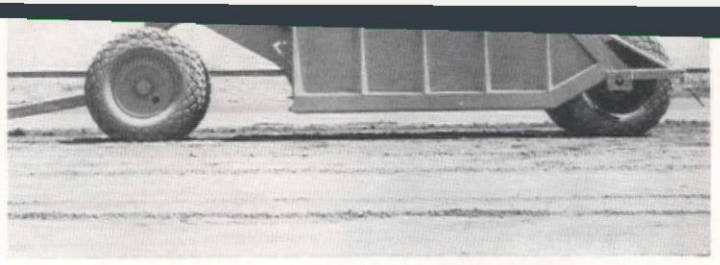


Unit "B"





Unit "C"



Unit "D"

another project using tuff for cement-treated subgrade. With the exception of minor differences in construction procedure and physical characteristics of the tuff material, conditions were identical on the two projects.

Here again, test sections were compacted by 15, 25 and 35 passes of a 12-ton, 3-wheel roller. It is interesting to note the similarity of the per cent relative compaction attained on the two projects with the different amounts of compactive effort, as evidenced by the following combined tabulation of test results of both projects.

Roller Passes	% Relative Compaction Project "A"	Project "B"
15	84	84
	85	84
25	84	84
	84	85
35	76	79
	77	81

Also, on both projects the 25 roller passes failed to increase the compaction above that attained by 15 passes and 35 roller passes resulted in a lower density. It should be noted the number of passes in all instances refers to passes distributed over a 12-ft. wide lane and not over a specific spot within the lane.

These instances, in which the specified degree of compaction was not obtained, are definitely the exception and not the rule. Experience has proved that 90% relative compaction, based on the California Impact Method Test, is attainable with reasonable compactive effort and moisture control.

New Types of Compaction Equipment — What Are Their Advantages?

THE MATERIALS and Research Department, in collaboration with the Construction Department, has investigated several new types of compacting equipment, some of which show considerable promise.

During the past year several compacting rollers new to California have made their appearance on construction projects. On each of these, limited observations and tests have been performed in an attempt to determine their effectiveness. In all instances data available at this time are too meager to permit conclusions of general validity; therefore, in the following discussion, the various units will be identified by code letter rather than by manufacturer's trade name. All the following described units are of the towed type and not self-propelled.

Pneumatic type with working wheels fore and aft . . .

Unit "A" (see illustration) is a pneumatic-tired roller consisting of a front group of 8 wheels and a rear group of 9 wheels with the wheels mounted in pairs on short axles in a suspension that permitted the wheels to follow surface irregularities and still exert their compactive effort. The gross weight of roller and ballast at the time of the test was 15,000 lb., carried on a total of 91 linear inches of tire width for a weight per linear inch of 165 lb. Tire size was 6.50 x 16 and inflation pressure 40 p.s.i. A cable control mechanism employed on this roller turns the rear group of wheels simultaneously with the front wheel group.

For purposes of comparison this roller was operated alongside a conventional 3-wheel, 12-ton roller in the compaction of a crushed rock and sand material being placed in 4-in. loose spread layers. The pneumatic roller attained 99% relative compaction as compared to 104% for the 3-wheeled type.

Pneumatic type with dual wheels on single axle . . .

Unit "B" (see illustration) is a 4-wheel pneumatic-tired roller with the wheels mounted dual on either end of a single axle. The gross weight of 30,000 lb. was carried on a total linear tire width of 48 in., for a weight per linear inch of 625 lb. Tire size was 12.00 x 20 and inflation pressure 90 p.s.i. A unique feature of this compactor is a mechanism incorporated into the unit which transmits through the wheels vibration of sufficient intensity to vibrate a considerable volume of the embankment being constructed. This roller was used for compacting a decomposed granite material on a project in Southern California and attained relative compactions of 90% to 96%. A series of tests were performed for purposes of comparison of this unit with Unit "C."

Drum type with heavy steel mesh forming the drum . . .

Unit "C" (see illustration) is a drum-type roller somewhat similar in design to the conventional sheepsfoot roller except that the drum consists of solid end plates of ⅞-in. thickness steel plate and a cylindrical shell formed by a square mesh gridwork of 1½-in. diameter steel bars with 3½-in. square openings between adjacent bars. There are, of course, no tamping studs affixed to the drum as in the case of a sheepsfoot roller.

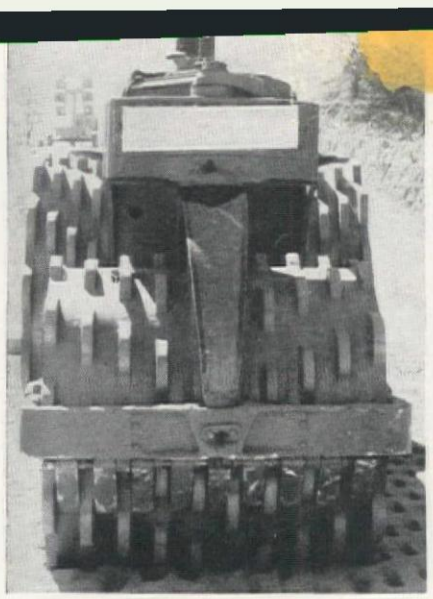
As used on the test section, the total weight of this roller plus ballast was computed to be approximately 22,000 lb.; since the total effective rolling width of the unit was considered to be 69 in., the weight per linear inch of width was about 319 lb. This unit, used on the same project as Roller "B," attained a slightly higher degree of compaction in routine operations than roller "B."

In conjunction with routine grading operations on the project, test lanes were constructed with 5-in. loose spread layers of decomposed granite compacted by 4 passes per layer with the vibrating, pneumatic-tired roller "B" and 4 and 8 passes of the square mesh roller "C." The pneumatic-tired unit with 4 passes produced approximately the same degree of compaction as did the steel mesh unit with 8 passes, both of which were satisfactory.

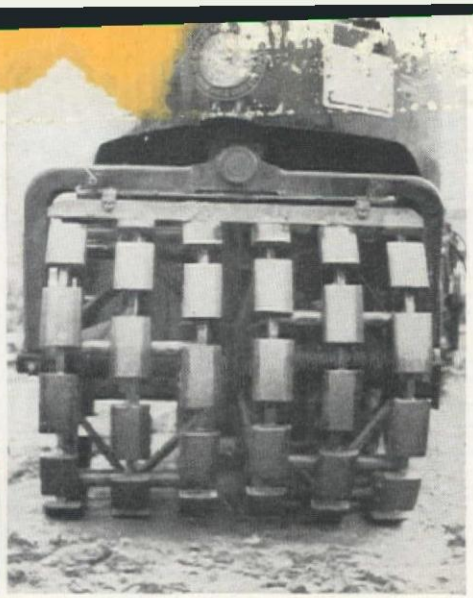
Pneumatic type with plenty of ballast space . . .

Unit "D" (see illustration) was a 100-ton capacity pneumatic-tired unit similar in construction to an earthmoving scraper with two wheels in front, three in the rear and a body between for loading with ballast. Arrangement of the wheels provided an effective rolling width of 9 ft. As loaded at the time of observation, the gross weight was approximately 50 tons and the inflation pressure of the 24.00 x 32 tires was 45 p.s.i.

In order to compare this unit with a 60-in. diameter drum size sheepsfoot roller having an approximate weight of 300 p.s.i. on the tamping feet, test sec-



Unit "E"



Unit "F"

tions were constructed with 6-in. layers of a silty sand material and compacted by 5, 10 and 15 passes respectively with each roller. Relative compaction attained on each section is shown in the following tabulation:

Roller Passes	Unit D (Pneumatic)	% Relative Compaction Sheepsfoot Roller
5	89	87
10	97	92
15	97	90

During the rolling operations the soil behaved like sand with the sheepsfoot failing to "walk-out" even after 15 passes so it was not surprising that the pneumatic roller surpassed the sheepsfoot tamper under these conditions.

Three-wheel type with scalloped ribs on rolls . . .

Unit "E" (see illustration) is essentially a 16-ton, 3-wheel roller equipped with a new type of wheels in lieu of the conventional smooth wheels or rolls. This compactor can be converted to a conventional type roller by the installation of standard smooth wheels available from the manufacturer for this purpose.

As may be noted in the illustration, on each of the new design rear wheels there is a series of five scalloped ribs at the outer circumference of the wheel. There are twelve 4-in. high scallops on each rib staggered from one row to the next in such a manner that there is a high point approximately every 3¾ in. These rear scallops are 2-in. wide, approximately 13 in. long at the base and spaced 2½ in. apart inside edge to inside edge, i.e., 4½ in. apart, center to center. The transverse slope of the rows of scallops on one wheel is opposite to the slope on the other wheel.

The arrangement of scallops on the front wheel, or guide roll, is similar to that of the rear wheels except that the scallops are 2 in. high and approximately 8 in. long as compared to 4 in. high and 13 in. long for the rear wheel scallops.

The total weight on the rear wheels is 22,940 lb., or 11,470 lb. per wheel. The unit weight per lineal or square inch will vary considerably depending upon the number and area of scallops in contact with the ground and their depths of penetration. The manufacturer's estimate of 5,700 lb./lin. in. and 1,400 lb./sq. in. may be applicable under specific conditions. Regardless of the exact unit weights, this compactor with a gross weight of 16 tons is considerably heavier than the conventional 3-wheel rollers currently in use on highway construction.

In operation on a decomposed granite, granular type material, the new type wheels appeared to compact the material with a minimum of lateral displacement and total absence of the ripping and plowing effect of a sheepsfoot type roller. The surface left by these wheels was relatively smooth and showed the distinct indentations made by the scallops in contrast to the churned mass appearance of the top several inches that usually is present following sheepsfoot rolling of this type material.

A test section to determine the efficiency of this compactor was set up in conjunction with routine grading operations. The roadway excavation material being processed consisted of decomposed granite with a natural moisture content of 5%-7% as compared to a test optimum moisture content of 9%. Water was not available to adjust the moisture content, therefore the material was compacted at below optimum moisture content.

The relative compaction attained by the compactor following 2 and 4 coverages respectively per 7-8-in. loose spread layer of material was:

87%-88% following 2 coverages per layer.

92%-93% following 4 coverages per layer.

[redacted] consider[redacted] three individual par[redacted] unit with no overlap c[redacted] ls. In the case of sheepsfoot type rollers, one pass constitutes one coverage.

On previous test sections employing similar material Unit "C" roller attained 87% R. C. with 4 passes and 93% R. C. with 8 passes over 4-in. loose spread layers. A conventional type sheepsfoot roller of the 60-in. diameter drum size attained 88% R. C. with 8 passes per 8-in. loose spread layer.

In comparison, the 92%-93% R. C. attained with Unit "E" compactor with 4 coverages of 7-8-in. loose spread layers indicated this unit more efficient, in the compacting of this particular material, than either Unit "C" or the conventional sheepsfoot type roller.

As stated, Unit "E" is essentially a 3-wheel roller with the only major departure from conventional design being the scallop-equipped wheels; therefore, it is felt that to determine the effectiveness of this new design and properly evaluate this compactor, it should be tested in direct comparison to a conventional 3-wheel roller ballasted sufficiently to approach the weight of this new compactor.

Tandem type with segmented roll in the front . . .

Unit "F" (see illustration) is a conventional tandem roller with the segmented front roll substituted for the usual smooth front, or guide, roll.

Tests have not as yet been conducted to determine the effectiveness of this roll. Weight computations indicate that even with the reduced contact area of the segmented roll as compared to a conventional roll, it is doubtful the compression per linear inch of width will equal that of the rear roll of the tandem roller or that of the rear wheels of a conventional 3-wheel roller of the 12-ton size; however, the segmented design may prove superior to other types for certain compacting applications. In the absence of factual data the effectiveness of this roller cannot be evaluated.

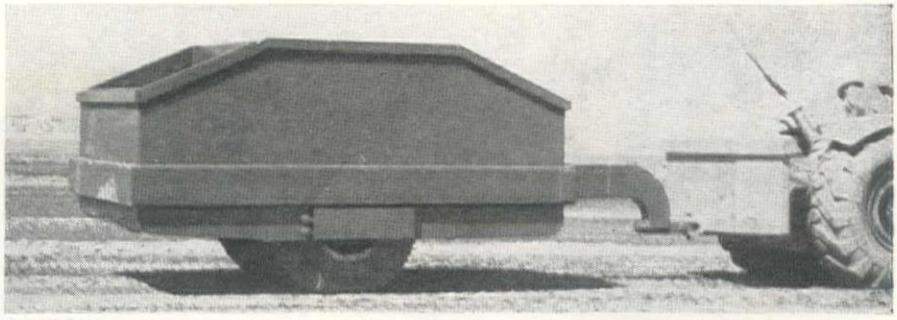
Pneumatic type with gross weight up to 80,000 lb. . . .

Unit "G" (see illustration) is a 40-ton pneumatic-tired roller recently fabricated in a California manufacturing plant and scheduled for demonstration on several highway projects in the near future.

This compactor is reported to incorporate wheel loads, contact pressures and maneuverability not heretofore available in rollers suitable for highway construction operations. Briefly, Unit "G" consists of a ballast box approximately 8 ft. wide and 13 ft. long plus a 6-ft. tongue to total 19 ft. overall length. Gross weight can be varied from 22,000 to 80,000 lb. Four 14 x 24-in., 20-ply tires

with an operating inflation pressure of 100 p.s.i., are mounted in an oscillating suspension that permits a 4½-in. vertical differential between adjacent tires.

Factual test data are not as yet available; mention of this unit being included only as an additional item of interest.



Unit "G"

Pneumatic tamper for sewer trench backfill . . .

On a project in the City of Los Angeles, the contractor desired to investigate the possibilities of a new type of equipment for compaction of sewer trench backfill.

The tamper proposed for use was a pneumatic device similar to the machine used for breaking pavement, but equipped with a 14 x 24-in. flat-face tamping foot in lieu of the concrete breaking tools. It was the opinion of the manufacturer that this tamper could satisfactorily compact deep trench backfills in one layer directly from the ground surface level, thereby eliminating the necessity for compacting a number of thin layers.

Trenches 2.5 ft. wide and 12 ft. deep excavated for installation of sewer pipe were to be backfilled with imported sandstone material in the lower 5 ft., followed by native soil, consisting of clayey silt and sand, in the remaining 7 ft. The specifications required that all backfill be compacted to not less than 90% relative compaction based on the standard impact method test.

The bottom 2.5 ft. of sandstone was compacted by flooding. The remaining 2.5 ft. of sandstone and the 7 ft. of native soil were pushed into the trench by a blade and left in a loose condition for compaction by the tamper.

Sixty lineal feet of backfill was compacted in a period of 33 min. by tamping the surface. The design of the tamper limited the depth of tamping foot action to approximately 12 in. below the original ground surface; therefore, as the backfill was compacted, it was necessary to blade in additional material to return the level of the backfill to within reach of the tamper.

The tabulation (bottom of this page) of results of compaction tests at several depths below ground surface indicates that satisfactory compaction had been obtained only in the top 2 ft. of the backfill and that the tamper did not produce the specified relative compaction in lower portions of the backfill.

No determination was made of the effectiveness of this tamper in compacting areas other than trench backfill. Because the machine in use on this project was so constructed that the tamper foot would reach only about one foot below the surface of the ground on which the truck was supported, the full depth of trench backfill had to be compacted in one lift. Accordingly, no tests were made to determine the thickness of lift which could be satisfactorily compacted by this tamper.

This study indicated that for the depth of trench and type of soil prevailing on this project the tamping machine in question did not obtain the required degree of compaction. Further tests would be necessary to determine its effectiveness under other conditions.*

It was the intent of this article to portray some of the practical aspects of compaction work, particularly its application to highway construction, rather than to present any new developments in theory or testing procedure. The large number of improved compactors, both new designs and heavier versions of conventional types, which have become available commercially during the postwar period, are evidence that encouraging progress is being made toward the attainment of the high soil densities which theory and laboratory tests have proved desirable. The fact that any one type of compaction equipment is not likely to be equally effective for all types of soil presents another difficulty, especially on California highway construction, where a number of radically different soil types are frequently encountered on one project.

Recognizing the superiority of heavier compacting equipment, California in 1945 increased the minimum weight requirements for tamping rollers to 250 p.s.i. on the tamping feet. The 40-in. diameter drum sheepsfoot tampers, which have been generally used in the past, are rapidly being replaced by heavier models; contractors and equipment men are evincing increasing interest in pneumatic-tired rollers, both the conventional type and some extremely heavy new units. Several compactors of new and radically different design have recently appeared on the market and advance information from manufacturers representatives indicates that additional new models are on the way.

The increased efficiency of improved compacting equipment should effect more thorough compaction without increase in construction costs, and may ultimately result in revisions of present standards of compaction. Mutual cooperation of engineers, contractors and equipment companies is essential for continued progress along this line; diligence and sound judgment on the part of the resident engineers and inspectors will continue to be important ingredients in the process of accomplishing thorough compaction.

*It has been reported that this tamping machine has been redesigned to increase the tamper foot reach below the ground surface permitting layer construction of deep trench backfills and increasing the effectiveness of the tamper . . . Ed.

Results of Test on Pneumatic Tamper for Trench Backfill

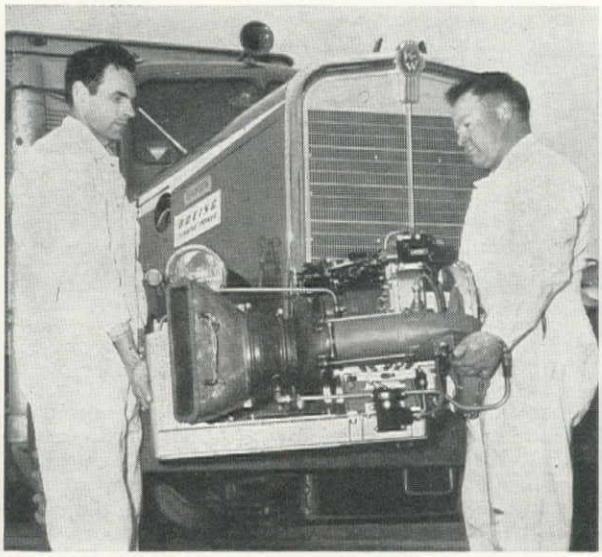
Depth	Material	In Place % Moist.	In Place Dry Lb./cu. ft.	Impact Test % Moist.	Impact Test Dry Lb./cu. ft.	% Relative Compaction
0′—2′	Native clayey silt and sand	12.1	118.6	12.6	121.4	98
2′—4′	"	12.6	106.4	13.0	121.4	88
4′—6′	"	12.0	83.6	12.3	122.0	68
6′—7′	"	11.4	82.0	12.8	120.4	68
7′—8′	Imported sandstone	8.6	84.8	13.4	117.6	72

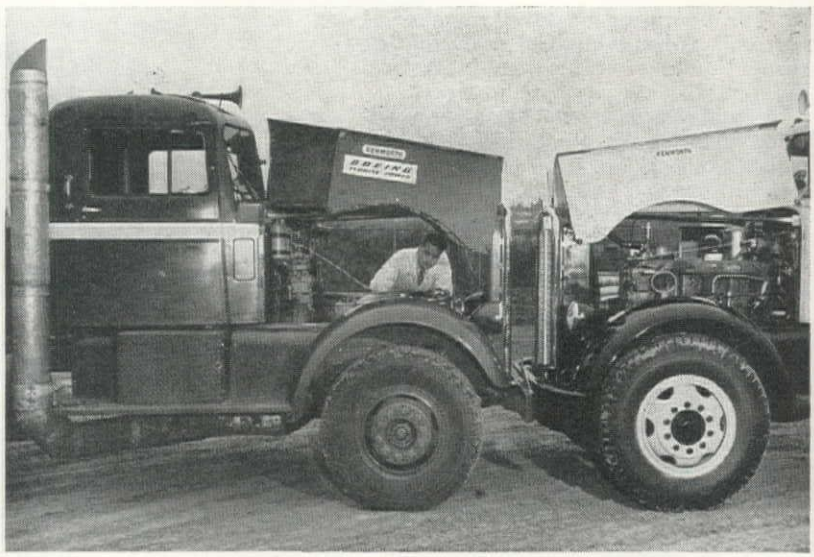
California Contractors' License Fee Is $2 More

THE CALIFORNIA State Contractor's License renewal fee for the Fiscal Year 1950-51 will be $7 instead of the customary $5 fee which has been in effect for a number of years. The increase was made necessary by a greatly increased workload, due to the steady influx in the number of licensees. Even so, the California license board is reported to be operating at a loss.

Renewal application forms were mailed to all licensees at their addresses as recorded between the 1st and 15th of May. Each renewal application contains complete instructions which should be read carefully by the licensee. These applications should be returned immediately to insure renewal of license. All licenses expire on June 30.

A COMPOSITE office of the Corps of Engineers is being established at Salt Lake City, Utah, to supplant district offices. At present, both the San Francisco and Sacramento Districts operate in Utah. The action is being taken because of the pending awards of contracts for the new Veterans' Administration hospital at Salt Lake City and the prospect of additional work in the area. Until March, all work in the Utah area was handled by the California districts—the San Francisco district handling military work, and the Sacramento district handling civil projects.





THE 200-LB. ENGINE can be lifted by two men, left. Comparative size of the 175-hp. gas turbine motor and a diesel power plant of similar rating is shown in the view at right. The two Kenworth trucks are identical, but the jet engine takes up 13% the space consumed by conventional engine.

First Gas Turbine-Powered Trucks Road Tested at Seattle by Boeing

SUCCESSFUL preliminary road tests of the world's first gas turbine-powered truck, using the Boeing 175-hp. lightweight turbine, have been completed by Boeing Airplane Co., Seattle, Wash. The development was predicted by *Western Construction News* three months ago (see "Jet Power for Heavy Construction," February 1950, page 87).

Trial runs of the new 200-lb. power plant in the chassis of a Kenworth truck have been conducted at Seattle during March and April, and tests will continue through the next few months. The tests will include regular freight-hauling over the high mountain passes east of Seattle and highway-endurance runs to gather additional data on fuel consumption, operating details and maintenance features.

Actually, the gas turbine is under development by Boeing for the U. S. Navy Bureau of Ships. But Boeing has stated that the unit should prove adaptable for a wide range of duties including land and water vehicles, small aircraft, and for such stationary power uses as electric generating sets, pumps and compressors. The truck installation is the first service test for the unusual engine under actual operating conditions. The Boeing gas turbine is similar to the jet airplane engine in its general design (see previous article) but the tremendous power developed is harnessed effectively by a secondary turbine to turn a shaft rather than being exhausted as jet thrust.

Non-conventional aspects

The new turbine-powered truck (see above) is considerably quieter than a conventional Diesel truck of equal power. Exhaust gases are approximately the same temperature as those from a Diesel or gasoline truck. At idling power, for instance, it is possible to place a hand over the end of the exhaust pipe without danger of being burned. The exhaust gases are almost invisible and without offensive odor.

The turbine runs equally well on gasoline, kerosene, light or heavy fuel oil, and has been test run on "bottled" gas. Features of interest to truck and car operators include the elimination of a cooling system, the elimination of much gear shifting, the ability to start and immediately develop full power without the "warm-up" period common to piston-type engines, and the impossibility of "stalling" the engine.

Although externally the experimental truck differs little in appearance from any other truck, Boeing engineers emphasize that production installations could lend themselves to important changes in basic design, i.e., simplification of cab-over-engine design. Because of the turbine's compact size, it occupies only 13% of the space normally taken by the conventional 200-hp. gasoline or Diesel engine.

Controls

Controls for the gas turbine truck differ but little from those of the conventional vehicle. Starting is accomplished by a standard automotive starter button, which brings the turbine to idling speed. Upon reaching this speed, the fuel valve is turned on and the engine operates on its own. Inasmuch as there is no direct connection between engine and drive shaft, the truck has in effect "gas drive" transmission, similar to the now familiar "fluid" drive on many cars, except that the fluid is gas instead of oil. A pedal is used for shifting from one gear to another, or for reversing. Speed is controlled with the usual foot throttle.

The engine installation includes a system of power braking which promises to be of much importance to truck operators in utilizing the power of the engine itself for braking to a much greater degree than is possible with conventional piston-type engines.

New Regions of GSA to Consolidate Operations

PLANS to establish regional offices of the General Services Administration in 10 cities have been announced by Jess Larson, Administrator of General Services. Five of the offices will be in the West—in Kansas City, Dallas, Denver, San Francisco and Seattle. In each region, the operating services of GSA will be consolidated and placed under the administration of a regional director. He will be responsible in each case for the administration of all GSA programs being carried on in his region for the benefit of other federal agencies and the public.

With GSA activities consolidated in this manner, Larson says that suppliers, manufacturers, contractors and others will be able to do business with GSA, or get all information necessary to do business, at the regional offices. Technical and other assistance for bidding on government contracts will be available at the office. This should be of particular advantage to small businessmen who need such help to make it possible for them to participate in government transactions, according to Larson.

The regions will begin functioning as soon as regional directors are selected and the orders establishing regional authorities can be drafted, according to Larson.

Geographical distribution of the Western regions is as follows: Seattle, Wash.—Washington, Oregon, Idaho, Montana and Alaska; San Francisco—California, Arizona, Nevada and Hawaii; Denver — Colorado, Wyoming, Utah and New Mexico; Dallas—Texas, Louisiana, Arkansas and Oklahoma; and Kansas City — Missouri, Kansas, Iowa, Nebraska, North and South Dakota and Minnesota.

Run-off Forecasts—
1950 Water Supply in Western States

Snow surveys indicate . . .

—Flood possibility in Northwestern States

—Drought conditions spreading in Southwest

—Liberal water supply in the Mountain States

—Generally, run-off following 1949 patterns

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WATER SUPPLIES of the Western states promise to follow closely the pattern of 1949. Analyses of results of the West-wide April snow surveys, announced by the Soil Conservation Service* read much like those which were announced a year ago.

As in several years past, *Western Construction News* recites below the state-by-state water outlook as it appeared on April 1. This forecast is subject to change, and April storms in several sections—notably the Cascades and Sierra—may result in run-off substantially greater than the first-of-the-month measurements could justify. However, April forecasts have developed the habit of reasonable accuracy, and the snow-surveyors do not expect the overall results of the snow-melt to vary greatly from the April prophesies.

Flood and drought patterns

Again there are possibilities of floods in the Northwestern states, while the drought in the Southwest, only slightly abated by the rains of last summer, continues. A slight shortage of snow in places was reported in Columbia Basin in January, when only on the Flathead watershed of Montana and the Willamette of Oregon did the snow cover appear unusually high. Now, however, conditions in the Kootenai and Flathead drainages are such that if cold weather and normal precipitation occur during the next several weeks, damaging high water along the main Columbia River will occur. If normal melting conditions prevail throughout the basin, the southern streams will peak before the northern ones reach a high stage. Therefore, under normal melting conditions, little high-water damage should occur down the lower Columbia. However, should the present heavy snow-pack melt uniformly over the basin, causing the rivers throughout the basin to peak simultaneously, damaging high water should be expected along the main stem.

Drought spreading

The extreme dryness of recent years in Arizona has now extended to New Mexico and southern Nevada, and unless benefited by an abrupt change of late-winter precipitation habits, those areas will be hard-pressed for water, especially toward the end of the irrigation season. Utah and western Colorado have much better prospects, and the slopes east of the Rocky Mountains have good reason to expect a liberal supply of water.

In the following paragraphs the prospects are described, state by state, as they were viewed on April 1. The two charts illustrate the situation graphically.

SNOW SURVEYORS weighing a snow core to determine the water content. From this information, gathered at 1,000 snow courses, predictions are made of summer water supplies in the West.

*The Division of Irrigation and Water Conservation is the Federal coordinating agency of snow surveys conducted by its staff and many cooperators, including the Bureau of Reclamation, Forest Service, National Park Service, Geological Survey, various departments of the several Western States, irrigation districts, power companies, and others. The California State Division of Water Resources conducts and coordinates snow surveys in that state, while the British Columbia Department of Lands and Forests, Water Rights Branch, has charge of the snow surveys in that province.

Arizona

Snowfall in Arizona has been far below normal. Verde and Salt River drainage areas had only about one-third normal snow cover, and Gila River area one-fifth of normal. As of April 1, there is practically no snow remaining on the watersheds of the state. Because of these poor snow conditions, the stream flow into the principal reservoirs has been disappointing. The Verde peaked at about 2,500 cu. ft. per sec., but only for a couple of days. The Salt never did peak, but has constantly run between 400 and 700 cu. ft. per sec. for about two months. The Gila River flow has been so low that water users have been constantly drawing on the San Carlos Reservoir storage.

As of April 1, the reservoir storage in the state is at 20% of capacity. It would be far below this amount had there not been a good run-off in 1949.

California

Sierra snow-pack on the first of April indicates that deficient stream run-off will occur in the San Joaquin River Basin from the Merced River south for the fifth consecutive year. The pack on the Tuolumne, Stanislaus, and Mokelumne watersheds is about normal. Watersheds of the Sacramento indicate conditions are also favorable and snow-melt run-off should be close to normal. In Sacramento-San Joaquin River basins there should be enough water to fill all reservoirs except Shasta and Millerton, with water spilling at peaks of the snow-melt run-off. Lake Tahoe is expected to reach 6,226.65-ft. level. (Prospects as of April 1 were somewhat improved by storms early in the month which precipitated rain in the valleys and snow in the mountains, in substantial amounts.)

Colorado

Snow cover in Colorado is near normal in most sections. Fall precipitation in the mountains was deficient, and the soil under the snow is dry. Summer run-off is expected to be slightly less than the current snow cover would indicate. On the Sangre de Cristo Range, between the Rio Grande and Arkansas watersheds, the snow cover is very low. The snow-melt season flow of these streams will reflect this condition.

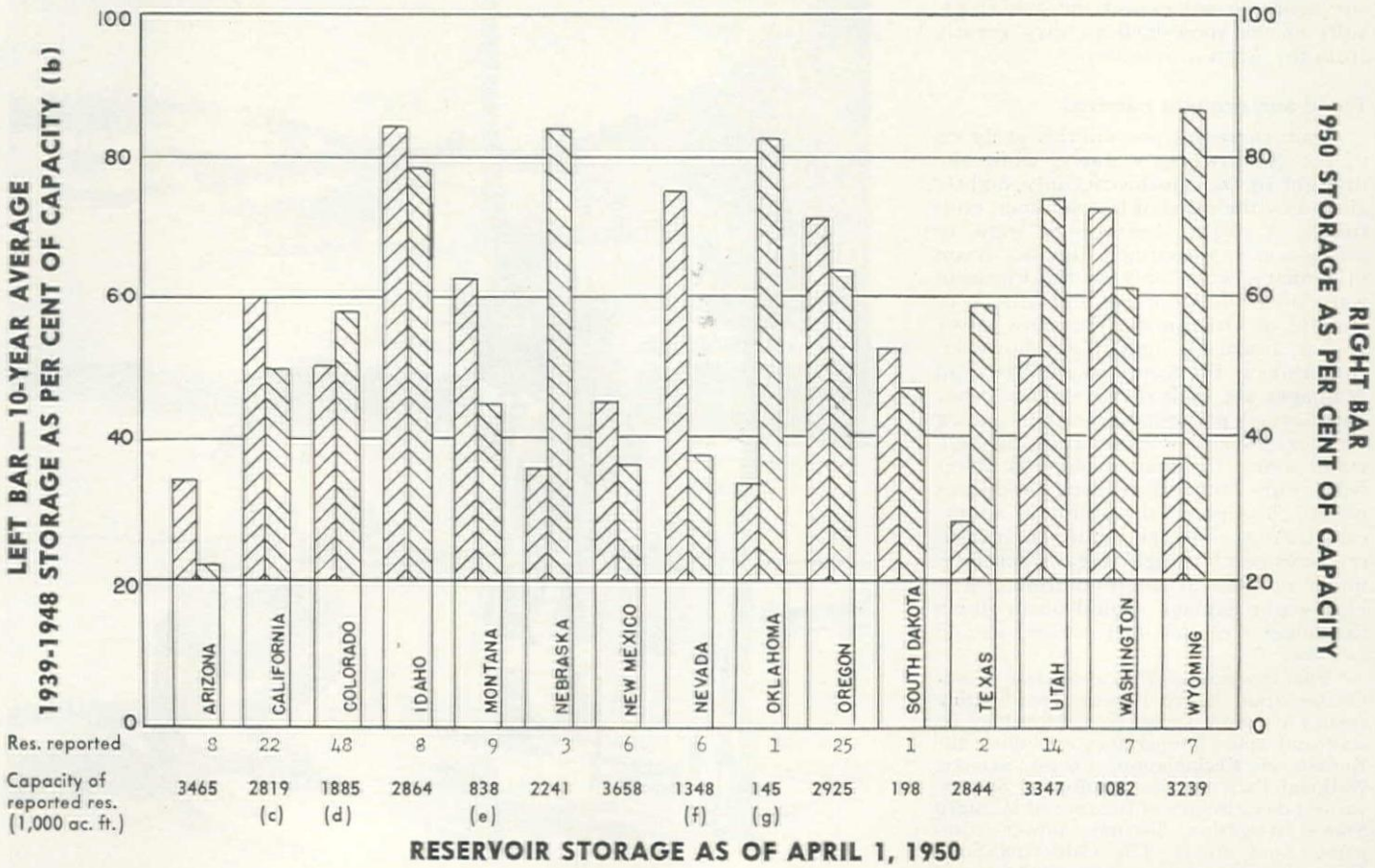
The soil moisture in irrigated areas east of the Continental Divide is low, owing to a lack of snow on the plains and in the valleys during the past winter. On the western slope, valley precipitation has been below average, but soil conditions are good. Reservoir storage is above average on the South Platte and Rio Grande watersheds and slightly below average on the Arkansas.

Idaho

The present snow-pack appears to assure adequate water for all requirements of irrigation and power throughout Idaho. April 1 snow surveys show the snow cover to be above normal, heavy snowfall having occurred since the surveys of January, which showed a snow pack of less than normal in more than half of Columbia Basin.

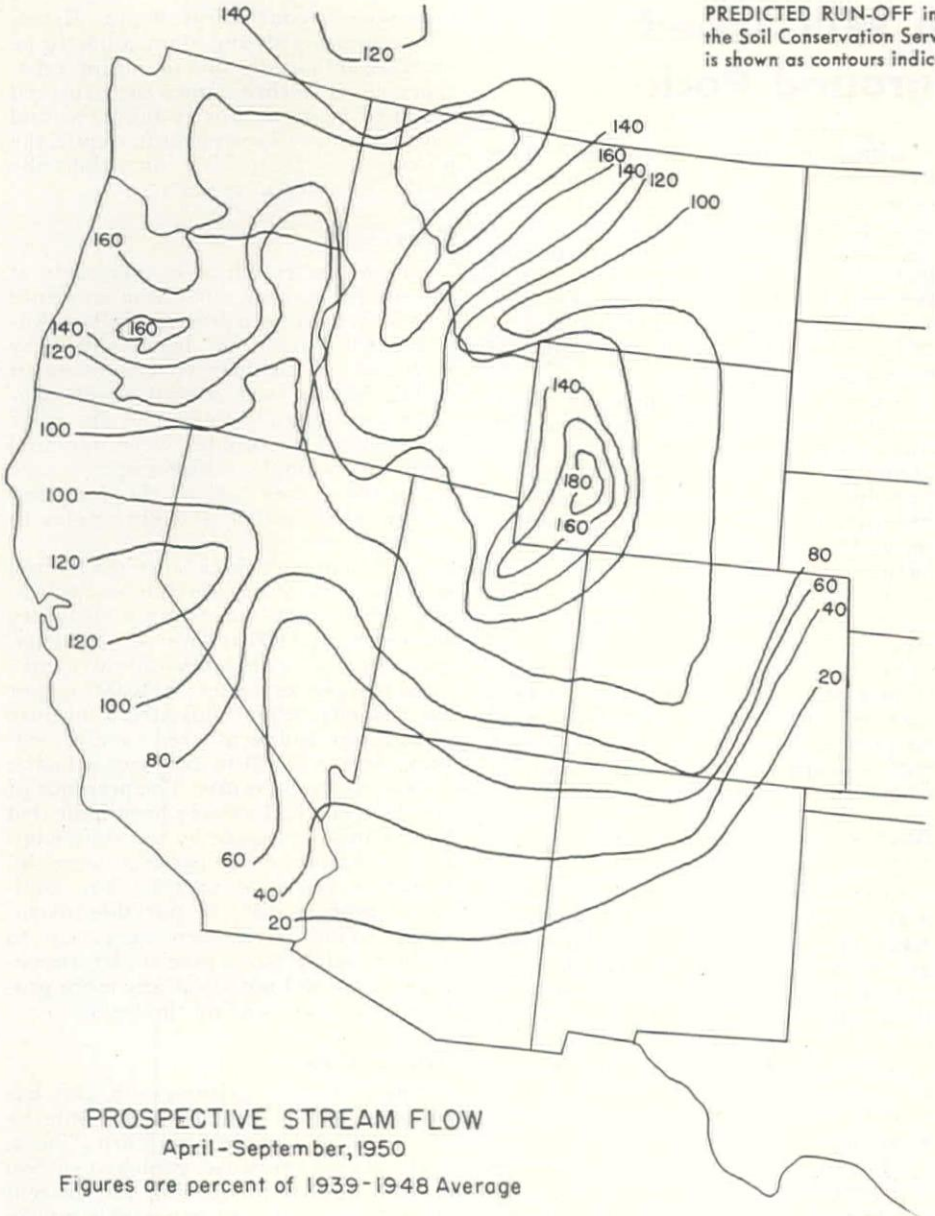
Montana

The outlook for the Upper Missouri River Basin is good. Snow measurements in the Jefferson and Gallatin basins show conditions slightly below average, but those for the Madison are above average. Storage is generally good, and with the proper operation of reservoirs, there should be ample water even for late irrigation. Although there are some deficiencies at low elevations, the bulk of the snow appears to be high in the mountains, for late release if the melt season is normal. The Upper Columbia River Basin also appears to be in excellent condition. Many snow courses in this basin have a record high-water equivalent, the measurements being higher than either 1948 or 1943. Once again, for the third consecutive year, a flood potential exists in the Upper Basin, particularly on the Flathead and Kootenai watersheds. The main stem of the Yellowstone River in southeastern Montana is in only fair condition. The snow pack in the tributary basins to this stream indicates about 80% to 106% of average snow pack. Although the conditions are not as critical as those farther south, water will not be plentiful for irrigation.



RESERVOIR STORAGE AS OF APRIL 1, 1950

Explanation: (b) Most state averages for reported reservoirs are for full 10-year period, but in a few cases reservoirs having shorter periods are included. (c) Does not include Friant or Shasta reservoirs. April 1 storage in these two reservoirs combined was 3,670,700 acre-feet, which is 73% of their capacity. (d) Does not include John Martin reservoir (capacity 655,000 acre-feet); April 1 storage 150,200 acre-feet. (e) Does not include Fort Peck reservoir (capacity 19,000,000 acre-feet); April 1 storage 11,932,000 acre-feet. Also does not include Flathead Lake (capacity 1,791,000 acre-feet); April 1 storage 614,300 acre-feet. (f) Does not include Lake Mead (capacity 27,217,000 acre-feet); April 1 storage 17,686 acre-feet. (g) Average is for 1945-49.



PREDICTED RUN-OFF in the Western States, as tabulated by engineers of the Soil Conservation Service from the study of snow survey reports on April 1, is shown as contours indicating percentages of normal run-off in 10-yr. period.

Nevada

Snow-water run-off in Nevada will vary from about 80% to 115% of normal in the eastern Sierra, while Humboldt Basin streams will flow from 65% to 115%. The southern two-thirds of the state can expect very little water from snow melt, as the snow surveys indicate that during the past winter many areas received their lowest recorded snowfall. Ground-water storage is better than at this time last year but still below normal, while early-season stream flow has been normal or above. Reservoir storage, while better than last year, is only 40% of capacity and 50% of the past 10-year average. Lake Mead contains about the same amount of stored water as at this time last year, and about 90% of normal for this date.

New Mexico

The snow cover in northern New Mexico is very low, many snow courses producing the lowest snow measurements since surveys were started in 1937. With only normal snow cover on the Upper Rio Grande in Colorado, the summer flow of the Rio Grande and its tributaries is expected to be from one-fourth to one-third that of the past 10-year average. Storage in Elephant Butte and Caballo reservoirs is about 30% above April 1, 1949, but below the 10-year average. On the basis of current outlook for the flow of the Rio Grande, there will be a substantial drop in storage during the next year. Soil moisture in all irrigated areas is reported as dry.

Oregon

The outlook is universally favorable, with prospects of supplies nearly equal to those of 1943 and 1946 and better than those of last year in some areas. Deficiencies are not expected anywhere if the snow melt and run-off take a normal course. New run-off records will be established in the Deschutes watersheds, and unusually high flows are expected in Willamette River tributaries draining the western Cascade slope from the Coast Fork and Row River northward to and including Santiam River.

Utah

Wide variation appears in the water-supply prospects. The water supply is excellent in the northern and northeastern part of the state, good in the central part, and fair in the southern part, except for the East Fork of Sevier River, where the expected water supply is poor. The snow blanket in the Cache-Wasatch-Ashley forests has a considerably higher than normal water content and could produce heavy spring stream flows if combined with heavy rains and/or above-normal temperatures. Reservoir-storage supplies are near or considerably above the past 10-year average.

Washington

Prospects already summarized for Columbia River Basin are those of Washington. They are generally favorable, though holding some possibility of high run-off if climatic conditions are not in normal adjustment during the melting period.

Wyoming

In northern Wyoming, the snow-pack of the Wind River Basin above Riverton appears to be in excellent condition as does the Popo Agie River Basin above Lander. The Big Horn watershed below Riverton also has a fair snow pack and the river will carry about the average volume for the run-off season. However, in northeastern Wyoming, the Tongue and Powder Basins do not share in this prosperous snow pack. The eastern slope of the Big Horn Mountains has only about 60% to 80% of average snow pack, and that section is likely to feel an irrigation shortage before the summer is over.

The outlook for the Green and North Platte watersheds is excellent. On the headwaters of the North Platte and Laramie rivers the snow cover is slightly above normal. West of the Continental Divide on the Green, the high-mountain snow cover is 50% above normal and well above that of April 1, 1949. Soil moisture on the range and meadow lands of the Upper Green is excellent.

On the North Platte, the irrigation supply for eastern Wyoming and western Nebraska is assured, owing to a record carry-over. Storage in the four major reservoirs now totals 1,675,000 ac. ft., or 73% of capacity. However, soil moisture is very low.

British Columbia

The April 1 snow survey showed no indication of general thawing. There has been little run-off, as the weather continued cool and cloudy. The snow is deep, and of low density. About half the results indicate the greatest measured snow-water content on record. The water-supply picture for the Columbia River Basin in British Columbia is therefore very good, with all prospects well above normal, provided normal temperatures and precipitation prevail until and during the run-off period. If the weather during April and early May continues cloudy, cool, and with even normal precipitation, a definite flood potential will exist.

Portable Seismograph Will Speed Exploration of Underground Rock

DEMONSTRATIONS are being conducted in the West of a portable seismograph that can be packed in three hand cases, total weight being about 100 lb. The seismograph, an instrument which measures the depth and approximate position of overburden and bedrock by determining the relative speed of sound waves traveling through the underground material, is not a new instrument to civil and construction engineers. But the portability of the unit which is being demonstrated is a new feature that will increase the possibilities for use of the seismic method.

Principal advantage that the "portability" feature gives to the new seismograph is the speed with which it can be carried to a job site, set up, readings taken and results computed. The entire gear consists of unitized equipment that can be carried about in three suitcases, each weighing from 25 to 30 lb. Usually, a fair-sized truck is required to carry seismic gear to a job site where preliminary investigations are to be made.

As observed at one of the demonstrations, the portable refraction seismograph shows considerable promise of saving considerable time in obtaining subsurface profiles. It will not replace core drilling but will be useful to guide and expedite drilling operations by providing quickly an outline of the areas where core drilling might be necessary. The principal advantage will be in areas where it has not been determined beforehand whether or not core samples will be required. Also, where drilling is necessary, the seismograph will greatly reduce the number of cores needed.

The method

The principle of the refraction seismograph has been known and applied to underground exploration since 1930, when Father Daniel Lineham of Boston College, Mass., began working with homemade equipment. The method for finding the thickness of overburden and the depths of bedrock is based on the measurement of the time required for a sound wave to travel from its source through the earth to a series of microphone pickups set along the line to be profiled. The sound wave is usually generated by a charge of dynamite, in most cases a part or full stick of 60% speed explosive. When the line to be profiled is relatively short, a dynamite cap by itself is frequently used. When the profile is both short and shallow, a blow on the ground with the blade of a hand shovel will generate sufficient energy to be measured.

The sound wave from the dynamite charge is picked up by a microphone and carried to a central amplifier, where it is boosted several thousand times. The amplified current then goes through a sensitive galvanometer which is connected to a small mirror so that the mirror is deflected when the sound wave current is picked up. A light beamed at the mirror strikes a piece of photographic paper upon each deflection. This paper is quickly developed in a portable field darkroom, one of the three suitcases previously mentioned.

During exposure, the paper turns on a pair of revolving spools, similar to a typewriter ribbon, and is turning at such a speed that time increments as small as .001 can be measured by the deflected mirror.

Beginning at the moment of explosion, time is measured for the sound to travel from the charge to the microphone pickups. The time differences, combined with the known distance between the microphones, is plotted to scale. The result is a subsurface profile of the site.

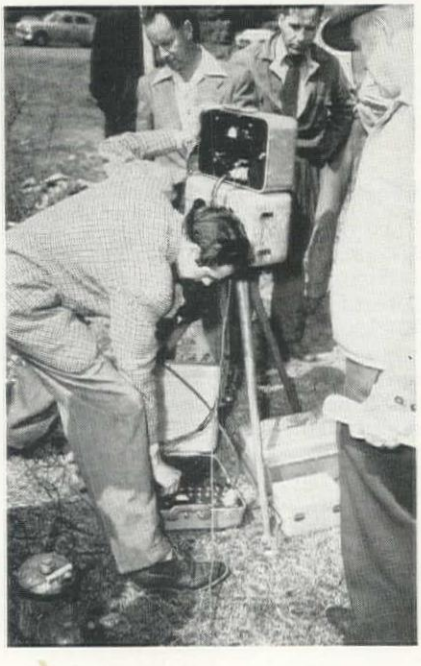
The amplifier unit of the portable seismograph is essentially an audio amplifier of the ordinary radio-phonograph type. To eliminate outside noises from trucks, heavy equipment, streetcars, etc., the amplifier is tuned to all frequencies below 300 cycles per second, with a sharply tuned filter to eliminate 60-cycle power line hum.

Accuracy and range

The accuracy of the portable unit, as with the larger-sized refraction seismographs, depends on the clearness of definition between any two layers of underground material. Accuracy may be within 1 to 3 ft., regardless of the overburden thickness. The margin of error is rarely more than 6 ft., and a clear break between types of bedrock and overburden can be indicated with a difference in sound speed of 500 to 1,000 ft. per sec., or an accuracy to within ½ ft.

Theoretically, the range of the instrument extends to the center of the earth. To date there has been no need for explorations beyond 600-ft. depth. Microphone pickups, strung along a line to be profiled, are usually spread out for a distance equal to three times the expected depth to bedrock. For instance, to find bedrock at an expected 50-ft. depth, the pickups are spread 75 ft. on either side of the recorder instrument.

SETTING UP the portable seismograph during one of the recent tests. The entire unit, weighing 100 lb., is carried in three cases.



Tests

One of the recent tests was made at the site for a grade separation structure on the Arroyo Seco freeway in Los Angeles. This area had been drilled by forces of the California Department of Public Works, and several profile sections were already known to the state engineers. Two profiles were operated with the portable seismograph — one along the center line of the proposed bridge, and another at right angles to the first.

Four main velocities were discovered in the survey of this section—a 2,600-ft. per sec. velocity, indicating a fairly dry sediment; a 5,000-ft. per sec. velocity, denoting the probability of water contained in the sediment; a 10,000-ft. per sec. velocity, which indicated a mixture of boulders and weathered zone of bedrock, and a 25,000-ft. per sec. velocity, indicating hard granite. The presence of this material had already been indicated by drilling tests made by the state engineers. Depths of the material were determined fairly accurately, but additional profiles with the portable instrument would have been necessary to make possible more precise determinations. Time did not allow any more profiles to be taken during the tests.

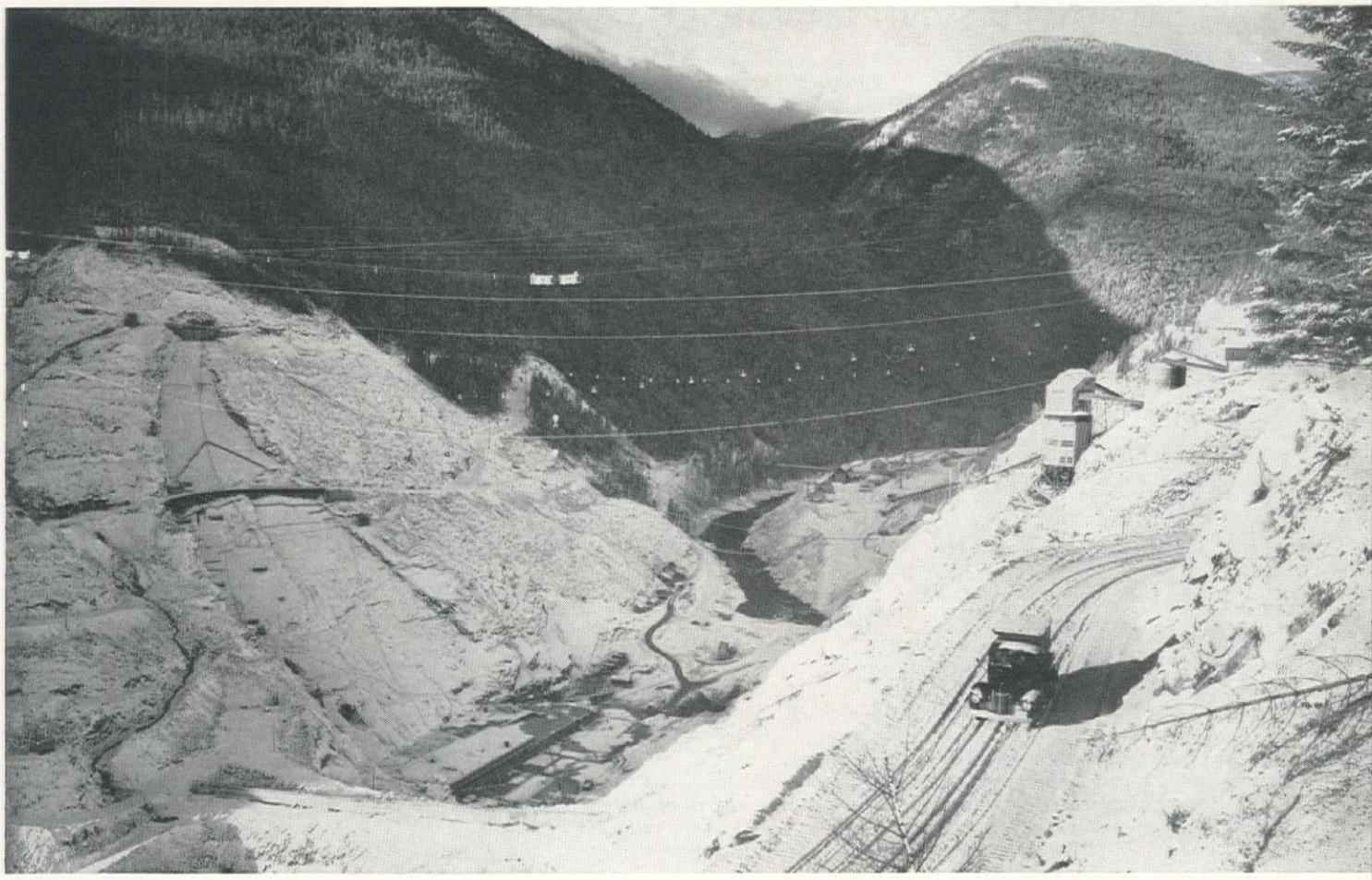
The developer

The refraction seismograph unit has been developed and made portable by the Century Geophysical Corp., Tulsa, Okla. R. Burton Rose, geologist of San Jose, Calif., is conducting the current tests being made of the portable unit in California. According to Rose, who has had a great deal of experience in other parts of the country with the seismic method of underground exploration, it is believed that sufficient experimenting with the seismic method in the West's areas which have been previously drill tested will make future seismic computations in engineering problems of the region an easier, faster process.

New Atomic Project Located In San Francisco Bay Area

A NEW ATOMIC energy research project has been located in the San Francisco Bay Area. The new project, to cost about $7,000,000, is located at the Livermore Naval Air Station. Preparation of the site has begun. Existing buildings are being modified and some new construction will be involved.

The program has been undertaken by the California Research and Development Co. in cooperation with the Radiation Laboratory of the University of California. The first-named company is a subsidiary of Standard Oil Co. of California.



Part 2 of a Two-Part Article Describing—

Concreting Methods at Hungry Horse

An average of 6,000 cu. yd. per day of concrete is being placed by General-Shea-Morrison—This article describes the modern mixing plant, the four cableways, procedures for mixing and placing concrete and plans for the next two years

By

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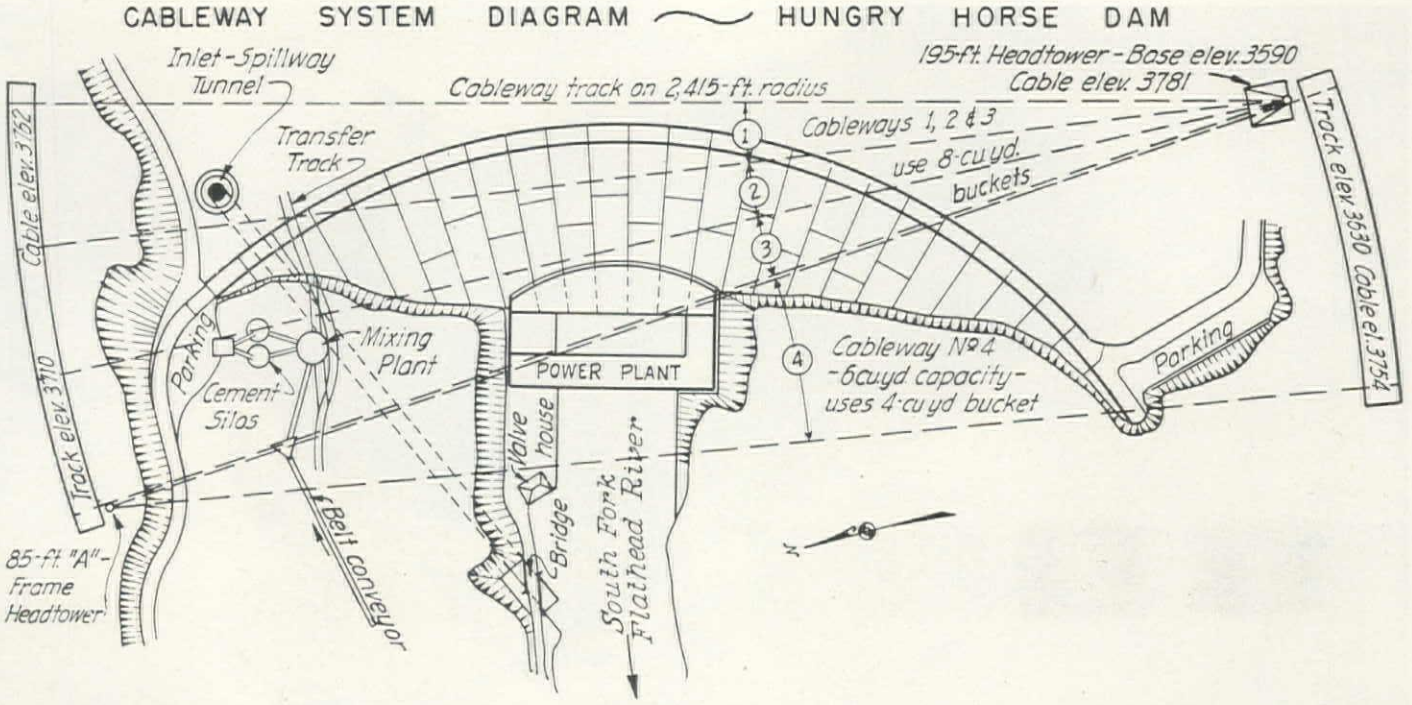
MAJOR concreting operations started April 7 at the Hungry Horse Project in northwestern Montana with placement of the first of approximately 1,000,000 cu. yd. of concrete scheduled to go into the big Bureau of Reclamation dam and powerplant this year. Approximately 50,000 cu. yd. of concrete was placed during April, and the pace has been gradually increased so that an average of 6,000 cu. yd. is being placed per day.

Part I of this two-part article, published last month, described early construction at the site, railhead facilities, handling and production of aggregate and the water supply system. Part II of the article, presented on the following pages, describes the concrete mixing plant, the cableway system, procedures for placing the concrete and plans for the next two years at the project.

The mixing plant is the real heart of the contractor's construction plant. Johnson automatic batchers and Koehring mixers are used, with all control and recorder instruments set for operation by one mixer operator. Five 4-cu. yd. mixers are spaced in a circle to permit front end charging from the central rotating hopper. All mixers discharge into a conical hopper which is directly over the loading or transfer tracks. The plant was placed in operation with four mixers installed, but due to the lateness of the available concrete season, less than 60,000 cu. yd. of concrete was placed in 1949, compared to the 250,000 cu. yd. which was originally planned. In view of these facts, it seemed imperative that the plant's capacity be increased by the addition of the fifth mixer. During the winter shutdown all of the mixers were lined with special steel liner plates to eliminate wear on the mixer barrels. Allowing 3 minutes for completing a cycle of charging, mixing (2½ min.), and dumping each mixer, there is a theoretical plant capacity of 400 cu. yd. per hour.

The "goose," with new features

By dumping each mixer into the central hopper, the sequence of discharge may be varied to take care of any irregularities or change of mix design. Further flexibility is provided by use of three Diesel-driven gondolas, generally referred to as the "goose," which have two 9½-cu. yd. hoppers mounted to discharge at the bottom side. In operation, the gondola car is spotted over the lip of the bucket which has been placed on the platform paralleling the transfer track at a lower elevation. The gate on the "goose" hopper is opened by an air ram to permit discharge of the concrete.



This method has an advantage over the old system of changing buckets, as was done at Boulder Dam, in that it eliminates the necessity of having two hook tenders on each car for changing buckets. The transfer track reduces the amount of tail-tower travel as each loaded "goose" is spotted directly under the cableway.

The cableway system

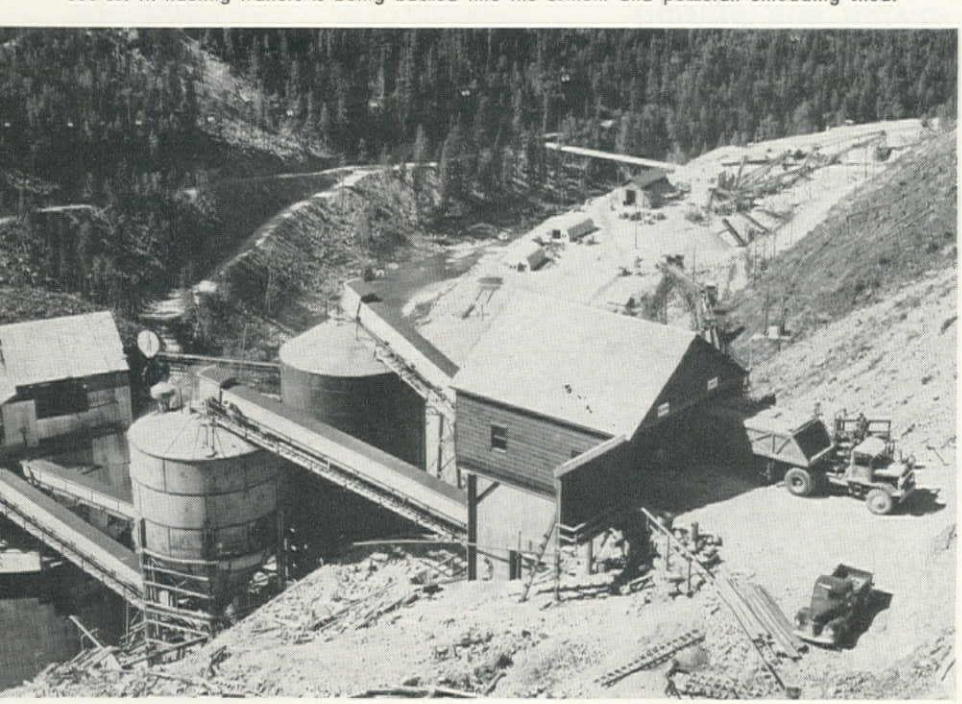
The operation which will create the widest tourist and visitor interest is the placement of concrete by the cableway system. The valvehouse, bridge and lower end of the spillway tunnel are the only parts of the project not entirely blanketed by the four cableways. There are three 25-ton capacity cableways having a common headtower 200 ft. high, located on the left bank at elev. 3590. The top of the tower is back-anchored to concrete placed in an anchor tunnel. Each tail tower is 52 ft. high, operating on a common circular track of 2,415-ft. radius. The main cables are of 3-in. lock coil, 2,429 ft. long.

The fourth cableway has an 85-ft. "A" frame headtower on the right abutment back of the access road. This is also back-anchored to concrete in a tunnel. The 125-ft. tailtower runs on a circular track on the opposite abutment at elev. 3630. This cableway has a nominal capacity of 20 tons and uses a 3-in. 6 x 61 Hercules cable. It will be the workhorse over the power plant area and left abutment and parkway. A 6-cu. yd. bucket will be used for all mass concreting operations under this line.

Each tailtower has a 500-ton concrete counterweight poured integrally into the back members of the tower to resist overturning. Two 75-hp. Westinghouse A.C., type CW motors operating on 2,200 volts are chain-connected to the drive wheels and can move the towers at speeds up to 150 ft. per min.

Lidgerwood hoists, direct-connected to 500-hp. General Electric DC motors operating on 425 volts, are located in a house at the base of the 200-ft. headtower. Operating controls and the operators are housed in a building 90 ft. up the front of the tower. A Washington Ironworks hoist and the same type GE motor is housed in the base of the No. 4 traveling tailtower. Likewise, the operator's house is located to provide an excellent view of the operations. Since the mixing plant is across the canyon, the bucket spotting operations on the transfer track can be watched by the operator as he receives his signals.

GENERAL VIEW of mixing plant, foreground, with aggregate plant in background. One of the 880-cu. ft. hauling trailers is being backed into the cement and pozzolan unloading shed.

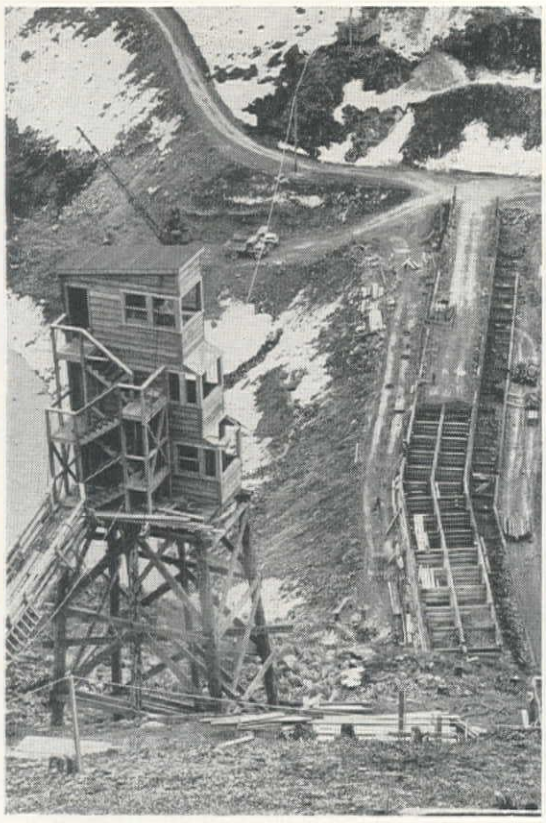


Colors help bellboys

The button line and principal messenger cables and the load and dump cables are all ⅞-in. diameter. The lift speed on the hoist is 300 ft. per min. (1,800 ft. per min. cable speed). The carriage can travel on the main cable at 1,500 ft. per min.

On several occasions last fall, placing operations had to be suspended because of fog conditions at the damsite. The bellboys were unable to see the travel of the bucket after it was 100 ft. or so away from them. This difficulty increased considerably under artificial light at night. Each carriage and block assembly is painted a different color—white, yellow, green and red—to aid the bellboy in identifying his line at all times.

A position advantage was gained by placing the mixing plant at elev. 3410, as over ¾ of the concrete in the dam and power plant is below this elevation. The



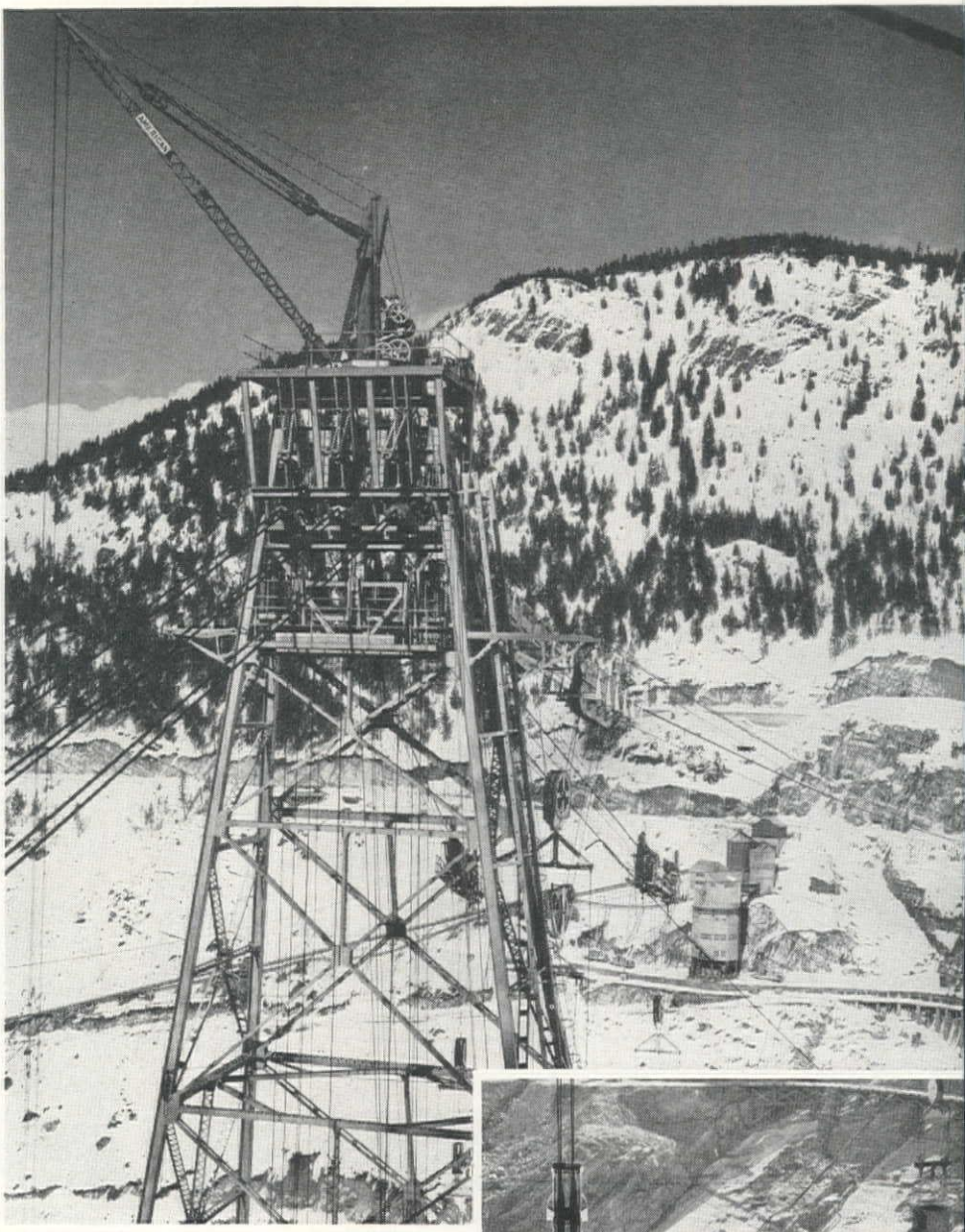
NEW CONTROL HOUSE for cableways 1, 2 and 3 is located on the right abutment at the same elevation as the concrete transfer track. It is designed to provide better visibility for spotting the buckets on the platform and for the concrete placing operations.

cableways can lower concrete for placing faster and more accurately than when lifting and spotting at the higher elevations.

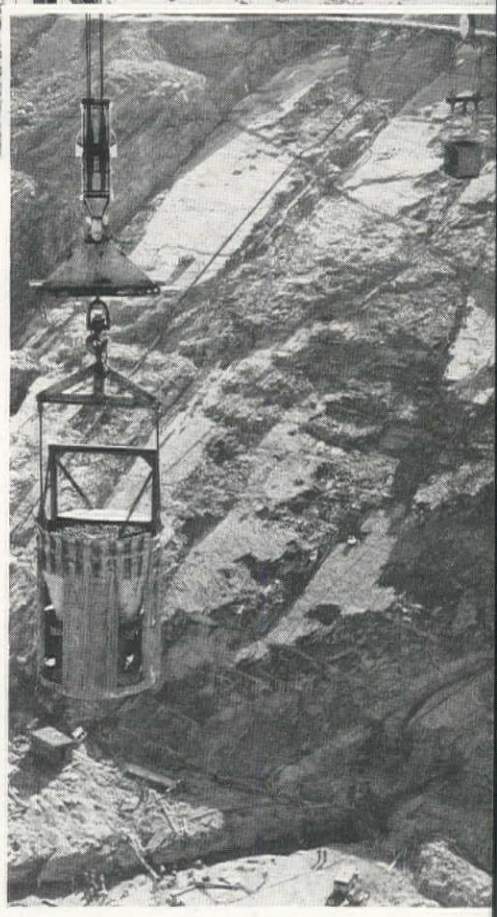
Concreting schedule

The original concrete placing schedule for the dam called for 250,000 cu. yd. to elev. 3120 in 1949, 1,000,000 cu. yd. to elev. 3270 in 1950 and 1,000,000 cu. yd. to elev. 3410 in 1951, with the balance of 650,000 in 1952. A total of only 59,554 cu. yd. was placed in the dam during September, October, and November of 1949. The total amount of concrete which will be required in the dam has been increased by 50,000 cu. yd., due to the additional excavation required to reach sound foundation rock, filling of fault zone and construction of upstream and downstream fillets. Because of these conditions, the concreting program must be speeded up to place 1,125,000 cu. yd. during each of the ensuing two years to maintain the projected schedule.

Unfortunately, the weatherman is in the driver's seat until after the spring runoff of the South Fork, which will determine whether or not this year's program will be fully met. The upstream cofferdam, which diverts the river through the 36-ft. diameter diversion tunnel, is constructed of ungraded rock and overburden from the foundation excavation, utilizing Wakefield piling for water-seal. This cofferdam must be constructed to elev. 3185, 115 ft. above the stream bed, to divert a flood flow of 40,000 cu. ft. per sec. through the tunnel.



THE 200-FT. main headtower, above. This tower supports three of the four cableways. Visible across the canyon are the right abutment key, concrete mixing plant, and the trackway for the "goose" with the trestle crossing the keyway. AT RIGHT, two 8-cu. yd. Crowe buckets suspended over the Flathead River canyon when concrete was being placed in a fault zone, which can be seen at the bottom of the canyon.



In 1948, the South Fork peaked at 43,400 cfs. Should the cofferdam be overtopped, several months would be lost on penstock placing and in cleanup operations with substantial losses to both the Government and the contractor.

Because of the severe weather (temperatures dropping to 40 deg. below zero in January), and with approximately 4 ft. of snow on the ground, the only work that could be carried on at the damsite throughout the past winter has been the excavation of the upstream and downstream fault zone treatment shafts. This fault was uncovered during the excavation and stripping of the foundation to final section. It consists of a zone of crushed and fragmented rock 20 ft. wide, cutting diagonally across the river bot-

tom in a northeasterly direction. To determine the extent and type of faulting, and to seal this zone against percolation, two shafts 8 ft. x 20 ft. in section were excavated following the dip of the fault. The upstream shaft was excavated to a depth of 201 ft., while the downstream shaft extended to 95 ft. Diamond drilling and grouting will be carried on from these shafts, after which they will be backfilled with concrete.

The construction program for the ensuing two years is one based on placing huge quantities of concrete in the dam so that storage of 1,000,000 ac. ft. of water may be made from the 1952 spring runoff. Meanwhile, the tempo will be gradually increasing on the power plant work so that one turbine can go on the line by October 1, 1952, to use this stored water. The outlet pipes must be installed complete with valves, awaiting the day in the spring of 1952 when the signal is given to drop the stop logs at the mouth of the diversion tunnel for the start of storage. Close coordination in planning and performance must be had, for once the stop logs are dropped, there will be no turning back or revision of plans. Estimate of the runoff must be accurate so there will be no overtopping of the dam. Cleanup and placing of the tunnel plug will have to proceed rapidly and efficiently.

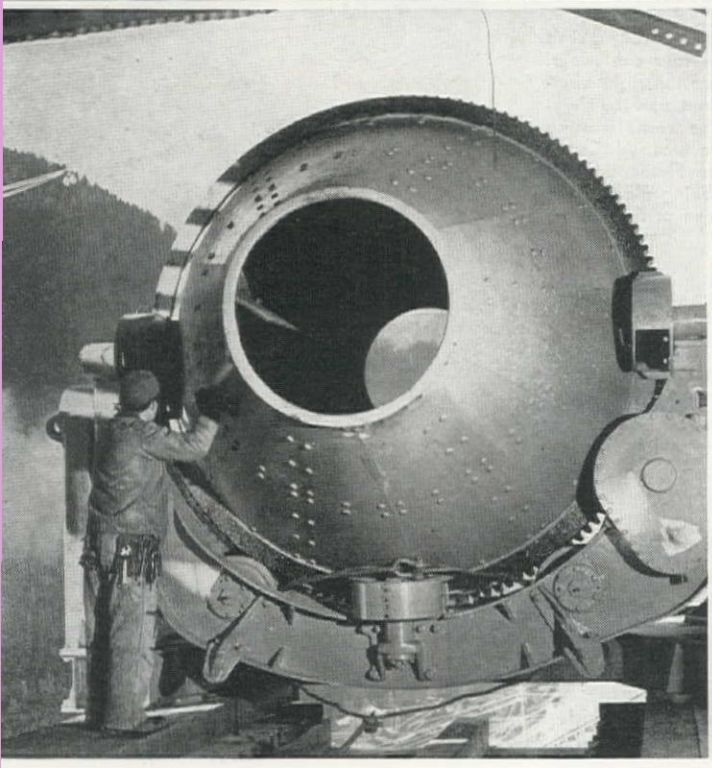
Plans for '52 and '53

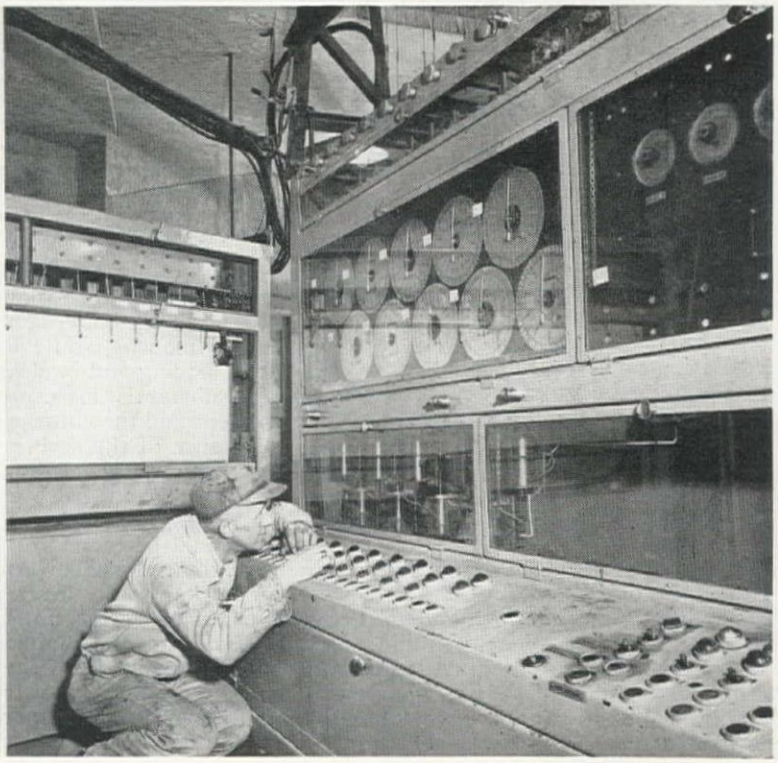
In 1952 and 1953, the contractor will proceed with work on the dam and power plant, including machinery installation, spillway tunnel lining and gate construction, diversion tunnel plug and many miscellaneous smaller jobs, such as drilling and grouting and trashrack and gate installations.

In order to put one generator on the line by October, 1952, one major design change is to be made. The superstructure of the power plant is to have steel framing instead of reinforced concrete. This change is necessary in order to permit earlier installation of the two 290-ton traveling cranes used for handling the turbines and generator machinery. The rotor for the 75,000-kva. generator will weigh about 350 tons. By going to steel, construction will not be so dependent upon the weather, and thus time gains of upward of six months are expected.

Hungry Horse builders

On-the-site personnel directing operations for General-Shea-Morrison Co. are: C. W. "Smoky" Wood, Project Manager; Mel Hord, Assistant Project Manager; R. W. "Dick" Jones, Chief





INSIDE THE CONCRETE MIXING PLANT.

LEFT—Batching deck, showing weigh-batchers suspended below hoppers. BOTTOM LEFT—The last of five 4-cu. yd. mixers being installed last year. With a 3-min. mixing cycle, the five mixers provide a 400-cu. yd. per hour theoretical capacity for the plant. BOTTOM RIGHT—The "electronic brain" which controls mixing operations. Weight of all materials in each batch is controlled automatically. Vern Nichols, plant superintendent, is making some final adjustments.

Engineer; Dave Henderson, Office Manager; T. R. Harris, Dam Superintendent; Tom Moyer, Assistant General Superintendent; Les Gardner, Executive Superintendent; Kenneth Johnson, Rigging Boss; Rudy Salquist, Concrete Superintendent, and C. W. Luther, Electrical Superintendent.

For the Bureau of Reclamation, the following are in charge: L. N. McClellan, Chief Engineer, Denver; Harold T. Nelson, Regional Director, Boise; and at the project, C. H. Spencer, Construction Engineer; David S. Culver, Assistant Construction Engineer; C. F. Palmetier, Office Engineer, and E. J. Niemen, Field Engineer.

Other phases of project construction remain to be done in the reservoir area. McLaughlin, Inc., is 55% complete on constructing 17 mi. of relocated Forest Service road. The F. R. Hewett Co. has already completed the first 14 mi. of this road. Clearing of 1,500 ac. of the reservoir at the damsite and extending on upstream 3 mi. to Hungry Horse Creek has been completed by the Seaboard Surety Co. Wixson and Crowe, and J. H. Trisdale are 96% complete on clearing 6,230 ac. Additional clearing contracts were let this past winter as follows:

Coleman H. Dykes, Knoxville, Tenn., 1,070 ac., $508,595.

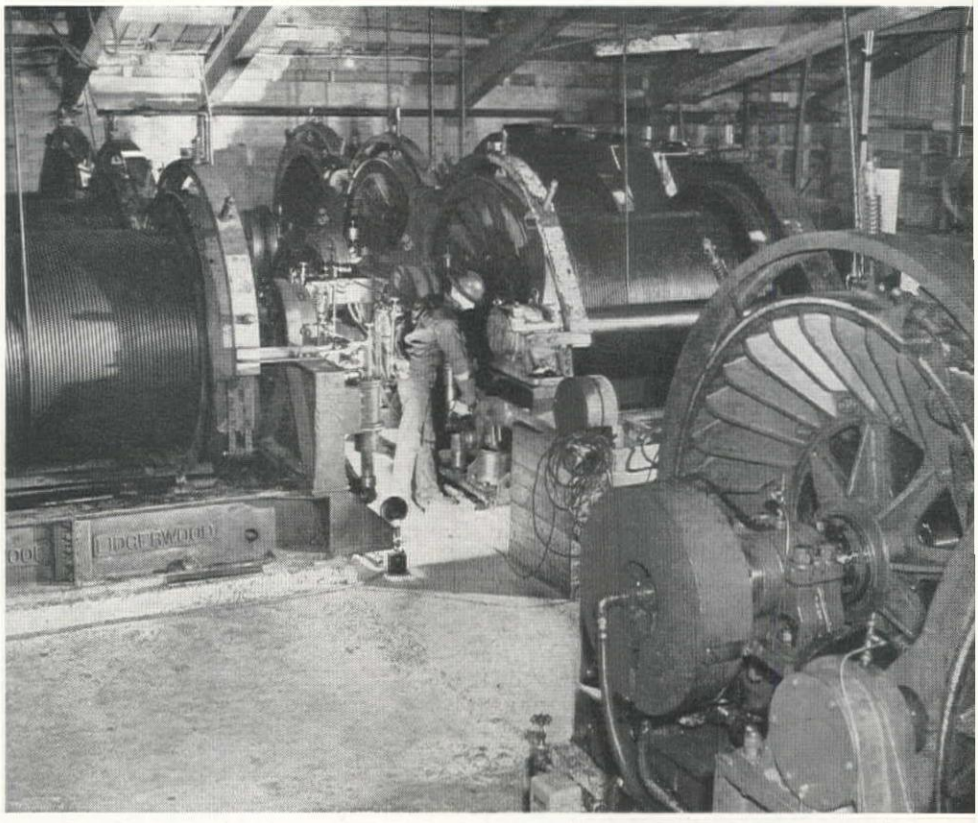
Wixson & Crowe, Inc., Redding, Cal., 6,840 ac., $2,446,850.

J. H. Trisdale, Inc., Redding Cal., 7,855 ac., $2,484,360.

If preliminary plans of Wixson and Trisdale materialize, several innovations in clearing operations are expected in the Hungry Horse reservoir operations.

Logging operators working under a timber sale agreement removed more than 47 million board feet of ties and saw logs from the reservoir area last year, which returned $231,230 to the Government. Another 23 million feet, principally saw logs, may be removed this season.

Forest Service telephone lines, lookout towers, and headquarters buildings will be replaced to higher elevations during 1951-1952. Construction of 41 mi. of fire road along the west side of the reservoir awaits agreement on location and standards but will probably be constructed in 1951 to 1953.



HOISTING EQUIPMENT in the 220-ft. headtower. The two hoists in the background are Lidgerwood; the one to the right going out of the view is a Washington Iron Works hoist.

Major Units of the Concreting Plant at Hungry Horse

Primary crusher (jaw)—Universal Engineering Corp., Cedar Rapids, Iowa.

Secondary crushers (cone) — Universal Engineering Corp., Cedar Rapids, Iowa.

Conveyor system — Link-Belt Speeder Corp., Cedar Rapids, Ia. (System is primarily second-hand, having been used previously by General Construction Co. at Ross and Diablo dams in Washington.) General Electric drive motors and U. S. Rubber Co. belting used in the conveyor system.

Screens—Ty-Rock, W. S. Tyler Co., Cleveland, Ohio.

Classifiers—Dorr Co., New York City.

Rod Mill—Marcy, from Mine and Smelter Supply Co., Denver.

Cement hauling units—Covered trailer units made by Olson Manufacturing Co., Boise, Idaho.

Batching plant—Automatic batchers and controls, C. S. Johnson Co., Champaign, Ill.

—Mixers, Koehring Co., Milwaukee, Wis.

—Diesel-driven gondola cars, Washington Iron Works, Seattle.

—Batching plant re-screens, two double-deck Ty-Rock shaker screens.

—Buckets, 8-cu. yd. Crowe, designed and used at Shasta Dam.

Cableway—Steel for the 200-ft. headtower and the three movable tailtowers on the right abutment furnished by Consolidated Western Steel Corp., Los Angeles. Much of the drive mechanism and motors, carriages and blocks, and the No. 4 movable tailtower in previous service at Shasta Dam.

Hungry Horse Employment Jumps in May, Will Reach Peak Next August

WITH the big Hungry Horse job now swinging into high gear, employment at the project is climbing gradually toward a peak of possibly 2,500, expected in August. This will include about 1,200 to be employed by General-Shea-Morrison, prime contractor for the dam and power plant, 800 to be employed in the reservoir area on logging, clearing and road relocation contracts, 350 Bureau of Reclamation employees and the balance on minor contracts and subcontracts.

General-Shea-Morrison had about 500 men on the rolls early in April as compared with a winter low of 110. Employment will probably take a big jump in May with start of work on the power house and the start of full-scale logging and clearing operations.

Major labor classifications required this year will include concrete workers, carpenters, loggers and laborers. Local workmen are being given first consideration, and workmen from other areas are advised to write to the Montana State Employment offices at Kalispell or Columbia Falls for information regarding availability of jobs before moving into the area.

Work now under way at the dam, in addition to placement of concrete, includes installation of the first sections of the 12½-ft. diameter penstock pipes that will feed the four 105,000-hp. turbines to be installed in the power plant; final excavation for power plant foundations; grouting operations in fault zone treatment shafts under the base of the dam, and filling of the shafts with concrete; and construction of the 24-ft. high timber crib extension on top of the upstream cofferdam. This cribbing may be raised an additional 12 ft. if necessary to prevent spring flood waters from topping the cofferdam and flooding the work area.

Colorado Highway Department Sells County Maps and Creates Good Will

IN THE LAST ten years the Colorado Highway Department has sold more than $25,000.00 worth of maps. Only $63.75 of the total was uncollectable due to bad accounts. The sales in 1950 are running higher than ever. It is doubtful if any other state can show as good a record.

The maps made by the department are planimetric highway and transportation sheets showing roads, streams, sections and other details. They were originally drafted for use of the Department and for the Bureau of Public Roads. When word got around that such maps were being made practically every one in the country wanted them and only a few expected to be charged. It finally became necessary to set a price on the maps. Twenty-five cents was estimated as sufficient to cover costs for the half-inch-to-the-mile size. It was judged that would pay for the costs of printing, prepaid mailing and for supplies such as wrapping paper and labels. The price has never been increased.

No advertising has ever been employed in promoting the sales. In fact, the stiff price of three dollars a sheet was made on the full scale size to discourage ordering this work which was reproduced in the Department's own blue print room. In spite of all that, industrial firms, Federal and State agencies, tourists, fishermen, hunters and just plain citizens are listed on the books as buyers by the hundreds.

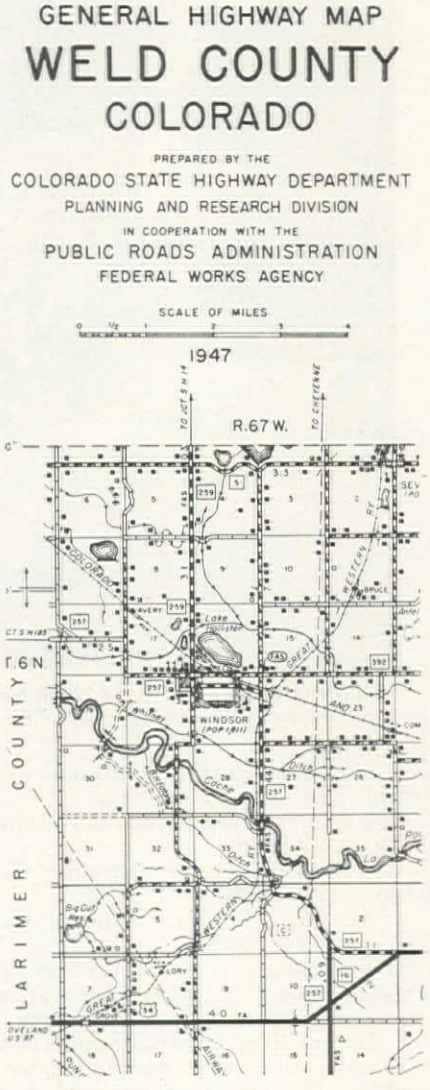
The uses to which the maps are put by the customers are many and varied. One wholesale milk company bought maps of all the counties covering their trade territory and traced routes of "pickups" for the drivers. Geologists, knowing the maps are not obtainable elsewhere, buy great quantities to meet competition in the everlasting pursuit of "black gold."

An enterprising salesman of school busses hit upon the scheme of furnishing the maps without cost to rural school boards. He gained additional goodwill when he helped draw the district's school bus routes. He usually ended by selling one or more busses.

During "Operation Snowbound," the Red Cross used two dozen map sheets of each western county of Colorado to make sure that every highway and byway was checked for stranded cars.

Incidents sometimes border on the ridiculous in the selling of maps. Recently, an order by a new customer over long distance was received to "hurry some of those county maps and bill us for them." The maps were sent post paid by return mail with invoices attached. Three weeks later a letter was opened in the Highway Department reading: "Receipt enclosed for you to sign and return, after which we will mail your check." Needless to say, the receipt was not signed until after receiving the check.

The half-scale maps are lithographed on paper 18 by 30 inches and have the same detail as the full scale maps which are blue line on white paper 36 by 60 inches. Also, a state map with or without drainage is available on paper 42 by 64 inches. Less frequent sales are made of state traffic volume, county outline maps and plats of incorporated places.



A PORTION of one of the county maps in reduced size. Roads, streams, reservoirs, sections, houses, population figures and other details make maps useful for many purposes.

Ethics

Should a state department sell maps in competition with private firms? This question rises frequently and the answer of course is: "Certainly not." However, the question is dissipated when it is explained that no mapping company sells comparable maps. As there are 63 counties in Colorado with each county comprising from one to five sheets for a total of 120, it is prohibitive for any private company to gather field data, correlate the notes, draft the maps and then publish them at a price the public would pay.

Private firms cannot secure reproducibles from the Colorado Highway Department because of policies laid down by both the state and the federal government. In the meantime, unsolicited customers are sending orders from every state in the country.

Final Approval Granted The Snake River Compact

CONSENT has been given by the Congress to the compact between Idaho and Wyoming for a division of the waterflow in the Snake River. The compact, which allocates Snake River water passing the Wyoming-Idaho line between the two states, was signed by representatives of Wyoming and Idaho on October 10, 1949 and was subsequently ratified by the two state legislatures.

The compact provides for equitable division of Snake River waters, and so opens the way for efficient multi-purpose use of the river. Other major objectives, as cited in the preamble, include the promotion of interstate amity, recognition that the most efficient utilization of the water is required for the development of the drainage area of the Snake River and its tributaries in Wyoming and Idaho, the promotion of joint action by the states and the United States in the development and use of such waters, and flood control.

The compact allocates waters of Snake River and Salt River, a tributary, crossing the Wyoming-Idaho border, 4% to Wyoming and 96 % to Idaho. This division recognizes established water rights in the two states and limits future development in Wyoming except domestic and stock water uses which are exempt within prescribed limits.

The use of water for power is made subordinate to use for domestic, livestock, and irrigation purposes. The compact recognizes, however, that power production does not consume the water; hence such use is not charged against a state's allocation.

The compact requires that additional facilities for water storage must be provided in Wyoming as a condition for full use of the Wyoming allotment in order to protect Idaho rights during periods of low flow. It further provides that no water may be exported from the basin above the Wyoming-Idaho line by either state without the consent of the other.

The compact will be administered by representatives of the two states with a Federal representative participating when the two state representatives fail to agree.

The compact's reservation of water for use in Idaho is expected not only to protect existing Idaho water users but to obviate certain disputes which might otherwise arise with respect to the waters required for prospective Federal investments in Idaho such as the Palisades power development, the enlargement of the Minidoka Project, the enlargement of the irrigation system on the Fort Hall Indian Reservation and the provision of water for both white settlers and Indians at Michaud Flats.

Contractor-engineer cooperation cuts lost time for constructing a section of the Coast Highway in Southern California—The job involves extensive clearing and grubbing, many drainage structures, imported sub-base and base materials, and plant-mixed surfacing on a cement-stabilized base course

Preventing Delays on a Tough Highway Job

By VICTOR E. PEARSON
Resident Engineer
California Division of Highways
San Luis Obispo, Calif.

ELIMINATION of another traffic bottleneck on the Coast Highway in San Luis Obispo County, California, is nearing completion. This project, which is 2.1 mi. in length, is located on the north approach of the Cuesta Grade near Santa Margarita and was awarded by the California Division of Highways in April, 1949, to the Granite Construction Co. of Watsonville, Calif. under a $467,181 contract.

The work consists of grading and surfacing an additional 24-ft. roadbed and resurfacing the existing pavement; placing imported sub-base material and imported base material; placing 4 in. of plant-mix surfacing; and applying Class "C" Fine seal coat and penetration shoulder treatment. The upper portion of the imported base material was stabilized using 2% of cement.

Extensive preliminary work

Various public and private utilities were removed and reconstructed during the early stages of the work. All of this preliminary work required cooperation and coordination with the contractor in order to prevent undue delays.

Clearing and grubbing over areas of new construction, requiring removal of dense willow growth, large oak and sycamore trees along Santa Margarita Creek, was accomplished with Caterpillar D-8 bulldozers and hand labor.

Roadway grading involved 105,000 cu. yd. of excavation and 1,000,000 sta. yd. of overhaul. Excavation was handled by LeTourneau Carryalls, Woolridge Terra Cobras and Caterpillar jeep scrapers. The excavation was watered both in the cuts and on the embankments so as to facilitate compaction, which was obtained with LeTourneau sheepsfoot tampers.

Ditch and channel excavation (32,000 cu. yd.) consisted mainly of relocating Santa Margarita Creek at various locations within the limits of the contract, with the resulting material from this operation being used in the roadway embankments. This work was accomplished with the Carryall units, except that in the swampy areas excavation was handled with a truck crane using a clamshell bucket.

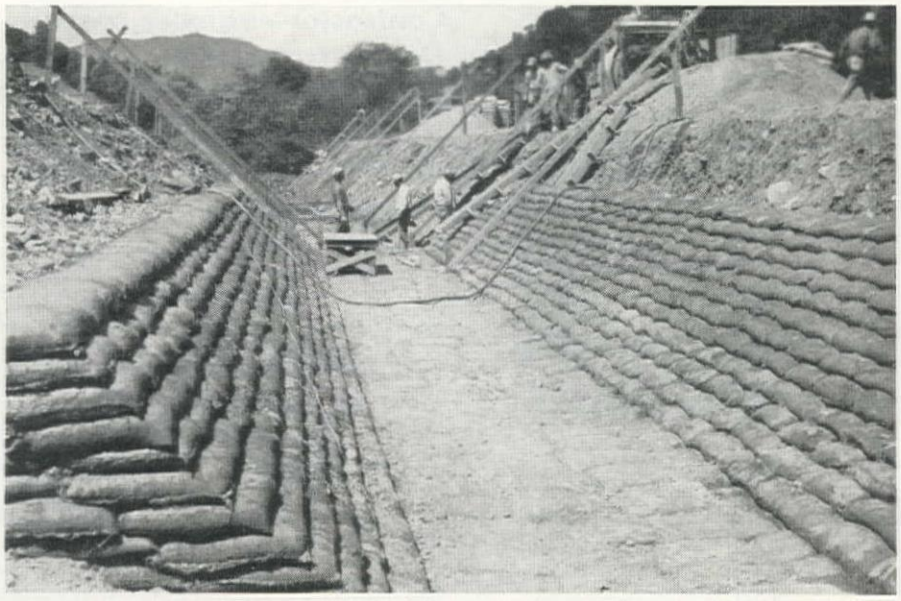
Considerable difficulty was experienced in obtaining adequate subdrainage and providing stable fill foundations. After the unsuitable material was removed, it was backfilled with pit-run gravel obtained from the Salinas River which proved adequate to correct this situation. Installation of perforated metal pipe drains was required at a number of locations.

Drainage structures were extended or replaced at various locations by using reinforcing concrete pipe or corrugated metal pipe. Several reinforced concrete box culverts were extended to provide adequate drainage under the two new lanes of construction.

Sacked concrete for riprap

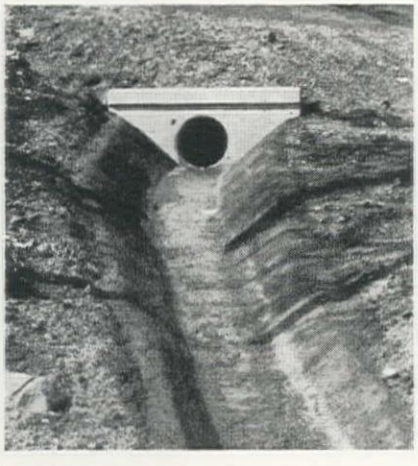
All PCC structures were poured with transit-mix concrete furnished by the Southern Pacific Milling Company's commercial batching plant in San Luis Obispo and from the W. B. Roselip plant in Atascadero. Sacked concrete riprap was used for revetment work along Santa Margarita Creek at various locations with materials obtained from the Salinas River. Ordinary jute gunny sacks were filled with one cubic foot of wet mix, and then placed by hand to

CEMENT-STABILIZED subgrade being mixed in place by a Madsen Traveling Pug, below. Note water truck with connecting hose to mixer which made this a single-pass operation.



SACKED CONCRETE was used for riprap along new channel excavation at various locations on the entire project. Sacks filled with wet mix were placed by hand neatly to grade lines.

EXCAVATION for relocated channel was handled by LeTourneau Carryalls. The Carryalls, Wooldridge Terra Cobras and Caterpillar jeep scrapers combined for the roadway grading.



PLANT-MIX surfaced drain ditches were used throughout the project.

established grade lines fitting the neatly trimmed channel banks. The tops of the sacks were folded under to form square ends and tramped into place to force grout through the jute mesh. This produced a flat lay in order to tie in and cement the joints tightly together in a firm and stable lining.

Plant-mix for drainage

The job includes 67,000 sq. ft. of plant-mixed surfacing gutters, ditches and slope drains. Plant-mixed aggregates to be used for the lining of ditches and slope drains were proportioned with maximum ⅜-in. minus size aggregate and 5% of 150-200 penetration liquid asphalt. The completed ditches then received a seal coat of asphaltic emulsion, penetration type, using approximately ½ to 1 gal. per sq. yd. Plant-mixed surfacing type ditches and slope drains constructed to date are in good condition considering the severe storms of the past winter.

Mineral aggregates for plant-mixed surfacing were obtained from the Salinas River located approximately 5 mi. north of Santa Margarita. Crushing was done with a standard Austin-Western portable crushing and screening plant with production being approximately 100 tons per hour. Excess fines passing ¼-in. mesh sieve were wasted. The mineral aggregate and natural fines were stockpiled conventionally in 2-ft. layers to prevent segregation.

The mixing plant

The plant-mixed surfacing was mixed in a Standard asphalt plant using a 3,000-lb. pugmill. Materials were fed from free flowing gates in a tunnel and conveyor arrangement to the cold elevator, a rotary kiln type dryer and hot elevator to the screens. A 50-hp. marine type boiler furnished steam to the asphalt tanks, steam jet nozzles of the dryer and the steam jams at the mixer.

The aggregates at this point in the Salinas River are principally of granitic origin, derived from granite dikes through which the river has cut a narrow gorge to the south during a recent geological period of upthrust. Some indurated shale and a little sandstone, however, are present and have been derived from overlying sedimentary deposits. The fines are mostly quartz and it has been necessary to add about 10% of river silt which is free from clay, in order to increase the 200-mesh content in the mix.

The bitumen content being used in the mix is 4.8% of 150-200 penetration liquid asphalt, while the 200-mesh fines vary from 6% to 7%. Swells are exceptionally low, 0.000 to 0.003. Stabilities are very good 38% to 48% and "R" values vary from 89% to 100%. It has been noted that the higher stabilities are resultant from test specimens showing 200-mesh content of about 6% and with bitumen contents of from 4.6% to 4.8%. These gradings and bitumen contents also result in mixes with very low permeabilities.

Temperatures at the dryer are being maintained at or near 325 deg. F., and liquid asphalt is heated to 300 deg. F. Mixing temperatures, therefore, for both aggregates and oil are about 300 deg. F., which are high enough to properly dry the aggregates and yet not hot enough to produce unnecessary hardening and oxidation of the oil film on the aggregate during the mixing cycle.

Surfacing operations

The plant-mixed surfacing is being spread on the street through a 12-ft. wide Barber-Greene self-propelled spreading and finishing machine with 2-ft. and 3-ft. outrigger attachments for paving the shoulders. The pavement is being consolidated with an 8-ton tandem roller, with the initial rolling at a temperature of about 130 deg. F., and final rolling at about 95 deg. F.

Sub-base, base and cement-stabilized base materials are being imported from a pit in Calf Canyon 6 mi. easterly from Santa Margarita on the Salinas River. About 45,000 tons of sub-base, 26,000 tons of base and 13,000 tons of base material to be cement treated are required. The Calf Canyon deposit is a ledge of decomposed granite and is being ripped with heavy duty LeTourneau rooters and D-8 bulldozers. This material is breaking up under scarifying and subsequent laying operations and is producing an exceptionally uniform good quality granular base.

California Bearing Ratio of the natural material at 0.1 penetration averages 125%. Swells are very low and zero P. I. indicates very little expansive and detrimental clays are present and the binder value is satisfactory. "R" values of the natural material average about 73%. The imported sub-base material is being laid over high swell clays and shales up to 10.7% in four equal layers of 3-in. thickness each and the imported base is being laid in two equal courses 4 in. thick, the latter to be cement stabilized. Over existing pavements a minimum of 6 in. of cement-treated base is being laid

or where there is a thickness of 8 in. or more required, imported base untreated to a thickness of 4 in. or more and cement-treated base to a thickness of 4 in. is being placed.

The cement stabilization processing is increasing the California Bearing Ratio of the natural material at 0.1 in. penetration by 100% or to a value well over 200 and is reducing swells to 0.1% or less. "R" values as obtained from the stabilometer are being raised from an average value of 73% to an average value of 80%.

Placing imported base

Imported sub-base and base materials hauled to the job are being tailgated, spread and rolled with D-8 bulldozers and sheepsfoot tampers, sprinkled with water, bladed with 12-ft. grader units with final compaction being shaped layer by layer accomplished with a Bros pneumatic-tired roller. Subgrade for the base to be cement stabilized is being carefully shaped true to grade and rolled with a 3-wheel 10-ton roller. Material to be cement stabilized is being laid out on the prepared subgrade through a Woods spreader box. Two windrows each of about 6.5 sq. ft. in section area are equally spaced from shoulder to shoulder over the roadbed to be treated. Ordinary Portland cement in bags are then laid out in lands marked off along these windrows. The sacks are then opened and distributed evenly on the top of the windrow. The cement content for the entire job will average about 1.8%.

Mixing and rolling

Two types of mixers have been used for the mixing operation—one a Gardner, the other a Madsen Traveling Pug. With the Gardner it was necessary to make two passes dry, then one pass adding the water and an extra pass wet to insure a uniform mix. With the Madsen only one pass was necessary, applying water at the same time. The mixing time with either machine was about the same due to the faster travel time of the Gardner mixer.

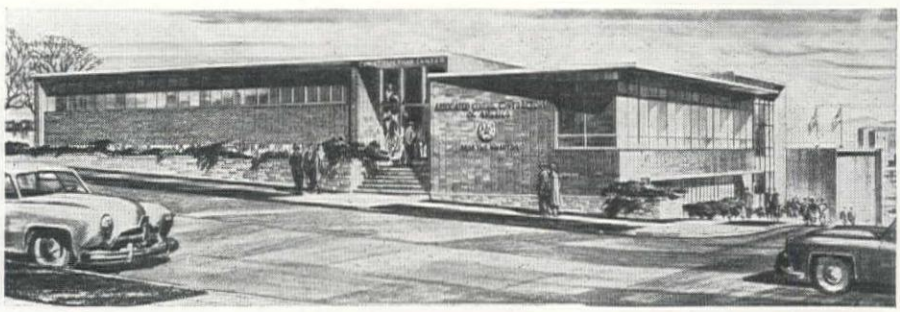
The mixed material was then laid out with blades as rapidly as possible. The flat-bladed material was rolled first with a sheepsfoot roller to initiate compaction on the bottom, only a few passes being required. This also kept the surface stirred up and seemed to reduce the blade time required to produce a flat lay. Guinea stakes were then set measuring up from those placed in the subgrade to establish a true grade for the workmen. Finish blading was immediately followed by rolling with the pneumatic-tired roller until the surface was smooth and well compacted. A light cut was then taken to dress down the surface to a true plane, wasting the material cut loose on the shoulder. An 8-ton tandem roller then finish rolled the surface which was left to dry and bake out in the sun.

A 0.25-gal. per sq. yd. penetration treatment of liquid asphalt SC-2 was then applied.

Granular bases of this type can usually be found locally and are becoming more and more popular. Some difficulty with scaling was experienced at first on this contract. The difficulty was traced back to the method of layout first employed, blading and rolling in thin increments near the surface. A thin layer spread on a partly compacted and partly dry surface will not bond and after the prime coat is spread and during surfacing operations, trucks and equipment traveling on the grade will produce slip planes immediately below the prime coat which will peel. The use of two blades on the layout was found desirable as the lay could then be made, compacted and shaved and final rolled before it could dry out enough to produce these laminations.

Robert L. Kenning and Edward J. Hickson are acting superintendents for the Granite Construction Co.

G. T. McCoy is State Highway Engineer of the Division of Highways. The work is being done under supervision of C. I. Brown, Assistant District Engineer, and E. J. L. Peterson is District Engineer for District V of the Division of Highways with headquarters in San Luis Obispo. The author is Resident Engineer on this contract with headquarters in San Luis Obispo.



Seattle A.G.C. "Construction Center" Designed Cleverly for Requirements

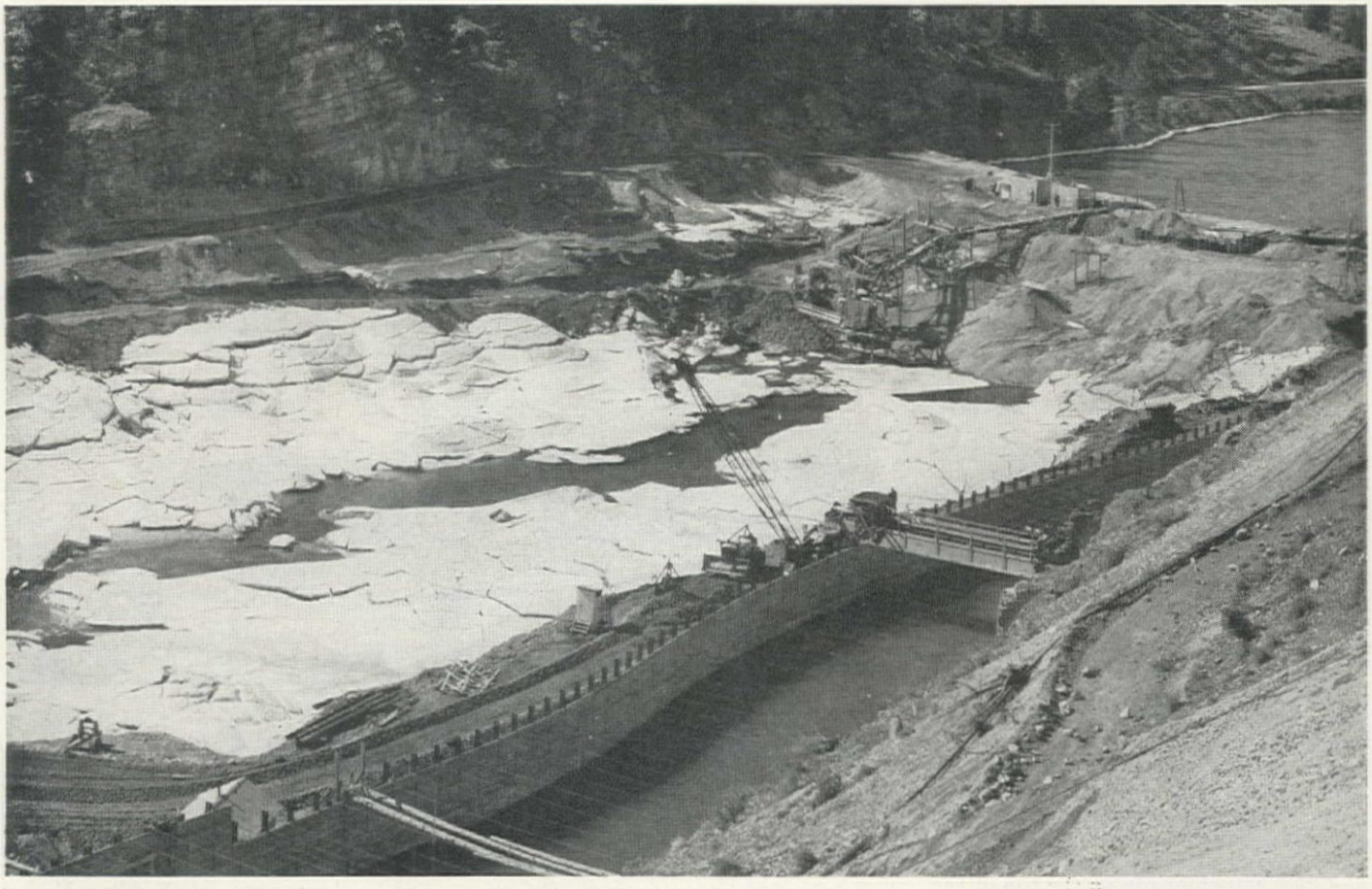
THE SEATTLE Chapter of the Associated General Contractors started erection April 3 on a new "Construction Center" that will house its own offices, those of its affiliate, the Seattle Construction Council, and others closely allied to the building industry. It is planned that the new structure will represent all that is latest and best in modern building structure and design, and it is designed to streamline and expand the organization's facilities.

Organized in 1922, the Seattle Chapter has maintained a steady increase in membership and activity, and now occupies the entire fourth floor of the Arctic Building in Seattle. The new building, located at 3rd Ave. West and West Harrison Street was deemed necessary when it became evident that quarters in the Arctic Building were proving sorely inadequate. The building program was first instituted in 1949 by a committee headed by Cliff Mortensen, then vice-president of the chapter, and James W. Cawdrey, the 1949 president.

The design of the building is based on a functional application of the requirements of the organization and is conceived as a two-story structure with the upper floor a few steps above Harrison Street and the lower floor reached from both Third Ave. West and a large parking area provided at the rear of the building. The "Construction Center" area of the building includes a large public space with facilities for plan racks, displays of materials and architects' sketches of new construction. The general office, with adjacent executive offices, affords complete control of the public area with counter facilities for checking out of plans and specifications by subcontractors and material suppliers. A wing extends to the east with a tri-level arrangement affording 24 plan rooms for the use of estimators and quantity surveyors. The space is planned so that it will be obvious at a glance which rooms are available for use. At the south end of the building is a large lounge and meeting room, so arranged that folding doors permit lounge use and a group meeting at the same time. The lower level will include eleven office areas to house associates allied to the Seattle Chapter's activities.

The building is to be executed in brick and stone veneer with some areas finished in a rough-sawn boarding. It will be roofed with a built-up tar and gravel roof and heated with a split system utilizing coils in the floor combined with an air conditioning system. The floor system between the two levels is designed using steel bar joists supported on steel I-beams with a 3-in. reinforced concrete slab. Various plastic materials are to be utilized in the building. The J. H. Wilson Construction Co., Seattle Chapter member, is in charge of construction. Stuart and Durham are architects, and Stevenson and Rubens are structural engineers. August of 1950 has been set as completion date. Elaborate and appropriate opening ceremonies are planned.

VISITORS to Oregon's Mt. Hood can soon ride on the Far West's first aerial tramway, with a length of 3.2 mi. and a lift of 2,500 ft. to the 6,000-ft. elevation. Riders will be transported in two 36-passenger cars, each of which is propelled on heavy cables by its own motor. The tram will operate throughout the year.



Unusual Diversion Scheme Sets Stage For Concreting at Canyon Ferry Dam

CONCRETE PLACING at Canyon Ferry Dam in Montana is expected to start about midsummer this year. Much of the preliminary construction work, including the diversion of the Missouri River, was accomplished last year.

The dam, located about 17 mi. east of Helena, will be the major structure on the Upper Missouri River in the Bureau of Reclamation program for development of the Missouri River Basin. The dam will be a straight gravity concrete structure about 1,000 ft. long at the crest, and approximately 212 ft. high, with an estimated concrete volume of 390,000 cu. yd. The reservoir capacity will be slightly over 2,000,000 ac. ft. The unusually high efficiency of the damsite is indicated by the fact that the storage capacity is approximately five acre feet per cubic yard of concrete in the dam.

A powerhouse containing three units each of 16,667-kva. capacity will be located at the toe of the dam on the right side of the river.

The contract for construction of Canyon Ferry Dam and Power Plant was awarded April 1949, to Canyon Constructors, a joint-venture group composed of Brown and Root, Inc., Wunderlich Contracting Co., Griffith Co., and J. C. Maguire, on a bid of $11,896,425.00.

Prior to the award of a contract for construction of the dam and power plant, a Government camp located about a mile from the damsite was substantially completed and 9 mi. of county road was relocated above the high water line of the reservoir.

During the 1949 construction season, Canyon Constructors erected shops, an office, a warehouse, bunkhouses, and seven residences, built a temporary river crossing below the damsite consisting of a timber pile bridge and several miles of connecting roads, excavated the upper portions of the dam abutments, started construction of an aggregate processing plant, excavated a bench for a cableway track, and built the cofferdams and flume for the initial diversion of the river.

In proportion to the size of the dam, the river diversion problem at Canyon Ferry is large. The river channel at the damsite is about 400 ft. wide, with a normal water depth of about 15 ft., and with approximately 30 ft. of very permeable sand and gravel overlaying the rock. The flow of the river averages about 4,000 c.f.s. and has exceeded 30,000 c.f.s.

The diversion scheme adopted by the contractor consists of upstream and downstream cofferdams, each composed of a sheetpile wall driven to rock and backfilled with sand and gravel, and a steel-framed, plank-lined flume located on a bench excavated along the right bank of the river. The flume is 65 ft. wide, 18 ft. high and 1,000 ft. long. Approximately half of the overburden in the foundation area of the dam and spillway was excavated by a floating gold dredge prior to closure of the cofferdams. Part of the material excavated by the dredge was used for backfilling the sheetpile walls of the cofferdams and the remainder was hauled upstream to spoil areas. Diversion of the river was accomplished on November 27, 1949.

PICTURED ABOVE—

A VIEW of the area between cofferdams with camera on right abutment approach road. The steel-framed, plank-lined diversion flume, 65 ft. wide, is in foreground.

The only work of consequence done during the past winter was the installation and operation of dewatering pumps and the sealing of the cofferdams by placing a heavy blanket of silt on the outside face of each cofferdam. Leakage through the cofferdams was considerably reduced by the silt blankets and the contractor is attempting to further seal the cofferdams by grouting along the sheetpiling with a mixture of bentonite, cement and sawdust.

Major construction activity for the 1950 season was started about March 15. By midsummer, foundation excavation and initial grouting should be substantially completed and the aggregate plant, concrete mixing plant and cableway should be ready for operation.

J. C. Maguire is sponsoring the construction of Canyon Ferry Dam and Power Plant for the joint venture group. Larry Soules is project manager and K. E. McDougal is construction superin-

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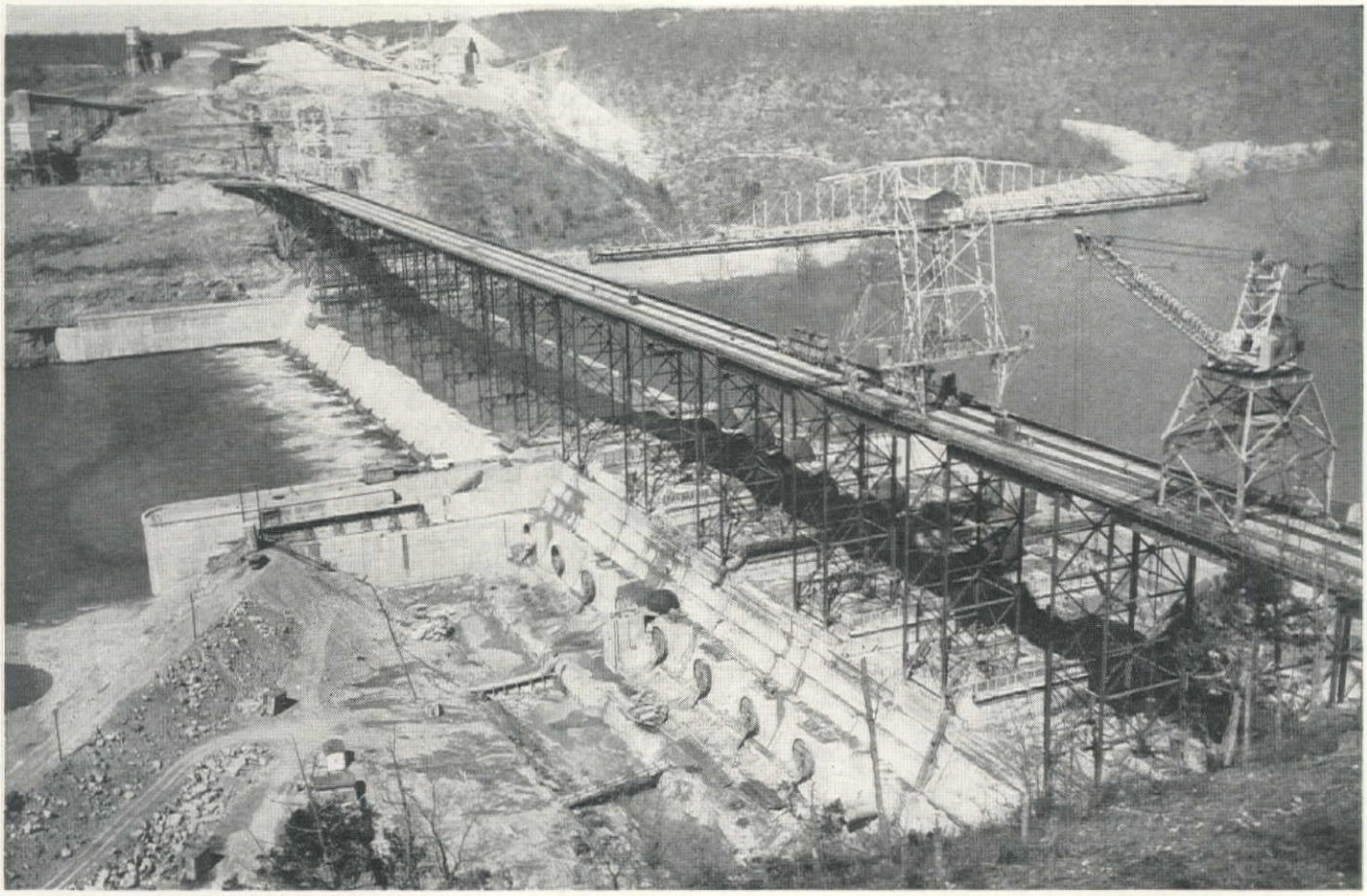


OVERALL VIEW of the Bull Shoals damsite, with about 900,000 cu. yd. of concrete in place. Powerhouse area is in left foreground. Note aggregate and concrete plants on opposite river bank.

Westerner Goes East to Supervise $76,000,000 Bull Shoals Dam Work

HARVEY SLOCUM
Superintendent,
Bull Shoals Dam

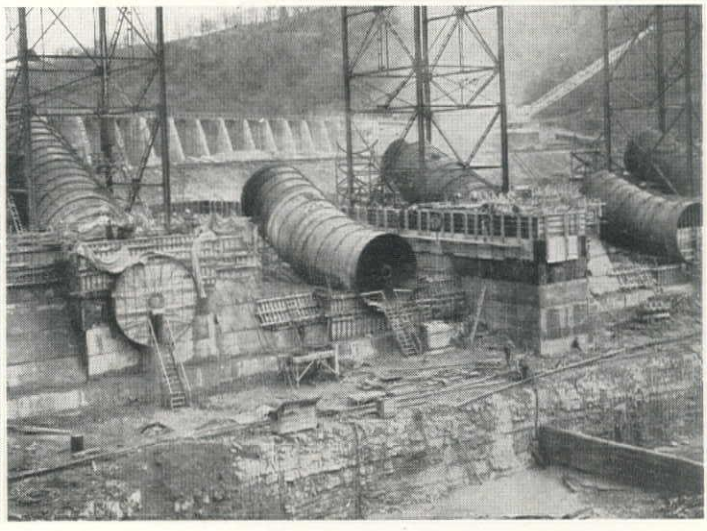
HARVEY SLOCUM, well-known in the West (as superintendent for Griffith Co. and Bent Co. on the $9,000,000 Apra breakwater at Guam, Friant Dam, etc.) is supervising construction of the $76,000,000 Bull Shoals Dam for Ozark Dam Constructors. Located on the White River in north central Arkansas, it is a Corps of Engineers project. A total of 2,000,000 cu. yd. of concrete is being placed in the dam and its powerhouse.

The gravity-type dam will create a reservoir containing some 5,060,000 ac. ft. of White River water. Height of the dam is 280 ft.; length is 2,256 ft. About half of the concrete yardage is in place, and completion is scheduled for 1951.

Ozark Dam Constructors, operating as Flippin Materials Co., is producing rock and sand from a quarry and transporting the crushed material to the dam site on a 7-mi. long conveyor belt line.

WORK on the east face of the quarry. Material crushed at the quarry to minus 6-in. size is conveyed to the damsite on a 7-mi. belt line.

THE PENSTOCK AREA. Powerhouse is on left bank of river immediately downstream from the dam. It will contain eight 45,000-kw. units.



Construction Design Chart

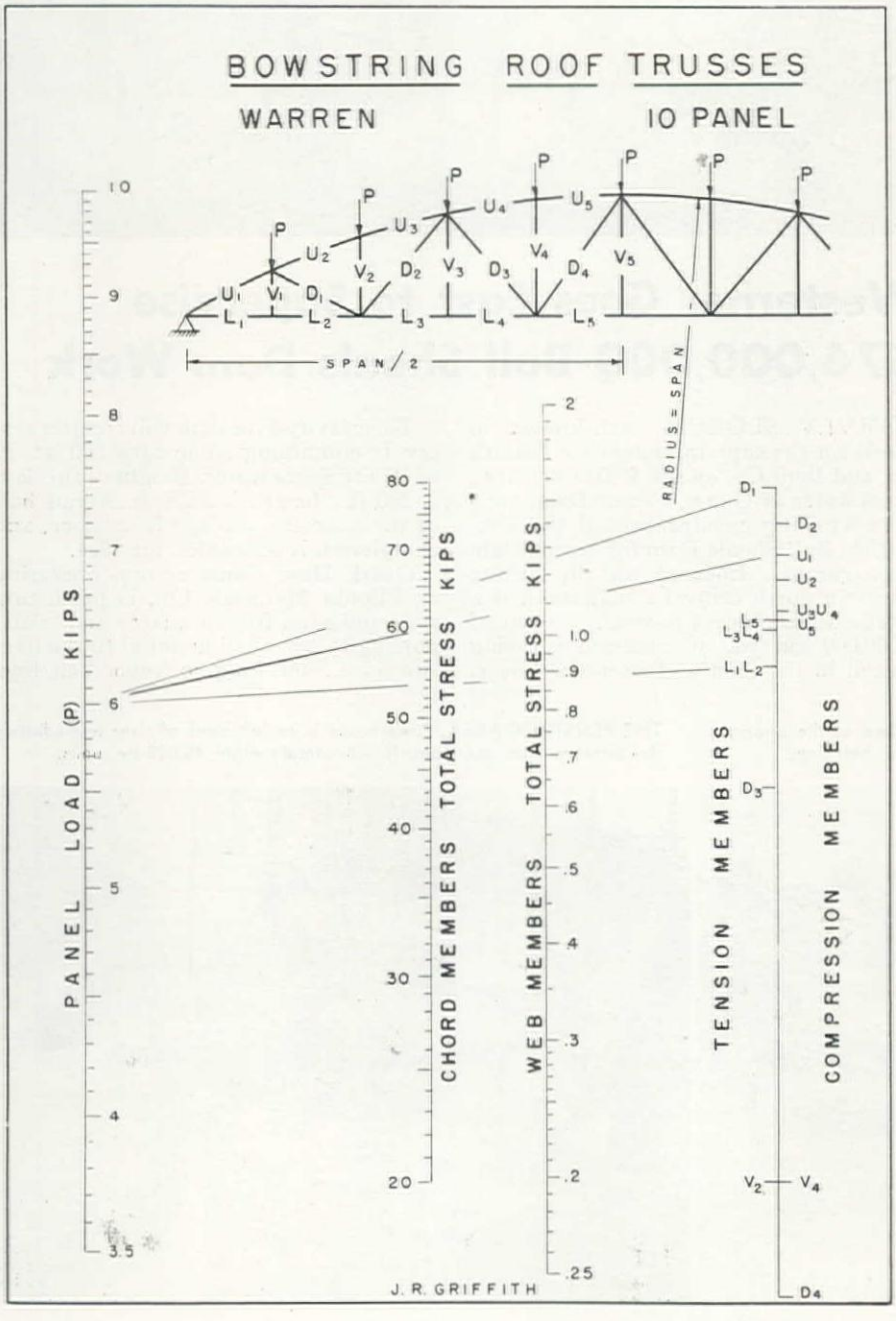
CXIX... 10-Panel Warren Timber Bowstring Truss

THE ACCOMPANYING chart adds another to the series on timber bowstring roof trusses, two others of which have already been published. The panel lengths of such trusses, as previously mentioned, should be in the neighborhood of seven feet. Thus the accompanying chart, for a 10-panel truss of the Warren type, should be used when the total span is in the range of from 65 to 75 ft.

I would also pass on some sound advice to the architects and engineers who may be specifying a timber roof truss for a building under design. Consult a fabricator of such trusses early in the planning stage. The chances are that he has previously fabricated trusses for almost identical spans and loads, and can give you very accurate cost data thereon. Utilizing available templates will tend to reduce costs. He knows timber and shop fabrication far better than you can ever hope to. If you still desire to impress your client with your knowledge, duplicate the necessary truss details which the fabricator will furnish. In the end, the owner will have a better job and his satisfaction is your prime concern. In the Northwest, the fabricators prefer to quote an in-place price as their field crews are usually able to erect the trusses more economically and assure that no damage will occur to the trusses during installation.

By

JAMES R. GRIFFITH
Dean of Engineering
University of Portland
Portland, Ore.



I have drawn solution lines on the accompanying chart for the stresses in three truss members for an assumed 6-kip panel load. The stress in the individual members, as will be noted on the chart, is as follows:

L_1 and L_2 = 53.5 kips, tension (chord member)

U_1 = 59.5 kips, compression (chord member)

D_1 = 1.25 kips, tension (web member)

If the stress coefficients, developed by Harold C. Kohl and previously referred to, are used, the results would be as follows:

L_1 and $L_2 = 6 \times 8.91 = 53.5$ kips, tension

$U_1 = 6 \times 9.98 = 59.8$ kips, compression

$D_1 = 6 \times 0.210 = 1.26$ kips, tension

Maintain, if possible, the top-chord radius equivalent to the span as indicated on the truss diagram. The chances are better that the fabricator will have available templates. If necessary to deviate from this rule, the stresses obtained from the chart must be modified by the factor

$$\frac{\text{span} \times 0.1339}{\text{total rise}}$$

When appearance is a factor, the architect will probably desire to reduce the total rise so that little of the roof will show above the parapet wall although the seriousness of such objections may be debatable. In order to be reasonably sure of safe deflections, the engineer will probably want to limit the minimum depth by the old rule in which the total rise in inches is equal to the span in feet. The stresses obtained from the chart, under such a rule, would be multiplied by the factor

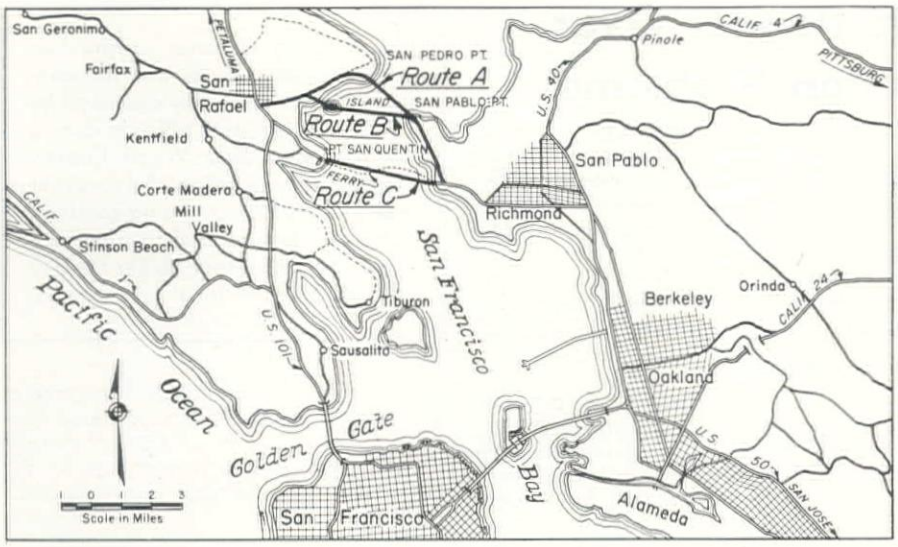
$$\frac{\text{span}}{\text{total rise}} \times 0.1339 = 12 \times 0.1339 = 1.607$$

Canyon Ferry Dam

... Continued from page 84

tendent. The work is under the supervision of L. N. McClellan, chief engineer for the Bureau of Reclamation. Kenneth Vernon is regional director for Region 6, which includes the Missouri Valley Project of which Canyon Ferry is a part. Harold E. Aldrich is district manager for the Upper Missouri Basin District with headquarters in Great Falls, and Wm. P. Price, Jr., is construction engineer at Canyon Ferry.

CALIFORNIA again led all of the 48 states in the total amount of new construction placed during 1949. New construction with a total value of about $2,118,000,000 was put in place in California during 1949. New York was second with about $1,676,000,000; Texas was third with about $1,349,000,000.



$36,000,000 Bridge Studied for the Northern Arm of San Francisco Bay

To remove a bottleneck in the main line of travel between two counties exhibiting great population growth, the California Legislature has financed studies of a major-sized bridge

DETAILED engineering studies for a $36,000,000 bridge project to span San Francisco Bay at the narrows between Richmond and San Rafael have been financed by a $200,000 appropriation approved by the present California Legislature. Discussed for many years as a logical addition to the bridges now connecting communities and highways in this general area, the project was given recent stimulus by a prolonged strike which tied up the existing ferry service for more than five months last year. As a result of this strike, the City of Richmond and the Board of Supervisors of Marin County authorized a preliminary study on the feasibility of the project for presentation to the California Toll Bridge Authority. This presentation resulted in the financing of the comprehensive design studies.

The preliminary report was prepared for Richmond and Marin County by Earl and Wright, Consulting Engineers, of San Francisco. Its findings and conclusions are reviewed briefly in the following.

Location and service

The proposed bridge will provide an important link in the most direct route between East Bay communities and the counties north of San Francisco Bay with their important recreational areas. In addition, the growing population in Marin County would be provided with a direct route to jobs in the industrial areas around Richmond.

The counties north of San Francisco Bay have increased in population about 60% during the past ten years, with a corresponding increase of 45% in motor vehicle registration. At the southern end of the proposed bridge the population increase in Alameda and Contra Costa counties has been 66% since 1940, and the industrial city of Richmond has grown more than 300%. These figures are quoted in the report to indicate the present and future traffic potential of the bridge. The report goes further to point out the usual increase in trans-bay traffic following the replacement of ferries with bridges.

The general location, as shown in the accompanying location map, shows three possible routes across the narrows. Beginning at the most northerly site, the route would require 3.25 mi. of 4-lane highway at the southern end to provide access to a bridge 10,600 ft. long. North of the bridge, 5.75 mi. of 4-lane highway would provide the connection with U. S. Highway 101 at San Rafael.

A southerly variation of this route would require the same approach on the southern end, followed by a water route 11,450 ft. long to reach the Marin Islands, followed by 3,600 ft. of roadway on fill to reach the mainland. The concluding northern approach would be 2½ mi. to San Rafael.

The most southerly location follows approximately the line of the present ferry route. It would require only a very short approach road on the southern end, but the over-water length of the structure would be 19,550 ft. The northern approach would be along the existing highway to the ferry.

A comparison of the three locations indicates that the middle one represents the lowest total cost, with an estimate of $25,000,000 for the bridge and $6,000,000 for the approaches. This location was also the one selected in the late '20s for a bridge proposed at that time.

More than one hundred borings have been made in this general area in connection with studies made for the proposed "Salt Water Barrier." The logs of these borings show that the depth to foundation material of coarse sand appears to be about 150 to 160 ft. below low water. Foundation conditions of this character were assumed in the estimates made for the present report.

Type of structure

The present estimate is based on a structure providing a double-deck highway bridge with two 13-ft. lanes on each deck. Distance between center lines of trusses is 34 ft. Grades have been assumed at not more than 5%. The main channel crossing is provided with a horizontal clearance of 1,000 ft. and a vertical clearance not less than 185 ft. above high water. Additional navigation openings about 500 ft. in width are provided on each side of the main opening.

Capacity of this structure is estimated at about 2,300 vehicles in one direction per hour.

The design on which the cost estimate was made provides the following elements starting from the Richmond end: six 509-ft. steel truss spans; a 2,000-ft. cantilever with 1,000 ft. between main piers; two 509-ft. truss spans; seven 292-ft. deck truss spans; fourteen 100-ft. girder spans, and the remainder of concrete causeway and roadway on fill.

Financing

Traffic estimates contained in the report indicate that the bridge can be financed by revenue bonds. The tolls, based on those charged by the present ferry, would cover operating expenses, interest, and debt retirement based on 3% interest and the estimated cost of $36,000,000. As to approach highways, the report states that these could be financed as a separate undertaking to lighten the financing for the bridge.

Revenues are estimated to be well over 1¼ times the annual charges for interest and debt retirement.

Conclusions

The report concludes:

a. A bridge between Contra Costa County and Marin County is needed to remove a bottleneck in a main line of travel.

b. Such a bridge can probably be built, inclusive of approach highways, for $36,000,000.

c. Traffic by the year 1956 will have increased to such an extent that the bridge can be financed.

THREE NEW MAPS of electrical facilities for Western states have been published by the Federal Power Commission. They are for the states of Idaho, Utah and Montana. The maps, reproduced in several colors on a scale of 20 mi. to the inch, show the location, capacity and ownership of the important generating stations, both hydroelectric and fuel-electric, as well as the ownership, location, nominal voltage, length, conductor size and material, and capacity of high voltage lines of 22,000 volts or over. Both existing facilities and those under construction are shown.

Copies of the maps, which are approximately 22 by 28 in., may be obtained from the Publications Section, Federal Power Commission, Washington 25, D. C., for $1.00 each.

Public Works Engineers Ponder Over Planning and Construction Problems

HOW to do a better construction job with public funds was the general subject thoroughly discussed by 250 engineers and officials during the Western Public Works Conference—But the spotlight did focus for a brief period on a rousing condemnation of federal policy which attempts to shift responsibility for civil defense plans to local government.

OVER 250 engineers and public works officials attended the April 2-3-4 Western Public Works Congress at Oakland, Calif., to confer and report developments and future trends of construction by public funds. The well-balanced meeting featured sessions equally divided between broad, generalized tendencies in design, and earthy, construction-wise know-how.

Although a heavy accent in the meeting was on Western construction, with its problems of salt water, weather, and phenomenal growth, a relatively new field was given prominence by an attack on the federal government and its lack of a program for public works under disaster conditions.

A look at federal policy

Richard Graves, Executive Director of the League of California Cities, condemned the policy of the federal government which attempts to shift responsibility for civil defense planning and organization to the governors of the states and the mayors of the cities. He stated Washington had a monopoly on the information necessary to a decision regarding the need for a civil defense program and a virtual monopoly on the highly technical information needed to determine the content of any civil defense effort, as well as the facilities necessary to equip it. Graves said, "There can be no sensible, orderly civil defense program until there is an honest, realistic national civil defense program which defines and distinguishes the jobs of federal, state and local government."

"In California," he continued, "the State Disaster Act provides the opportunity and imposes the obligation on state and local government to do a thorough job of basic planning for natural disaster. Much of what is done for disaster preparedness will have value in a civil defense program, but it would be dangerous in the extreme to assume that a good job of disaster planning represents an adequate job of civil defense programming because there are wholly new elements in civil defense for which there is no counterpart in natural disaster. Sound policy would appear to require state and local government in California to act vigorously to make fully effective the State Disaster Act and the local ordinances adopted under it. This much we can do and, therefore, must do. To do more, to give citizens the idea that the civil defense job has been taken care of when it cannot be in the absence of a federal program, would be equally unsound."

City street problems

City streets were featured in a panel on management and operation. One-way routes and all-through streets received the bulk of attention. Richard Gallagher, Director of Public Works, Berkeley, preferred through streets from ¼ to ½ mi. apart, but found this hard to arrange due to the steep topography of Berkeley. In answer to the question of when to reverse morning and evening flow on one-way streets, or center lanes on through streets, in order to handle commuter traffic, William A. Bowes, Commissioner of Public Works, Portland, advised consideration of safety before volume. First attention should go to pedestrian corners and street intersections. Residential areas frequently complain about the existing through routes and resultant noise, speed, danger, and vibration. "Everybody wants mass transportation," Bowes said, "but they want it one block away." On the other hand, Portland has seven bridges across the Willamette River, and the commuters are accustomed to having three lanes in their direction during peak flow. Reversing flow on inside lanes is not the ideal situation, but works well in this instance considering the cost.

Donald S. Berry, Assistant Director, Institute of Transportation and Traffic Engineering, University of California, stated that the unbalanced flow of commuter traffic should usually reach 3:1 proportions before it is practical to reverse the flow in center lanes of through routes. Although merchants may disagree, Berry continued, reversing center lane flow is a more drastic method of providing additional capacity than an order prohibiting parking.

What types of signs and pavement marking are best for occasional one-way streets? J. C. Albers, City Engineer, Glendale, stated that the simple "Do Not Enter" and "No Right—or Left—Turn" is best. The signs should be reflective in all cases. Gallagher, Berkeley, said that the neon-lit "One Way" sign, combined with arrow, is particularly good for intersections handling heavy out-of-town traffic.

Importance of public relations

Both Bowes, Portland, and Professor Glenn, I.T.T.E., University of California (who submitted initial report to city of Portland on recently established one-way grid system) agreed that public relations are all-important to success of the downtown one-way grid system. Extensive press, radio, and personal contact with the public was powerful in smoothing the first day of operation. Five days later on Saturday, however, a great number of rural area drivers, without benefit of the public relations program, came to town to conduct their weekly business. It happened that the sixth day of the new system was hopelessly tangled in a web of farmers who were not prepared for the radical change. Even after the downtown area had come to an absolute standstill, it took little over two hours for Portland's worst traffic jam in history to be cleared up, once the metropolitan police were called on the job to straighten the mess. At first announcement of Portland's grid system, initial animosity came from the downtown garage operators and department stores. However, with the press solidly behind the one-way movement, businesses recognized the system to be to their advantage. Average vehicle speed in the downtown area picked up from 7 to 15 m.p.h.

Trends, good and otherwise

It was the opinion of the city streets panel that vehicle loads are becoming heavier and travelling faster, whether highway engineers liked it or not. Also,

AMONG those active at the conference. LEFT PANEL, l. to r.—*C. E. Henriot*, public works board, Tacoma; *W. A. Bowes*, public works commissioner, Portland; *J. S. Roberts*, public works commissioner, Tacoma. CENTER PANEL, l. to r.—*Oren King*, city manager of Eugene; *Milton Offner*, public works board, Los Angeles; *Harry Bartell*, board of supervisors, Alameda; *C. E. Rishell*, mayor of Oakland, and *Charles Reed*, Oakland city engineer. RIGHT PANEL, l. to r.—*W. E. Rodes*; *Emil Kaleschke*, assistant superintendent of streets, Oakland; *Walter Gibson*; *Raymond Ribal*, Oakland assistant city engineer; *Victor Sauer*, Oakland construction engineer; *Ernest Tarr*, and *Donald Herrick*, director of American Public Works Conference, Chicago.

CITY STREETS were pertinently discussed by panel members grouped around table at left above. They are, l. to r.—*Ralph Moyer, George Hellesoe, Bob Glenn* (standing, chairman of the panel and an associate engineer of I. T. T. E.), *Richard Gallagher, Harmer Davis, William Bowes, J. C. Albers, Phillip Storm* and *Donald Berry*. Looking over a special structure during the panel on sewer problems at right are—*Reuben Brown, Charles Gilman Hyde* (chairman of the panel and a consulting engineer of Berkeley), *Robert C. Kennedy, R. Robinson Rowe* and *Robert Lauenstein*.

direction signs are getting bigger as more and more freeways are inaugurated in the Western states. Each year, an inch or two is added to the average height of letters on road signs, until it is common today to see 18 to 24-in. high letters on freeways. One sign, now planned for an approach on the four-level grade separation in Los Angeles, is 54 ft. long and 9 to 10 ft. high. No conclusions were reached on details such as lettering style or advantages of upper or lower case letters, but the panel was in general agreement that complicated approaches and higher freeway speeds are requiring bigger signs. It is expensive to provide standard driver decision and reaction time at the higher speeds.

Professor Ralph Moyer, Research Engineer, I.T.T.E., foresees no truck highways, exclusively for heavy axle loads, for many years. He stated truck operators are usually in a hurry and that the only solution at present is to continue existing "combination" routes and their pavements, widths, and strict speed and load limits. Moyer stated that only high cost is preventing separation of truck routes from automobile arterials on state highways.

Panel on sewer problems

Silencing manhole covers is mainly a public relations job, yet necessary as part of any technical design. Important points covered in the special sewer and aqueduct structures panel, led by Charles G. Hyde, Consulting Engineer, Berkeley, are: Present-day accurate casting of covers helps eliminate noise; covers are more often surfaced; maintenance is continually improving. Other silencing aids are beveled edges (Los Angeles), steel shims, extra weight from 150 to 225 lb. (San Francisco), and a generally flat design with no arch.

Robert C. Kennedy, Manager, Sewage Disposal Engineering and Construction, East Bay Municipal Utility District, traced the history and development of portable ladders and manhole steps. He noted the trend toward the use of ladders, and demonstrated by means of drawings the system as used by the District.

Many other Western city engineers participated in the technical program. They include Charles A. Reed, Oakland; R. W. Finks, Seattle; Ralph G. Wadsworth, San Francisco; William P. Hughes, Lewiston, and W. M. Jarrett, Alhambra. Other public works officials include Carl Froerer, Alameda City Manager; Victor W. Sauer, Oakland Construction Engineer; Raymond R. Ribal, Oakland Assistant City Engineer; R. Robinson Rowe, Supervising Bridge Engineer, Calif. Div. of Highways; Robert F. Lauenstein, San Francisco Engineer of Design; Reuben F. Brown, Los Angeles Supt. of Sewer Maintenance; Emil J. Kalesche, Asst. Supt., Streets, Oakland; Donald F. Herrick, Executive Director, American Public Works Association, Chicago; B. A. Devine, Manager and Chief Engineer, Public Utilities Commission, San Francisco; George F. Hellesoe, Maintenance Engineer, Calif. Div. of Highways; John G. Marr, City Planning Engineer, Oakland; and Phillip W. Storm, Redding City Manager.

The Western Public Works Congress was sponsored by the American Public Works Association and its Western Area, Northern California Division, and East Bay Chapter officers. Other sponsors are the League of California Cities and the Institute of Transportation and Traffic Engineering, University of California.

Storage at Grand Coulee Will Cut Columbia's Spring Flood Height

A THREE-WAY agreement among the Bureau of Reclamation, Bonneville Power Administration and the Corps of Engineers may cut a critical 1.2 ft. off the Columbia River spring flood crest at Vancouver, Washington, through use of 900,000 ac. ft. of flood control storage in Grand Coulee reservoir.

The agreement was announced in a joint statement by Colonel O. E. Walsh, North Pacific division engineer of the Corps of Engineers; Harold T. Nelson, regional director of the Bureau of Reclamation, and Dr. Paul J. Raver, Bonneville Power Administrator, on April 26.

The three officials said conditions bearing on the magnitude of the coming flood have been the subject of considerable study by their agencies in view of flood predictions based on unusually heavy snow conditions in the Columbia River's higher tributaries.

Results obtained during the 1949 flood in reducing the crest by control of flood waters in Grand Coulee reservoir, although the project was not constructed for the control of floods, were studied by engineers of the three federal agencies in the hope of bettering last year's score.

In the 1949 flood only 365,000 of an available 425,000 ac. ft. of flood control storage was used, resulting in a reduction of the peak river flow at The Dalles by 35,000 cu. ft. per sec. and cutting 0.8 ft. off the flood crest as measured on the Vancouver gage.

Considerations other than power production limit the drawdown and control of the Grand Coulee reservoir. Because of the adverse effect on logging operations within the reservoir area, saw mills operating in the vicinity, and other important factors, use of not over 900,000 ac. ft. of storage for flood control was agreed to. This necessitates holding the reservoir around an elevation of 1,279 ft. mean sea level until the critical part of the flood, when it will be filled.

Discussion of the problem by representatives of the three federal agencies—the Bureau of Reclamation which built and operates Grand Coulee dam, Bonneville Power Administration which transmits the power generated, and Corps of Engineers bearing responsibility for flood control—was initiated by Colonel Walsh. It was agreed that a flood of such magnitude as that which can be expected this spring, if unregulated, would cause considerable flooding on the Columbia River and its backwater, between the mouth of the Yakima River and the sea, with resulting damages of several million dollars.

Engineers collaborating in the plan believe that the reduction in flood heights to be effected through the use of flood control storage in the Grand Coulee reservoir may substantially reduce such damages.

The agreement includes a standing provision for a day-to-day control of Grand Coulee reservoir during the flood period. The Bureau of Reclamation will adjust the pool and discharge at the dam in accordance with daily requests by the North Pacific division office of the Corps of Engineers, based on current water and weather conditions and official forecasts of the U. S. Weather Bureau.

THE WESTERN Chapters Conference of the Associated General Contractors will be held in Reno, Nevada, on June 12 and 13 concurrently with the convention of the Western Association of State Highway Officials, which is scheduled for June 12-15.

NEWS OF WESTERN CONSTRUCTION

MAY 15, 1950

Contractors Breach Cofferdam at McNary

BREACHING of the Washington shore cofferdam to permit water to flow between the spillway piers of McNary Dam on the Columbia River was accomplished April 21. The cofferdam, construction of which started in 1947, is no longer needed to protect work on the navigation lock, Washington shore fish ladder and lock and the 13 bays of the 22-bay spillway dam, since that part of the work is now nearing completion under a $21,781,467 contract held by McNary Dam Contractors, a joint venture of Guy F. Atkinson Co., Ostrander Construction Co., and J. A. Jones Construction Co.

The actual breaching of the cofferdam was carried out by the contractors. The first step occurred April 14 when the pumps were shut off and the water from natural seepage was allowed to fill the enclosed area. When this water inside the cofferdam reached an equalizing level with the water in the river, work crews operating draglines began removing material to open the downstream wing. After this opening was made crews began work on the upstream wing to make the final breach.

Both the downstream and upstream breaches were made where the earth and rock fill wings connect with the circular steel sheet piling cells in the Washington channel of the river. The cells will remain as an anchor for the second-step Oregon shore cofferdam which is now under construction to enclose the area for the powerhouse and remainder of the spillway.

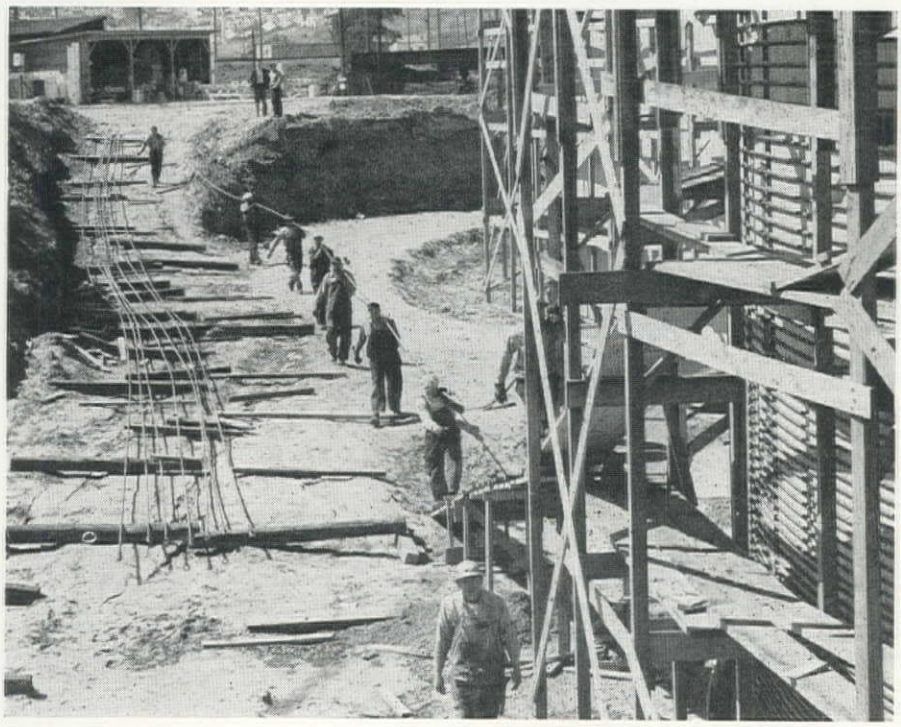
Much of the Washington shore cofferdam has already been removed, only enough having been left to provide roadway for trucks. Starting from the breach on the river end of the wings, draglines will work shoreward until the removal job is completed.

Although the Columbia River will now be flowing through the spillway section of the dam, the navigation lock will not be in operation for river transportation until early next winter. A temporary miter gate has been installed and the only water flowing through the lock will be in the intake and outlet channels. When the final closure of the river takes place on the Oregon side, this temporary miter gate will be moved to another position and river transportation then will use the lock. Until that time river traffic will use the Oregon channel.

Meanwhile the contractors are working ahead of schedule under their $15,835,539 contract on the Oregon shore. Inside the "junior" cofferdam excavation for the substructure for two units and service bay of the powerhouse is progressing along with work on the Oregon shore abutment embankment. Work on the second-step cofferdam will be resumed following the high water period this summer.

8,000 PRE-STRESSED STEEL RODS ENCIRCLE SEWAGE DIGESTOR TANKS

WORKMEN are shown installing one of 8,000 high tensile roll thread rods used to band the concrete walls of the ten big digestor tanks in the City of San Francisco's $5,000,000 North Point sewage plant. The 1⅛-in. rods are each 31 ft. 8 in. long. MacDonald, Young & Nelson and Morrison-Knudsen are general contractors. Soulé Steel Co. of San Francisco, sub-contractors, supplied the Bethlehem Pacific rods.



USBR Puts Four Large Earth Dams Up for Bid

FOUR LARGE earth dams are being advertised for bids by the Bureau of Reclamation this month. On May 12, the Bureau issued invitations for construction of Trenton Dam on the Republican River in Nebraska. The dam, to be 100 ft. high and 8,000 ft. long, will involve 5,400,000 cu. yd. of earthfill and 4,060,000 cu. yd. of excavation for spillway and outlet works. Spillway and outlet works will be of concrete. Also on May 12, the Bureau asked for bids on the Carter Lake Reservoir about 8 mi. west of Berthoud in Colorado. This will be an offstream reservoir consisting of three earthfill dams 50 to 200 ft. high, and a 600-ft. long concrete lined tunnel, 6¼ ft. in diameter. Excavation for the dams will be 2,977,000 cu. yd.; earthfill totals more than 2,000,000 cu. yd.

On May 19, bids will be invited for Big Sandy Dam and dike, an earthfill structure 70 ft. high and 2,300 ft. long on the Big Sandy Creek near Eden, Sweetwater County, Wyoming. Earthfill totals 750,000 cu. yd. On May 22, bids

will be invited for the earthfill Cachuma Dam on the Santa Ynez River in Southern California. The dam, to be 216 ft. high and 2,900 ft. long, will involve more than 3,000,000 cu. yd. of excavation and 6,200,000 cu. yd. of earthfill.

On May 15, the Bureau asked for bids on a 23-mi. section of Friant-Kern Canal, which will be concrete lined. A total of 2,981,400 cu. yd. of excavation is involved. The section includes the 300-ft. long Poso Creek siphon and the 200-ft. Calloway and Santa Fe siphons.

On May 17, the Bureau is asking for bids on the San Luis Wasteway on the Delta-Mendota Canal near Los Banos, Calif. Excavation for the unlined wasteway totals more than 3,000,000 cu. yd.

Construction of a 17-mi. unlined section of the Potholes East Canal near Othello, Wash., will go up for bid on May 29. Some 4,000,000 cu. yd. of excavation is required.

Relocation of 18 mi. of C. B. & Q. railroad at Trenton Dam in Nebraska was advertised for bids on May 10. Excavation for roadway totals 3,460,000 cu. yd.; overhaul for roadway, 7,130,000 sta. yd. Construction of bridge superstructures for 7 steel railroad bridges on the above project will be advertised for bids May 22.

Increased Trucking Adds to Oregon's Road Repair Costs

BECAUSE of increased trucking during the past two years and partly because of overloading of trucks, the repair and maintenance of Oregon's highways will divert nearly half of the state's new construction funds in the 1950 fiscal year budget, according to R. H. Baldock, chief engineer of the Oregon State Highway Commission. Currently, the state is spending about $15,000,000 per year now on new construction. Baldock is recommending that half of this amount be diverted to strengthen existing highways. Many other states of the West are also facing the necessity of strengthening roads built before the recent heavy increase in trucking operations. A review of the entire "truck and highway" problems in the West will be presented in the Annual Highway Issue of *Western Construction News* next month.

Colorado River Dredge—

RAISED during February, the dredge "Colorado" of the Bureau of Reclamation is being rehabilitated for further excavation and levee building along the Colorado River. The dredge sank last November and refloating became a major engineering job. The work included pumping out compartments in the pontoon hull and lifting with salvage hoists to break sand suction.

The methods used in raising the dredge will be described in an authoritative article next month.

Wyoming Makes Six Recommendations For Federal Water Resources Policy

SIX POSITIVE recommendations concerning formulation of the nation's water policy have been made by L. C. Bishop, State Engineer of Wyoming, in a letter addressed to Morris L. Cooke, Chairman of the President's Water Resources Policy Commission. Bishop strongly urged that water compacts should be required by all federal agencies on interstate streams, and pointed out the need for legislation to set out properly the allocation of project costs which should be charged to national costs.

The following is quoted from Bishop's letter, in which the six recommendations were made and the reasons outlined for each recommendation. Recommendations are in bold face type; reasons for the recommendations follow.

1. Water compacts should be required by all federal agencies on interstate streams where it is proposed to divert, store or in any manner appropriate the waters of said streams. Reasoning: The construction of large developments on a river system, particularly where irrigation is proposed, creates a priority in water use which may prevent another state from securing in the future its equitable share of the water for future development and use.

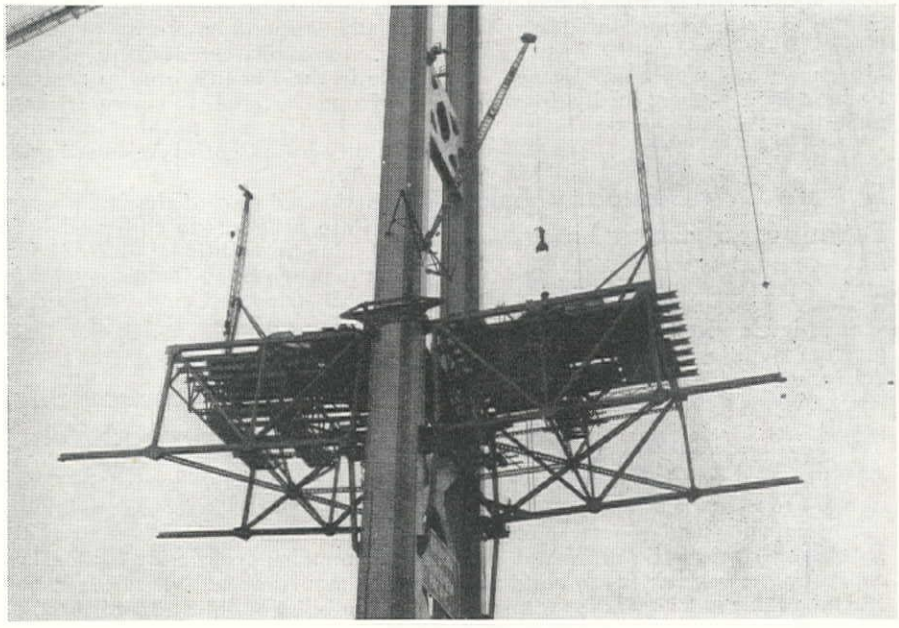
2. There is a need for legislation by the Congress to set out properly the allocation of project costs which should be charged to such national benefits as power, silt and flood control, wildlife and recreation benefits. We believe these benefits are much greater than presently anticipated by the federal agencies. Reasoning: The need for a national policy on allocation of costs for multiple purpose projects has been apparent for some time, and bills have been introduced in the Congress for that purpose. As stated, we are of the opinion that there are greater benefits for some of these purposes than have been anticipated, and the water user under the project should only repay a fair share of the cost.

3. The use of water for domestic, municipal, stock water, irrigation and industrial purposes should be superior to any use for power or navigation purposes in all river basins the same as it is in the Missouri River Basin. Reasoning: The use of water for irrigation, domestic and stock purposes is of paramount importance in the arid states of the West, and the use of water for power and navigation purposes should in no way be allowed to interfere with such uses. Legislation should be passed for protection of all large river basins in the arid and semi-arid West. Power if necessary can be developed by other means and other methods of transportation than navigation can be used if necessary.

4. Supplemental water should be furnished for acreages in excess of 160 ac. under projects where the lands are largely devoted to raising hay for livestock and are now in private ownership. Reasoning: Several projects proposed for construction in Wyoming would furnish a badly needed supplemental supply of water to lands which because of high elevation and short growing season are devoted to raising hay for livestock. Such an economy must depend on a considerable acreage of hay lands as the

FLOOR PANELS OF TACOMA NARROWS BRIDGE MOVE INTO PLACE

THE START of structural steel erection from one of the main towers of the Tacoma Narrows Bridge is shown below. Erection is proceeding from both main towers, in both directions from each. As work of erecting the roadbed goes ahead, steel panels for floor are attached to suspender wire ropes which hang vertically from main cables.



yields per acre are low. Some adjustments of the acreage limitation of 160 ac. is necessary on these projects. Definite provision for this should be made on each project before construction.

5. Wyoming is opposed to the creation of any type of Valley Authority or Administration. We believe the development of our water resources should be by existing agencies of the federal government under authorization and control of the Congress. Reasoning: Our citizens have shown themselves to be opposed to the creation of so-called Authorities to take over development of stream basins. They are very apprehensive as to the effect upon their water rights of any such administration. Further they do not favor giving broad powers as have been proposed to any authority or board appointed by the President.

6. Management of projects should be eventually turned over to irrigation districts and perpetual water rights adjudicated to indvidual users under State laws. Reasoning: The Bureau of Reclamation should operate only as a construction agency and contracts for the use of water should provide that each individual user acquire a perpetual water right and a proportionate interest in the irrigation works. In the case of large multiple purpose projects for the benefit of a stream basin, the operation should remain with the federal government.

Begin $7,500,000 Housing Project at Fort Bliss

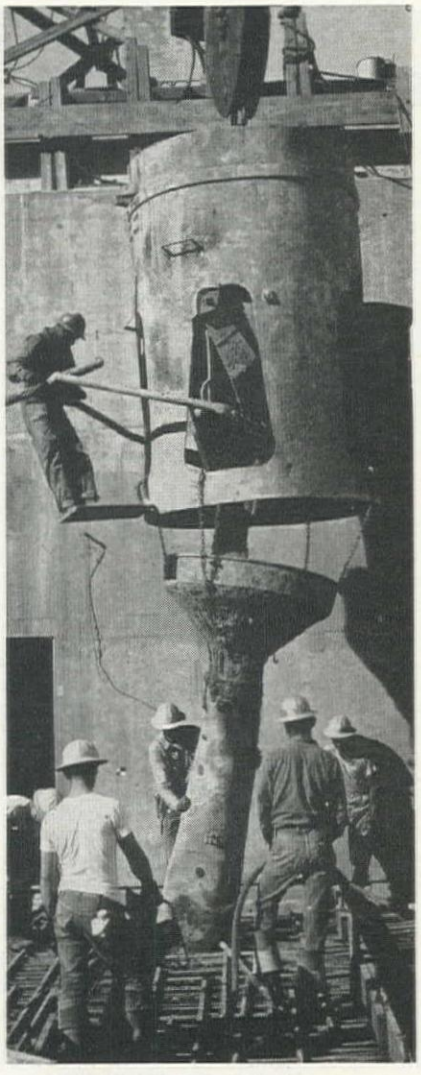
FORT BLISS near El Paso, Texas, the nation's largest military installation, will soon have the second housing development to be constructed under terms of the Wherry Military Housing Bill, passed by the last Congress. The project, to be known as Van Horne Park, will cost $7,500,000, and will be an 800-unit development for the families of officers, enlisted men and civilian employees of the Army. The entire project will be completed within one year. Groundbreaking ceremonies were conducted recently. Developers and builders of Van Horne Park are two El Paso firms—Morgan Co., Inc., and Leavell and Ponde, Inc., both specially formed to undertake the joint venture.

El Paso Gas Company Asks Permit for Arizona Line

EL PASO Natural Gas Co., of El Paso, Texas, is proposing the construction, acquisition, and transfer of natural gas pipeline facilities in order to increase its deliveries of natural gas to Phoenix, Ariz., by approximately 35,000,000 cu. ft. per day.

The company has applied to the Federal Power Commission for authorization (1) to construct approximately 34.2 mi. of pipeline and several meter and regulating stations in Pinal and Maricopa Counties, Ariz.; (2) to build about 10.3 mi. of line in Phoenix for transfer to Central Arizona Light and Power Co.; (3) to abandon several city gate stations in Phoenix and environs; (4) to transfer approximately 24.6 mi. of existing line in the Phoenix area to the Central Arizona Co.; and (5) to acquire approximately 11.9 mi. of line in Maricopa County from Central Arizona Light and Power.

Estimated cost of the facilities which El Paso proposes to construct is $610,730, plus an additional $256,324 for the line it proposes to build for transfer to Central Arizona. Central Arizona is the distributor of natural gas in Phoenix.



PLACING DAVIS DAM CONCRETE

WORKMEN at Davis Dam place concrete with a 4-cu. yd. bottom-dump and short rubber elephant trunk in Unit 1 of the dam's power house. Note metal platform attached to bucket for men to stand on. The power plant at Davis will be substantially completed this year.

Federal Aid Highway Bill Includes Local Road Help

HEARINGS have started in Congress on a $961,000,000 federal aid highway bill (S. 3424) which calls for a $150,000,000 annual appropriation for local roads. The monetary authorization proposed in the bill would be administered under the supervision of the Bureau of Public Roads. Funds would be available to any rural local road not on the Federal Aid Secondary System.

The county road appropriation would be allocated to the states and in turn to the counties of each state under the same formula presently employed for distribution of the federal-aid secondary funds. The federal government's share of construction costs would be 40%, the state 25%, and the county 35%. It is further provided that the cost to the federal government should not exceed $4,000 per mile.

Big Dam Proposed in Feather River Canyon

A BILL has been proposed in the California Legislature for construction of a big dam on the Feather River 5 mi. above Oroville, Calif., that would have a reservoir capacity of 3,000,000 ac. ft. and would be higher than Shasta Dam by some 75 ft. Through connection with the Central Valley Project facilities, the Oroville dam would supply water to the San Joaquin Valley, thereby releasing San Joaquin storage in Shasta's reservoir for use in the Sacramento Valley through canals proposed to be constructed on both sides of the Sacramento River. The legislative bill would authorize the Bureau of Reclamation to make detailed studies and cost estimates of a Feather River Basin Development, which would include besides the dam the system of irrigation canals, power generating plants and transmission lines. It is estimated that 300,000 kw. of power could be generated. It was stated that the project would be self-liquidating under the reclamation law.

Electronic System Measures Level of Remote Reservoir

A MEASURING SYSTEM which will electronically record pressures up to 30 mi. from the point of measurement has been developed. Typical of practical applications for such a system is the determination of level of reservoirs located long distances from cities. Continuous measurement of reservoir levels could reduce spill-over water losses in cases where one reservoir is fed from others, according to the developers. The measuring system consists of a transducer which senses pressure changes and converts the charge into electricity, and a remotely located indicating or recording instrument to which the energy is transmitted. The system was developed jointly by Manning, Maxwell & Moore Co. and the Brown Industrial Division of Minneapolis-Honeywell Regulator Co.

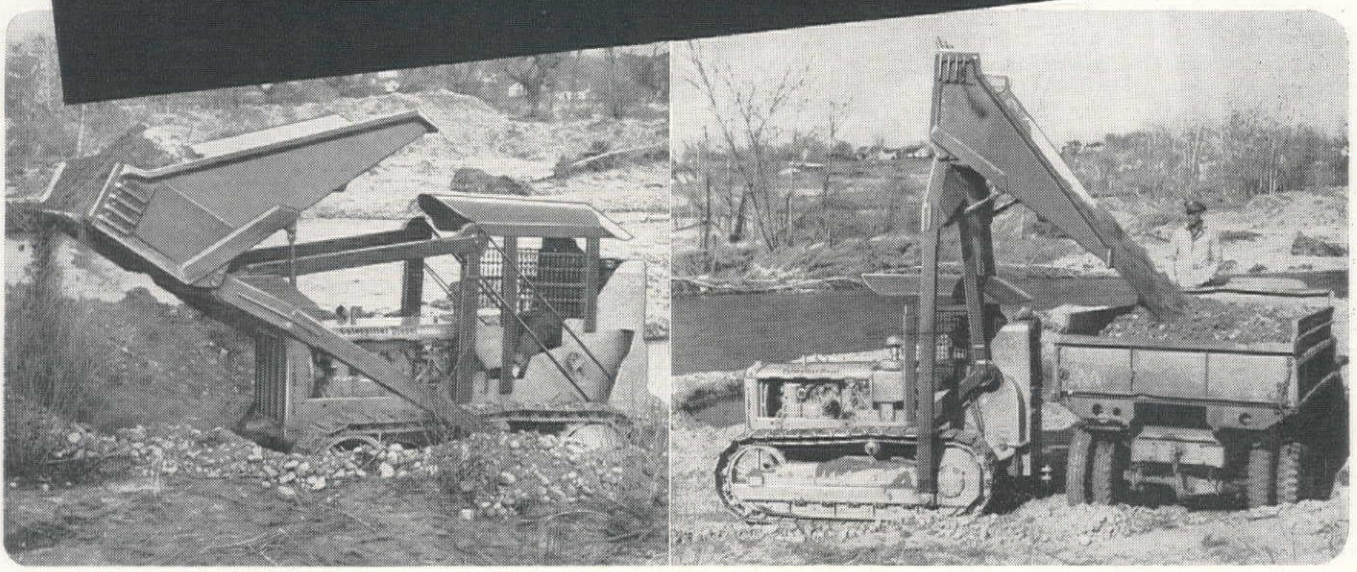
PRODUCTION of construction materials in January 1950 dropped 12% from the December level but was 3% higher than in January 1949, according to the U. S. Department of Commerce.

Load 125 Yards Per Hour...

with your Utility Size Tractor*...

AUSTIN 4-C OVERSHOT LOADER

*The Austin 4-C Overshot Loader fits the Caterpillar D-4, International TD-9, and Allis Chalmers HD-5



At the time these pictures were taken, this operator was loading bank-run gravel at 125 yards per hour on a 50-minute hour with fuel consumption about the same as for normal dozing operations. The simple shuttle operation of the tractor and single lever control of the loader permit a 20-second loading cycle without swinging and blocking.

The power system is a Caterpillar Model 24 cable control unit driving a single cable through a wrap-around series of sheaves. This gives even tension at both sides, maximum power at the start of the loading cycle, and maximum speed for the balance of the cycle.

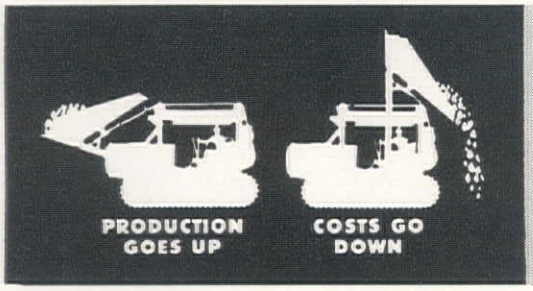
Designed for Underground Mining or Surface Operations

For underground mining, the loader has an overall height of 12′ with bucket raised, and a dumping clearance of 6′. The standard machine for surface operation has an overall height (bucket raised) of 15′-3″, and dumping clearance of 8′. A height of 7′-8″ with bucket lowered gives easy clearance at all underpasses during transportation, as does the 7′-6″ overall width. Bucket capacity is 1 cu. yd., rated; weight is approximately 7,000 lbs.

Does the Work of an $18,000 Machine Only $4,300 (Plus tractor)

The Austin 4-C Overshot Loader handles stock pile and loose bank material at lower cost than you've ever known and saves your expensive equipment for other duty. F.O.B. Factory price of the loader is $4,300.00, subject to change without notice. Make your tractor a one-man machine for loading, cleaning, sweeping and excavating. It has a place in any operation.

OTHER MODELS—1½, 2½, and 3½ yds. rated capacity • • • ASK FOR FOLDER



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PERSONALLY SPEAKING

R. D. Goodrich, retired dean of the University of Wyoming school of engineering, was named engineer for the Upper Colorado River Commission at a recent meeting of the commission in Grand Junction, Colo. Goodrich, at one time city engineer of Cheyenne, has been actively engaged in hydraulic engineering for the past 50 years. He will move his residence to Grand Junction.

* * *

Clifford M. Weber, district construction supervisor at Los Angeles for the California Division of Architecture, retired last month after 38 years of state service. He has had charge of all state construction projects handled by the Division of Architecture south of the Tehachapis.

* * *

G. A. Anderson, national manager of store construction for Safeway Stores, Inc., for 12 years with headquarters at San Francisco and more recently an engineer for Del E. Webb Construction Co. at Emeryville, Calif., is now general manager of the Hoffman Development Co., Portland, Ore. Hoffman Development Co., affiliated with L. H. Hoffman Construction Co. of Portland, was formed recently to provide "package" service for industrial firms locating in the Pacific Northwest, particularly in the Portland area, which is the fastest growing section of the United States. The firm's service includes procurement of site, design of buildings for the site, construction of the buildings, financing and leasing for industrial plants, commercial buildings and warehouses. The new firm's Portland address is 705 S.W. Columbia St.

* * *

Verne L. Peugh, formerly with Winston Bros. Co., is now with Peter Kiewit Sons' Co. and is stationed at the firm's branch office in San Francisco.

* * *

L. Vaughn Downs, Bureau of Reclamation engineer at Coulee Dam in Washington, has been transferred to Ephrata, Wash., as chief of the field engineering subdivision of the Columbia Basin's Project's irrigation division. In his new assignment, he will be responsible for the location of lateral canals and the layout of farm units in connection with acreage irrigated by the project's works. Downs has been construction engineer in the Coulee Dam division, directing all contract construction work, worth some $25,000,000.

* * *

Following dismissal of removal proceedings that had been inaugurated by Montana's Governor John W. Bonner, the following men have resigned from the Montana State Highway Commission—**Lee M. Ford,** chairman; **A. W. Heidel** and **H. W. Kincaid,** members, and **Will O. Whipps,** secretary. Three new members to the Commission have been named. They are **Harry Soderberg, Nels N. Bach** and **John R. Graham. George Poore** is acting Montana State Highway Engineer.

* * *

REYBOLD

Lt. Gen. Eugene Reybold, wartime Chief of Engineers, U. S. Army, has been appointed executive vice-president of the American Road Builder's Association, with headquarters in Washington, D. C. His appointment was announced by the association's president, **Col. E. R. Needles,** New York consulting engineer. Gen. Reybold succeeds **Charles M. Upham,** who recently retired as executive head of ARBA after 24 years as its engineer-director. Prominent in the engineering profession and in the construction and equipment fields, Gen. Reybold, a veteran of both World Wars, has an Army career dating back to 1908. His career as a builder in the Corps of Engineers brought him assignments as district engineer at various locations in the East. He retired from the Army in 1946. He is a member of the American Society of Civil Engineers.

* * *

Bernard Hodgin has been named county engineer of Maricopa County, Arizona, to replace **Julius Irion,** resigned. Hodgin has held the post twice before in recent years, and has worked as an engineer with the Arizona State Highway Department.

* * *

George W. Marx of Phoenix, Ariz., chief sanitary engineer of the Arizona State Department of Health, was elected president of the Arizona Sewage and Water Works Association at the organization's annual meeting in Safford last month. Other new officers include **Stuart Henderson,** Prescott, first vice-president; **M. T. Goudy,** second vice-president, and **H. Rotthaus,** secretary-treasurer.

* * *

A new Wyoming state highway department district has been set up at Evanston. **W. E. Sutton,** highway department chief maintenance engineer and his assistant, **G. T. Shrum,** are assisting **C. R. Lord,** district maintenance engineer, in getting the new district into operation.

* * *

Representing the five national engineering societies, the Water Policy Panel of the Engineer's Joint Council, New York, has undertaken the highly important and timely task of developing a statement on the water resources of the nation, with particular reference to the use and abuse of water supply sources. The Panel has been asked by the President to speed the development of its report for consideration by and guidance of the federal "Temporary Water Resources Commission." Eight task committees have been named. Chairman of Committee No. 4, dealing with "Irrigation," is **S. T. Harding,** conservation engineer of Berkeley, Calif. Chairman of Committee No. 6, dealing with "Recreation, Fish and Wild Life Aspect of Water Resources" is **M. P. O'Brien** of the University of California at Berkeley. Chairman of the eight committees is **Dr. Abel Wolman** of Johns Hopkins University.

* * *

Kenneth G. Tower, hydraulic engineer with the Portland District, Corps of Engineers, for the past ten years, has been named chief of the power division of the United Western Investigation of the U. S. Bureau of Reclamation at Salt Lake City. Tower has been head of the hydraulics and power section of the Portland District's engineering division. At that post, he had to do with the hydraulic design of Fern Ridge, Cottage Grove and Dorena Dams; the hydraulic design of Detroit and Lookout Point Dams, and McNary and the lower Snake River series of dams. He also had previously worked for three years as structural engineer on structural and hydraulic design for the Bureau of Reclamation at Denver. Primary purpose of the United Western Investigation division which he will head is to get water to Los Angeles by any means, one of which suggested is taking water from the Columbia River to California.

* * *

William F. Kubach, Jr., Comptroller of the Bureau of Reclamation, has retired after 40 years of government service.

* * *

A new engineering services division has been established at the Hanford Works atomic plant at Richland, Wash. **J. G. Carriere** has been appointed manager of the new section of the project's design and construction divisions. **T. G. LaFollette** was appointed assistant manager of the engineering services division. The new division will be responsible for coordination between the design and construction sub-contractors to General Electric Co., which operates the Hanford Works as contractor to the Atomic Energy Commission.

* * *

A. G. Rockstad is president and general manager of Pacific Coast Construction, new general engineering and construction company with offices in Southgate, Calif., and Everett, Wash.

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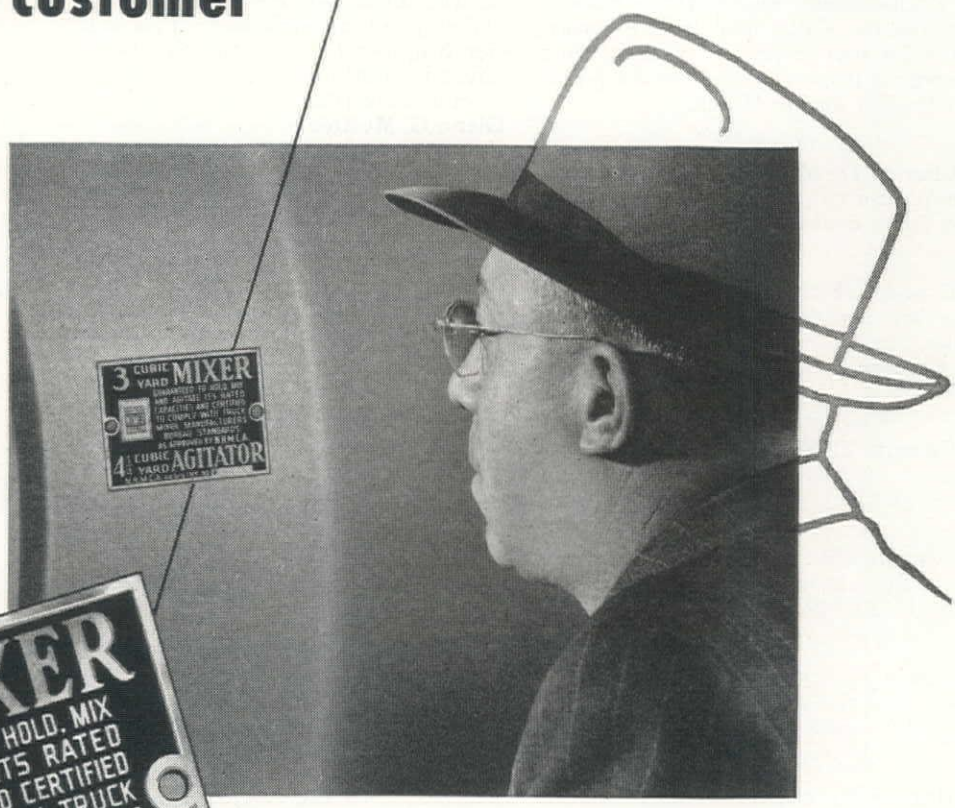

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Truck Mixer Manufacturers Bureau

OBITUARIES . . .

Oscar C. Blumberg, 46, senior sanitary engineer with the California State Department of Public Health, died recently at Berkeley. He had been with the department since 1942, and at the time of his death was in charge of the water supply section for the entire state.

* * *

A. B. Ribbeck, 38, chief of the Bureau of Reclamation's engineering offices at Sacramento, Calif., died from exposure when he was caught in a snowstorm during an inspection trip on the Klamath Project during March.

* * *

Charles D. Murphy, 61, co-owner of the Western Construction Co., of Clifton, Ariz., died recently.

* * *

Ernest C. Fullmer, 63, partner in Fullmer Brothers, contracting firm of Salt Lake City, Utah, died April 4. He founded the firm with two brothers 20 years ago.

* * *

Edward Y. Billups, 76, building contractor of Alamogordo, New Mexico, died April 5.

* * *

Lawrence W. Crehore, 70, who served as the first city engineer of Fallon, Nev., from 1912 to 1924, died April 2.

* * *

Edwin Henry Seymour, 50, who retired from the contracting business last year at Yakima, Wash., died recently.

* * *

Horace Mathis, 55, building contractor of Los Angeles, died April 6.

* * *

John P. Conduit, 82, civil engineer of Los Angeles, died April 16.

* * *

Levi Stone Heywood, 89, retired building contractor of Layton, Utah, died April 17.

* * *

James C. Broad, pioneer contractor of Spokane, Wash., died April 7. Many water systems, sewers and bridges were built by his general contracting firm in eastern Washington during the past 50 years.

* * *

William C. Crowell, 78, contractor of Pasadena, Calif., who built many of the buildings on the campus of the California Institute of Technology, died April 14. He had been in the contracting business for 50 years.

* * *

Raymond George Tryon, 83, paving contractor of Los Angeles, died April 23.

* * *

Earl Friend Stone, 26, resident engineer in Battle Mountain, Nev., for the Nevada State Highway Department, was killed in an automobile accident April 22.

SUPERVISING THE JOBS

Ben L. Richards is the superintendent for Winston Bros. Corp., Azusa, Calif., on the $3,022,478 construction of the spillway and east embankment for Whittier Narrows Dam on the San Gabriel River in southern California. The contract was awarded in March of this year. **Glenn G. McAfee** is supervising excavation work.

* * *

Ed Roach is the superintendent for Northwestern Engineering Co., Denver, Colo., on the $296,995 contract awarded in March for construction of about 13 mi. of state highway between Rangely and Meeker in Colorado. **Jim Guilford** is foreman of grading operations and **Ed Burnside** is the field office manager.

* * *

Richard L. Gardner of Gardner Construction Co., Glenwood Springs, Colo., is supervising the $328,352 construction for the firm of 2.3 mi. on the northern approach to the Denver Valley Highway. The contract was awarded in March. **Harry I. Gardner,** owner of the firm, is generally supervising the work and acting as purchasing agent.

* * *

Charles H. Thompson is the superintendent for Guy F. Atkinson Co., South San Francisco, on the firm's $2,340,600 contract with the Corps of Engineers for construction on the San Diego-Mission Bay Floodway in southern California. The contract was awarded in March. **Eugene Blossfield** is the project engineer; **Louis Hershberger** is office manager. Purchasing is from the firm's Long Beach office.

* * *

I. N. McClure is field superintendent for the J. R. Porter Construction Co. on the $188,000 construction for the Bureau of Reclamation of a Systems Dispatchers building at Phoenix, Ariz.

* * *

Del E. Webb Construction Co., Phoenix, Ariz., has brought construction of the $4,000,000 Veterans Administration Hospital in Phoenix to one-third of completion. **Lu Germain** is supervising the work, and **Fred McDowell** is assistant superintendent. **C. A. Cosgrove** is the company engineer. **Willard Davidson** is the general carpenter foreman and **Red Jones** is labor foreman.

* * *

John Gracik and **Carl Pearson** are shift bosses and **L. H. Kilgroe** is structures superintendent for J. H.-N. M. Monaghan Construction Co., Derby, Colo., on the $600,000 re-alignment of State Highway 81 near Wellington, Colo. **Nolan Yeates** is office manager.

* * *

D. J. Price is the superintendent for Olson Construction Co. of Salt Lake City on the $1,100,000 construction of the Sisters of Charity hospital at Cheyenne, Wyo. Foremen include **P. F. Walters, Frank Ross, B. Downey** and **W. H. Land. R. H. Marker** is office manager.

* * *

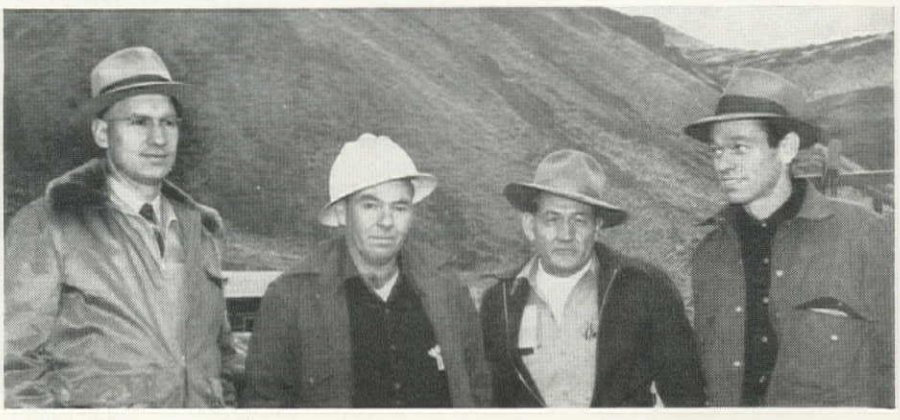
Ralph J. Walker is the superintendent for Walker Bros. Construction Co. on road re-alignment near Castle Rock, Colo. Foremen are **Bob Walker** and **Earl Weston.**

* * *

Charles Prose is the superintendent for Arizona Sand & Rock Co., Phoenix, Ariz., which has the $340,000 contract for construction of the Coolidge Substation on the Davis Dam Project (Ari-

SUPERVISING relocation of 17.8 mi. of the Spokane, Portland and Seattle railroad at McNary Dam reservoir site for Morrison-Knudsen Co., Inc., are, left to right—*O'Dean Anderson*, project manager; *G. G. "Dick" Johnson*, assistant superintendent; *Clyde Bledsoe*, project engineer, and *William Kennish*, general superintendent, well-known M-K railroad construction boss in the Northwest. Completion is in December.

Photo courtesy Em Kayan.



zona-California border, Colorado River) for the Bureau of Reclamation. **Joe Brown** is carpenter foreman and **Hugh Howell** is concrete foreman. Construction under the contract consists of concrete and steel structures.

* * *

Homes & Son, Phoenix, Ariz., has several contracts under way. **Earl Kurtzman** is supervising construction of a dormitory building at Tempe, Ariz., for the firm. **Ed Johnson** is supervising construction of the Bayless & Sons store building in Phoenix. **Otto Stromschalt** is supervising residence construction.

* * *

M. M. Sundt Construction Co., Tucson, has **Howard McCormick** as superintendent on construction of a sewage disposal plant at Tucson. **Morris Bolzer** is engineer.

* * *

Current personnel for H. L. Royden, heavy duty contractor of Phoenix, Ariz., include **W. F. "Bill" Scudder**, assistant to Royden; **H. L. Wheat** as superintendent; **Woodrow B. Joslyn**, master mechanic.

* * *

A. V. Toolson is the superintendent for Gibbons & Reed Co., Salt Lake City, Utah, on the $1,548,600 relocation of about 11.6 mi. of the Spokane, Portland & Seattle Railroad between Yellepit and Finley in Washington. The project, which is in connection with construction of McNary Dam on the Columbia River, was started last month. **John D. Bowman** is the job engineer and **J. S. Nowell** is the office manager.

* * *

C. J. Smith is project manager for the Guy F. Atkinson Co. out of the firm's Portland, Ore., office on the $810,310 contract for rebuilding approaches to the toll bridge across the Columbia River at Longview, Wash. The contract was awarded in March. **Ted Wiegman** is structure superintendent; **R. L. Henderson** is paymaster.

* * *

Ray L. Browne is the superintendent for Utah Construction Co., San Francisco, on the $672,760 relocation of a section of the Southern Pacific Company Railroad in connection with construction of Lookout Point Dam on the Willamette River in Oregon. **Dave Howard** is general foreman. Work started last month.

* * *

F. E. Petersen is the superintendent for D & H Paving Co., Vancouver, Wash., on the $239,361 widening and surfacing of about 2.7 mi. of U. S. Highway 1 to the Seattle city limits in King County, Wash. **Fred E. Hardisty** is superintendent on the job.

* * *

C. F. Urbutt is the project manager and **Fred A. Divita** is job superintendent for J. H. Pomeroy & Co., San Francisco, on the $2,685,795 construction of military installations at Fire Island in Alaska. Work on the project started

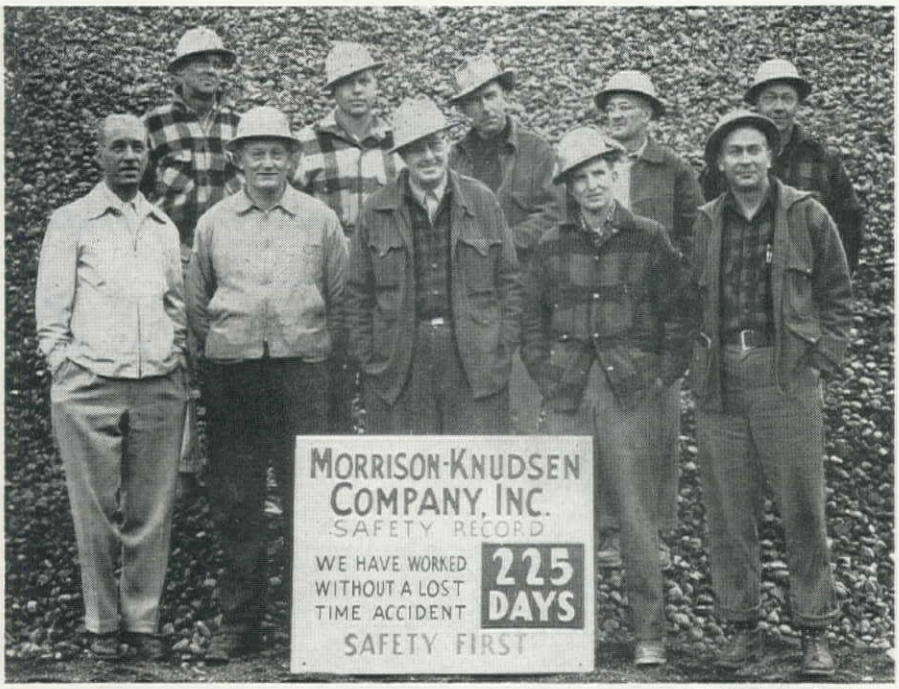


Photo courtesy Em Kayan.

225 CONSECUTIVE DAYS WITHOUT A LOST-TIME ACCIDENT. That's the record posted by the crews of Morrison-Knudsen Co., Inc., during construction of the West Main Canal of the Columbia Basin Project in eastern Washington. Responsible for the record are the men above. Front row—*Frank Morrison*, office manager; *T. K. Jensen*, head Monighan operator; *Arthur Sorrels*, assistant excavation superintendent; *Thomas Barber*, project engineer, and *George Ralph*, safety engineer. Back row—*William Goodwin*, rock superintendent; *William Ellis*, master mechanic; *Roy Johnson*, project superintendent; *Emil Wikner*, excavation superintendent, and *Bill Porter*, batch plant foreman.

last month. **R. B. Davis** is carpenter foreman and **A. F. Sullivan** is chief accountant.

* * *

H. C. Longenbaugh is superintendent and **Lester Clark** is his assistant for G. I. Martin Construction Co. on the $299,000 construction of a road from Santa Rosa to Vaughn in New Mexico. Completion of the project is scheduled for July of this year.

* * *

Dan Daniels is project manager and **Sid Milligan** is assistant superintendent for contractor Jack Adams on construction of a farm-to-market road in New Mexico.

* * *

"Bill" Williams is the superintendent for Pecos Valley Construction Co. on a $274,060 contract from the Bureau of Reclamation for lining of main canal on the Fort Sumner Project in New Mexico. Completion is scheduled for April, 1951.

* * *

Kenneth J. "Red" Mann is the superintendent for Peter Kiewit Sons' Co. on the firm's $1,216,698 contract from the Bureau of Reclamation for construction of the Poudre Supply Canal near Fort Collins, Colo. **Ralph A. Cassell** and **James Ward** are assistant superintendents. Other key personnel include **Jerry Aymer**, office manager; **Jerry Keeley**, project engineer; **Homer J. Olsen**, office engineer; **John Booth**, master mechanic; **Zelmo Mullican**, general structures foreman; **Phillip Bott**, grading foreman; **Jack Mihoover**, labor foreman; **George Hatfield**, steel foreman, and **Orville Saalfeld**, carpenter foreman.

* * *

Guy Mertz is superintendent and **George Bullard** is pipe foreman for Northwestern Engineering Co., Denver, Colo., on the $50,000 construction of water mains for the City of Denver.

* * *

Roy Meller is superintendent and **John I. Schneider** is general foreman for Hutcheson Construction Co. on the $135,000 construction of two bridges—one across the Platte River at Littleton, Colo.; the other across Cherry Creek on Clarkston St., in Denver.

* * *

Carl Larson is superintendent for P. J. Walker Co. on construction of a research center building for the Union Oil Co. at Brea, Calif., a $4,500,000 job. Other key personnel on the job include: **L. "Whitey" Warbis**, general carpenter superintendent; **Bob Choate** and **Johnny Allen**, carpenter foremen; **Alex Stewart**, mill foreman; **Bob Sewe**, engineer; **R. S. Watje** and **Ralph Reed**, labor foremen; **George Lord**, office manager. Completion is scheduled for next September. **Duke Wilson** is project engineer for Union Oil Co.

***A. S. Vercruyssen*, below, is superintendent on road construction near Livermore, Calif., for Louis Biasotti & Son, Inc., Stockton, Calif.**

* * *

***Willard Swenson* is superintendent on the $2,000,000 construction of a high school building at San Jose, Calif., for contractors Williams & Burrows and Carl N. Swenson of Burlingame.**

* * *

C. Z. Wadsworth is project manager and **Ed Seybert** is superintendent for Osage Construction Co. on construction of a pumping plant and canal lining on the Fort Sumner Project of the Bureau of Reclamation in New Mexico.

* * *

K. DeWitt is general foreman, **R. B. Barker** is master mechanic and **Charles Lukin** is office manager for Phoenix-Tempe Stone Co. on the $200,000 construction of a 10-mi. section of highway near Yucca, Ariz. Completion is scheduled for August of this year.

* * *

L. L. Wowland is superintendent for Dunn Bros. of Dallas, Texas, on construction of a gas pipeline from Wenden, Ariz., to Needles, Calif.

* * *

On construction of a 115-kv. transmission line from Palisades Dam to the Goshen sub-station outside of Idaho Falls, Idaho, **W. G. Aspel** is the superintendent and **J. G. Hathorne** is superintendent for Darnell & Askevold Construction Co. **David B. Simon** is office manager. The firm holds a $585,516 contract from the Bureau of Reclamation for the project. Completion is scheduled for next September.

* * *

George Hickman is supervising construction of 210 homes in the Phoenix, Ariz., area for F & S Construction Co., Phoenix. **Howard Blansell** is general superintendent on all Arizona operations of the firm.

* * *

Lynn Stogsdill is project manager and **B. B. Harvey** is superintendent for Maxey & Leftwich on the $800,275 construction of housing units at the Holloman Army Air Force Base in New Mexico.

* * *

Harold C. Adler is project manager for Adler Construction Co., Madras, Ore., on construction of the Bureau of Reclamation's Dickinson Dam in North Dakota under a $1,034,071 contract. Actual construction of the dam by the Adler firm started in March 1949 and it

is anticipated that work will be completed before July of this year, eleven months ahead of schedule. The structure, of earthfill with a concrete open type spillway, will dam the Heart River at about 2 mi. west of Dickinson, N. Dak. Other key personnel on the project include the following: **Earl Sparks,** general excavation foreman; **A. B. "Abie" Farnworth,** general concrete foreman; **Oscar Mitchell,** grading foreman; **Hans Schilling,** equipment and maintenance foreman; **Lester Gowey,** steel foreman; **Bernard Adler,** lubrication foreman, and **George Osborn,** project engineer.

* * *

F. B. Pacheco is project manager and **H. N. Gates** is superintendent for F. B. Pacheco Co. on a $118,000 contract for construction of a school building at Tucson, Ariz. The same men are directing the $270,000 construction of a Masonic Temple in Tucson.

* * *

W. J. Ross is the superintendent for Pecos Construction Co. on construction of a natural gas pipeline at Orla, Texas.

* * *

Myram Evans is the foreman for G. J. Weisbrod, Inc., of Huntington Park, Calif., on the steel erection for the machine shop building at Parker Dam, Ariz.

* * *

Frank Wood is the project manager for Clyde W. Wood & Sons, Inc., Los Angeles, on construction of canal for the Bureau of Indian Affairs near Parker, Ariz., **Wes Myers** is superintendent; **Aaron Schirmeister** is labor foreman; **George Lewis** is concrete foreman, and **Frank Harvey** is office manager.

* * *

John F. Blakemore, contractor of Monrovia, Calif., is personally supervising earth moving for the Baldwin Hills Reservoir being constructed for the Los Angeles Department of Water and Power. (See article in February, 1950, issue of *Western Construction News.*) **M. B. Spell** is superintendent; **Wig Wiggings** is labor foreman; **Ernie McCleary** is master mechanic.

* * *

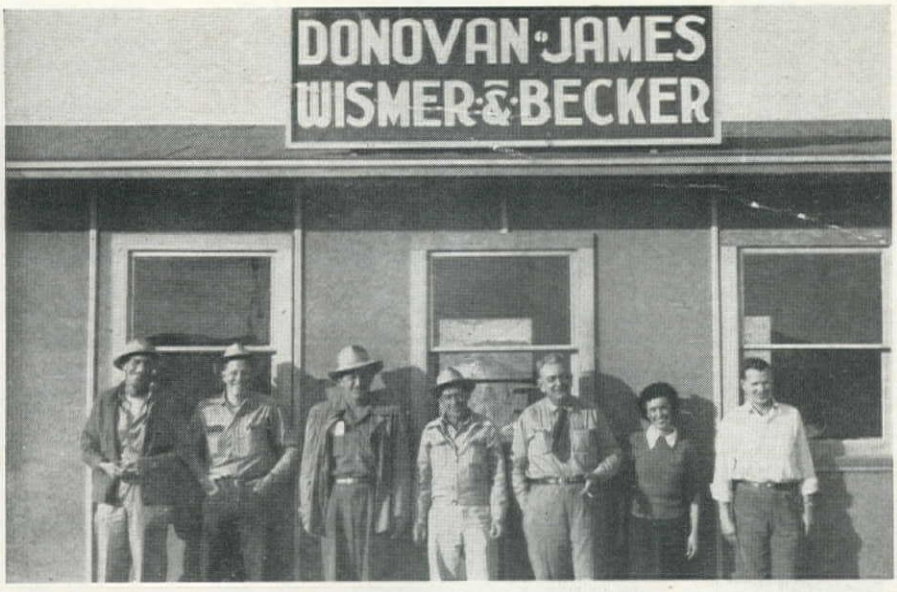
Bruce Kemper is superintendent for the M. F. Kemper Construction Co. of Los Angeles on construction of the lining and outlet works, including a 400-ft. length of tunnel, for the Baldwin Hills Reservoir of the Los Angeles Department of Water and Power. **Jerry Fox** is general foreman; **Fargo Hodges** is foreman; **Joe M. Stockton** is master mechanic.

* * *

Huso Festich is the superintendent for Fisher Contracting Co., Phoenix, Ariz., and **Bob Meyers** is assistant superintendent on the $58,000 construction of a tunnel and road near Superior, Ariz.

* * *

N. C. Hester is project manager and **Guy Reid** is general superintendent for Vinnell Co., Inc., on the $250,000 construction of 3.26 mi. of grading and



AT DAVIS DAM (see item directly to right of picture), personnel for Donovan-James-Wismer & Becker includes, left to right above—*Bob Myers*, field superintendent; *Roy Friedrichs*, job engineer; *D. W. "Red" McKinnie*, project superintendent; *S. Pickett*, carpenter superintendent; *H. O. "Duke" Davis*, office manager, *Harriet Harper*, office, and *Roy Wilson*, paymaster.

drainage on the Prescott-Flagstaff Highway in Arizona. **Buck Newberry** is assistant superintendent. The project is near completion after two months of work.

* * *

Hoyle Lowdermilk is project manager and **J. H. Johnson** is superintendent for Lowdermilk Bros. on the $373,000 construction of grading and structures on the highway between Alamogordo and Cloudcroft in New Mexico. **Lyle Hartwig** is assistant superintendent. Completion is scheduled for July of 1950 on the Public Roads Administration project.

* * *

On construction of a $356,000 concrete hospital building at Blackfoot, Idaho, **Jim Priest** is superintendent for Arrington Construction Co., and **Frank Anderson** is foreman. **Lyman Monson** is superintendent for the firm on the $125,000 construction of a store building at Idaho Falls, and **Wilford Taylor** is foreman.

* * *

H. W. Sherman is general superintendent and **Ben Cass** is job superintendent for Curlett Construction Co. of Long Beach, Calif., on construction of a $140,000 addition to the Clark County Courthouse at Las Vegas, Nevada.

* * *

Chuck Jenkins is superintendent for Bakker Construction Co. of San Bernardino, Calif., on the $90,000 construction of the El Rancho theatre building at Victorville, Calif.

* * *

Elwyn Shields is the superintendent for C. V. Wilder Co., Bellingham, Wash., and Gaasland Co., Inc. (a joint venture) on construction of the $1,015,620 concrete snowsheds on U. S. 10, Snoqualmie Pass, Wash. The contract was awarded in March. **Sam Lowry** is the superintendent of excavation.

W. R. Myzelle is the superintendent for Robinson & Wilson of San Bernardino, Calif., on the $150,000 construction of additional stories to the Harris Department store building in San Bernardino.

* * *

Glenn C. Curtis is project manager and **Joe Eckberg** is superintendent for Curtis Gravel Co., Spokane, Wash., on the $341,695 surfacing, stockpiling and construction of guardrails on 15 mi. of highway in Grant County, Wash. **Delbert Curtis** is trucks superintendent; **J. H. Miller** is timekeeper.

* * *

James S. White, superintendent for Webb & White, Los Angeles, is supervising the $775,147 construction of channel improvements on the Sawtelle-Westwood system from Braddock Drive to Washington Place in Los Angeles, a Corps of Engineers Project. **Al Olmstead** is general foreman and **Don Mose** is purchasing agent. The job started last month.

* * *

Lee Gordon is the superintendent for Kuckenberg Construction Co., Portland, Ore., on the $272,050 construction of a mooring basin, concrete breakwater and appurtenant works for the Corps of Engineers at Depoe Bay, Oregon. **Merrill Henderson** is the job engineer; **Wallace Powell** is general foreman; **Bert Soucie** is timekeeper.

* * *

D. W. McKinney is project manager and **Bob Myers** is superintendent for Donovan - James - Wismer & Becker, Davis Dam, Nevada, for erection of the Davis Dam generators, turbines and switchyard. The $1,500,000 project is for the Bureau of Reclamation. Other key personnel include **Roy Friedrichs,** job engineer, and **H. O. "Duke" Davis,** office manager. The firm started work recently with completion scheduled in 18 months. The company is a joint-venture firm composed of James Construction Co. and Donovan Construction Co. of St. Paul, Minn., and Wismer & Becker, electrical contractors of Sacramento, Calif. Matthews Construction Co. of Alhambra, Calif., has subcontracted for backfill and concrete on the switchyard and has **J. E. Hawkins** as superintendent, **Ed Peterson** as assistant superintendent, **Allen Hanson** as carpenter superintendent, and **Bob Riggs** as labor foreman. **Charles Whitley** is superintendent for Newbery Electric Co. of Los Angeles, subcontractors on electrical work. **Otto Schultz** is superintendent for American Bridge Co., which is building a bridge over the Colorado River at the Davis Dam site.

* * *

Curt VanderLinden is the superintendent for Valley Paving & Construction Co., Pismo Beach, Calif., on the surfacing of about 5.3 mi. of State Highway 152 in Merced County, Calif., under a $153,595 contract. **M. L. Hickenbottom** is the office manager. The project was under way last month.

* * *

Tom Stewart is supervising construction of a stretch of highway in Lander County, Nevada, for Wells Cargo, Inc., Reno, under a $167,321 contract. **T. S. Hilberg** is the job engineer and **M. Barkdull** is job foreman.

* * *

Robert Banger is supervising construction of sewers at Long Beach, Calif., for Artukovich Bros., Paramount, Calif. **Nick Leko** is the job foreman. The job is near completion.

* * *

James D. McClary is project manager, **Charles S. Bradley** is assistant project manager and **John Christman** is project superintendent for Morrison-Knudsen de Sonora (affiliate of Morrison-Knudsen Co., Inc., Boise, Ida.), on construction of the big Morelos Dam on the Colorado River at the Arizona-Mexico border, a project sponsored by the Mexican Government. Completion of the project is scheduled for next August.

* * *

Bill Johnson is the superintendent for J. H. Welsh & Son on construction of a sewage disposal plant at Coolidge, Ariz.

* * *

Earl Nichols is the general construction superintendent for Bechtel Corp.,

***Robert Powell*, left, is superintendent and *Leslie Black* is his assistant on the $870,000 construction of a high school building at San Lorenzo, Calif., by Empire Construction Co., San Francisco.**

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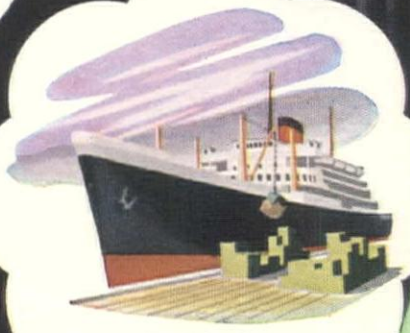

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Contractors Equipment Corp., Portland, Ore.
Air-Mack Equipment Co., Seattle, Wash.
Dietrich-Collins Equipment Co., Ltd., Vancouver, B. C.

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***Cal Baker*, left, general superintendent, and *John Artukovich*, contractor (P. & J. Artukovich), on the $750,000 construction of sewers, Walnut Creek, Calif.**

San Francisco, on construction of the big plant for Lever Brothers Co. at Los Angeles. **Rex Dunn** is building superintendent; **Fred Paul** is superintendent of electrical and sub-contract work; **John Becich** is mechanical superintendent; **Jack Chamberlain** is superintendent in charge of piping, and **Basel Licklider** is office manager.

* * *

Robert Bowman is superintendent for Bechtel-Conyes-Price on construction of the "Super-Inch" pipeline for Pacific Gas & Electric Co. Work is being carried on by two spreads, one now near Topock on the Arizona-California border, and the other near Tehachapi in California. **Fred Yost** and **Bill Hanna** are assistant superintendents. A record was established recently when more than four miles of the big pipe was placed in one day. **Ray Hamilton** is project engineer.

* * *

Al Poggi is the superintendent for Conyes Construction Corp. and Bechtel Corp., joint-venture firm, for construction of a 340-mi. natural gas pipeline for the Montana-Dakota Utilities Co. The line will extend from Casper, Wyo., to Baker, Mont. **Jimmy Alman** is welding foreman (the line will be of all welded construction), and **Fred King** is office manager.

* * *

Vern B. Harmon is supervising construction of a large store building in Phoenix, Ariz., for the owner, Dr. Duke Gaskins.

* * *

A new heavy construction firm, the Russell F. Long Co., was recently formed at Phoenix, Ariz. Specialties will be bridges, pipelines and sewers. Principals are **Russell F. Long** and **John P. Slough.** The firm is currently working on a sewage disposal plant at Somerton, Ariz., and construction of aviation fuel facilities at the Williams Army Air Base, Chandler, Ariz.

* * *

George Ban is superintendent, **Joe Axline** is grading and pipe foreman and **R. W. Jepperson** is transportation superintendent for United Concrete Pipe Corp. of construction of the concrete pipe outlet for the Baldwin Hills Reservoir being constructed by the Los Angeles Department of Water and Power.

* * *

E. Snary is superintendent for Ted F. Merrill & Sons, Inglewood, Calif., on the $264,000 construction of an addition to the Inglewood High School buildings.

Art Bowden is general foreman, and **L. H. Anderson** is office manager. **C. V. Horne** and **C. M. Switzer** are carpenter foremen.

* * *

N. J. Skousen is the project manager and **Andy Isbell** is the general superintendent for Skousen-Hise Constructing Co. on the $917,000 construction of highway near Separ, New Mexico. **Phil Johnston** is the assistant superintendent. The job, started in January, will be completed before July 15.

* * *

Lamar Homes, Inc., Phoenix, Ariz., has **Niles Carr** as superintendent on construction of the building for the State Childrens Colony at Phoenix.

***Thomas*, left, and *Richard Walsh* are now associated with their father, *R. A. Walsh*, general contractor with new offices at 919 San Pablo Ave., El Cerrito, Calif. The sons are thoroughly grounded in all phases of construction.**

Contracts . . .

Summary of Bids and Contracts For Major Projects in the West

Arizona

Macco Corp., Paramount, Calif., submitted the low bid of $178,728 before the Bureau of Reclamation for construction of the Gila Valley Canal Desilting Basin of the Gila Project near Yuma.

Pioneer Construction Co., Memphis, Tenn., was awarded a $319,698 contract for grading and surfacing of about 8.8 mi. of the Grand Canyon-Old Trails Highway, Coconino County.

L. M. White, Tucson, with a bid of $110,220, was awarded the contract for grading and draining, applying bituminous plantmix surfacing and seal coat on the Pima County East Speedway.

California

P. & J. Artukovich, Inc., Los Angeles, submitted the low bid of $417,956 for construction of Ballona Creek interceptor sewer, which will include a pumping plant and sewer system. The same company was low bidder at $286,308 for construction of 4 sewage pumping stations at the north end of Lake Tahoe in Nevada County.

Asta Construction Co., Rio Vista, was awarded a $273,294 contract for improvement of sanitary sewers, water mains, pavement, curbs and gutters in Antioch, Contra Costa County.

Ted Bares Construction Co., San Leandro, was low bidder at $373,140 for construction of a sanitary sewer separation project at San Jose.

N. M. Ball Sons, Berkeley, was low bidder on 5.6 mi. of grading and concrete paving at Bakersfield, to cost about $750,000. The firm was also awarded a $393,374 contract for the construction of a 2-span steel girder and reinforced concrete bridge and grading of 4.7 mi. of state highway near Winton Corners in Del Norte County.

Barrett & Hilp, San Francisco, was awarded a contract at $2,015,957 for constructing a classroom building of reinforced concrete at the Berkeley campus of the University of California.

Basich Bros. Construction Co. and **Basich Bros.** of San Gabriel, as joint venturers, bid low at $191,600 for the widening and surfacing of 16.1 mi. in San Bernardino County between Manix and Croniss Lake.

M. W. Brown, Redding, was low bidder at $191,432 for the grading and construction of 1.4 mi. of state highway near Tule Lake in Lake County.

Empire Construction Co. of San Francisco submitted the low bid of $1,475,000 for construction of a 13-building high school plant between Atherton and Menlo Park in San Mateo County.

Erickson, Phillips and Weisberg, Oakland, was low bidder at $369,587 before the Bureau of Reclamation for the construction of a 67-mi. section of the Shasta-Tracy 230-kv. transmission line, to include construction of foundations and erection of 296 double-circuit steel towers.

Granite Construction Co., Watsonville, was awarded a $191,842 contract for construction of 2.4 mi. of state highway near Salinas, Monterey County.

Griffith Co., Los Angeles, received the $172,724 contract for the surfacing of about 11.2 mi. of state highway with plantmix surfacing and application of seal coating in San Diego County, Del Mar to San Onofre.

Charles L. Harney, San Francisco, was low bidder at $121,177 for reconstruction of sewers and track removal on Jackson St. from Drumm to Battery in San Francisco.

Hess Construction Co., Long Beach, bid low at $371,648 for construction of 2 reinforced concrete bridges as highway separation structures and grading and surfacing of 1.7 mi. of the City Creek Highway near Running Springs in San Bernardino County.

H. H. Johnson, Inc., of Chula Vista, Calif., has started construction of 650 housing units at the Victorville Air Base in the Mojave Desert. Estimated cost of the project is $6,000,000.

Peter Kiewit Sons' Co., Arcadia, was low bidder at $444,857 for the construction of 4.9 mi. near Corona, Orange County, to be graded and surfaced with plantmix surfacing on cement-treated base and existing surfacing. The firm also received a $207,943 contract for the surfacing of about 11.8 mi. in San Diego County.

Kleinsmid Construction Co., Bakersfield, was awarded a contract at $151,117 for construction of 3.2 mi. of forest highway at Mt. Pinos in Kern and Ventura Counties.

L. H. Leonardi, San Rafael, was low bidder before the Bureau of Reclamation at $664,575 for the installation of insulators and overhead ground wires and stringing of conductors for 123 mi. of the Shasta-Tracy 230-kv. transmission line between Cottonwood and Madison.

Lord and Bishop, Sacramento, was awarded a contract of $526,299 for construction of a structural steel and reinforced concrete bridge across the Sacramento River at Walnut Grove in Sacramento County.

Lowrie Paving Co., San Francisco, was awarded a $147,333 contract for street improvement on Alameda de las Pulgas, Project No. 1, in San Mateo.

M. J. B. Construction Co., Stockton, has been awarded a $649,296 contract for the construction of two reinforced concrete girder bridges and grading and surfacing of 4.1 mi. of state highway near Atascadero, San Luis Obispo County.

Macco Corp., Paramount, Calif., was low bidder at $242,593 for construction of a structural steel beam bridge and approaches across Rio Hondo Channel on Anaheim-Telegraph Road, Los Angeles County. The firm was low bidder before the Bureau of Reclamation with a bid of $432,990 for the erection of crossing towers over the Sacramento and San Joaquin Rivers, a part of the Shasta-Tracy 230-kv. transmission line.

McGillivray Construction Co., Sacramento, bid low at $380,573 for the widening and resurfacing of 3 concrete bridges and 20.6 mi. of state highway near Proberta in Tehama County.

Robert E. McKee Co., Los Angeles, was awarded a contract of approximately $1,700,000 for construction at Chino State Prison, San Bernardino County.

Mercer Fraser Co. and **Mercer Fraser Gas Co., Inc.,** Eureka, were low bidders at $203,177 for the surfacing of about 3.8 mi. with plantmix surfacing on cement-treated base in Humboldt County, near Orick.

Morrison-Knudsen Co., Inc., Los Angeles, submitted low bid of $158,490 for construction of right wing dikes on the Folsom Reservoir Project in Sacramento County.

Nomellini Construction Co., Stockton, was awarded a contract approximating $1,500,000 for construction of the state hospital at Porterville, Tulare County.

Ofcco Construction Co., Long Beach, received a contract award of $173,225 for construction of a complete sewage disposal plant and water supply project at Atascadero State Hospital, San Luis Obispo County.

Rand Construction Co., Bakersfield, received the contract of $448,728 for the grading and surfacing of 8 mi. of state highway between Spring Hill and Weed in Siskiyou County. The same firm was also awarded a $303,851 contract for construction of 8.9 mi. of highway in Modoc County between Toma Creek and Cedarville.

Stolte, Inc., Oakland, was awarded a contract for construction of a hospital near Ceres, Stanislaus County, at a cost of about $900,000.

Sully-Miller Construction Co., Long Beach, with a bid of $131,538 received the contract for grading and surfacing about 5.4 mi. of state highway on Huntington Beach Blvd., Orange County.

Swinerton & Walberg, San Francisco, received a contract at about $1,500,000 for construction of a junior high school at El Cerrito in Contra Costa County.

A. Teichert & Son, Sacramento, was low bidder at $1,874,737 for the construction of bridges, widening of 2 existing bridges, and grading, surfacing with plantmix surfacing on untreated rock base of 5.3 mi. in Los Angeles County, between Frenchman's Flat and Los Alamos Creek.

Thomas Construction Co., Burbank, submitted the low bid of $188,891 for construction of a structural steel girder bridge with concrete deck and grading and bituminous surface treatment of 1 mi. of state highway near Lotus in El Dorado County.

United Concrete Pipe Corp. and **Vinnell Co.,** Baldwin Park, Calif., bidding together, were awarded contracts for Schedule No. 1, at $473,117, and Schedule No. 2, at $1,027,690, of the Delta-Mendota Canal of Central Valley Project. The schedules include construction of earthwork, concrete lining and structures near Newman, Stanislaus County.

Westbrook & Pope, Sacramento, was low bidder at $237,183 for 1.4 mi. of state highway to be graded, roadmix surfacing applied, and seal coat near Tule Lake, Lake County.

Howard J. White, Palo Alto, was awarded the contract of about $1,300,000 for construction of a tuberculosis hospital at Redwood City, San Mateo County.

Clyde W. Wood, Inc., North Hollywood, received a $150,418 contract for constructing 19 miles of forest highway in Placer County.

Colorado

Smith Construction Co., Nashville, Tenn., bid low at $415,235 for construction of Green Mountain-Oak Creek 115-kv. transmission line of the Colorado-Big Thompson Project.

Idaho

Morrison-Knudsen, J. A. Terteling & Sons, Macco Corp., and **Puget Sound Bridge & Dredging Co.** bid $3,494,965 as joint venturers on the basic construction of Lucky Peak Dam on the Boise River, Idaho.

Peterson Engineering Co., San Francisco, offered the low bid of $313,971 for clearing part of the Cascade Reservoir site, Idaho.

Charles A. Power, Spokane, was awarded a $286,657 contract for construction of a 119-ft. railroad overpass on U. S. Highway No. 10 between Huetter and Coeur d'Alene, Idaho.

Montana

Stanley H. Arkwright, Billings, received a $94,212 contract for grading and applying gravel roadmix oil on 4.2 mi. of St. Xavier-Hardin State Highway.

Grant Pacific Mining Co., Virginia City, with a bid of $203,440, was awarded the contract for excavation, grading and sand surfacing 0.8 mi. of new state highway near Whitehall, Jefferson County.

Hansen & Parr Construction Co., Spokane, Wash., received a $392,604 contract for construction of the steel and concrete bridge on Idaho Line-Plains highway, Sanders County.

Nilson-Smith Construction Co., Great Falls, was awarded a $199,160 contract for grading, gravel surfacing, bituminous surfacing treatment of 10.2 mi. of Three Forks-Townsend highway in Broadwater County.

O'Neil Construction Co. of Havre and **Lewis Construction Co.** of Great Falls were low bidders at $396,147 for the building of 449 mi. of rural electric power lines in Hill, Blaine, Liberty, and Chouteau Counties.

Utility Builders, Inc., Great Falls, with a bid of $165,197, received the contract for completion of structures in the irrigation project on lower Musselshell canals in Musselshell and Rosebud Counties.

Nevada

Foster & McHarg, Riverside, Calif., was awarded a $184,359 contract for construction of a portion of state highway from a point 5 mi. south of Comet Coalition Mine to the Caselton Mill, Lincoln County.

Jaw Plates Cost Less Than . . .

1 CENT A TON

Low Bidding Depends on Low Cost Crushing

FOR EXAMPLE one contractor crushing river gravel with a 30″ x 9″ Kue-Ken* Crusher has run 18 months on the original jaw plates. They have not been turned once. When reversed should give an additional 14 months service. Jaw plates on previous crusher were completely worn out in three months.

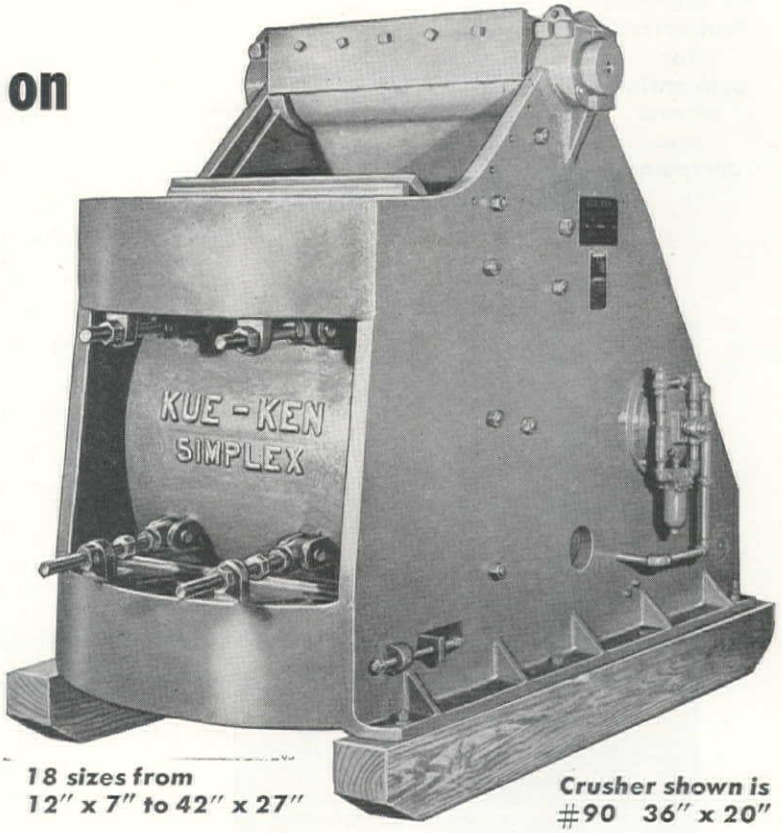
His Kue-Ken Crusher operates in closed circuit with a screen. 100% minus 1½″ and 100% minus 1″, depending on requirements. Capacity of plant 800 tons per 8 hours to 1½″, about 50% through the crusher. In 18 months operation 90% of total production has been 100% minus 1″. *The previous crusher was unable to produce anything finer than 1½″.*

ANOTHER OPERATOR uses a 30″ x 12″ Kue-Ken Crusher rated at 34 tons per hour of 2″ rock actually gets 80 to 125 tons per hour. The feed is extremely hard river boulders. In the same plant a 24″ x 10″ Kue-Ken produces 75 tons per hour of 3″ rock. The catalog rating is only 54 tons per hour.

Longer Jaw Plate Life and Bonus Capacity gives lowest cost crushing to Kue-Ken users.

Write today for Bulletin 605

*Pronounced Que-Ken. U. S. and Foreign Patents Pending.



18 sizes from 12″ x 7″ to 42″ x 27″

Crusher shown is #90 36″ x 20″

1. **Sealed mechanism requires lubrication only once a year.**
2. **Simple safety device for tramp iron and overload.**
3. **Only light foundation required for Kue-Ken Crushers.**

YOUR NEAREST WESTERN DEALER

Oregon-Washington	P. L. Crooks & Co.	*Portland*
Montana	Caird Engineering Works	*Helena*
Utah	Lund Machinery Co.	*Salt Lake City*
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Exclusive manufacturer for Eastern U. S., Canada and Puerto Rico: Pennsylvania Crusher Co., Broad and Arch Sts., Philadelphia, Pa.

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STRAUB MFG. CO.

Kue-Ken Balanced Crushers	Rib Cone Ball Mills	Overflow Classifiers
Kue-Ken Simplex Crushers	Concentrating Tables	Feeders
Kue-Ken Gyratory Crushers	Overhead Eccentric Crushers	Screenwheel Classifiers

McNeil Construction Co., Los Angeles, has been awarded a million dollar contract for the construction of a race track grandstand and club house at Las Vegas.

Silver State Construction Co., Fallon, was awarded a $261,800 contract for the widening of Fernley overpass and surfacing of 11.4 mi. of state highway near Fernley in Lyon and Churchill Counties.

New Mexico

Brown Contracting Co., Albuquerque, has been awarded a $206,560 contract for grading and asphalt paving of 24.5 mi. of U. S. highway in Rio Arriba and Taos Counties. The firm was also awarded a contract of $132,028 for drainage and grading of 3.7 mi. between Hot Springs and Engle in Sierra County.

P. R. Burn, Las Cruces, with a bid of $160,733, received the contract for erecting a bridge of structural steel to cross the Gila River in Hidalgo County.

Henry Thygesen & Co., Albuquerque, was awarded a $129,239 contract for the grading, paving, and surfacing of 11.8 mi. of State Highway 32 in McKinley County. The Company was also awarded a $193,398 contract for construction of a steel bridge and of 4.9 mi. of highway in Rio Arriba and Taos Counties.

Utah Construction Co. and **C. H. Leavell Co.,** El Paso, Tex., were awarded a contract of $2,668,767 for a housing project at Los Alamos, to include utilities, drainage, roadways, and underground utility systems.

North Dakota

P. A. Bradbury Construction Co., Aberdeen, S. D., with a bid of $289,715, was awarded the contract for constructing 13.2 mi. of State Highways 17 and 20 from Starkweather to a point south of Webster.

Peter Kiewit Sons' Co., Omaha, Neb., received a contract for its bid of $431,702 for the construction of 18.4 mi. on State Highway 3 south of Dunseith.

Northern Construction Co., Grand Forks, was awarded a $246,646 contract to construct 11.2 mi. of State Highway 1, near Oakes.

Western Contracting Co., of Sioux City, Iowa, was awarded a $772,787 contract for 15.7 mi. of construction on U. S. Highway 81 south of Fargo.

Oregon

Coos Bay Dredging Co., Coos Bay, was low bidder at $241,480 for the grading and paving of 1.1 mi. on the Oregon Coast Highway at Coos Bay.

Tom Lillebo, Reedsport, bid low at $462,124 on one project and received the award on another totaling $229,329 during the month. He was low bidder for the construction of a reinforced concrete viaduct, and grade and paving of 0.5 mi. of highway at Eugene. The contract awarded is for construction of a concrete and steel bridge near Roseburg on the Pacific Highway.

Manson Construction Co., Seattle, was awarded a contract for its bid of $715,740 for the construction of the 2nd unit of the outfall section of Portland's sewage treatment project.

McNutt Bros., Eugene, was awarded a $337,700 contract for work at Lookout Point Reservoir in the Willamette River Basin, to include construction of a shoofly and a section of permanent Southern Pacific Company Railroad, and necessary Forest Service Road relocation.

Morrison-Knudsen Co., Inc., Boise, **Peter Kiewit Sons' Co.,** of Omaha, and **Macco Corp.,** of Paramount, Calif., were awarded the contract by the Corps of Engineers for Lookout Point Dam and Reservoir for their joint low bid of $18,696,031. The contract provides for completion of earth embankment dam and construction of concrete spillway structure, including construction of appurtenances on the Middle Fork of Willamette River in Lane County.

Ralph and Horwitz, Portland, was awarded a contract of $1,335,447 for construction of a 10-story office building in Portland.

State Construction Co., Seattle, was low bidder at $172,699 for construction of the Marion St. Bridge over the Willamette River at Salem.

South Dakota

Western Construction Corp., Sioux Falls, bid low before the Bureau of Reclamation at $1,335,000 for the construction of 115-kv. transmission lines of the Voltaire-Rugby-Devil's Lake-Carrington-Jamestown section of the Missouri River Basin Project.

Utah

H. W. Glenn Construction Co., Murray, bid low at $248,460 for construction and improvement of 6.6 mi. of roadmix surfaced road on U. S. Highway 189 in Wasatch and Summit Counties.

Strong Company of Springville bid low at $440,209 for the surfacing of 22.1 mi. of U. S. Highway from Scipio, Millard County, to Levan, Juab County.

L. A. Young Construction Co., Richfield, was low bidder at $100,686 for the surfacing of 10.3 mi. of highway in Garfield and Piute Counties.

Washington

Roy L. Bair & Co., Spokane, was awarded a $217,419 contract for clearing, grading and paving 3.4 mi. of highway in Stevens County.

Fiorito Bros., Seattle, was awarded a $678,875 contract for grading, draining, and laying asphaltic concrete pavement over 10.1 mi. from Kalama River to Longview Wye and from Ostrander to Castle Rock, all in Cowlitz County.

General Construction Co. bid low at $966,000 for construction of a utilities tunnel at the University of Washington at Seattle.

Hall-Atwater Co., Seattle, was awarded a $870,501 contract for the construction of Military Project P-44 in Clallam County.

Roberts & McInnis and **Henry George & Sons,** Spokane, were low bidders at $496,000 for the construction of a concrete stadium at Spokane.

S. S. Mullen Construction Co., Seattle, bid low at $1,418,900 for the construction of a junior high school at Richland.

Westinghouse Electric Corp., Seattle, was low bidder at $4,277,100 for the construction of 4 alternating current generators and appurtenances at Chief Joseph Dam.

Wyoming

Brown Construction Co., Pueblo, Colo., was awarded a $320,000 contract for the construction of 2 bridges and 13.7 mi. of roadway in Laramie County.

H. R. Emme, Rapid City, S. D., received the $168,139 contract for 10.1 mi. of grading, draining and miscellaneous work on the Edgemont connection road in Niobrara County.

Alaska

Sam Bergessen, Tacoma, was low bidder at $1,395,000 for construction of 8 buildings for the Alaska Native Service at Nome.

Gaasland Co., Inc., Bellingham, bid low at $1,766,677 for the construction of Naknek military installation, including construction of living quarters, heat and power facilities.

Morrison-Knudsen Co., Inc. and **Peter Kiewit Sons' Co.,** Seattle, received a $3,175,000 contract for construction of the Murphy Dome military installation at Fairbanks.

M. P. Munter, Seattle, was awarded a $209,925 contract for dredging at 5 harbors: Seward, Valdez, Cordova, Juneau, and Ketchikan.

J. H. Pomeroy Co., San Francisco, was awarded the contract for building the Fire Island military installation at Anchorage, for which it bid low at $2,787,000.

NEWS of DISTRIBUTORS AND FACTORY BRANCHES

Blaw-Knox Co. announces the opening of a West Coast district office for its construction equipment department. Located in the Monadnock Building, 681 Market St., San Francisco, the new office will service Western contractors with the complete line of Blaw-Knox construction machinery. This will be done through the established distributors, who will continue to represent the company's construction equipment department. LOUIS J. SAROSDY has been named manager of the new office, and he will be assisted by LESTER M. HORTON. Sarosdy is a veteran Blaw-Knox

SAROSDY HORTON

engineer with many years' experience in general concrete construction. He has been serving as chief engineer of the construction equipment department, has pioneered new designs in steel forms for concrete construction and has developed new types of mechanized construction machinery. Horton, a resident of San Francisco, joins Blaw-Knox after long experience in serving Western construction industries. He is a specialist in ready-mix concrete plants and related equipment. The territory to be covered by the new office includes British Columbia, Washington, Oregon, California, western Montana, Idaho, Nevada, Utah and Arizona. Demand for the company's construction equipment has been growing in this area and the new regional office will enable Blaw-Knox distributors to better accommodate this demand. Among the products which will be handled by the San Francisco office through distributors are Blaw-Knox clamshell buckets, bins and batchers, truck mixers, paving finishers, spreaders, subgraders, steel road and street forms and concrete buckets. In addition, the San Francisco office will handle steel forms for tunnels, dams, sewers, bridges and general concrete work, directly with users.

☆ ☆ ☆

ED DALEY, Regional Manager for *Marion Power Shovel Co.* at San Francisco, has resigned that position to become Assistant Regional Manager of *Cummins Engine Co.* with headquarters in Los Angeles.

☆ ☆ ☆

DEAN CALLAN has been appointed Regional Manager for *Marion Power Shovel Co.* with headquarters in San Francisco. He comes from St. Louis where he held a similar post for Marion. His territory will now include California, parts of Nevada and parts of Arizona.

☆ ☆ ☆

A. GEORGE SETTER has joined the sales organization of *Western Machinery Co.*, Denver, Colo., according to LEIGH M. JONES, manager. He will cover the Western Slope of Colorado in engineering sales of the firm's lines of construction and mining machinery. Setter was formerly with the *Vulcan Iron Works* in Denver, and has a broad background in mining engineering.

☆ ☆ ☆

JACK HOW, General Manager of *Edward R. Bacon Co.*, San Francisco, announces the appointment of CARL SUND as Logging Representative for the Bacon company in the northeast California territory. Sund for many years formerly represented a Reno, Nevada, equipment firm in that area, and prior to that was a construction superintendent for a well-known Northern California contractor.

☆ ☆ ☆

SCOTT S. CORBETT, JR., general sales manager, replaces the late ROY E. NELSON as president and general manager of the *Nelson Equipment Co.*, Portland, Ore. Other elected officers are MRS. MARVEL J. NELSON, vice-president; CAROL H. CORBETT, treasurer, and CARVEL C. LINDEN, secretary. Scott Corbett has been associated with the company since his return from war service in 1945. For the past two years, he has been general sales manager. The firm has recently been appointed distributor in Oregon and several counties in Idaho for electric generating plants manufactured by *D. W. Onan & Sons, Inc.*, Minneapolis, Minn.

☆ ☆ ☆

Chicago Pneumatic Tool Co., through its Southern California district manager, H. P. HANSEN, has announced the appointment of *Shaw Sales & Service Co.*, Los Angeles, as distributor for CP products from Kern County south, excluding San Diego and Imperial counties.

☆ ☆ ☆

Foulger Equipment Co., Salt Lake City, Utah, has been appointed distributor in southern Idaho counties for the Wayne-Crane ½-cu. yd. shovels. C. G. VINCENT has recently been appointed a salesman for the firm, according to B. L. FOULGER, president and manager. Vincent will travel south of Salt Lake, west to Reno and east to Vernal and Green River. Formerly assistant to the vice-president of Columbia Steel Co. during construction of Geneva Steel plant, Vincent has built up a wide acquaintance with construction men in the area served by the Foulger firm.

☆ ☆ ☆

EVANS

CHARLES O. EVANS, has been appointed district representative for the sale of *Galion Iron Works Mfg. Co.* motor graders and rollers in the states of Washington, Oregon, Idaho, Montana, Utah and Wyoming. He replaces JAMES D. BORROR, who has accepted a sales position with *Loggers & Contractors Co.*, distributors for Galion equipment in Oregon and southern Washington. Evans, a native of Ohio and a graduate of Ohio State University College of Civil Engineering, had three years of military service in the last world war.

☆ ☆ ☆

Bow Lake Equipment Co., Seattle, Wash., has moved from 16826 Pacific Highway to new quarters at 300 Michigan, Seattle. The new premises are three times as large as at the old location and are more conveniently located. CONRAD CREIM is president and general manager of the firm.

☆ ☆ ☆

Coast Equipment Co., San Francisco, has been appointed Northern California sales and service representative for the *C. S. Johnson Co.*, Champaign, Ill. The Johnson line includes portable and stationary central-mix and transit-mix plants, concrete buckets, wheelbarrow scales and all component parts.

☆ ☆ ☆

HENRY BARNHART, general sales manager of *Lima-Hamilton Corp., Crane and Shovel Division*, Lima, Ohio, was a recent visitor to the West. During his visit, *Garfield & Co.*, San Francisco, was appointed distributor for the Division in Northern California.

☆ ☆ ☆

Arnold Machinery Co., Salt Lake City, Utah, has been named LaPlant-Choate distributor for the state of Utah, the southern part of Idaho and the western part of Wyoming, according to ROBT. G. ARNOLD.

☆ ☆ ☆

JAMES M. "JACK" ROBINSON, salesman for the *Cramer Machinery Co.*, Portland, Ore., died March 27. He came to Portland from the east 42 years ago to work for a hardware company. In the following years, he was sales manager for *Clyde Equipment Co.* and for the *Howard-Cooper Corp.* He was also Northwest representative for *Jaeger Machine Co.* and other eastern construction machinery manufac-

NEWS of DISTRIBUTORS AND FACTORY BRANCHES

turers. He had been with the Cramer firm for the past two years. He was a member of the Associated General Contractors.

☆ ☆ ☆

E. L. Benson, Area Sales Manager at San Francisco for *Barber-Greene Co.*, attended the meeting for regional sales managers of the firm held recently at the firm's Aurora, Ill., offices. He stopped at Salt Lake City for a few days while enroute.

☆ ☆ ☆

Thomas Hewes Fortner, district manager in Texas, Oklahoma and New Mexico for the *Thew Shovel Co.*, died March 22. He had been associated with the construction and construction equipment industries for the past 25 years.

☆ ☆ ☆

Robert M. Gates has been appointed sales engineer for the *General Electric Company*'s Apparatus Department at Spokane, Wash., according to H. C. Glaze, Spokane manager. A graduate of the University of Southern California, Gates joined the firm as a student engineer at Schenectady, N. Y., where he has been located for the past 3 years.

☆ ☆ ☆

Charles V. Roeder, son of C. D. Roeder, has joined *C. D. Roeder Equipment Co.*, Reno, Nevada, in the field as a salesman. The new salesman has recently resigned from the maritime service where he served as first mate.

☆ ☆ ☆

Harold A. Hintz has been appointed manager of *Motoroil-Refiner Sales*, Los Angeles, distributor of Luber-finers in the eleven counties of Southern California. Hintz comes to Motoroil-Refiner Sales after seven years as Pacific Coast sales manager of *H. K. Porter Co.*, of Pittsburgh, Pa.

☆ ☆ ☆

Newly-named dealers for *Allis-Chalmers* general machinery division are the *Warren & Bailey Co.*, Los Angeles, for Texrope drive equipment, and the *Miami Armature Works*, Miami, Okla., for motors and controls. Warren & Bailey has been named to represent Allis-Chalmers on Texrope drive equipment in California south of and including San Luis Obispo, Kern and San Bernardino counties. Miami Armature Works has been appointed dealer for Allis-Chalmers motors and controls in six Oklahoma counties and two Kansas counties.

☆ ☆ ☆

Two new district managers of lift truck, Turret Truck, straddle truck and mobile crane sales in Eastern territories have been announced by C. H. Collier, Jr., head of Eastern Division truck sales for the *Hyster Co.*, Portland, Ore. W. M. Costley, for-

merly with Clark Equipment Co., Chicago, will be in charge of territory comprising Minnesota, Wisconsin, northern Illinois, Iowa, eastern Nebraska, North and South Dakota and eastern Montana. DAN STEARNS, also formerly with Clark Equipment Co., will handle sales in Pennsylvania, New Jersey, Virginia, West Virginia and the District of Columbia.

☆ ☆ ☆

Construction of a new plant on the West Coast has been announced by *Bendix-Westinghouse Automotive Air Brake Co.*, Elyria, Ohio. The new building, located at 2000 Fifth St. in Berkeley, Calif., contains about 20,000 sq. ft. of floor space for sales and service and warehousing of new parts as well as production equipment for rebuilding air brake units under the company's long-established repair exchange program. Experienced sales and service personnel have been assigned to the new plant. C. R. MITCHELL, for many years regional manager at Philadelphia, has been appointed division manager in charge of all operations on the West Coast. He will be assisted by T. J. TUREK, division engineer, formerly assistant research engineer at the main factory in Elyria. The new division will service all manufacturing accounts west of the Rockies.

☆ ☆ ☆

Appointment of CHARLES A. PHILLIPS as factory sales representative for *Federal Motor Truck Co.*, Detroit, in the Denver region has been announced by CARL LOUD, general sales manager. An industrial engineer, Phillips will supervise dealer relations and coordinate merchandising and sales activities for the company in Colorado, New Mexico and southern Wyoming from his Denver headquarters.

NEWS of DISTRIBUTORS AND FACTORY BRANCHES

☆ ☆ ☆

JAMES R. RUSSELL, who has been explosives representatives for *Atlas Powder Co.* in San Francisco, has been appointed special representative in the company's New York district, according to W. E. COLLINS, JR., director of sales.

☆ ☆ ☆

Distribution of Fiberglas Aerocor, a soft and resilient thermal and acoustical insulation manufactured by *Owens-Corning Fiberglas Corp.*, has been established through *Edward E. Conn, Inc.*, 371 Fifth St., San Francisco, and 416 West Eighth St., Los Angeles. The Conn organization will sell the product to retail outlets in Washington, Idaho, Oregon, California, Nevada and Arizona.

☆ ☆ ☆

JAMES N. COUNTER, newly-appointed general manager of commercial steel sales for *Colorado Fuel & Iron Corporation's* Western division, has announced several personnel changes in the division. ROBERT F. BOURNE will assume the post of manager of rolled product sales. To fill the vacancy left by Counter's recent advancement, J. R. CATEN, for some time district manager at Phoenix for the firm, will return to the main offices at Denver as division sales manager for the Rocky Mountain division. LUKE HELMS, JR. leaves his post as assistant district manager at Fort Worth, Texas, to become district sales manager at Phoenix,

☆ ☆ ☆

Appointment of RUSSELL W. MCINTOSH as West Coast representative for Pittsburgh protective coating with offices in the Russ Bldg., San Francisco, has been announced by RUSSELL H. COE, manager, Protective Coatings Division, *Pittsburgh Coke & Chemical Co.* McIntosh handled sales for *Koppers Co., Inc.*, along the Pacific Coast prior to his new affiliation.

☆ ☆ ☆

Arcos Corp., Philadelphia, manufacturer of stainless low alloy high tensile and nonferrous electrodes, announces three new appointments to its staff. BERNARD E. DAVID joins the company as a special field engineer, located in Los Angeles. Previously, David acted as a manufacturer's representative for a line of welding supplies. WALTER GORDON LIST will act as special field engineer in the Ohio-Western Pennsylvania territory. New Arcos sales representative is J. J. SCHLASS, who will work in the firm's Philadelphia district.

NEWS of MANUFACTURERS

Appointment of R. S. STEVENSON as general sales manager of the *Allis-Chalmers Tractor Division* has been announced by W. A. ROBERTS, executive vice-president of the company. Stevenson succeeds MARSHALL L. NOEL, who recently resigned for personal reasons and whose resignation was accepted by the company with regret. Stevenson has been associated with Allis-Chalmers since 1933 when he joined the Kansas City branch as a salesman. In 1941, he was appointed Southwest Territory manager, remaining in that position until the fall of 1948 when he became assistant general sales manager. His field experience has given him a broad understanding of equipment usage and a general knowledge of the entire tractor industry.

☆ ☆ ☆

V. M. DOBEUS, president of *Tractomotive Corp.*, Deerfield, Ill., announces that MARSHALL L. NOEL has joined the company as vice-president and treasurer. Noel is well known in the construction machinery field, having spent more than 21 years with the Tractor Division of Allis-Chalmers.

☆ ☆ ☆

Gunn-Carle & Co., San Francisco, has dissolved the existing partnership after the State of California purchased the firm's building and land to make way for freeway construction. The firm's Building Specialties Division will be operated by JAMES J. CONDON, present department manager, as *Condon & Co.*, located at 753 Bryant St., San Francisco. The Materials Handling Department will be taken over by C. F. ELDER, present department manager, operating as *Elder Co.* at 390 Seventh St., San Francisco. The Concrete Reinforcing Steel Department, which has operated for many years under the direction of EDWARD L. KRAMER, is being discontinued.

☆ ☆ ☆

The third generation Morse has been named president of *Fairbanks, Morse & Co.*, Chicago. ROBERT H. MORSE, JR., who started with the company in 1916 in the foundry at Beloit, Wis., was elected to the presidency by the directors of the company. He has been vice-president in charge of sales and was previously vice-president in charge of sales and assistant general sales manager. His father, COLONEL ROBERT H. MORSE, whom he succeeded, became chairman of the board. Colonel Morse has been president since 1931. The new president's grandfather, CHARLES HOSMER MORSE, was the founder of the company.

☆ ☆ ☆

Silver Booster Manufacturing Co., Burbank, Calif., has moved to new and larger quarters at 132 West Verdugo Ave., Burbank, according to president JULIUS WAGERMAN. The company now has about 4,700 sq. ft. of floor space with complete engineering and manufacturing facilities for producing its full line of products, which include the Silver Steering Booster,

NEWS of MANUFACTURERS

providing finger-tip control for all crawler type tractors; the Quick-On Emergency Cap Tension Bolt, for quick repairing of broken track tension bolts, and the Hi-Lo Filter-Flo Control which protects hydraulic equipment from grit and dirt.

☆ ☆ ☆

Appointment of ROGER M. KYES as general manager of the GMC Truck & Coach Division of *General Motors Corp.*, Detroit, Mich., has been announced by C. E. WILSON, president. Kyes, assistant general manager of the division since last October, succeeds MORGAN D. DOUGLAS, who is taking a leave of absence because of his health.

☆ ☆ ☆

Appointment of JOHN M. HOOPER as a staff engineer in the engineering department of *Columbia Steel Co.*, San Francisco, has been announced by PAUL F. KOHLHAAS, vice president-engineering. Hooper was assistant general superintendent of the Fontana plant of *Kaiser Steel Corp.* before joining Columbia Steel. He joined Kaiser in 1945.

☆ ☆ ☆

HAL WHITE, JR. has been appointed purchasing engineer for the *Hyster Co.*, Portland, Ore., industrial truck and tractor attachment manufacturer. White served in Hyster's sales promotion and advertising department during the past five years and has also held various engineering positions since joining the company in 1943. Chief responsibility of his new position will be study of the economic factors involved in quantity buying or factory production of parts used in Hyster's truck and tractor equipment.

☆ ☆ ☆

Expansion of *Federal Motor Truck Company's* sales organization has been announced by CARL LOUD, general sales manager. WALTER L. HAYES, formerly head of the firm's eastern field organization, has been promoted to assistant general sales manager with headquarters at Detroit, Mich. HARRY L. NORTON, a member of the sales department since 1946, has been named truck distribution manager.

☆ ☆ ☆

KENTNER W. SHELL has been named as assistant to ROBERT JONES, sales manager of the Soil Stabilizer Division of *Harnischfeger Corp.*, Milwaukee, Wis. Shell assumes the post held by ROBERT GRAFF, who was recently transferred to P & H's Dallas, Texas, office. Shell was formerly assistant city engineer of Corpus Christi, Texas.

☆ ☆ ☆

Construction of an applied research laboratory—third unit in the multi-million-dollar *B. F. Goodrich Chemical Co.* installation at Avon Lake, Ohio—has begun, according to W. S. RICHARDSON, president. The new laboratory is a further step in the company's research and development program and will broaden and improve

UNIT BID SUMMARY

Water Supply . . .

Arizona—Pima County—City—Water Lines

E. P. Hunziker Construction Co., Tucson, with a bid of $108,849 for complete installation of all items, was low before the City of Tucson for water works improvements in Jefferson Park, Schumaker and Tucson Heights. Alternate bids were presented on cast iron pipe and cement asbestos pipe. Sub-totals were consistently lower on the cement asbestos pipe. Unit bids were submitted as follows:

(1) E. P. Hunziker Construction Co.	$132,595	$108,849
(2) J. H. Welsh & Son Contracting Co.	123,720	109,353
(3) Mark Cockrill Contracting Co.	127,492	113,098
(4) Fisher Contracting Co.	124,721	115,585
(5) Weeco Contractors, Inc.	132,281	125,494

CAST IRON PIPE ALTERNATE

		(1)	(2)	(3)	(4)	(5)
7,900	cu. yd. excavation	2.35	2.11	1.17	3.10	2.20
175	lin. ft. installing 12-in. cast iron pipe	2.00	.92	1.63	.85	1.00
175	lin. ft. furnishing 12-in. cast iron pipe	4.30	3.34	4.29	4.28	3.82
9,600	lin. ft. installing 8-in. cast iron pipe	.80	.66	.627	.54	.95
9,600	lin. ft. furnishing 8-in. cast iron pipe	2.50	2.28	2.57	2.48	2.23
22,300	lin. ft. installing 6-in. cast iron pipe	.60	.58	.537	.45	.90
22,300	lin. ft. furnishing 6-in. cast iron pipe	1.67	1.52	1.758	1.68	1.52
2,400	lin. ft. installing 4-in. cast iron pipe	.50	.52	.48	.35	.80
2,400	lin. ft. furnishing 4-in. cast iron pipe	1.125	1.01	1.188	1.15	1.03

CEMENT ASBESTOS PIPE ALTERNATE

		(1)	(2)	(3)	(4)	(5)
7,900	lin. ft. excavation	2.35	2.11	1.17	3.37	2.30
175	lin. ft. installing 12-in. cement asbestos pipe	1.25	.90	1.49	.44	1.00
175	lin. ft. furnishing 12-in. cement asbestos pipe	3.64	3.48	4.20	3.83	3.48
9,600	lin. ft. installing 8-in. cement asbestos pipe	.30	.40	.29	.37	.90
9,600	lin. ft. furnishing 8-in. cement asbestos pipe	2.00	1.96	2.389	2.16	1.96
22,300	lin. ft. installing 6-in. cement asbestos pipe	.25	.35	.23	.34	.85
22,300	lin. ft. furnishing 6-in. cement asbestos pipe	1.45	1.39	1.685	1.54	1.39
2,400	lin ft. installing 4-in. cement asbestos pipe	.20	.30	.21	.17	.75
2,400	lin. ft. furnishing 4-in. cement asbestos pipe	.93	.90	1.08	.98	.90

ADDITIONAL ITEMS

		(1)	(2)	(3)	(4)	(5)
250	lin. ft. furnishing and installing 2-in. copper pipe	1.75	2.00	1.52	1.47	2.75
130	lin. ft. furnishing and installing 1½-in. copper pipe	1.50	1.65	1.21	1.04	1.71
20	lin. ft. furnishing and installing 1-in. copper pipe	1.25	1.40	1.36	.68	.77
500	lin. ft. furnishing and installing ¾-in. copper pipe	1.00	1.10	.62	.56	.59
23	ea. installing 8-in. valves furnished by City of Tucson	27.50	15.00	26.36	22.50	22.00
92	ea. installing 6-in. valves furnished by City of Tucson	22.50	12.50	17.89	18.00	20.00
5	ea. installing 4-in. valves furnished by City of Tucson	17.50	12.00	19.09	15.00	18.00
6	ea. furnishing and installing 2-in. valves	15.00	9.50	13.00	11.00	15.00
4	ea. furnishing and installing 1½-in. valve	12.00	7.50	13.00	7.50	12.00
17,300	lb. installing cast iron fittings	.22	.15	.083	.087	.13
17,300	lb. furnishing cement lined cast iron fittings	.20	.125	.175	.155	.17
43	ea. installing fire hydrants furnished by City of Tucson	30.00	41.50	32.02	45.00	52.00
1	ea. tie-over of 2-in. copper services	45.50	50.00	31.12	26.30	45.26
2	ea. tie-over of 1½-in. copper services	40.50	30.00	23.03	17.30	35.54
5	ea. tie-over of 1-in. copper services	25.00	25.00	14.67	9.00	21.07
87	ea. tie-over of ¾-in. copper services	17.50	18.00	12.95	6.70	13.55
2	ea. tie-over of 2-in. iron services	50.00	50.00	29.66	26.00	50.75
3	ea. tie-over of 1½-in. iron services	45.00	30.00	23.20	17.30	50.14
9	ea. tie-over of 1-in. iron services	25.00	25.00	14.59	8.80	20.37
350	ea. tie-over of ¾-in. iron services	17.50	18.00	12.88	6.60	12.30
2	ea. furnishing and installing 2-in. corp cocks	30.00	30.00	17.30	16.00	26.48
3	ea. furnishing and installing 1½-in. corp cocks	26.00	25.00	13.38	11.00	22.75
1	ea. furnishing and installing ¾-in. corp cocks	25.00	15.00	8.26	3.80	17.86
420	lin. ft. salvaging 8-in. wrought steel pipe	.35	.75	.83	.60	.60
5,280	lin. ft. salvaging 4-in. wrought steel pipe	.22	.50	.62	.50	.40
1,520	lin. ft. salvaging 3-in. wrought steel pipe	.20	.50	.63	.35	.35
17,400	lin. ft. salvaging 2-in. wrought steel pipe	.18	.30	.63	.15	.25
210	lin. ft. salvaging 8-in. cement asbestos pipe	.60	.75	.76	.90	.60
380	lin. ft. salvaging 2-in. cast iron pipe	.60	.50	.46	.60	.30
310	sq. ft. cutting and replacing asphaltic pavement	1.50	.50	.47	.90	.60

Miscellaneous . . .

Oregon—Lane County—Corps of Engineers—Railroad Relocation

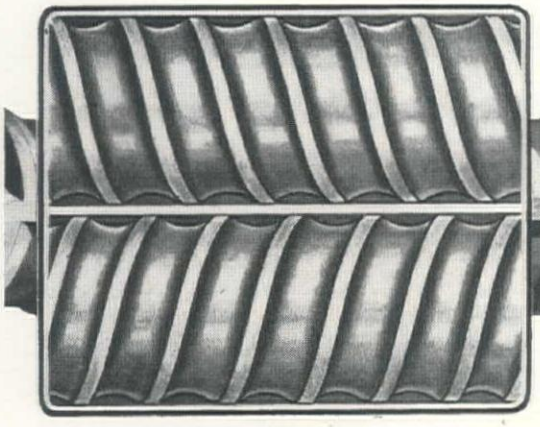
Guy F. Atkinson Co., South San Francisco, was low before the Corps of Engineers, Portland District, with a bid of $2,846,611 for constructing a section of the Southern Pacific Railroad relocation and a section of Oregon State Highway No. 58 relocation including logging, clearing, grubbing, roadway grading, detours and constructing all drainage structures, channel changes and right-of-way fences. Site of the work is between railroad stations 1760 plus 00 and 2006 plus 00 and between highway stations 1760 plus 00 and 2019 plus 00. The work is in connection with construction of the Lookout Point Reservoir in the Willamette River Basin of Oregon. A total of 540 calendar days are allowed for completion of the project. Unit bids were submitted as follows:

(1) Guy F. Atkinson Co.	$2,846,611	— T. E. Connolly, Inc.	$3,357,376
(2) Peter Kiewit Sons' Co.	2,864,860	— E. C. Hall and Leonard & Slate	3,605,411
(3) Morrison-Knudsen Co., Inc.	2,941,863	— C. F. Lytle Co. and Amis Construction Co.	3,976,992
(4) The Utah Construction Co.	2,953,995	— Natt McDougall Co.	3,978,912
(5) K. L. Goulter Co.	2,989,076	(7) Contracting Officer's Estimate	3,105,490
(6) McNutt Bros.	2,999,935		

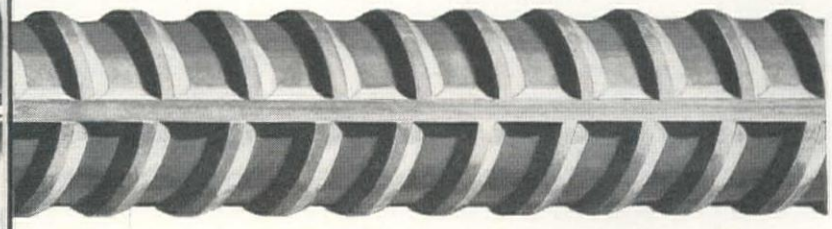
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
250	M.f.b.m. credit to the Gov't for merchantable old growth Doug. fir timb.	8.00	.01	4.00	4.00	2.00	3.00	5.00
120	M.f.b.m. credit to the Gov't for merchantable hardwoods	1.00	.01	.50	1.00	1.00	2.00	1.00
1,900	M.f.b.m. credit to the Gov't for all other merchantable timb. not incl. in Items 1 and 2	5.00	.01	1.00	4.00	1.00	2.00	2.00
280	acre clearing	631.00	540.00	650.00	700.00	600.00	500.00	560.00

(Continued on next page)

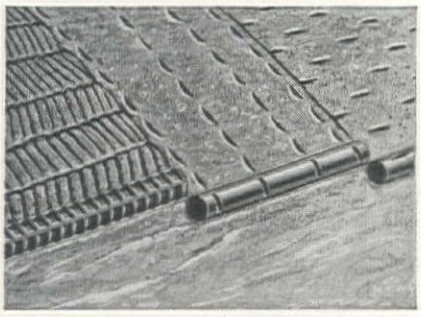
KAISER HI-BOND... GREATEST GRIP OF ANY BAR EVER DEVELOPED!



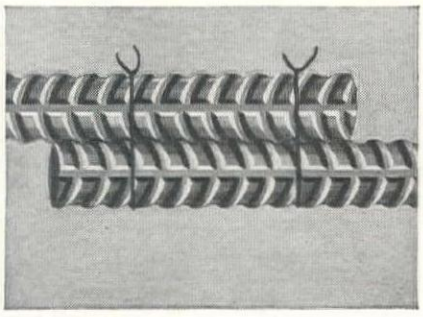
New Hi-Bond reinforcing bars—produced in the West by Kaiser Steel and competitively priced—offer you better construction at lower cost!



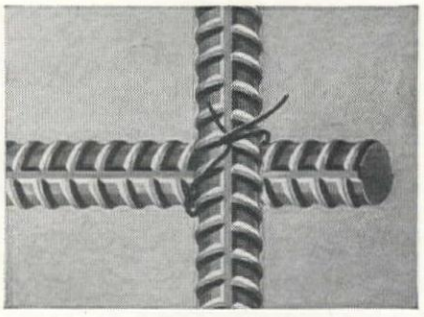
1. These reversed double-helical ribs provide the most effective mechanical bond with concrete ever developed—*regardless of position in which bars are cast or direction in which they are pulled!*



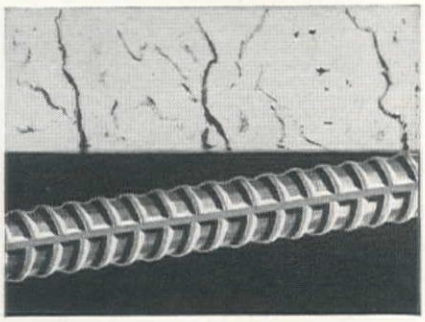
2. Patterns in wet concrete prove no ordinary bar can anchor itself as firmly as a Kaiser Hi-Bond bar.



3. Helical ribs in Kaiser Hi-Bond bars dovetail to give high tensile strength with shorter overlap at splices.



4. Crossed and wired, Kaiser Hi-Bond bars have gear-like contact. The simplest tie makes them *stay* anchored!



5. Because of greater bonding efficiency, you can minimize ugly, dangerous tensile cracks in concrete with Kaiser Hi-Bond bars—without using more steel than you need for strength.

More efficient transfer of stress at splices, reduced need for hook anchorage, reduced deflections of beams, less columnar deformation, lower construction costs through more efficient use of labor—all these are *extra* advantages you get when you specify Kaiser Hi-Bond bars!

On your next job, make sure the reinforcing bars are Kaiser *Hi-Bond* bars!

Hi-Bond reinforcing bars—produced in the West by

Kaiser Steel

PROMPT, DEPENDABLE DELIVERY AT COMPETITIVE PRICES • plates • continuous weld pipe • electric weld pipe • hot rolled strip • hot rolled sheet • alloy bars carbon bars • structural shapes • cold rolled strip • cold rolled sheet • special bar sections • semi-finished steels • pig iron • coke oven by-products
For details and specifications, write: **KAISER STEEL CORPORATION, LOS ANGELES, OAKLAND, SEATTLE, PORTLAND, HOUSTON, TULSA, NEW YORK**

NEWS of MANUFACTURERS

technical service and material evaluation facilities presently located in Cleveland, Ohio. A general chemicals plant and experimental station are already in operation.

☆ ☆ ☆

Four promotions in the Los Angeles Sales office of *Columbia Steel Co.*, a U. S. Steel subsidiary, have been announced by FRANCIS S. HOWARD, division vice-president of the Southern Sales Division. Appointed to the head of two account groups in the division are LORING S. BROCK, manager of sales, and L. W. HALL, manager of sales. M. J. COVER has been appointed division staff manager. DAN M. PETRAKIS, formerly assistant service manager, has been appointed service manager. All will headquarter in Los Angeles.

☆ ☆ ☆

The manufacturing and sales rights for Ford Motor Coaches have been purchased by *Marmon-Herrington Co., Inc.*, Indianapolis, according to DAVID M. KLAUSMEYER, president of Marmon-Herrington.

☆ ☆ ☆

CHARLES R. TYSON, president of *John A. Roebling's Sons Co.*, Trenton, N. J., announces that WALTER A. HUBER has been appointed general manager of the firm's wire rope division. The appointment is part of a plan to decentralize the company's various divisions. For the past nine years, Huber has served as manager of preformed wire rope sales for the *American Chain & Cable Co.* He has been secretary of the Wire Rope Institute for the past ten years.

☆ ☆ ☆

ARTHUR TEMPLETON has been appointed to the sales engineering staff of *Templeton, Kenly and Co.*, Chicago manufacturer of Simplex Mechanical and Hydraulic Jacks. He is the son of the company's founder and has served for the past four years in the production department. He will cover the Chicago territory.

☆ ☆ ☆

JOHN B. MOXNESS has been appointed industry engineer in charge of sales promotion of control divisions for *Brown Instrument Division of Minneapolis-Honeywell Regulator Co.* Moxness' promotion was announced by L. MORTON MORLEY, vice-president and general sales manager of the Brown division.

☆ ☆ ☆

Rice Pump and Machine Co., Milwaukee, Wis., formerly a division of *Milwaukee Chaplet & Manufacturing Co.*, has recently been established as a separate corporation. R. D. HOUGHTON, formerly division manager, has been elected president and treasurer of the new corporation. ERWIN LOSSE, formerly superintendent of the Rice Pump Division, is secretary, while ROBERT G. RICE, president of Milwaukee Chaplet, is vice-president of the new corporation. Houghton will serve as general manager and sales manager of the new

106 acre grubbing	360.00	350.00	475.00	400.00	500.00	350.00	400.00
1,638,000 cu. yd. excav., solid rock	.56	.59	.91	.875	1.00	.86	.965
1,639,000 cu. yd. excav., common to embank., or waste	.56	.59	.30	.26	.30	.36	.36
2,760,000 cu. yd. compaction of embank.	.08	.03	.04	.05	.01	.04	.055
10,500 lin. ft. rounding tops of cut banks	.15	.10	.18	.25	.20	.20	.20
1,000 M. gal. sprinkling	3.00	2.00	3.00	3.00	3.00	3.00	2.80
400 hr. rolling, addtl. roller hours	10.50	10.00	12.50	9.00	5.00	1.00	8.15
1,050,000 yd. mi. overhaul	.205	.25	.20	.21	.20	.30	.20
14,000 cu. yd. foundation excav.	3.00	3.35	3.75	5.25	4.00	5.00	4.00
2,600 cu. yd. conc., in place	43.00	45.00	44.00	61.00	42.80	44.00	44.00
3,900 bbl. Portland cement, Type I and III	5.10	4.20	5.60	6.25	6.00	5.00	5.00
460,000 lb. reinforcing steel	.095	.09	.105	.12	.11	.10	.105
360 lin. ft. 8-in. perf. track drain, in place	3.00	4.00	3.90	4.00	4.00	3.75	3.35
24 lin. ft. 12-in. corr. met. culv. pipe, in pl.	4.00	5.00	3.90	4.50	4.00	3.65	4.80
60 lin. ft. 18-in. corr. met. culv. pipe, in pl.	6.50	7.00	7.50	7.50	6.00	6.50	6.45
860 lin. ft. 24-in. corr. met. culv. pipe, in pl.	10.00	11.00	10.85	11.50	10.00	10.00	9.00
66 lin. ft. 30-in. corr. met. culv. pipe, in pl.	12.50	13.50	13.75	19.00	12.00	13.00	12.50
1,420 lin. ft. 36-in. corr. met. culv. pipe, in pl.	15.00	16.00	16.40	24.00	15.00	15.00	14.00
200 lin. ft. 42-in. corr. met. culv. pipe, in pl.	17.50	18.50	19.00	27.00	20.00	18.00	17.00
202 lin. ft. 48-in. corr. met. culv. pipe, in pl.	24.50	27.50	27.75	35.50	30.00	26.00	23.50
150 lin. ft. 60-in. corr. met. culv. pipe, in pl.	32.00	36.00	36.00	44.00	40.00	34.00	30.00
5,000 cu. yd. hand placed riprap	9.00	13.50	10.50	9.80	10.00	10.00	9.45
1,500 rod right-of-way fence, barbed wire, in pl.	6.00	4.75	5.90	5.25	6.00	5.00	4.65
8,300 cu. yd. base crse. for detours, in pl.	2.80	2.90	3.10	3.25	3.00	3.00	2.25
456 cu. yd. gravel surf. for access rd., in pl.	2.80	2.90	3.10	3.25	3.00	3.00	2.50
2,500 cu. yd. foundation backfill	3.60	3.00	4.00	6.00	4.00	4.00	2.50
1,200 sq. ft. removal of danger trees	5.00	3.50	5.00	5.25	5.00	1.50	2.50
Lump sum, const. of temp. drainage struct.	$7,000	$7,700	$8,090	$12,500	$5,000	$6,000	$6,500

Irrigation . . .

Wyoming—Fremont County—U.S.B.R.—Buried Membrane Lining

Lichty Construction Co. and Brasel & Whitehead, Riverton, Wyoming, were low before the Bureau of Reclamation with a bid of $96,290 for construction of a buried asphaltic membrane lining pilot canal on the Riverton Project in Wyoming. Unit bids were submitted as follows:

(1) Lichty Construction Co. and Brasel & Whitehead $96,290
(2) W. E. Barling, Inc. 98,860
(3) Peter Kiewit Sons' Co. 98,960
(4) Sharrock & Pursel ..... $ 99,220
(5) Inland Construction Co. 119,416
(6) Engineer's Estimate 102,500

	(1)	(2)	(3)	(4)	(5)	(6)
5,000 cu. yd. excavation	.50	.50	.92	.60	1.20	.60
100 cu. yd. excav. and salv. riprap	1.00	1.00	1.00	1.00	1.35	3.00
260 cu. yd. replacing riprap	6.00	5.00	4.00	4.00	6.10	10.00
48,000 lin. ft. dragging	.085	.05	.10	.04	.05	.13
160,000 sq. yd. rolling	.04	.03	.04	.03	.04	.04
30 M gal. sprinkle of subgrade	20.00	14.00	15.00	10.00	48.50	12.00
25,000 sq. yd. furn. and applying soil sterilant	.25	.20	.20	.20	.15	.13
1,000 ton furn. catalytically blown asphalt	40.00	40.00	42.00	41.00	52.00	40.00
160,000 sq. yd. applying catalytically blown asph.	.065	.10	.08	.09	.07	.08
52,000 cu. yd. placing soil cover	.30	.35	.15	.35	.42	.35
11,000 cu. yd. placing gravel cover	.35	.35	.85	.50	.67	.25
33,000 mi. cu. yd. hauling gravel for cover	.15	.13	.14	.12	.16	.20

Dam . . .

New Mexico—De Baca County—U.S.B.R.—Concrete

A. L. Murphy, Los Angeles, and Nathan A. Moore, El Monte, Calif., with a total bid of $457,760, were awarded the contract by the Bureau of Reclamation for work on Fort Sumner Diversion Dam on the Fort Sumner projects in New Mexico. The work under the contract includes the following: Excavation and earthwork for the concrete diversion dam and excavation and earthwork for the sluiceway, main canal headwork and a portion of main canal; construction of the concrete dam, sluiceway and main canal headworks, and placing concrete lining in the main canal, construction of a 6 x 11-ft. concrete generator house, and removing a portion of the existing concrete diversion dam and removing an earthfill portion of the existing diversion dam. Unit bids were submitted as follows:

(1) A. L. Murphy and Nathan A. Moore $457,760
(2) Peter Kiewit Sons' Co. 533,844
(3) List & Clark Construction Co. 590,238
(4) Daley Construction-Acme Materials Co. 632,828
(5) Bent Construction Co. 651,242
(6) Al Johnson Construction Co. 656,744
— Macco Corp. 657,609
— C. M. Elliott and John C. Gist 673,380
— Bates & Rogers Construction Corp. 696,601
— Carrother Construction Co. 705,988
— Texas Construction Co. 708,829
— Guy H. James Construction Co. $731,378
— Stebbins-Frost Construction Co. 783,452
— Northwestern Engineering Co. 783,845
— United Construction Co. 861,355
— Wyche & Bruse Construction Co. 873,167
— Otto B. Ashbach & Sons 889,903
— Knisely-Moore Co. 923,039
— W. E. Kier Construction Co. 924,306
— Earl W. Baker Co. 937,373
— J. A. Tobin Construction Co. 955,534
— Grafe-Callahan Construction Co. 1,145,570
(7) Engineer's estimate 790,464

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lump sum, diversion and care of river during const. an unwatering foundations	$20,000	$40,500	$10,000	$15,000	104,900	$55,000	$40,000
2,500 cu. yd. removing conc. in exist. dam	4.00	2.50	1.50	4.50	2.00	3.90	10.00
7,600 cu. yd. removing earth fill in exist. dam	1.00	.80	.50	1.00	.40	1.20	.60
Lump sum, removing and transp. sluiceway gates for existing dam	500.00	700.00	500.00	$1,000	600.00	$1,530	$1,600
Lump sum, removing timber bridge	300.00	100.00	100.00	200.00	100.00	35.00	250.00
30,000 cu. yd. excav., common, for struct.	1.50	1.50	1.50	2.00	2.50	.85	1.15
14,000 cu. yd. excav., rock, for structs.	3.00	1.50	1.50	2.00	2.50	3.35	4.00
3,100 cu. yd. backfill	1.00	1.50	.75	.70	.50	1 00	.75
950 cu. yd. compacting backfill	1.00	2.60	2.00	5.00	3.00	2.90	2.50
540 cu. yd. riprap	2.00	7.00	4.00	6.00	4.00	6.00	4.00
135 cu. yd. gravel bedding under riprap	3.00	3.00	4.00	7.00	4.00	4.00	4.00
2,250 lin. ft. drilling grout holes	2.00	1.00	2.00	2.50	1.20	2.30	2.50
2,200 lb. furn. and plac. grout pipe and fitgs.	.50	.50	.50	.25	.70	.38	.70
2,250 cu. ft. pressure grouting	2.00	2.80	1.50	2.00	1.50	1.60	3.00
21,500 cu. yd. conc. in overflow weir and sluiceway weir	11.00	13.00	18.00	16.50	15.00	17.25	22.00
2,700 cu. yd. conc. in gravity wall sects.	15.00	18.00	19.00	16.50	15.00	21.70	28.00
460 cu. yd. conc. in reinf. conc. structs.	30.00	53.00	53.00	90.00	35.00	48.00	50.00
170,000 lb. furn. and plac. reinf. bars	.10	.12	.085	.15	.12	.127	.12
40 sq. ft. furn. and plac. ½-in. elastic filler in joints	2.50	2.00	2.00	3.50	1.50	1.80	1.50

(Continued on next page)

How to make a superintendent's eyes sparkle

(A Pioneer Rubber Mills Progress Report)

Superintendents are supposedly cold-blooded—given to little emotion—but PIONEER representatives swear they've seen their eyes light up like short-circuited pinball machines.

Here's an example:

This PIONEER Rubber Conveyor Belt is one of three that speeds production in this modern food processing plant. One belt carries cooked beef; another carries beans—a dash of tomato sauce is added at the right moment and PRESTO!—chili like mother tried to make.

To avoid costly shutdowns—to keep ingredients coming on schedule—PIONEER tailored these conveyor belts to fit the job. PIONEER'S engineering department worked with this Superintendent in eliminating former trouble-making faults: no metal cleats because they were hard to keep clean; no ordinary rubber compound because it would absorb natural meat juices.

The belt PIONEER engineered is a joy to behold, as seen by the eyes of the Superintendent.

1. Conventional belts became worn on the edge, resulting in food spillage. This is now eliminated with PIONEER "SURE TITE" edges that defy wear and fraying.
2. Built-in rubber cleats replaced the former cumbersome, hard-to-clean metal cleats—and they can carry food up inclines as steep as 53 degrees!
3. Amber rubber cover that is impervious to oils and juices.

While rugged construction that eliminated breakdowns was an important factor, ***maintenance savings were not overlooked.*** Cleaning this PIONEER belt with a detergent and water is as easy as washing a dish—no more tedious scrubbing of metal cleats with steel wool. As the cost accountant remarked to the Superintendent, "Unless my slide rule is broken, ***our maintenance time*** has been reduced *90%* on this machine since we installed this belt!"

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NEWS of MANUFACTURERS

corporation, and Losse will be in charge of manufacturing, engineering and product development. The new corporation will continue the manufacture of Rice Centrifugal Pumps in a complete range of sizes and models for contractors, utilities, oil field and industries.

☆ ☆ ☆

A revolutionary new process for making low-cost multi-purpose three-ply wood panels from wood waste, has been acquired by *United States Plywood Corp.*, New York City, according to LAWRENCE OTTINGER, president. These panels, having many of the properties of plywood, will be produced first at a new plant to be erected by the plywood company at Orangeburg S. C., and later at plants in all sections of the country, as the result of an agreement just concluded in New York with Fred Fahrni, Swiss engineer. The new product, known as "Novopan" is made of wood waste into a composite board of three layers, two surface layers of wood shavings and the core material of wood chips.

☆ ☆ ☆

At a recent meeting of the board of directors of *Fairbanks, Morse & Co.*, two new vice-presidents were elected. They are O. O. LEWIS, vice-president in charge of sales, and F. J. HEASLIP, vice-president in charge of purchases and traffic. Both men have been associated with the firm for a number of years. Lewis was named sales manager in 1948.

☆ ☆ ☆

HOWARD H. SPRINKLE has been appointed assistant sales manager of the *Republic Rubber Division, Lee Rubber & Tire Corp.*, Youngstown, Ohio, according to G. L. SMITH, Republic's sales manager. Since 1933, Sprinkle has been sales representative in the Cleveland and Buffalo areas.

☆ ☆ ☆

COLUMBUS BASILE has been elected vice-president for operations by the board of directors of *Link-Belt Speeder Corp.*, Chicago. Basile comes to Link-Belt Speeder from the parent *Link-Belt Company's* plant in Chicago, where he has been shop superintendent since 1947.

☆ ☆ ☆

R. Q. ARMINGTON, general manager of the *Euclid Road Machinery Co.*, Cleveland, Ohio, announces the company is proceeding with its plan to establish a subsidiary —*Euclid, Ltd.*, in Great Britain, to manufacture Euclid earth-moving equipment in Great Britain. Manufacturing facilities in Scotland are being leased and operations will start soon.

☆ ☆ ☆

GORDON H. BANNERMAN, nationally-known aerial tramway engineer, has been named manager of a newly-created tramway division of *Columbia Steel Corp.*, according to ALDEN G. ROACH, president. Bannerman was formerly with the *Amer-*

5,000 lb. furn. and plac. wrought-iron water stops in joints	.30	.40	.25	.60	.30	.64	.40
1.4 M.b.m. furn. and erect. timber in structs	200.00	350.00	300.00	350.00	350.00	300.00	300.00
Lump sum, furn. and plac. insulation and roofing	100.00	185.00	300.00	260.00	600.00	185.00	175.00
Lump sum, furn. and install. generator hse. mtlwk.	200.00	470.00	500.00	700.00	400.00	850.00	400.00
34,000 lb. installing radial gates	.05	.20	.06	.17	.10	.10	.10
9,000 lb. installing radial gate hoists	.10	.20	.10	.17	.10	.10	.12
14,820 lb. installing screw-lift gates	.05	.20	.10	.20	.10	.05	.15
Lump sum, furn. and install. trashrack metalwork	500.00	770.00	870.00	$1,000	720.00	$1,370	$1,000
3,580 lb. furn. and install. pipe handrailing	.30	.50	.45	.50	.50	.75	.45
Lump sum, furn. and install. miscl. metalwork	300.00	$1,165	$1,500	$2,600	600.00	$1,730	850.00
180 lin. ft. furn. and install. elect. metal conduit ¾ in. and less in diam.	.50	2.50	.75	1.70	.75	1.25	1.50
200 lin. ft. furn. and install. elect. metal conduit 1 inch in diam.	3.00	2.50	.85	2.50	1.00	1.50	2.00
90 lb. install. and connect. elect. conductors	2.00	3.50	2.00	1.70	2.00	2.00	1.50
60 lb. furn., install. and connecting gd. wires	1.00	2.50	2.00	3.50	3.00	2.00	1.50
1,500 lb. installing elect. apparatus	.40	.30	1.00	.25	.50	.10	.75

California—Fresno County—Corps of Engineers—Concrete

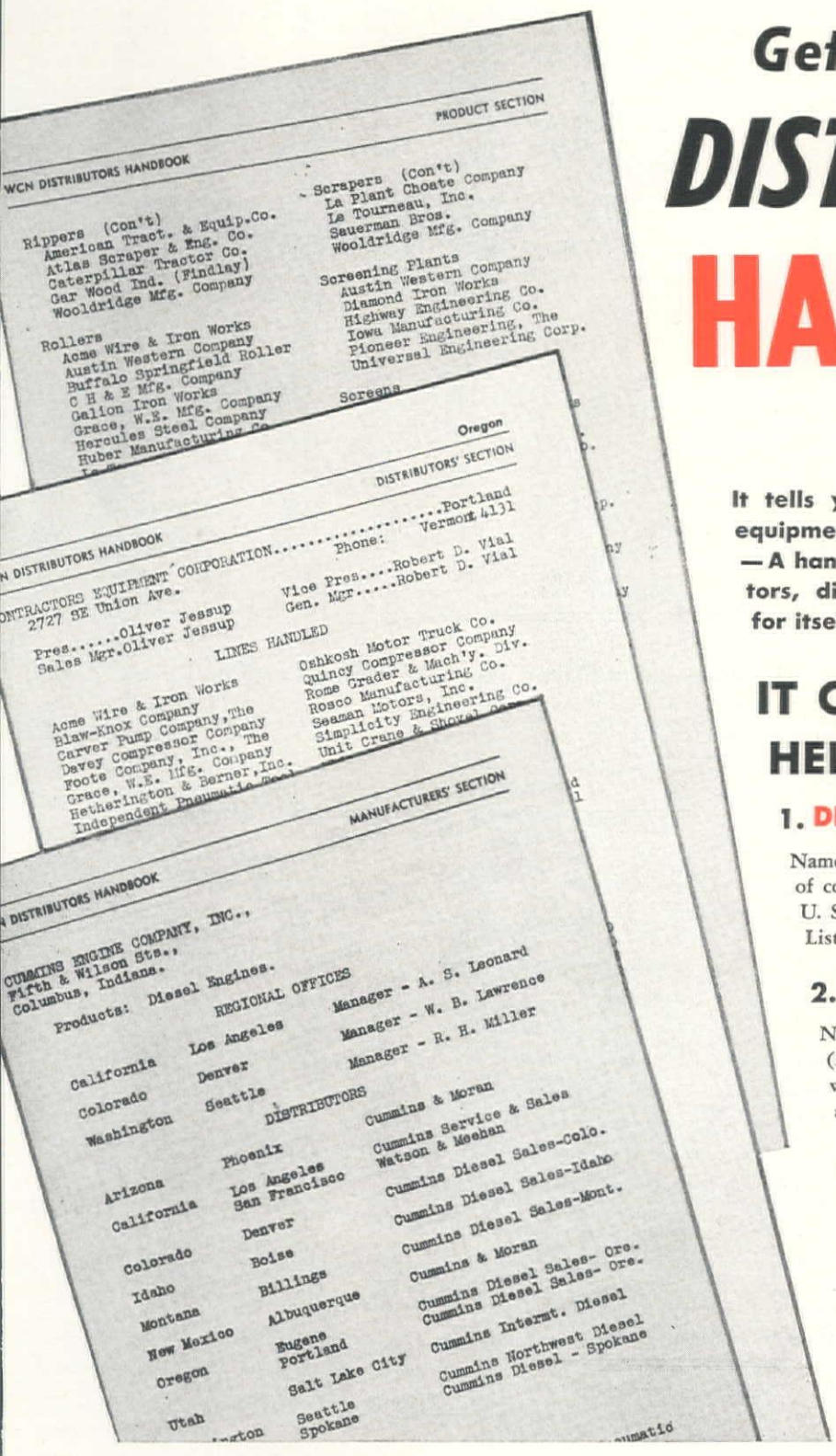
Preliminary activity is well under way, the construction plant is being set up and concreting is scheduled to begin next fall at Pine Flat Dam on the Kings River in California about 27 mi. east of Fresno. Preliminary excavation was carried out under two contracts totalling $795,000. A $24,339,776 contract was awarded to a group of contractors as a joint-venture firm for the main dam work. The group consists of Guy F. Atkinson Co.; Bressi & Bevanda Constructors, Inc.; Charles L. Harney, Inc.; J. A. Jones Construction Co., and A. Teichert & Son, Inc., with the Atkinson company as sponsor. On the job, the contracting organization is known as Pine Flat Constructors. The main dam will consist of a straight gravity section with maximum height of 440 ft. above streambed. Total crest length of 1,820 ft. is divided into right abutment, non-overflow, 789 ft.; center spillway section, 292 ft., and left abutment, non-overflow, 739 ft. Mass concrete will total 2,150,000 cu. yd., with 1,600,000 bbl. of cement required. Additional unclassified excavation totals 100,000 cu. yd. A review of progress to date on construction under the main contract was presented in the April 1950 issue on page 100. Unit bids November 1949 were as follows:

(A) Guy F. Atkinson Co.; Bressi & Bevanda Constructors; Charles L. Harney; J. A. Jones Construction Co. and A. Teichert & Son	$24,339,776
(B) Morrison-Knudsen Co., Inc.; Peter Kiewit Sons' Co., and Macco Corp	24,935,977
(C) United Construction Co.	25,982,816
(D) The Arundel Corp., L. E. Dixon Co. and American Pipe and Construction Co.	28,445,966
(E) Walsh Construction Co.	30,235,634
(F) C. F. Lytle Co.; Johnson, Drake & Piper; D. W. Winkleman Co.; Massman Construction Co.; Charles H. Tomkins Co.; Inland Construction Co.; Kansas City Bridge Co.; Manhattan Construction Co. and S. J. Groves & Sons Co.	30,262,074
(G) S. A. Healy Co. and Material Service Corp.	35,291,745
(H) Engineer's Estimate	23,747,511

(1) Lump sum, diversion and care of water.
(2) 100,000 cu. yd. excav., unclassified.
(3) 4,300 cu. yd. excav., parking area.
(4) 5,400 cu. yd. excav., dental, 0-10 ft.
(5) 1,200 cu. yd. excav., dental, 10-30 ft.
(6) 800 cu. yd. excav., dental, 30-60 ft.
(7) 850 cu. yd. excav., dental, over 60 ft.
(8) 21,700 cu. yd. dumped rock backfill.
(9) 1,400 cu. yd. graded backfill.
(10) 40,000 sq. yd. foundation clean-up.
(11) 170 lin. ft. field stone wall in parking area.
(12) 950 lin. ft. 18-in. semi-circular metal drains.
(13) 2,150,000 cu. yd. mass concrete for dam.
(14) 10,000 cu. yd. conc. for backfilling dental excav., drifts, tunnels and calyx holes.
(15) 25,125 cu. yd. conc. in power intakes, spray walls, bridge, piers and turnaround.
(16) 220 cu. yd. conc. in parapet walls, floatwell gauge room and outside stairs.
(17) 2,100,000 lb. steel reinforcement.
(18) 1,600,000 bbl. Portland cement.
(19) Lump sum, install Gov't-furn. sluice gates and accessories.
(20) Lump sum, sluice gates operating equip.
(21) Lump sum, install Gov't-furn. tainter gates, machinery and accessories.
(22) 1,560,000 lb. penstock liners.
(23) 364,000 lb. trash rack guides.
(24) Lump sum, power, lighting and tele. systems.
(25) Lump sum, tower.
(26) Lump sum, roadway drains.
(27) Lump sum, domestic water system.
(28) Lump sum, sanitary system.
(29) Lump sum, sump pumping system.
(30) Lump sum, compressed air system.
(31) Lump sum, office ventilating and heating sys.
(32) Lump sum, floatwell.
(33) 46,000 lb. air intake liners; sluice conduits.
(34) 58,400 lb. air intake liner, penstocks.
(35) 33,000 lb. copper water stops.
(36) Lump sum, tile partitions in gallery toilets.
(37) Lump sum, metal covered doors and frames.
(38) 3,520 lin. ft. parapet handrail.
(39) 12,100 lb. pipe handrail.
(40) 5,000 lin. ft. safety treads.
(41) Lump sum, emergency generator engine fuel and exhaust system.
(42) 500 lb. cast iron drains in roof and floors.
(43) 2,000 f.b.m. timber.
(44) Lump sum, sluice stop log gate and lifting beam.
(45) 380,000 lb. gate guide frames and accessories.
(46) 4 each electric hand lantern.
(47) Lump sum, portable fire extinguishers.
(48) 54,500 lb. miscel. iron and steel.
(49) 600 lin. ft. 4-in. galvanized steel pipe.
(50) 125 lin. ft. 12-in. black steel pipe—sched. 40.
(51) 400 lin. ft. 8-in. black steel pipe—sched. 40.
(52) 680 lin. ft. 6-in. black steel pipe—sched. 40.
(53) 500 lin. ft. 4-in. black steel pipe—sched. 40.
(54) 2,500 lin. ft. 3½-in. blk. steel pipe—sched. 40.
(55) 100 lin. ft. 3-in. black steel pipe—sched. 40.
(56) 5,000 lin. ft. 2½-in. blk. steel pipe—sched. 40.
(57) 720 lin. ft. 2-in. black steel pipe—sched. 40.
(58) 180 lin. ft. 1½-in. black steel pipe—sched. 40.
(59) 2 ea. 12-in. dresser coupling.
(60) 3 ea. 12-in. gate valve.
(61) 10 ea. 6-in. gate valve.
(62) 14 ea. 2-in. bronze gate valve.
(63) 14 ea. 1½-in. bronze gate valve.
(64) 21,900 lb. miscl. pipe fittings.
(65) 75 lin. ft. 12-in. stainless steel pipe—sched. 40.
(66) 570 lin. ft. 6-in. stainless steel pipe—sch. 40.
(67) 180 lin. ft. 2-in. stainless steel pipe—sch. 40.
(68) 520 lin. ft. 1½-in. stainless steel pipe—sch. 40.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
(1)	$450,000	$174,000	$811,859	$1,050,000	$500,000	$700,000	$400,000	$400,000
(2)	4.50	11.00	10.00	4.25	5.20	4.00	6.00	5.25
(3)	2.50	2.30	4.31	4.25	3.00	2.00	6.00	1.72
(4)	10.00	25.00	13.10	35.00	17.00	22.50	10.00	15.56
(5)	20.00	75.00	50.00	35.00	24.00	37.00	20.00	43.68
(6)	40.00	75.00	60.00	35.00	40.00	61.00	30.00	66.16
(7)	40.00	75.00	95.00	35.00	48.00	75.00	50.00	69.20
(8)	1.90	2.20	3.00	3.65	3.00	3.00	5.00	2.43
(9)	3.00	3.00	4.43	2.70	3.10	4.00	6.00	2.73
(10)	2.25	4.40	2.50	25.00	9.00	17.50	3.00	4.45
(11)	14.00	13.00	9.75	10.50	28.00	12.00	15.00	10.30
(12)	7.00	8.00	4.50	12.50	3.40	9.00	4.00	3.66
(13)	7.71	7.27	7.80	8.32	8.93	9.35	11.55	6.55
(14)	9.00	13.00	12.00	11.92	14.40	18.00	16.50	6.20
(15)	24.00	28.00	24.40	38.20	29.32	25.00	36.00	17.44
(16)	100.00	150.00	119.00	120.00	120.00	100.00	100.00	94.70
(17)	.085	.11	.12	.115	.11	.18	.15	.11
(18)	2.75	3.20	3.00	3.10	4.40	3.30	3.75	3.80
(19)	$100,000	$80,000	$60,000	$75,475	$82,000	$175,000	$201,250	$146,300
(20)	$50,000	$35,000	$32,000	$62,060	$47,000	$48,000	$55,000	$34,060
(21)	$100,000	$90,000	$100,000	$90,444	$62,000	$199,000	$156,000	$117,000
(22)	.24	.23	.20	.234	.20	.25	.22	.25
(23)	.16	.16	.15	.205	.22	.15	.16	.27
(24)	$90,000	$96,258	$110,000	$144,278	$108,000	$100,000	$122,600	$113,900
(25)	$115,000	$90,000	$60,000	$83,922	$77,000	$75,000	$105,000	$86,600
(26)	$2,000	$3,200	$1,700	$1,204	$1,000	$1,000	$3,000	926.00
(27)	$11,000	$15,000	$12,000	$22,413	$14,500	$15,000	$33,000	$9,830
(28)	$13,500	$10,000	$9,500	$22,459	$20,000	$16,000	$45,000	$9,575

(Continued on next page)



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NEWS of MANUFACTURERS

ican Steel & Wire Co. at New Haven, Conn. He has recently been conducting preliminary surveys of the San Jacinto, Calif., passenger tramway project. During his association with American Steel & Wire Co., he is credited with having been engaged on more than 100 tramway projects.

☆ ☆ ☆

GENERAL BREHON SOMERVELL, president of *Koppers Co., Inc.*, since 1946, has been named chairman of the board of directors. He replaces J. P. WILLIAMS, JR., who has retired. W. F. MUNNIKHUYSEN, who has been vice-president and general manager of the company's wood preserving division, was named executive vice-president of the company.

☆ ☆ ☆

Appointment of HAROLD M. WINTON as director of training for the mechanical goods division, *United States Rubber Co.*, has been announced by ERNEST G. BROWN, vice-president and general manager. His headquarters will be at Rockefeller Center, New York.

☆ ☆ ☆

LEWIS M. PARSONS, formerly assistant to vice president, sales, has been elected a vice president, director and member of the executive committee of *United States Steel Corp. of Delaware*, according to BENJAMIN F. FAIRLESS, president. Parsons will continue to be located at Washington, D. C.

☆ ☆ ☆

Timken Roller Bearing Co., Canton, Ohio, now has J. R. COMBER, former manager of the firm's sales order division, as head of the Canton office of the Automotive Division, and, in addition, to handle special sales administration assignments. Also, E. H. HUGHES, systems department manager for the firm was appointed manager of the sales order division.

☆ ☆ ☆

DAVID M. KLAUSMEYER, president of *Marmon-Herrington Co.*, Indianapolis, Ind., announces the appointment of FRED B. CRONER to a vice-presidency of the company, in charge of procurement. Also, GEORGE H. FREERS, who has been the company's chief engineer for the past ten years, was named to the position of vice-president in charge of engineering.

☆ ☆ ☆

Duff-Norton Manufacturing Co., Pittsburgh, Pa., announces the appointment of CHARLES R. ELLICOTT, JR., as eastern district sales manager with headquarters in New York City.

☆ ☆ ☆

EDWARD LEE SOULE', JR. has been elected to the post of vice-president and general production manager for all plants of the *Soule' Steel Co.* Lee Soule' has been connected with the firm for 15 years. During the war he was in charge of the company's San Francisco naval craft construction.

(29)	$4,500	$5,000	$5,800	$7,979	$5,000	$7,500	$9,000	$3,760
(30)	$5,000	$7,000	$10,000	$12,190	$7,000	$8,000	$14,000	$6,120
(31)	$2,500	$4,000	$2,600	$4,853	$3,000	$3,000	$3,000	$2,280
(32)	$16,000	$20,000	$20,000	$15,504	$16,000	$15,000	$22,000	$12,025
(33)	.25	.32	.31	.22	.33	.25	.23	.16
(34)	.25	.31	.30	.23	.34	.30	.38	.17
(35)	1.60	1.30	1.22	2.18	1.37	2.00	1.20	2.14
(36)	$1,000	400.00	$1,150	$1,746	$1,400	$1,000	$1,500	430.00
(37)	$1,600	$1,500	920.00	$1,592	900.00	600.00	$1,600	870.00
(38)	4.50	6.00	6.70	4.05	3.10	4.00	15.00	4.95
(39)	.65	.65	.92	.65	.76	.50	.50	.50
(40)	2.00	2.10	3.30	1.20	1.37	1.75	7.50	2.07
(41)	$2,500	$1,900	$4,900	$2,523	$1,500	$2,000	$15,000	$12,600
(42)	2.00	.50	1.43	2.00	2.30	3.00	1.10	1.30
(43)	.40	.40	.51	.36	.70	.50	.30	.34
(44)	$7,500	$8,000	$6,200	$9,902	$8,200	$9,000	$12,500	$11,600
(45)	.30	.32	.29	.415	.343	.40	.35	.36
(46)	18.00	20.00	33.00	20.00	35.00	10.00	10.00	9.75
(47)	500.00	200.00	405.00	275.00	160.00	300.00	250.00	70.00
(48)	.45	.40	.35	.48	.41	.45	.55	.35
(49)	2.25	4.00	3.00	3.50	2.60	2.00	4.50	2.00
(50)	7.50	14.00	5.50	14.00	11.00	11.00	25.00	7.12
(51)	4.50	8.00	3.50	5.00	6.00	7.00	15.00	10.48
(52)	4.00	6.00	3.00	5.50	4.10	4.50	10.00	3.20
(53)	2.25	4.00	1.50	2.25	2.50	2.50	4.50	2.70
(54)	2.25	3.00	3.50	2.00	7.20	2.00	5.00	2.65
(55)	1.75	2.50	2.54	1.75	1.70	1.75	3.50	1.45
(56)	1.75	2.00	2.25	1.40	2.30	1.40	2.50	2.16
(57)	1.30	1.50	1.00	1.05	1.60	.90	2.25	1.00
(58)	1.20	1.00	.65	1.90	1.30	.70	1.75	1.30
(59)	35.00	60.00	44.00	45.00	30.00	40.00	25.00	44.00
(60)	350.00	400.00	300.00	290.00	530.00	600.00	575.00	720.00
(61)	125.00	200.00	150.00	90.00	160.00	200.00	210.00	234.00
(62)	25.00	60.00	30.00	13.00	32.00	30.00	22.50	75.00
(63)	25.00	50.00	20.00	8.50	26.00	20.00	21.00	50.00
(64)	.70	.70	1.20	.95	.61	2.00	.70	.96
(65)	80.00	60.00	60.00	50.00	108.00	50.00	95.00	85.00
(66)	18.00	22.00	20.00	20.00	23.00	20.00	38.50	21.80
(67)	6.50	6.00	6.00	5.75	10.00	5.00	14.80	4.75
(68)	5.50	5.00	4.00	4.50	8.00	4.00	10.50	4.00

California—Santa Clara County—District—Earth and Rock

Guy F. Atkinson Co., South San Francisco, with a bid of $1,879,772, was low before the Santa Clara Water Conservation District for construction of the Leroy Anderson storage dam on the Coyote River. The bid was for completion of the dam in one year. Alternate bids were submitted for completion of the dam in two years. Caputo & Keeble, San Jose, with a bid of $2,000,552, was low bidder for completion of the dam in two years. The combination earth and rock dam will contain about 3,000,000 cu. yd. in the main embankment. The reservoir will have about 75,000 ac. ft. capacity. Unit bids were submitted as follows:

PROGRAM A—COMPLETION WITHIN ONE YEAR

(1) Guy F. Atkinson Co. $1,879,775
(2) M & K Corp., Fredrickson & Watson and Piombo Construction Co. 1,967,056
(3) Macco Corp. and Morrison-Knudsen Co., Inc. 2,097,913
(4) Bressi & Bevanda 2,222,366
(5) Vinnell Co. & Wunderlich 2,308,243
(6) Western Contracting Co. $2,294,407
— Peter Kiewit Sons' Co. 2,328,324
— A. Teichert & Son 2,330,714
— Dragline Rentals, Inc. 2,568,757
— Ball, Harms & Parker 2,570,078
— McNutt Bros. 2,731,535

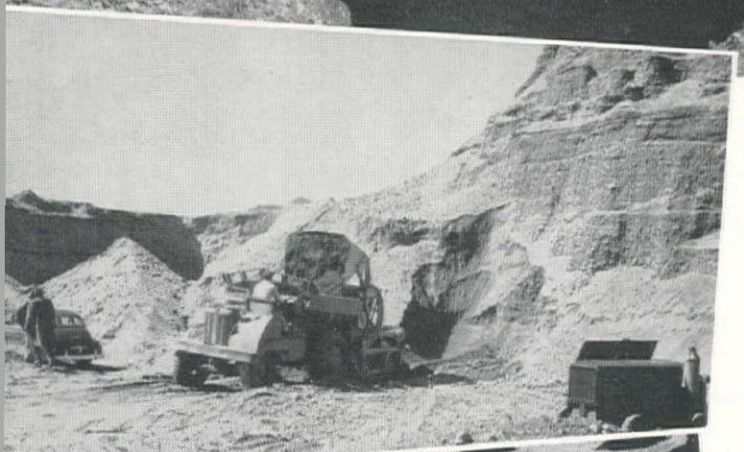
		(1)	(2)	(3)	(4)	(5)	(6)
259,000	cu. yd. excav. under dam except bedrock, below elev. 410; earth gravel, boulders and decomposed rock	.90	1.50	.85	.35	.70	.95
126,100	cu. yd. excav. under dam except bedrock, above elev. 410; earth, gravel, boulders and decomposed rock	.42	.37	.55	.35	.40	.60
148,200	cu. yd. stripping for dam and spillway	.36	.27	.55	.35	.40	.35
3,000	cu. yd. rock excav. in cut-off trench under dam	2.00	1.60	1.50	3.00	4.00	3.00
84,900	cu. yd. excav. for spillway and approach chan.; earth, gravel boulders, rock	.32	.35	.50	.35	.40	.70
80	lin. ft. drill grout holes under dam; depths from 0 to 30 ft.	2.00	3.00	1.00	3.00	2.00	5.00
1,100	lin. ft. drill grout holes under dam; depths from 30 to 100 ft.	2.00	5.00	5.00	4.00	2.00	5.00
23	holes furn. and install grout pipe and fittings in grout holes under dam	20.00	6.00	17.50	20.00	8.00	35.00
300	sacks pressure grouting under dam	1.50	7.00	3.00	4.00	4.00	4.00
720	lin. ft. drill grout holes under spillway weir to depth of not more than 20 ft.	1.50	3.00	1.00	3.00	2.10	5.00
36	holes furn. and install grout pipe fittings for spillway weir	25.00	19.00	17.50	20.00	10.00	35.00
180	sacks pressure grouting under spillway weir	2.00	7.00	3.00	4.00	5.00	5.00
352,000	cu. yd. rolled earth-fill in Zone 2 of embank.	.32	.38	.41	.43	.32	.57
714,400	cu. yd. rolled-fill in Zone 3 of embank.	.32	.38	.41	.43	.32	.57
948,100	cu. yd. rock-fill in Zone 1 of embank.	.66	.65	.67	.74	.80	.57
1,064,400	cu. yd. rock-fill in Zone 4 of embank.	.525	.58	.59	.60	.80	.64
400	cu. yd. conc. for spillway and weir footing	35.00	32.00	25.00	40.00	26.00	45.00
2,990	cu. yd. conc. for spillway lining and cut-off walls	40.00	32.00	38.00	40.00	30.00	37.50
29	cu. yd. conc. for inlet struct. and outlet valve vault	80.00	90.00	63.00	85.00	65.00	140.00
82	cu. yd. conc. for paved outlet works channel including cut-off walls	90.00	47.00	31.00	55.00	50.00	130.00
2½	cu. yd. conc. for control locker	110.00	100.00	100.00	150.00	125.00	140.00
20	cu. yd. conc. for outlet pipe jacket	25.00	36.00	41.00	25.00	30.00	55.00
441,300	lb. furn. and place reinf. steel	.07	.065	.07	.10	.09	.12
Lump sum,	install sluice gate, butterfly valve, taper sections, discharge pipe, hydraulic control lines and all other appurt., all to be furn. by the District	$1,000	$4,500	$3,600	$4,000	$3,000	$5,000
550	lin. ft. furn. and install wooden protective covering for hydraulic control lines	2.50	2.50	2.00	2.50	2.50	1.70
2,400	lb. furn. and install struct. steel in place	.25	.35	.61	.60	.20	.15
250,000	cu. yd. overhaul for borrow matl. for Zone 3; average overhaul (beyond 2,000 ft. free haul limit) is 1,000 ft.	.003	.003	.003	.003	.001	.03
Lump sum,	bronze tablet	125.00	240.00	250.00	500.00	100.00	150.00

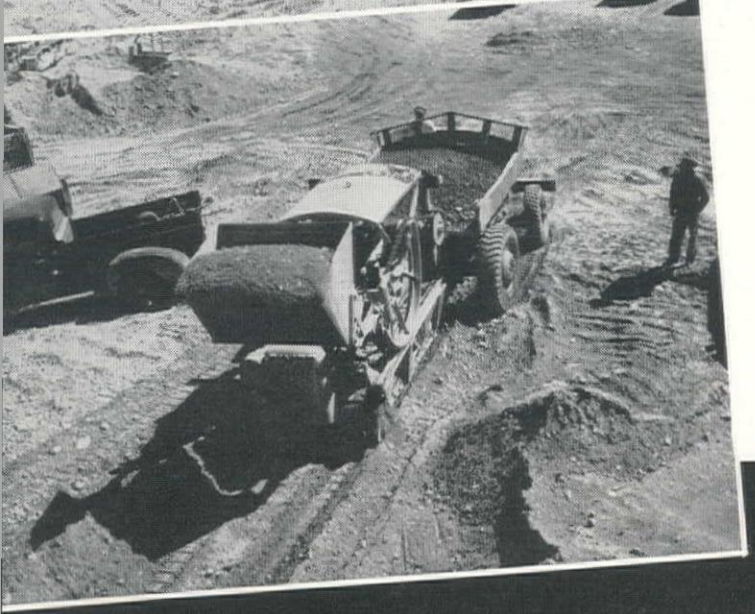
PROGRAM B—COMPLETION WITHIN TWO YEARS

(1) Caputo & Keeble $2,000,552
(2) United Concrete Pipe Corp. and Westbrook & Pope 2,175,781
(3) T. E. Connolly 2,232,016
(4) Grafe-Callahan 2,240,022
(5) A. Teichert & Son $2,280,624
(6) Stolte, Inc. 2,348,992
— Ball, Harms & Parker 2,368,729
— Clyde W. Wood 2,398,203

(Continued on next page)

EIMCO RockerShovel 104





Eimco 104 RockerShovel loading sand and gravel (weight: 125 lbs. per cu. ft.) at the rate of 8 yards per minute.

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The Eimco 104 RockerShovel is designed for loading heavy, abrasive rock or sand and gravel using a 1¼ yard bucket for heavy rock, and a 2 yard bucket for sand and gravel. The 104 is available with a 48 H.P. Diesel engine, or 30 H.P. Electric motor.

This machine is ideal for loading, bulldozing, or cleaning in roadwork, quarries, stock piles, and mines. Operators are finding new uses for it every day.

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AGENTS IN ALL PRINCIPAL CITIES THROUGHOUT THE WORLD

Alaska Construction

. . . Continued from page 63

produced for the Government by separate contracts and furnished to each of the construction contractors requiring it. Government-furnished materials, including concrete produced under separate contract, and also the value of equipment rentals, aggregated approximately $14,000,000 for the 48 separate contracts totaling $46,000,000 which were let in 1949.

To eliminate from the bids as many as possible of the items involving risks difficult or impossible to estimate, the Government conducted or directly supervised some of the work incidental to construction. Lack of a fully developed economy in the territory, unstable labor supply, and high transportation costs are the principal contributing factors which tend to make estimates difficult in some bid items.

Construction equipment stored at Fort Richardson and Ladd Air Force Base was loaned to contractors undertaking construction jobs in these localities. Equipment was made available in such quantities as to virtually eliminate the contractors' need for providing such equipment of their own.

This arrangement whereby the Corps of Engineers eliminated procurement of equipment as a contractor's problem, at a time when most equipment items were in short supply, not only served as an inducement to submit bids but also effected a substantial saving in the overall cost of the job. Transportation problems, always a major factor to be considered by contractors doing business in Alaska, were considerably reduced.

Feeding and housing facilities, erected under the cost-plus-fixed-fee contract system previously in use, were operated last year under a camp service contract with Universal Food Service, Inc. Payment direct to the camp service contractor was made by the construction contractor who made corresponding deductions from the construction worker's pay.

Three unit price contracts for production of concrete and concrete products were placed through competitive bidding and resulted in simpler and more efficient job control. By this arrangement the concrete supplier furnished concrete to all the construction contractors uniformly and in accordance with their job demands. Concrete produced in this manner cost the Government very little more than one-half the delivery price from the nearest commercial plant. In one case, that of the Eielson Air Force Base, there was no commercial plant in the immediate area.

The Alaska District Engineer, Colonel Lyle E. Seeman, has his office at Fort Richardson, about 3 mi. from Anchorage, Alaska's largest city. Charged by military order with the responsibility for supervision of construction in Alaska for the national military establishment, the District Engineer's military clients are the U. S. Air Force, the U. S. Army, and the Alaska Communications System (Signal Corps, U. S. Army).

	(1)	(2)	(3)	(4)	(5)	(6)
259,000 cu. yd. excav. below 410	.80	3.00	3.00	2.00	1.50	.90
126,100 cu. yd. excav. above 410	.60	.80	.31	.24	.32	.80
148,200 cu. yd. stripping	.60	.80	.15	.31	.30	.30
3,000 cu. yd. excav. rock cut-off trench	2.00	4.00	1.50	10.00	5.00	4.00
84,900 cu. yd. excav. spillway	.75	.60	.65	1.00	.50	.60
80 lin. ft. drill grout holes 0-ft. to 30-ft.	4.50	1.00	5.00	10.00	3.00	3.00
1,100 lin. ft. drill grout holes 30-ft. to 100-ft.	4.50	2.00	3.00	10.00	3.00	4.00
23 holes grout fittings—dam	10.00	25.00	10.00	20.00	5.00	6.00
300 sacks grout under dam	3.50	6.00	5.00	10.00	4.00	4.00
720 lin. ft. drill grout holes spillway weir	4.50	1.00	3.00	10.00	3.00	3.00
36 holes grout fittings—spillway	10.00	25.00	5.00	30.00	5.00	6.00
180 sacks grout under spillway weir	3.50	6.00	5.00	10.00	4.00	4.00
352,000 cu. yd. embankment Zone 2	.30	.31	.38	.45	.57	.50
714,400 cu. yd. embankment Zone 3	.30	.30	.45	.45	.57	.50
948,100 cu. yd. embankment Zone 1	.90	.72	.70	.75	.70	.73
1,064,400 cu. yd. embankment Zone 4	.40	.62	.70	.60	.60	.66
400 cu. yd. concrete supply weir	30.00	30.00	30.00	42.00	35.00	35.00
2,990 cu. yd. concrete spillway lining	27.00	30.00	30.00	17.50	35.00	40.00
29 cu. yd. conc. inlet and outlet struct.	100.00	90.00	40.00	107.00	75.00	70.00
82 cu. yd. conc. outlet channel	50.00	30.00	50.00	85.00	70.00	70.00
2.5 cu. yd. conc. control locker	80.00	300.00	100.00	230.00	100.00	100.00
20 cu. yd. conc. outlet pipe jacket	30.00	30.00	20.00	70.00	35.00	40.00
441,300 lb. reinforcing steel	.0675	.07	.10	.12	.08	.07
Lump sum, install valves and appurt.	$1,500	$1,000	$1,000	$2,150	$3,000	$2,500
550 lin. ft. protective covering	2.00	2.50	2.00	1.75	4.00	2.00
2,400 lb. structural steel	.40	.40	.20	.85	.30	.50
2,500,000 sta. yd. overhaul Zone 3	.01	.01	.001	.001	.005	.01
Lump sum, bronze tablet	250.00	200.00	100.00	400.00	200.00	100.00

Bridge and Grade Separation . . .

Washington—Franklin and Walla Walla Counties—State—Steel Girder

General Construction Co., Seattle, Wash., with a bid of $1,244,545, was low before the Washington Department of Highways for construction of a 1,770-ft. steel girder bridge across the Snake River at Pasco, Wash. Unit bids were submitted as follows:

(1)	General Construction Co.	$1,244,545	
(2)	Manson Construction and Engineering Co.	1,414,100	
(3)	J. H. Pomeroy & Co., Inc.	1,417,405	
(4)	Roy L. Bair & Co. and Hansen & Parr Construction Co.	1,494,375	
(5)	Morrison-Knudsen Co., Inc.	$1,563,850	
(6)	Guy F. Atkinson Co.	1,592,640	
—	Ben C. Gerwick, Inc.	1,614,859	
—	M. P. Butler and J. C. Boespflug Construction Co.	1,697,340	

	(1)	(2)	(3)	(4)	(5)	(6)
10,600 cu. yd. struct. excav.	5.00	4.00	10.00	6.50	6.15	5.00
Lump sum, shoring and cribs	$90,000	$245,000	$200,000	$150,000	$240,000	$337,000
15 days mechanical tamper	36.00	60.00	30.00	30.00	50.00	45.00
2,470 cu. yd. concrete Class A in place	65.00	65.00	60.00	90.00	78.00	82.00
6,670 cu. yd. concrete Class F in place	30.00	30.00	30.00	40.00	28.00	26.00
5,600 cu. yd. concrete Class H in place	20.00	20.00	21.00	30.00	16.00	19.00
940,000 lb. steel reinf. bars in place	.09	.095	.085	.11	.10	.09
1,870,000 lb. struct. carbon steel in place	.16	.16	.15	.15	.18	.17
1,210,000 lb. struct. low alloy steel in place	.17	.16	.165	.165	.198	.18
32,000 lb. cast steel in place	.25	.35	.30	.30+	.32	.28
40 only bridge drains comp. in place	50.00	50.00	40.00	50.00	50.00	60.00
290 lb. copper seals in place	1.50	2.00	.75	1.50	2.00	1.50
390 lin. ft. downspouts in place	7.00	8.00	6.25	5.00	10.50	10.00
Lump sum, removing existing structure	$25,000	$53,000	$70,000	$20,000	$100,000	$80,000
230 M.b.m. hauling salvaged material	3.00	5.00	5.00	3.00	6.00	7.00

Highway and Street . . .

Washington—King and Kittitas Counties—State—Concrete Snowsheds

C. V. Wilder Co. and Gaasland Co., Inc., Bellingham, Wash., with a bid of $1,015,620 was awarded the contract by the Washington Department of Highways for construction of two precast concrete snowsheds on State Highway No. 2. The sheds will total 0.34 mi. in length, and will extend over two lanes of a four-lane highway. Construction of the additional two lanes to convert the route into a four-lane highway is included in the bid. Traffic will use outside lanes during snowshed erection, inside lines during heavy snow periods. Unit bids were submitted as follows:

(1)	C. V. Wilder & Gaasland Co., Inc.	$1,015,620	
(2)	Kuney-Johnson Co.	1,090,703	
(3)	Guy F. Atkinson Co.	1,230,560	
(4)	N. Fiorito Co.	1,245,469	
(5)	S. S. Mullen, Inc.	1,249,320	
(6)	C. E. Oneal	1,291,267	
—	Manson Construction and Engineering Co. & Osberg Construction Co.	$1,334,030	
—	Scheumann & Johnson	1,336,696	
—	Peter Kiewit Sons' Co.	1,434,711	
—	C. J. Montag & Sons	1,452,335	
—	Morrison-Knudsen Co., Inc.	1,594,408	

	(1)	(2)	(3)	(4)	(5)	(6)
Lump sum, clearing and grubbing	$22,000	$6,000	$4,000	$17,500	$12,500	$5,000
154,640 cu. yd. Cl. B excav. incl. haul of 600 ft.	.62	.60	.80	.55	.63	.70
67,170 cu. yd. solid rock excav. incl. haul of 600 ft.	1.58	1.50	.80	1.40	1.40	1.70
40 cu. yd. com. trench excav. incl. haul of 600 ft.	3.00	1.50	3.00	4.00	2.00	3.00
40 cu. yd. solid rk. tr. excav. incl. haul of 600 ft.	10.00	5.00	8.00	6.00	5.00	4.50
245,630 cu. yd. sta. overhaul	.025	.02	.02	.025	.015	.02
458.21 M. cu. yd. sta. overhaul	5.00	10.00	13.00	6.00	8.00	8.00
790 cu. yd. structure excav.	3.50	4.00	3.00	4.00	3.00	3.50
69 days mechanical tamper	40.00	35.00	70.00	35.00	35.00	25.00
53.4 sta. (100 ft.) finishing roadway	20.00	20.00	20.00	15.00	15.00	15.00
1,100 M. gal. water in place	4.00	2.50	5.00	2.00	3.00	3.00
36,900 cu. yd. talus backfill in place	.50	1.00	.27	.75	.30	.75
9,280 cu. yd. gravel backfill in place	.75	2.00	1.00	1.50	1.35	2.50
5,960 cu. yd. sel. roadway borrow in place	2.30	3.00	1.80	1.50	1.75	2.50
1,930 cu. yd. cr. stone surf. top course in place	4.00	4.00	6.00	6.00	5.00	5.00
TYPE I-1 ASPHALTIC CONCRETE PAVEMENT						
398 ton Class C wearing course in place	15.40	15.00	16.00	16.00	15.00	15.00
596 ton Class L leveling course in place	15.40	15.00	16.00	16.00	15.00	15.00
MISCELLANEOUS ITEMS						
5,205 sq. yd. cem. conc. pave. std. 14-day mix 8-in. sec. in pl.	3.75	5.00	5.50	5.00	5.40	5.00
456 only dowel bars with rubber caps in place	.50	1.00	.60	.50	.50	.75

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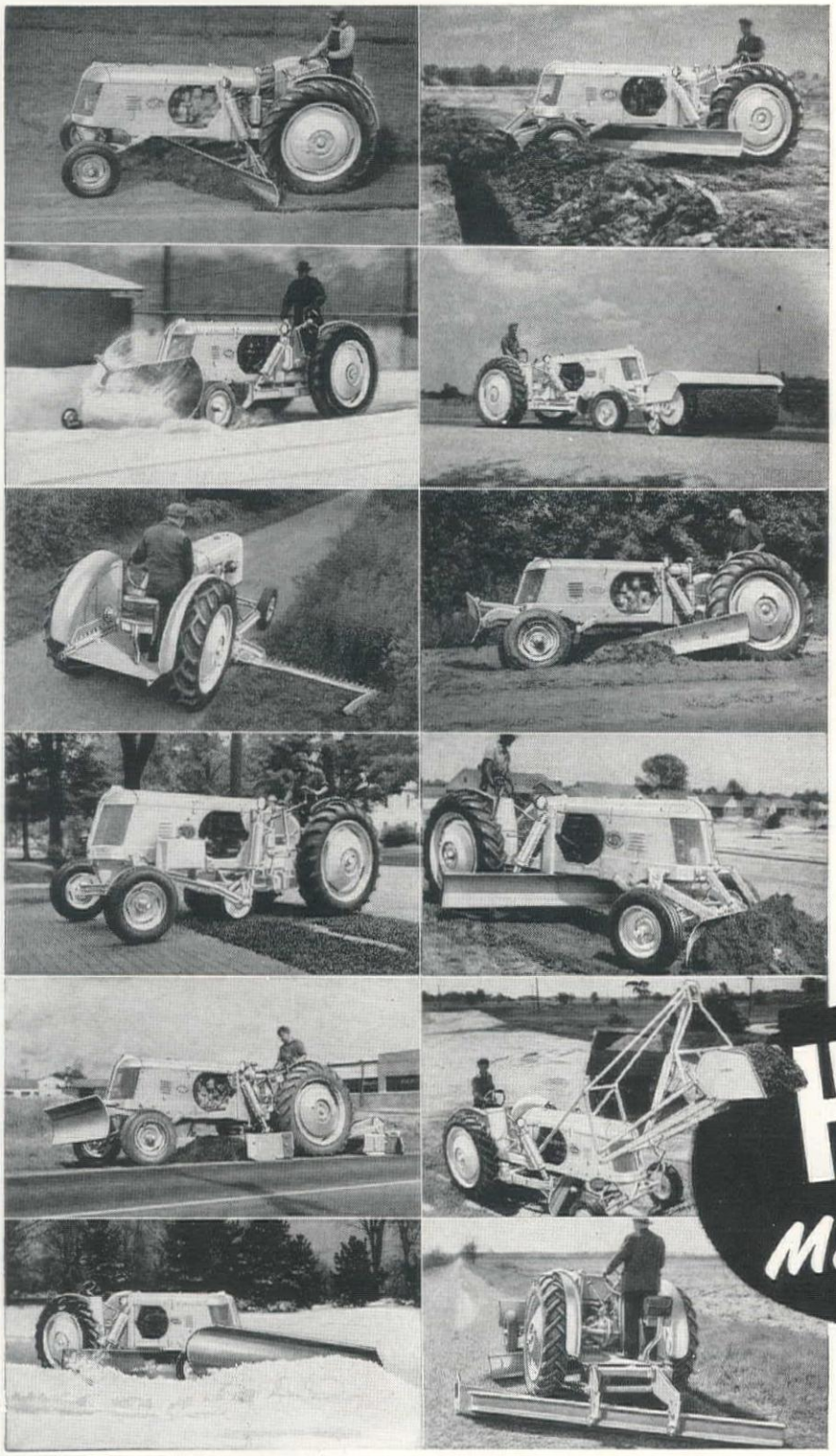

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Edward F. Hale Co.	Hayward, Calif.
Foulger Equipment Co., Inc.	Salt Lake City 8, Utah
The Colorado Builders' Supply Co.	Denver 9, Colorado
The Colorado Builders' Supply Co.	Casper, Wyoming
Montana Powder & Equip. Co.	Helena, Billings, Montana

692 lin. ft. sp. ½ rd. corr. mtl. sp'wy #14 ga. diam. in pl.	3.85	5.00	6.00	3.50	4.00	3.85
1,800 lin. ft. spec. cem. conc. curb and gutter in place	2.50	2.50	3.50	3.00	2.50	2.00
18 only bridge drains complete in place	50.00	80.00	60.00	50.00	60.00	60.00
6 cu. yd. concrete Class C in place	25.00	100.00	70.00	100.00	40.00	75.00
132 lin. ft. std. reinf. conc. culv. pipe 18-in. diam. in place	4.00	4.00	4.00	4.00	3.50	4.00
1,659 lin. ft. std. reinf. conc. culv. pipe 24-in. diam in place	6.00	6.00	6.00	6.50	6.00	5.50
54 lin. ft. std. reinf. conc. culv. pipe 30-in. diam. in place	7.50	8.00	8.00	10.00	8.25	7.00
1,231 lin. ft. remov. and resetting cable guard rail	.75	2.00	1.50	2.00	1.60	1.95
9,027 sq. yd. removing concrete pavement	.65	.60	.70	1.00	.50	.40
40 lin. ft. remov. open wood flume spillway	1.00	1.00	2.00	1.00	5.00	2.00
2,380 lin. ft. removing cable guard rail	.25	.70	.70	1.00	.50	.20
4 only removing concrete pipe headers	35.00	25.00	12.00	50.00	25.00	15.00
SNOWSHEDS						
10,780 cu. yd. structure excavation	2.30	2.00	2.10	2.00	3.00	3.90
3,120 cu. yd. concrete Class A precast	49.80	42.00	65.00	46.00	60.00	44.00
685 cu. yd. concrete Class A in place	39.00	52.00	70.00	55.00	60.00	56.00
9,800 cu. yd. concrete Class B in place	22.00	30.00	38.00	45.00	39.00	44.00
2,705,000 lb. steel reinforcing bars in place	.085	.08	.09	.085	.095	.09
2,200 lb. structural carbon steel in place	.25	.40	.50	.50	.35	.35
18 only manhole frames and covers in place	65.00	60.00	50.00	50.00	40.00	50.00
344 lb. copper seals in place	1.50	2.00	2.00	2.25	2.00	1.25
1,540 sq. yd. waterproofing	2.25	5.00	3.20	3.25	3.25	3.75
Lump sum, removing structure	$5,000	$10,000	$8,000	$10,000	$7,500	$5,000

Oregon—Union County—State—Grade and Surf.

M. L. and C. R. O'Neil, Creswell, Ore., was awarded a $460,296 contract by the Oregon State Highway Department for 13.6 mi. of grading and topping with cinders and gravel on the Ladd Canyon-North Powder Section of the Old Oregon Trail Highway. Unit bids were submitted as follows:

(1)	M. L. and C. R. O'Neil	$460,296	
(2)	Allen E. Sackett & D. F. McKenzie	464,847	
(3)	Cosmo Gilo	471,043	
(4)	R. A. Heintz Construction Co.	473,102	
(5)	Roy L. Houck & Son	476,692	
(6)	J. C. Papin & Durbin Bros.	481,508	
(7)	Stevenson Construction Co.	483,010	
—	Morrison-Knudsen Co., Inc.	527,170	
—	Parker Schram Co.	534,537	
—	C. H. Grimstad & T. Vanderveld & Heavy Hauling Co.	545,512	
—	Roy L. Blair & Co.	564,952	
—	K. F. Jacobsen & Co., Inc.	$569,175	
—	Leonard & Slate Oreg. Ltd. & E. C. Haul Co.	569,840	
—	McNutt Bros.	575,376	
—	Natt McDougall Co.	578,176	
—	Smith Bros. & John Havlik	603,555	
—	J. N. & M. J. Conley	603,779	
—	Peter Kiewit Sons' Co.	620,311	
—	Tony Marrazzo	630,560	
—	Quinn Robbins, Inc.	739,394	
—	F. R. Hewitt Co.	769,785	
—	C. J. Eldon	871,230	

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lump sum, clearing and grubbing	$20,310	$5,000	$3,000	$25,000	$2,500	$8,420	$11,400
2,100 cu. yd. trench excav., unclassified	2.00	2.00	2.50	3.50	2.00	2.50	2.00
642,000 cu. yd. general excav., unclassified	.30	.33	.27	.21	.30	.33	.32
1,718,000 yd. sta. short overhaul	.01	.01	.01	.0075	.01	.01	.01
15,000 yd. sta. long overhaul	.40	.40	.40	.35	.35	.30	.40
13.58 mi. finishing roadbed and slopes	400.00	300.00	400.00	300.00	300.00	350.00	300.00
20,000 lin. ft. bounding cutbanks	.12	.15	.10	.15	.15	.15	.12
1,340 lin. ft. 18-in. concrete pipe	3.35	3.00	3.70	4.00	2.50	2.50	2.75
180 lin. ft. 18-in. conc. pipe, extra str.	3.60	3.20	4.00	4.50	2.75	2.75	2.95
1,400 lin. ft. 24-in. concrete pipe	4.65	4.50	5.00	5.00	3.60	3.60	3.90
230 lin. ft. 36-in. concrete pipe	8.10	10.00	8.40	8.75	6.80	6.60	7.50
240 lin. ft. 48-in. corr. metal pipe	13.60	15.00	14.00	13.50	12.50	12.75	12.00
330 lin. ft. 60-in. corr. metal pipe	23.25	21.50	20.80	19.50	21.00	21.00	20.00
70 lin. ft. 72-in. corr. metal pipe	31.25	25.00	27.50	25.50	26.00	26.75	25.00
460 lin. ft. 18-in. corr. metal siphon pipe	5.25	5.00	5.80	5.00	5.20	4.35	4.25
200 lin. ft. 24-in. corr. metal siphon pipe	6.75	7.50	7.40	6.50	7.30	6.50	5.75
450 lin. ft. 6-in. perf. metal dr. pipe, coated	1.75	2.00	2.50	2.00	1.30	1.50	1.50
50 cu. yd. conc. end basins	54.00	54.00	75.00	60.00	40.00	50.00	54.00
60 cu. yd. rock or gravel backfill in drains	5.00	5.00	6.00	7.50	2.00	5.00	5.50
250 cu. yd. Class "A" concrete	54.00	54.00	60.00	52.50	48.00	50.00	54.00
38,000 lb. metal reinforcement	.11	.11	.11	.125	.10	.12	.11
310 lin. ft. 102-in. sectional plate culv.	36.00	34.25	50.00	44.00	32.25	35.25	36.00
274,700 cu. yd. selected cinder topping	.24	.25	.22	.31	.25	.25	.25
50,700 cu. yd. selected gravel topping	.40	.40	.25	.35	.30	.38	.40
842,000 yd. mi. hauling cinder topping	.05	.05	.08	.0875	.08	.06	.065
182,000 yd. mi. hauling gravel topping	.07	.07	.15	.12	.12	.09	.10
8,100 M. gal. sprinkling	1.00	1.00	2.50	2.00	2.50	1.75	1.50

California—Tuolumne County—State—Grade and Surf.

Chittenden and Chittenden, Auburn, Calif., with a bid of $167,391, was low before the California Division of Highways for the grading, penetration oil treatment and seal coating of 12.6 mi. of Keystone-La Grange Road between S. H. Route 13 and Stanislaus County Line. Unit bids were submitted as follows:

(1)	Chittenden and Chittenden	$167,391	
(2)	George E. France, Inc.	174,348	
(3)	Eugene G. Alves	181,138	
(4)	John Delphia	183,351	
(5)	Dan Caputo and Edward Keeble	912,457	
(6)	Beerman and Jones	192,454	
—	Munn & Perkins	199,179	
—	Anderson Co.	205,494	
—	H. Earl Parker, Inc. and N. M. Macal Improvement Co.	$209,753	
—	T. M. Page	227,530	
—	F. E. Young	249,373	
—	McGillivary Construction Co.	277,067	
—	J. P. Brennan and M. W. Brown	300,934	
—	L. A. and R. S. Crow	314,106	

	(1)	(2)	(3)	(4)	(5)	(6)
70 cu. yd. removing concrete	10.00	4.00	3.00	9.00	5.00	4.00
666 sta. clearing and grubbing	10.00	8.00	2.00	15.00	10.00	5.00
181,000 cu. yd. roadway excav.	.50	.56	.52	.47	.58	.60
1,550 cu. yd. struct. excav.	2.00	3.00	2.00	2.95	3.00	4.00
950 cu. yd. ditch and channel excav.	1.00	3.00	2.50	.80	1.00	3.00
1,077,000 sta. yd. overhaul	.005	.005	.015	.005	.01	.005
Lump sum, dev. water supply and furn. water. equip.	$4,600	$1,700	$1,500	$7,500	$6,600	$2,500
4,600 M. gal. applying water	1.25	1.25	2.50	1.20	1.00	1.50
666 sta. finishing roadway	5.00	6.00	2.50	10.00	10.00	10.00
200 ton untreated rock base	3.40	3.00	3.00	3.90	3.37	3.60
400 ton liq. asph. SC-2 (pen. tr.)	25.50	21.11	23.00	27.00	22.60	24.00
300 ton sand (pen. tr.)	4.00	5.00	3.50	5.40	2.00	5.50
100 ton min. aggr. (P.M.S.)	5.00	7.00	5.50	6.00	6.83	5.65
5 ton liq. asph. SC-3 or SC-4 (P.M.S.)	20.00	31.11	30.00	30.00	22.06	22.00
165 ton liq. asph. SC-6 (sl. ct.)	27.00	21.09	28.00	28.00	23.50	24.00
2,500 ton screenings (sl. ct.)	4.00	3.90	5.00	6.25	4.50	5.75
1,450 lin. ft. 18-in. C.M.P. (16 ga.)	2.80	2.86	2.75	3.25	2.60	2.80
124 lin. ft. 24-in. C.M.P. (14 ga.)	4.00	3.78	4.00	4.70	3.90	4.50
218 lin. ft. 30-in. C.M.P. (14 ga.)	5.00	4.58	5.00	6.00	4.90	5.50
52 lin. ft. 36-in. C.M.P. (12 ga.)	7.50	6.44	7.50	8.75	7.70	8.25

(Continued on next page)

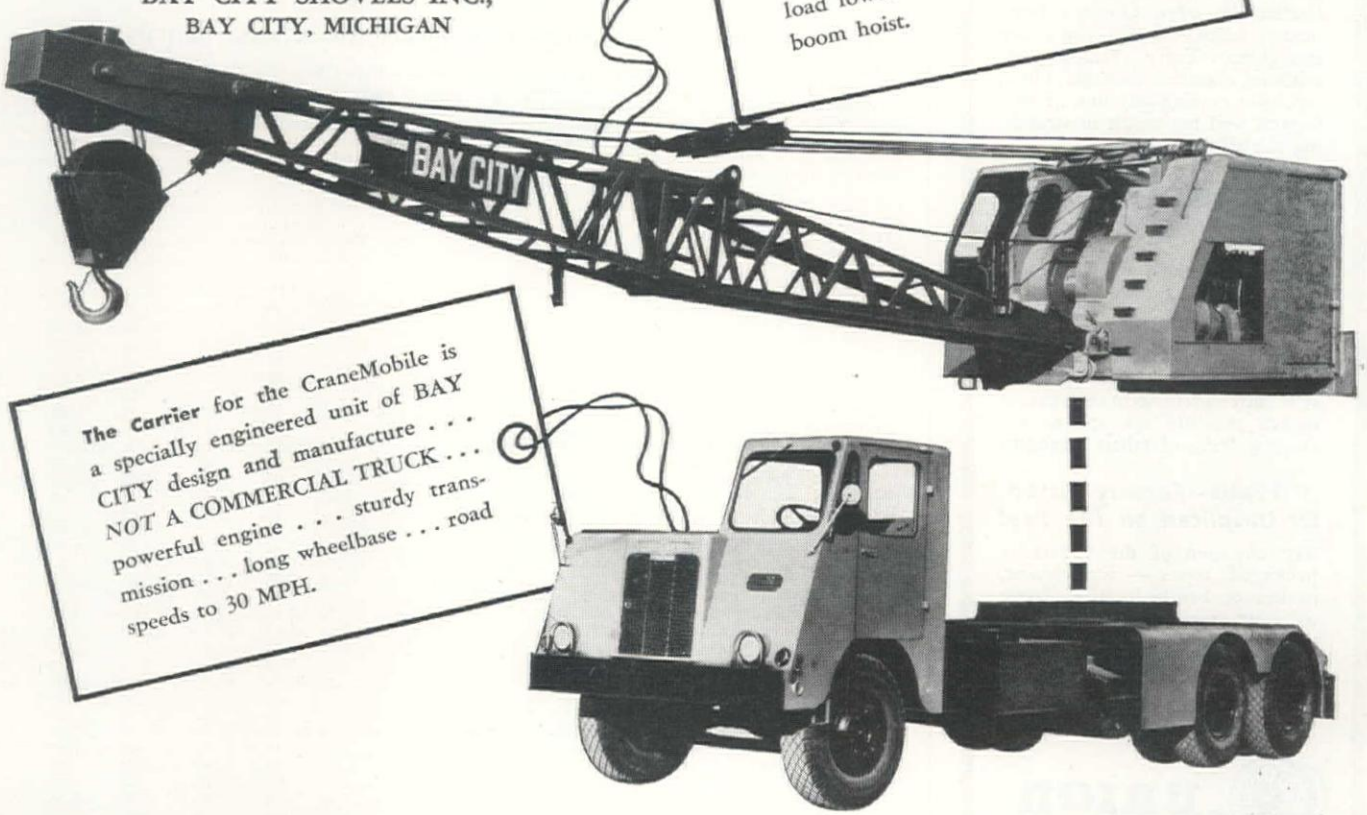
The CRANEMOBILE is a compact-complete unit . . .

crane and carrier both designed and built by BAY CITY

BAY CITY designs and builds both crane and carrier for its speedy, versatile, heavy-duty CraneMobile —another good reason why the CraneMobile, with capacities up to 25 tons, is daily gaining favor with contractors, and riggers . . . the men who have to meet the increasing demands for greater efficiency in handling long reaches and heavy lifts. Users of BAY CITY CraneMobiles find this compact, complete unit to be the perfect answer to difficult crane problems where smooth maneuverability and plenty of power are essential.

BAY CITY SHOVELS INC.,
BAY CITY, MICHIGAN

The Crane is designed for maximum efficiency in every detail from the sturdy full length cast base to the point of the pin-connected boom . . . Large capacity tandem drums . . . power load lowering . . . independent worm boom hoist.



The Carrier for the CraneMobile is a specially engineered unit of BAY CITY design and manufacture . . . NOT A COMMERCIAL TRUCK . . . powerful engine . . . sturdy transmission . . . long wheelbase . . . road speeds to 30 MPH.

The CraneMobile is available in 5 sizes with crane capacities up to 25 tons.
For complete details, write for catalog.

BAY CITY

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

102 lin. ft. 48-in. C.M.P. (12 ga.)	11.00	8.88	10.50	12.50	9.50	12.50
106 lin. ft. 54-in. C.M.P. (12 ga.)	12.50	10.51	13.00	15.00	11.50	16.00
228 lin. ft. 72-in. C.M.P. (8 ga.)	25.50	22.01	25.00	29.00	24.00	24.50
60 lin. ft. 8-in. perforated metal pipe (16 ga.)	1.55	2.13	2.00	2.00	1.50	2.00
4 ea. spillway assemblies	25.00	30.00	30.00	31.00	30.00	25.00
4 ea. pipe anchors	10.00	25.00	25.00	33.50	20.00	15.00
1,660 lin. ft. salv. exist. pipe culverts	1.00	.60	1.50	1.35	1.50	.75
500 lin. ft. relay. salvaged C.M.P.	1.00	1.50	1.50	1.60	1.50	1.00
4 ea. cattle guards	250.00	400.00	250.00	265.00	250.00	150.00
25 cu. yd. Class "A" P.C.C.	60.00	65.00	70.00	80.00	75.00	50.00
458 lb. bar reinf. steel	.20	.25	.15	.12	.10	.20

Arizona—Apache County—State—Grade and Surf.

Daley Construction Co. - Acme Materials Co., Phoenix, was awarded a $212,362 contract by the Arizona State Highway Commission for furnishing and placing select material, plant-mixed bituminous stabilized base (two courses) and plant-mixed bituminous surface on 5.8 of the Holbrook-Lupton highway. Unit bids were submitted as follows:

(1) Daley Construction Co.-Acme Materials Co. $212,362
(2) Packard Contracting Co. 215,024
(3) Wallace & Wallace 215,065
(4) Tiffany Construction Co. 215,294
(5) Phoenix-Tempe Stone Co. $215,838
(6) W. J. Henson 217,539
— Arizona Sand & Rock Co. 218,616
— R. C. Tanner and Sons & Heuser 225,615

	(1)	(2)	(3)	(4)	(5)	(6)
600 cu. yd. drain excav. (ditch lt. sta. 1845+00 to Sta. 1857+00)	.50	.25	.40	1.00	.22	.50
1,600 M. gal. watering (CIP)	2.50	2.26	2.50	2.50	2.75	2.10
1,300 hr. rolling	6.00	6.60	6.00	7.30	6.00	6.00
63,800 ton select material (CIP)	.54	.39	.35	.34	.42	.38
23,100 ton plant mixed bitum. stabilized base (CIP except cost of paving asphalt)	1.95	1.64	2.10	2.20	2.05	2.50
1,700 ton cover matl. for seal coat (Type B) (CIP)	5.00	6.00	5.00	4.00	4.40	6.00
15,200 ton bitum. mix (Class II plant-mix) (CIP except cost of paving asphalt)	2.50	3.10	2.70	2.78	3.00	2.50
1,000 ton stock piling bitum. mix (Class II plant)	2.25	2.80	2.10	2.60	2.75	2.00
1,790 ton pav. asph. for mixed bitum. surf., bitum. stab. base and tack coat (Grade 150-200 penetration) (CIP)	29.00	33.00	33.00	31.50	30.50	30.00
45 ton liq. asph. for stkpld. bitum. mix (grade MC-2) (CIP)	31.00	35.00	34.00	32.50	32.00	32.00
170 ton emuls. asph. for seal coat (Grade A) (CIP)	35.00	40.00	38.00	39.50	37.00	37.00
4,250 lin. ft. road guard (Std. C-7) (CIP)	2.50	2.50	2.40	2.60	2.35	2.50
191 ea. guide posts (Std. C-8) (Type B) (CIP)	5.00	4.90	5.00	6.00	4.50	4.00
1 ea. survey monument and cover (Std. C-1) (CIP)	40.00	74.00	50.00	50.00	40.00	40.00
5.7 mi. cleaning roadway ditches	200.00	125.00	400.00	40.00	55.00	180.00

California—Orange County—State—Grade and Pave

Sully-Miller Contracting Co., Long Beach, Calif., with a bid of $466,258, was awarded a contract by the California Division of Highways for constructing a 5-mi. portion on the Santa Ana Freeway between the Los Angeles County line and southeasterly on Euclid Ave. The new two-lane highway will be graded and surfaced with asphaltic concrete on cement-treated base, the existing roadway to be widened with asphaltic concrete on cement-treated base; portions of the existing pavement to be resurfaced with asphaltic concrete; shoulders to be constructed of untreated rock surfacing, and outer highways to be constructed to provide a four-lane highway. Unit bids were submitted as follows:

(1) Sully-Miller Contracting Co. $466,258
(2) Griffith Co. 488,040
(3) Peter Kiewit Sons' Co. 514,167
(4) Cox Brothers Construction Co. and J. E. Haddock Ltd. $516,891
(5) Basich Brothers Construction Co. and Basich Bros. 578,498

	(1)	(2)	(3)	(4)	(5)
1,080 cu. yd. removing conc.	4.15	4.30	7.50	5 75	5.00
264 sta. clearing and grubbing	14.00	11.00	40.00	40.00	25.00
70,000 cu. yd. roadway excav.	.36	.43	.40	.50	.42
5,050 cu. yd. struct. excav.	2.00	1.65	2.00	1.30	2.20
260,000 sta. yd. overhaul	.008	.003	.003	.005	.005
94,000 sq. yd. compacting orig. ground	.02	.03	.04	.05	.03
13,000 ton imp. borrow	.40	.68	.65	.55	.70
71,000 ton imp. base matl.	.45	.68	.72	.64	.85
Lump sum, dev. wat. supply and furn. wat. equip.	$14,000	$5,000	$7,700	$11,000	$5,000
6,300 M. gal. applying water	1.15	1.10	1.25	1.20	1.25
264 sta. finishing rdwy.	7.00	7.00	8.00	14.00	25.00
92,000 sq. yd. mix. and compact. (cem. tr. base)	.30	.30	.15	.23	.30
10,500 bbl. P. C. (cem. tr. base)	3.58	3.10	3.35	3.25	4.00
180 ton asphaltic emuls.	29.00	37.00	38.00	35.00	35.00
25,000 ton untreated rock base and surf.	1.43	1.70	1.50	1.85	1.85
50 ton liq. asph., SC-2	21.00	21.00	32.00	19.50	16.00
475 ton liq. asph., SC-3 (B.S.T.)	13.00	14.50	15.00	13.25	15.00
39,000 sq. yd. prepar. mix. and shap. surface (B.S.T.)	.10	.11	.13	.10	.10
8,300 ton min. aggr. (P.M.S.)	3.45	3.30	3.00	4.20	3.50
580 ton paving asph. (P.M.S.)	3.45	13.00	13.00	4.20	15.00
75 ton screenings (sl. ct.)	4.50	4.25	8.00	6.50	6.50
34,000 ton asph. conc.	3.60	3.48	4 00	3.65	4.75
340 cu. yd. Cl. "A" P.C.C. (struct.)	45.00	40.00	52.00	52.00	55.00
42,000 lb. bar reinf. steel	.10	.09	.10	.095	.085
3,000 lb. misc. iron and steel	.25	.27	.35	.30	.35
520 cu. yd. P.C.C. (curbs, gutters and sidewalks)	36.00	41.00	35.00	37.00	45.00
2,500 ea. curb dowels	.40	.47	.80	1.00	.60
6,900 sq. ft. pneumatically applied mortar	.32	.45	.50	.49	.40
850 sq. yd. mesh reinforcement	.90	.60	.60	.61	.75
32 ea. instal. culv. markers	1.50	5.00	2.50	2.00	3.00
53 ea. instal. guide posts	1.00	5.00	2.00	1.75	3.00
2.8 mi. new property fence	600.00	700.00	700.00	750.00	800.00
145 lin. ft. salv. exist. property fence	.10	.25	.22	.25	1.00
105 lin. ft. reconstr. salvgd. property fence	.10	.25	.35	.50	1.50
3,800 lin. ft. chain link fence	.80	.98	.90	1.00	1.20
600 lin. ft. 15-in. R.C.P.	3.00	2.75	2.90	3 00	3.20
370 lin. ft. 18-in. R.C.P.	3.50	3.20	4.25	4.00	4.20
1,960 lin. ft. 48-in. R.C.P.	11.50	11.30	12.50	12.00	11.00
240 lin. ft. 18-in. C.M.P. (16 ga.)	2.50	2.10	2.50	2.50	2.50
290 lin. ft. 24-in. C.M.P. (14 ga.)	3.60	3.25	3.50	4.00	3.60
1,110 lin. ft. 26-in. x 15-in. C.M.P. arch (14 ga.)	3.60	3.80	4.25	4.00	3 90
125 lin. ft. 36-in. x 5-in. part circle, C.M.C. (8 ga.)	4.00	3.90	3.80	3.50	4.50
12 lin. ft. 48-in. x 9⅝-in. part circle C.M.C. (8 ga.)	5.00	5.00	5.00	6.50	5 50
70 lin. ft. salv. exist. pipe culv.	.60	1.00	1.00	1 25	1.50
1 ea. manhole Type "EZ"	350.00	170.00	275.00	450.00	250.00
5 ea. adjusting manholes to grade	20.00	22.00	30.00	25.00	25.00
63 ea. horizontal reflector units	8.00	8.00	8.50	7.00	10.00
9 ea. Type W21R reflector units	11.00	19.00	15.00	17.50	15.00
246,000 ea. mesembryanthemumedule cuttings	.025	.035	.04	.027	.025
350 lin. ft. metal plate guard railing	3.00	3.30	3.00	3.00	3.50

STANDARD ENGINEER'S REPORT

DATA

LUBRICANT Calol Multi-Service Oils

UNIT Compressor cylinders - 30"x20" parallel

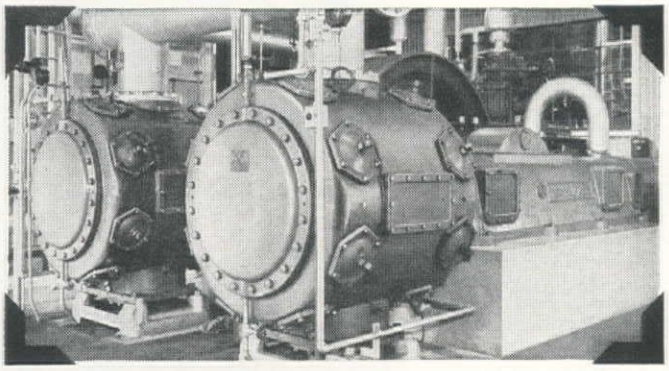
LUBRICATOR Force-feed

CONDITIONS Furnishes furnace stack draft and compresses flue gas — high chemical content

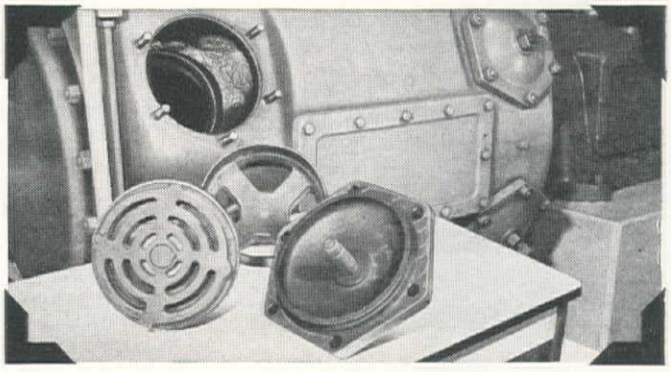
PERIOD 2 years

FIRM Pure Carbonic Co., Berkeley, Calif. (A Division of Air Reduction Co., Inc.)

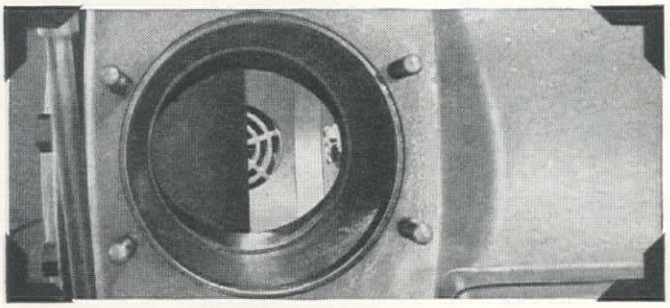
Special oil cuts wear in compressor handling corrosive gas



CALOL MULTI-SERVICE OIL 55X held wear down in these thirty-inch compressor cylinders to an average of only 0.0015 inch in two years, although they handle only raw flue gas. This is part of Pure Carbonic Company's process for producing CO_2 to make "Dry Ice."



OXYGEN, NITROGEN, SULPHUR and carbon dioxide are some of the chemicals in the millions of cubic feet of flue gas from furnace stacks that go through the compressor in a day. A valve has been removed showing where deposits from corrosive elements may accumulate.

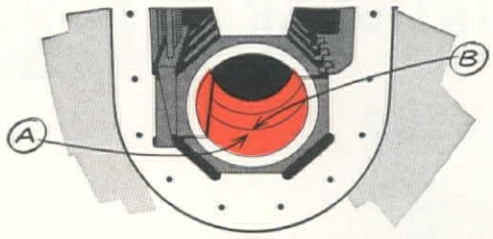


PORTION OF A CYLINDER, seen through a valve port, shows how CALOL Multi-Service Oil 55X keeps walls clean and lubricated. It withstands the highest operating temperatures, keeps a uniform lubricating film on all surfaces and is especially resistant to lacquer formation.

REMARKS: The compressor pictured here is an Ingersoll-Rand Type XPL. (30X20" Compressor Cylinders; 13x20" Steam.) The gas it handles in 24 hours produces 120,000 pounds of liquid carbon dioxide. CALOL Multi-Service Oil 55X lubricates the journals and crankpins as well as cylinders. There are grades of CALOL Multi-Service Oil to meet conditions in all types of compressors.

Trademark "CALOL" Reg. U. S. Pat. Off.

How CALOL Multi-Service Oil cuts costs in all types of compressors



In crankcase and on cylinders, CALOL Multi-Service Oil reduces oil consumption -- has cut consumption 20% in air compressors.

A. Oxidation-resistant compounds prevent formation of varnish. Detergent keeps contaminants suspended in oil, prevents foam.

B. Special compound assures "hot-spot" lubrication ... covers surfaces rapidly.

CALOL Multi-Service Oils also recommended for pumps, diesel engines, enclosed gears.

STANDARD TECHNICAL SERVICE checked this product performance. If you have a lubrication or fuel problem your Standard Fuel and Lubricant Engineer or Representative will give expert help; or write Standard of California, 225 Bush St., San Francisco 20.

STANDARD OIL COMPANY OF CALIFORNIA

NEW EQUIPMENT

MORE COMPLETE INFORMATION of any of the new products or equipment briefly described on the following pages may be had by sending your request to Equipment Service, Western Construction News, 609 Mission Street, San Francisco 5, Calif. For quicker service, please designate the item by number.

501

Power Buggy

Manufacturer: Whiteman Manufacturing Co., Los Angeles, Calif.

Equipment: 1950 Whiteman Power Buggy.

Features claimed: Dumping operation is faster and easier by use of a new curved

rack and pinion mechanism which improves leverage and gives the operator full control of the dump, and return of the bucket when partial dumping is required. Speed of the buggy has been increased from 12 to 16 m.p.h., and capacity has been enlarged from 12 to 13 cu. ft. at 2,000 lb. A lower center of gravity, wider tread, and shorter wheelbase give better distribution of weight and improve maneuverability. The new model can be used on light scaffolds or runways. It is powered by a 7.5-hp. air-cooled engine, and has an automatic clutch and speed changer. The operator can turn in the buggy's own length, and pull a load up 25% inclines.

502

Concrete Forms

Manufacturer: Symons Clamp and Mfg. Co., Chicago, Ill.

Equipment: 1950 model wooden concrete forms.

Features claimed: Improvements include: Steel corner plate in corner reinforcement; steel cross-members to stop bulging where extremely heavy pressure is encountered; ring shank nails for securing sheathing to frame; recess in frame where steel straps secure joints, eliminating possibility of poor alignment; ¾-in. Exterior Grade AB-DFDA (marine) plywood used in the 2 x 6 and 2 x 8-ft. sizes is finished with sealed edges ready for assembly; and the steel wedges used in the Symons system are now curved at the ends to prevent wedges from digging into the wood.

503

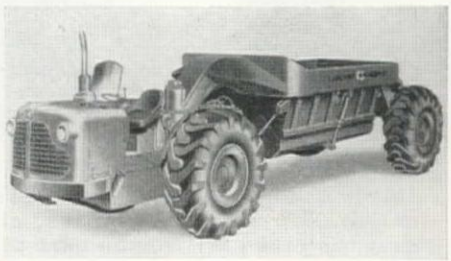
Earthmovers

Manufacturer: LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa.

Equipment: Models TS-200 Motor Scraper and TW-300 Motor Wagon.

Features claimed: After extensive testing, the self-propelled, rubber-tired 9-12 cu. yd. TS-200 motor scraper has been placed in production. Powered by a 145-hp. Buda Diesel, the unit has a standard top speed of 23.4 m.p.h., increased to 27.4 m.p.h. with optional transmission. Steering and

Model TS-200 Motor Scraper



Model TW-300 Motor Wagon

scraper control are both done hydraulically, and braking is by air power. Hydraulic power comes from a dual fluid power unit. Shipping weight of the complete unit, including 21.00 x 25 20-ply tires, is 34,000 lb. The TW-300 motor wagon is powered by a 225-hp. supercharged Buda Diesel. Capacity of the wagon is 14-19 cu. yd. Top speed is 21.2 m.p.h. Doors are hydraulically controlled, and the tractor unit is identical to the unit used with the TS-300 scraper. Shipping weight of the TW-300, including 24.00 x 29 24-ply tires, is 45,360 lb. The wagon alone can be shipped to the field for conversion of the motor scraper to complete wagon.

504

"Maintainer" Attachment

Manufacturer: Huber Manufacturing Co., Marion, Ohio.

Equipment: Improved Lift-Loader attachment for the Huber Maintainer.

Features claimed: Tested under varying job conditions over the past several months, the new Lift-Loader adds to the Maintainer's versatility and performance as a materials handling machine. Standard bucket is ⅜-cu. yd. The hydraulically-operated unit can raise a 1,000-lb. load 9 ft., 8 in., dumping at any desired height. Because the loader mounts on the Maintainer frame at the blade lift cylinder uprights, it is possible to bring the lip of the bucket, in loading position, to 34½ in. ahead of the front wheels. Spillage of the load is held to a minimum by the quick tilting action of the bucket as the load is raised. When the bucket is 4½ ft. above grade, the lip of the

bucket is 23 deg. above horizontal. In addition to the Lift-Loader, the Huber Maintainer can be supplied with attachments for use as a grader, berm leveler, road planer, bulldozer, snow plow, mower, and one-way broom and patch roller.

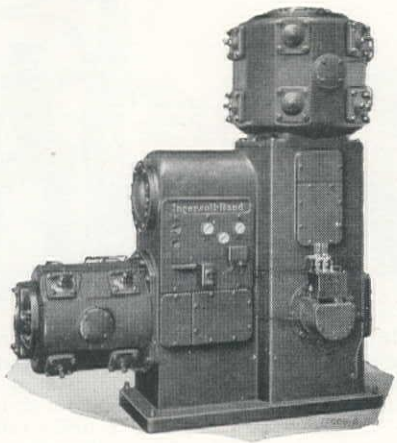
505

Powerful Compressor

Manufacturer: Ingersoll-Rand Co., New York, N. Y.

Equipment: XLE two-stage 125-350-hp. air compressor.

Features claimed: Sizes range from 125 to 350 hp. for continuous full-load service and two-stage compression to 80-125 p.s.i. discharge pressures. It is particularly suitable wherever skid-mounting or ground conditions require a well-balanced machine. The completely new L design embodies a



single vertical low-pressure compressor cylinder, and a synchronous motor mounted directly on the crankshaft. Air enters and leaves the compressor through main air connections on the frame, instead of on cylinders. There is no interstage piping or cylinder strain due to air piping. Compressor valves are the well-known I-R Channel-Valve type, adapted for the XLE. Main and crankpin bearings are of aluminum alloy, and crankcase construction features dust-tight, pressure lubrication.

506

4-Ton Trucks

Manufacturer: Dodge Division, Chrysler Corp., Detroit, Mich.

Equipment: Models Y and YA four-ton Job-Rated trucks.

Features claimed: The trucks have a nominal rating of four tons, a gross combination weight of 50,000 lb., and a gross vehicle weight of 28,000 lb., an increase of 5,000 lb. over the 23,000-lb. maximum GVW formerly offered by Dodge. A newly

designed engine develops 154 hp. with a displacement of 377 cu. in. at a compression ratio of 6.5:1. New features of the engine include twin carburetors and intake manifolds, a twin exhaust system, and hydraulic

valve lifters. Body and payload allowance runs up to 19,800 lb. The trucks are built with wheelbases of 130 to 190 in., and were engineered to meet demands for a powerful unit of near maximum weight. Rear axle capacity is 18,000 lb., however a 22,000-lb. rear axle is also available, for use where state laws permit. A five-speed constant-mesh transmission is standard, with overdrive optional. A separate single power take-off gear is available from either right or left side. Over 30 basic models of the new truck have been introduced, bringing to 396 the different basic truck models now offered.

507

Side-Dump Truck Body

Manufacturer: Easton Car & Construction Co., Easton, Pa.

Equipment: Model BD-1116H, capacity 16 tons.

Features claimed: The side-dump truck body features hydraulic dumping, and a

fully automatic down-folding side gate. Operation of the gate is controlled by a sturdy new leverage system with the door operating mechanism completely enclosed for protection against falling stone. The gate opens flush with the floor as the body is raised for dumping, and closes automatically as the body is lowering to the riding position. When open, the gate provides a chute which carries the load clear of the tires. Three-sleeve telescopic hydraulic jacks, one at each end of the body, are used for dumping. The model illustrated here, on an Autocar Diesel chassis, is especially designed for handling shovel-loaded earth in stripping and overburden service. The same design is available in larger capacities and also in heavier construction for handling shovel-loaded rock and ore.

508

Air-Entraining Agent

Manufacturer: Autolene Lubricants Co., Denver, Colo.

Equipment: Protex.

Features claimed: The product will not settle out, eliminating operating difficulties and assuring uniform results. It is a liquid which entrains air bubbles equal in volume to 200-mesh sand, evenly dispersed throughout the mortar phase of concrete.

509

"Cold Welding" Cast Iron Electrode

Manufacturer: Eutectic Welding Alloys Corp., New York, N. Y.

Equipment: Eutectrode 24, "Formula 1950."

Features claimed: The amperage required for running this electrode has been substantially reduced by "Formula 1950." The 5/32-in. size, formerly requiring 120-125 amp., can now be readily deposited on the same thickness of metal at only 80 to 90 amp. Spatter is non-existent, and the flux can be brushed off. The electrode is especially useful for welding cast iron, cast iron to steel, and repairing machining and foundry defects.

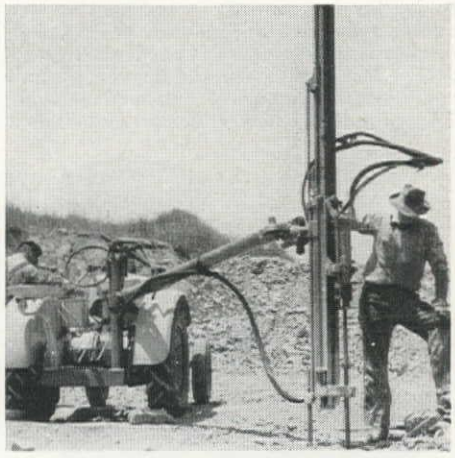
510

One-Man Wagon Drill

Manufacturer: Le Roi Company, Milwaukee, Wis.

Equipment: Le Roi Tractair Mobildrill.

Features claimed: The equipment is one-man operated, self-contained, self-pro-



pelled, and is designed for faster drilling operations in quarry, pit, and road cut applications. The Mobildrill consists of a swinging boom which extends out from the Tractair platform, and a universally mounted wagon drill guide shell for a 6-ft. steel change. The Le Roi Cleveland H10 45-lb. class sinker operates off the 105 c.f.m. compressor. With truck mounted Mobildrills, where 160 c.f.m. compressor capacity is available, a heavier Le Roi Cleveland H23, 80-lb. class sinker, may be used. The Mobildrill is flexible enough to drill angle, vertical, or horizontal holes at any elevation, and can be equipped with an air motor powered boom. One man can handle every phase of drilling, including the simplified moving of equipment between locations. The 35-hp. tractor is capable of operating over rough terrain, and has 4 forward speeds up to 12 m.p.h. and a reverse gear. Drill, blow, and feed controls are centrally located at the guide shell.

511

Light Duty FWD

Manufacturer: Four Wheel Drive Auto Co., Clintonville, Wis.

Equipment: Model LD light duty four wheel drive truck.

Features claimed: The recently introduced model has a gross vehicle weight of

14,500 lb., whereas 17,000 lb. formerly marked the gross vehicle weight that marked the beginning of the FWD range, which extends upwards to 58,000 lb. The

light duty model has been requested for truck service requiring the added traction of four wheel drive design. While the new model LD will have its place in off the highway service, it also is said to have high efficiency on the road.

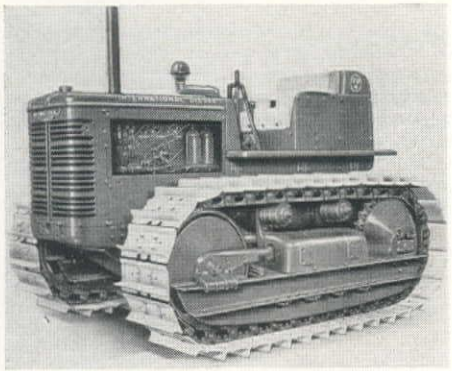
512

More Power for TD-9

Manufacturer: International Harvester Co., Chicago, Ill.

Equipment: Design changes in the Series 9 four-cylinder engine.

Features claimed: New model TD-9, now in production, has a drawbar horsepower of 40.5, as compared to 38.9 in the previous model. Power at the flywheel has been in-



creased 2 hp. to 51.5, and maximum drawbar pull in first gear is boosted over 1,000 lb. to 11,400. Travel speeds are unchanged. The greater power was obtained through a redesigned combustion system, featuring new pistons, improved precombustion chamber, simplified injection nozzles, the new "A" model IH fuel pump, and a hiking of the compression ratio from 14.4 to 15.7:1.

513

Truck Mixers

Manufacturer: The Jaeger Machine Co., Columbus, Ohio.

Equipment: Late model Jaeger Payloader truck mixers.

Features claimed: Lighter weight, lower price, shorter length, faster operation, and reduced cost of upkeep are the advantages offered in the newly announced models. Weight reductions ranging from 600 lb. in

the 2-cu. yd. model to 1,600 lb. in the 5½-cu. yd. size have been effected by design improvements, to comply with strict load limitations while carrying larger payloads. Reductions of 9 to 13 in. in frame length, with shorter cab-to-axle requirement and load center farther forward, facilitate mounting on short wheelbase trucks and give best load distribution on all truck sizes. Faster end-loading of dry materials is obtained by a new hopper design and ability to revolve drum at high speed while charging. Pre-mixed or shrink-mixed materials can be charged in one drop through

a top door in the drum, which is equipped with new quick-opening toggle lock. Rate of discharge averages 20-25 seconds per cu. yd. of 4-in. slump concrete, and 60 seconds per cu. yd. with 1-in. slump. Positive and faster water distribution is provided by a Jaeger self-priming pump which delivers accurately metered water at 60 p.s.i. and 100 g.p.m. through a clog-proof jet of special design. Drums are of larger diameter than previous models and equipped with die-shaped continuous spiral blades with additional throw-back remixing blades. Major engineering improvements to eliminate common maintenance problems in truck mixer fleets include new spider drum drive in place of older type ring gear or chain, with a flexible sleeve in the front trunnion which insures permanent self-alignment of the drum. Entire transmission is mounted as one unit with the engine, clutch, automatic brake, 2-speed gear box, and enclosed final gear reduction on one frame. The whole assembly may quickly be removed as a unit. Fluid drive, in place of standard clutch, is available if wanted. Payloader models are offered in 2, 3, 4½, and 5½ cu. yd. sizes as truck mixers, and 3, 4½, 6⅛, and 7⅜ cu. yd. sizes as agitators. Sealed drum models with air-tight rear discharge door are available for wet-mix plant operation.

514

Power Feed Attachment

Manufacturer: DeWalt, Inc., Lancaster, Pa.

Equipment: Power feed attachment for DeWalt radial arm power saw.

Features claimed: The unit is designed for straight rip sawing, bevel ripping, molding, power feed shaping, ploughing, grooving, and rabbeting. Material is fed by adjustable feed rollers and held firmly against the guide strip. Feed rate is quickly adjustable from extreme low to a high of 120 ft. per min. The equipment can be attached under many table saws, as well as radial arm saws.

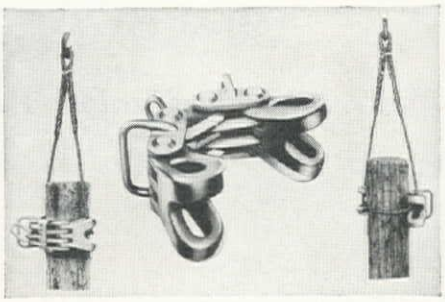
515

Pile Puller

Manufacturer: Downs Crane & Hoist Co., Los Angeles, Calif.

Equipment: Efficient Downs Pile Puller designed to adjust itself to any size or shape piling.

Features claimed: The inner surface of the puller consists of a series of heavy knife



edges for biting into the pile transversely to the grain of wood. It provides a positive hold for pulling pilings that are hard to grip due to creosote coating, marine growth, grease, or odd shape. The puller maintains its grip throughout the pulling and stacking operation, yet is easy to remove from the pile. It can be set in place on a pile by hand, or with the assistance of a pile line. Large handles aid workmen in setting the pile puller in place. Large smooth eyes are easy on wire rope slings.

516

Crawler Crane-Excavator

Manufacturer: Manitowoc Engineering Works, Manitowoc, Wis.

Equipment: Model 4500 5½-cu. yd. shovel, crane, and dragline.

Features claimed: Designed for mobility, model 4500 has air controls for all operating clutches and brakes, straight Diesel power and crawler drive. If required, loading or unloading from trailer of flat car can be done in 3 to 5 days, with the machine handling its own heavy components. Job speed is 0.77 mph., with a ground bearing pressure as low as 9.6 p.s.i. Standard crawlers are 25 ft., 9 in. long, 21 ft. wide, and with a choice of 48 or 60-in. pads. Steering is air controlled, permitting locking of either crawler for short radius turns. Shovel booms are available in lengths of 38 ft., 6 in., with 27-ft. stick and 5½-cu. yd. dipper, up

to a 60-ft. boom with 45-ft. stick and 4½-cu. yd. dipper. The dipper stick is a single tubular unit which rolls through the saddle on concave rollers, free to turn without transmitting twisting stresses to the boom. Crowd and retract mechanism is independent cable type. Double lines are driven from a drum mounted on the boom, and have no reverse bends. Optional dragline and clamshell boom lengths vary from 100 to 140 ft., with the upper 75 to 95 ft. constructed of aluminum alloy. All-steel lift-crane booms are available in lengths from 87 ft. up, with crane rated lifting capacity of 100 tons at 20-ft. radius.

517

Stud Gun

Manufacturer: Mine Safety Appliances Co.

Equipment: MSA Velocity-Power Driver.

Features claimed: New feature of the MSA velocity-power driver is a spring-impelled firing pin that virtually eliminates the human factor in firing a stud-cartridge unit. The arrangement is positive in action, yet safe and tamper-proof. With the new design, the operator still must push the tool forward to fire the stud-cartridge, but the speed and force of the forward motion no longer are important to the operation. No matter how slowly the pressure is applied, the tool can be operated satisfactorily. This enables its use in closely confined locations without misfiring due to hesitation by the operator. Stud-cartridge units for the tool are manufactured in 32 and 44 calibers.

Barrels—large and small bores—are interchangeable in the tool for different calibers. Cartridge loads for the various types of material are light, medium, and heavy, and there are several different stud sizes and types. The studs are electroplated to resist corrosion.

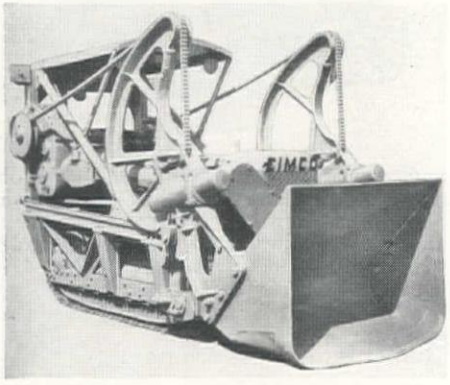
518

RockerShovel

Manufacturer: The Eimco Corp., Salt Lake City, Utah.

Equipment: Eimco RockerShovel 104.

Features claimed: After years of field testing, the firm announces its model 104. At a recent public demonstration before the Highway Engineering Conference in Salt Lake City, the 104 loaded wet sand and gravel at the rate of 8 cu. yd. per second and filled a 6-ton Dumptor in 40 seconds. The 104 has a 48-hp. Diesel engine and rolls its



2-cu. yd. gravel bucket overhead with ease in the mile-high gravel pits in the West. The versatile machine can be used for loading or bulldozing. Straight backward and forward motion eliminate necessity of turns in order to dump. Field tests have shown the 104 to be at least twice as fast as much larger conventional excavators having much more power. The 104 is designed to dig and load blocky rock and abrasive ores in underground or surface operation. It is constructed of alloy-steel materials throughout to resist abrasion. For heavy-duty rock loading, a smaller, 1¼-cu. yd. bucket is provided. The 104 is powered by either Diesel engine or electric motor.

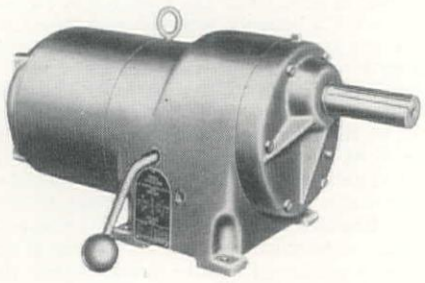
519

Gearshift Drives

Manufacturer: Lima Electric Motor Co., Lima, Ohio.

Equipment: Type R3C Lima low cost, heavy duty selective speed gearshift drives.

Features claimed: The drive features a combination of integrally mounted electric



motor and a four-speed transmission having both primary and secondary gear reductions to give a compact drive of modern design providing low, multiple output speeds. Both constant-torque and constant-horsepower two-speed motors are available on these units, which give the increased flexibility of additional speeds. Some of the

applications of the unit include use on automatic screw machines, drag conveyors, mixing equipment and installations where a low range of selective speeds with high radial load capacity are required. Design is for polyphase AC power supplies of 25-50-60 cycles and voltages below 600.

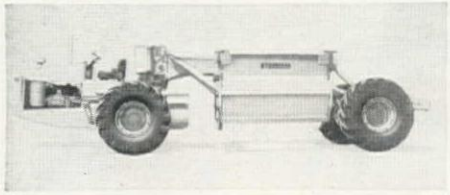
520

Tournahopper

Manufacturer: R. G. LeTourneau, Inc., Peoria, Ill.

Equipment: Model E-16 Diesel powered Tournahopper.

Features claimed: Designed for bottom-dump hauling, the model E-16 is powered by the C Roadster Tournapull prime mover, available with a choice of three engines, GM-6-71, Cummins HRB-600, or the Buda 6-DC-844. The unit has a heaped capacity of 16 tons or 15 cu. yd., with a



9 ft., 2 in. square bowl that presents an easy target for shovel or dragline. Bottom-dump doors operate in a manner similar to a clamshell, swinging upward along the outside of the bowl as they open. Positive electric control of the self-cleaning doors permits controlled ejection by opening the doors to any desired width. Where controlled ejection is unnecessary, the doors can be opened to full width, making possible extremely fast injection. Clearance with the bowl doors opened is 22 in.; with bowl doors closed, 19¾ in. The 90-deg. left and right turning angle gives the rig a minimum turning radius of 14 ft. This, plus multiple disc air brakes on all four wheels and positive electric power steer, make it safe and easily maneuverable. Speeds range from 3.37 in first gear to 34.61 m.p.h. in fifth gear. The Tournahopper's overall length is 33 ft., 1 in.; width 10 ft., 1 in., and wheelbase 19 ft., 0 in. It is equipped with 21 x 25 tires. The rig has a total weight of 29,840 lb.

521

Button Bottom Piles

Manufacturer: Western Foundation Corp., New York, N. Y.

Equipment: High bearing capacity piles.

Features claimed: The company reports that frictional capacity developed by Button Bottom piles has greatly increased bearing capacity. The enlarged button at the point and the cylindrical shaft of a Button Bottom pile give a greater volume of displacement, where it counts, than a top-bearing or tapered pile.

522

Rock Drill

Manufacturer: Kennametal, Inc., Latrobe, Pa.

Equipment: Tri-Point rock drills.

Features claimed: The triangular-shaped design of the vacuum sintered cemented carbide cutting tips gives maximum resistance to wear and shock, as well as freedom from packing. The drill will penetrate the hardest rock, as well as granite, hard limestone, and concrete. They are used in air or electric hammer type drills, and come in diameters from ⅜-in. to 1 in. Lengths are from 7⅜-in. to 12 in., depending upon diameter.

523

Truck Mixer

Manufacturer: T. L. Smith Co., Milwaukee, Wis.

Equipment: Loadlimit model Smith-Mobile truck mixer.

Features claimed: Reduced weight is accomplished through the elimination of parts

and assemblies which are not basic or necessary to mixer operation. Conversion between standard truck mixer or agitator and the Loadlimit model can be made easily in the field. Mixer sizes are 2, 3, 4½ and 5½ cu. yd.

524

Timber Mowing Machine

Manufacturer: American Steel Dredge Co., Inc., Fort Wayne, Ind.

Equipment: The Bushwacker.

Features claimed: Production model of the Bushwacker, a mowing machine for trees, evolved from five machines that have been built and operated during the past six years. It weighs 14 tons, is mounted on a crawler tractor, and is powered by a 168-hp. Diesel engine. Overall length is 21½ ft., and width is 11 ft. The rig clears a swath 6 ft.

wide at speeds from 1½ to 5 m.p.h. In one pass over a densely wooded area, trees up to eight inches in diameter and all undergrowth were reduced to small fragments and deposited upon the ground. The topsoil is not disturbed. Regrowth is retarded, due to the fragmentation of trunk fibers at the root junctures. The shredded residue left upon the ground serves as a mulch and eventually decays, adding humus to the soil. Erosion is prevented while moisture tends to remain in the soil, favoring the rapid growth of native grasses on the cleared areas. The Bushwacker operating principle is relatively simple. Twenty 19½-lb. chrome manganese steel "flails" are attached by chains to a revolving steel drum, mounted on a shaft at the front of the machine and partly enclosed within a heavy steel housing. The drum is powered by a 168-hp. Diesel engine and revolves at 1,050 r.p.m. The flails strike at 11,500 ft. per min.

velocity, shredding all wood fibers. During the above test, the Bushwacker cleaned up an entire acre in one hour and 24 minutes, at a total cost of $40.

525

Swing Loader

Manufacturer: The Mandt Mfg. Co., Columbus, Ohio.

Equipment: Hydraulic ⅝-cu. yd. swing loader.

Features claimed: The compact 180-deg. swing loader is operated entirely by four hydraulic cylinders to hoist and lower, swing and open and close the bucket. Swinging boom permits loading from a 9-ft. wide swath, and dumping into trucks without any backing, turning, or maneuvering of the machine. In narrow alleys, loader and

truck can work in a space 15 ft. wide. Bucket clearance is 8 ft., 2 in. No gear shifting is needed to reverse. In loading, the design of the boom crowds the bucket 16 in. forward into the material as it rises. Maximum traction is obtained by centering machine weight and the leverage of the load on the front drive wheels, equipped with large flotation tires. Hydraulic jack that controls bucket enables operator to rock bucket to break stiff loads loose and to change digging pitch as needed. Traction speeds range from 1½ m.p.h. to 15 m.p.h. travel speed for self transportation over highways. Automotive transmission, driving and steering axles, and hydraulic brakes are standard.

526

Power Plants

Manufacturer: Cummins Engine Co., Inc., Columbus, Ohio.

Equipment: Diesel-powered electric generator units.

Features claimed: Sixty-cycle units are available in 40, 50, 60, 75, 100, 125, 200, and 250-kw. ratings. They are designed for continuous service applications where the unit is the primary source of power. Their instant starting and high availability characteristics also make them excellent standby or emergency sources of power. Optional equipment offered by Cummins for the various generator units includes automatic overspeed shut-down control; automatic high temperature and low lubricating oil pressure shut-down; complete marine-type or radiator-type cooling systems; hydraulic governor; water-cooled exhaust manifold, and generator mounted package control unit. Special generator voltages and kw. ratings are also available.

527

Small Turbine Pump

Manufacturer: A. O. Smith Corp., Milwaukee, Wis.

Equipment: Watermaster vertical pump.

Features claimed: The pump is adaptable to deep wells as small as 4 in., and has up to 40% more capacity than the average pump in its class. Using glass-lined bowls and bronze impellers, the new unit delivers 15 to 115 g.p.m. Design features include an adjustment on the drive head to change capacity or pressure in one quick operation. Closely spaced synthetic rubber bearings and ¾-in. stainless steel shafting are included. Developed for small community water systems and industrial plants, the pump provides high capacity with low initial investment in both pump and well casing.

528

Portable Light Plants

Manufacturer: Kohler Co., Kohler, Wis.

Equipment: Light plants with capacities of 350 and 750 watts.

Features claimed: Engineered to meet the demand for portable electric power, the 350-watt plant, equipped with carrying handles, weighs 70 lb. and will fit in the trunk of a car. The semi-portable 750-watt plant will operate thirty 25-watt lights at one time, household appliances, and various power tools with motors not exceeding ¼-hp. The automatic model starts when any light, appliance, or motor is turned on, and stops when all loads are turned off.

529

Lift Hoist

Manufacturer: Harnischfeger Corp., Milwaukee, Wis.

Equipment: 1950 line of P&H Zip-Lift electric hoists.

Features claimed: An even greater measure of safety is now provided by the use of a magnetic lower limit switch. The cable cannot run off the drum and rewind itself.

An extra ground conductor on feeder cable is now standard, making a short in the circuit impossible. Models are available in capacities up to 2,000 lb. The new models also have a reinforced push button pendant. This extra protection is provided for cases

where operators move heavy loads along jibs and trolleys by pulling the push-button cable. Grooved drums are now used, contributing to longer cable life.

530

Trolley Batcher

Manufacturer: C. S. Johnson Co., Champaign, Ill.

Equipment: Roadbuilders Batching Equipment Lo-Bin Trolley Batcher.

Features claimed: Adding a pneumatic-tired wheel and two-bar assembly to the batcher is the latest advancement to the unit. The resulting improved portability reduces time losses between jobs, and eliminates the need for dismantling the batcher. The batcher is designed with a maximum bin capacity of 30 tons, and with an exceptionally low charging height of 9½ ft. With flared extension panels removed, the bin measures 7½ ft. in height and holds 8 tons. Overall height of 20-ton panel unit is 8½ ft.

531

Aluminum Electrode

Manufacturer: Eutectic Welding Alloys Corp., New York, N. Y.

Equipment: Eutectrode 2101.

Features claimed: The electrode has a tensile strength of 34,000 p.s.i., over three times that of conventional rods for aluminum electrodes. It handles almost as easily as a mild steel electrode, permitting stop and start welding. There is no smoke, no spattering, and the weld puddle is visible at all times. The electrode uses 30% less current and is ideal for reclamation of castings.

LITERATURE FROM MANUFACTURERS . . .

Copies of the bulletins and catalogs described in this column may be had by addressing a request to the Western Construction News, 609 Mission Street, San Francisco 5, California.

532

CONVEYOR HANDBOOK — How much? How far and how high? This is the theme of a new 52-page conveyor handbook, published by the **Pioneer Engineering Works,** Minneapolis, Minn. The booklet covers two plans for ordering conveyors: pre-engineered and job-engineered types. It gives recommended widths, lengths, angles of incline, spacing of idlers, power requirements, and many answers to questions of installation. Published for every man who deals with aggregates or bulk materials handling problems, the handbook is complete with tables to simplify conveyor selection.

533

UNDERGROUND PIPE INSULATION—**Zonolite Co.,** Chicago, has published a brochure describing the qualities and applications of Z-Crete, a lightweight resilient concrete used for the insulation of heated piping installed underground.

534

COMBINATION SHOVEL-CRANE —**Marion Power Shovel Co.,** Marion, Ohio, has published a bulletin giving a complete description of the new Marion Type 43-M one-cubic yard machine. With various front-end attachments, the 43-M is described as serving as a shovel, dragline, clamshell, crane, backhoe and pile driver. According to the booklet, the new unit is designed for a wide range of applications in construction because of its versatility, mobility and portability.

535

ALUMINUM PAINT — **Aluminum Company of America,** Pittsburgh, Pa., is distributing a 32-page brochure explaining how aluminum paints can be used to best advantage. Profusely illustrated, the book uses thirty photographs to show proven applications of aluminum paints over the years, ranging from oil refineries to industrial fencing and bridges. The booklet emphasizes that uses of aluminum paint by business and industry fall into three classifications: (1) for metal, concrete and masonry and similar non-absorbent surfaces; (2) for weather-exposed wood; and (3) for interior heated surfaces and for decorative purposes. Several pages are devoted to questions and answers and an aluminum paint coverage table.

536

DIESEL ENGINES — **Cummins Engine Co.,** Columbus, Ind., has published booklets giving complete specifications for automotive and industrial models of the two V-type, 12-cylinder Cummins Diesels —the supercharged 550-hp. NVHS engine and the naturally aspirated 400-hp. NVH engine. The bulletins contain installation drawings, photographs and charts on torque, horsepower and fuel consumption, in addition to general specifications for standard equipment.

537

ASPHALT PLANTS — **White Manufacturing Co.,** Elkhart, Ind., has published an 8-page bulletin describing the firm's

portable pavement repair trucks with capacities up to 10 tons per hour, and the moderate size asphalt paving plants with capacities up to 30 tons per hour. Announced in the circular is the availability of the firm's larger models equipped with vibrating separation screens, multi-compartment hot storage bins, dust collectors, and with either regular volumetric control or with weigh scales.

538

BAR SIZE SHAPES—A convenient pocket-size handbook entitled "Properties of Bar Size Shapes" has been published by **Bethlehem Pacific Coast Steel Corp.** This publication contains valuable design data for which there has been considerable demand on the part of many industries using bar size steel sections. Tests in various size bars are covered for easy reference.

539

PROTECTION FOR METAL SURFACES — **The Arco Company of California,** Los Angeles, has published a 12-page booklet describing Dum Dum for Metal, particularly designed for exterior metal protection. According to the booklet, Dum Dum for Metal is spray-applied in a thick and tough but elastic coating, and covers completely, attaching itself firmly to metal surfaces regardless of shape or contour. Features are that no measurable moisture vapor transmission is possible through the film, and that when the outside surface is broken, the pliable undersurface hardens where exposed.

540

PROTECTIVE COATING FOR CONCRETE—**The Arco Company of California,** Los Angeles, has published a booklet describing the properties of Dum Dum Masonoc, which can be applied in a coat many times the thickness of paint without sagging or cracking as a protective and decorative coating for concrete, stucco and masonry surfaces. The coating is described as forming a tough-plastic coat that bridges and fills the cracks that give deterioration its start, providing a surface impervious to weather.

541

SEWAGE AND TRASH PUMP—**Fairbanks, Morse & Co.,** Chicago, Ill., has published the first bulletin describing its new bladeless sewage and trash pump, which incorporates the recently developed single passage bladeless impeller. The 16-page bulletin gives design and construction details, selection tables, performance characteristics and specifications.

542

COMPRESSOR — **Worthington Pump and Machinery Corp.**, Harrison, N. J., has released a 6-page folder listing specifications, dimensions, and accessories for the Blue Brute 60 c.f.m. portable compressor, contractor's model. Field photographs and sectional drawings are featured.

543

BUILDING YOUR OWN FORMS—**Symons Clamp & Mfg. Co.**, Chicago, Ill., has published a new bulletin giving full construction details for contractors interested in building their own forms, using the Symons Forming System. Specific information and tables give complete, pertinent information on concrete pressure and what causes heavy pressure in concrete. The use of panel ties and walers is also explained in relation to concrete pressure. Actual construction of panel forms is shown through detailed drawing of a typical panel.

544

SELF-PROPELLED COMPRESSORS—**Schramm, Inc.**, West Chester, Pa., has published a bulletin describing and illustrating the latest development in self-propelled compressors by the firm, the Schramm Model 60 and 105 Pneumotractors, a tractor-compressor combination powered with the Standard Model 60 Unistage or the 105 Pneumopower compressor. The units are described as designed with a completely engineered and approved set of accessories, such as front-end loaders, etc.

545

INDUSTRIAL WHEEL TRACTORS —**Oliver Corp.**, Cleveland, Ohio, has published a 24-page booklet covering the complete Oliver line of industrial wheel tractors. It includes specifications, cross-sections, and detailed data on engines and transmission as well as many application photographs. One section is devoted to the matched allied equipment available with Oliver Industrials, such as bucket loaders, maintainers, plows, mowers, backhoes, brooms, scrapers and trenchers.

546

HAND HOISTS—The Wright Hoist Division of **American Chain & Cable Co.**, York, Pa., has released a folder which describes the new line of Wright Safeway hand hoists. The 3-color, 6-page folder describes the compact, efficient hoists, which are available in capacities from ½ to 4 tons. The booklet contains such information as complete specifications, action photographs, a cross-sectional view of the hoist, graphic illustrations of the hoist and a listing of its features.

547

FOUR-CYLINDER DIESELS—**Cummins Engine Co.**, Columbus, Ind., has published a bulletin containing complete specifications of all automotive and industrial models of HR-400 Cummins Diesels. These four-cycle, four-cylinder Diesels have a 5⅛-in. bore and 6-in. stroke, and a piston displacement of 495 hp., according to the booklet, and they develop a maximum of 100 hp. at 1,800 r.p.m. They are described as available in six models for use in all types of highway and off-highway applications.

548

REINFORCING BARS — **Joseph T. Ryerson & Son., Inc.**, Chicago, Ill., has published an 8-page bulletin describing a specialized steel service for contractors. The booklet features the Hi-Bond reinforcing bars, a uniquely-designed bar that is said to give much greater bond between steel and concrete. Other points of superiority claimed for Hi-Bond bars are: easier to tie; provide a strong, safe ladder for further erecting; stays in better during pouring operations; hook anchorage unnecessary, and cracking of concrete structures reduced.

549

HARD HAT — A descriptive circular published by the **E. D. Bullard Co.**, San Francisco, tells how the State of Oregon has awarded the "glass" Hard Boiled Hats of the firm its approval as a device for safeguarding workers exposed to head injuries. According to the circular, the hat passed by a wide margin tests for impact-resistance, waterproofness and dielectric strength tests.

550

ADVANCED STUDY IN TRANSPORTATION—**Institute of Transportation and Traffic Engineering**, University of California at Berkeley, has issued a 24-page booklet listing opportunities for advanced engineering students to undertake college study in transportation and traffic, particularly at the graduate level. The Institute's main activities are in highway engineering, traffic, and airports, although courses are available in all phases of transportation.

551

ELECTRIC CHAIN HOIST—**Yale & Towne Mfg. Co.**, Philadelphia, Pa., has published a 2-page bulletin listing engineering specifications and technical data on all models of the chain-type Load King Electric Hoist. The hoist is available in load

capacities of 500, 1,000, and 1,500 lb., all through a 40-ft. lift height. Principal distinction of the hoist is that link chain, over an electrically driven sheave, supports the load. This permits extra long lifting lengths since wound-up chain does not wrap around a drum but collects in a metal container as the hook raises. The hoist hook can "reach out" as far as 30 deg. from the vertical to pick up loads. The wide pick-up angle and the flexibility of the load chain—free of twists and kinks—enables an appreciable reduction of time and power consumed in inching the hook up or down for load spotting.

552

OPEN STEEL FLOORING—**Kerlow Steel Flooring Co.**, Jersey City, N. J., has released a bulletin on various designs of open steel flooring, describing forged and welded rectangular patterns, and a triangular pattern suitable for a wide variety of flooring, grates, and platforms. The 4-page bulletin also gives dimensions of each design of grating and safety step, and includes a safe-load table.

553

GRANOLITHIC CEMENT FLOORS—**Kalman Floor Co., Inc.**, New York, N. Y., has published an illustrated 8-page catalog describing the Kalman process, a precision method of building for maximum hardness and uniform density over complete floor areas. The laying process is shown in detail, including the underslab preparation, preparation of proper-aggregate Kalman topping mix, absorption control, compacting, surfacing, troweling, and curing.

554

FIRM BIOGRAPHY—**L. H. Hoffman**, active Pacific Northwest contractor, has published a 50-page book illustrating the history of the **Hoffman Development Co.**, Portland, Ore., and its predecessors. Some of the larger structures built by the firm are illustrated, together with photographs of the firm's organization and equipment.

555

AIRFLEX COUPLINGS—**Falk Corp.**, Milwaukee 8, Wis., has published two 8-page bulletins on the firm's Airflex Couplings. Bulletin 8100 lists the coupling advantages for frequent high torque load fluctuations and shows photographs of the construction features incorporated in the coupling. Typical installations of all couplings are shown. Bulletin 8105 lists the dimensions and specifications, methods of selection for engine-driven system and electric-motor-driven systems involving shock, in addition to the construction features.

556

WIRE ROPE—Four descriptive bulletins for Western wire-rope users are available in bound form from the **Republic Supply Co.** of California, distributor for Edwards Wire Rope. They were prepared to assist industry in the proper selection and correct use of wire rope to obtain the greatest possible service lift, and are listed as B—the rope to choose, C—use and abuse, D—splicing and fitting, and E—data and tables.

557

CYLINDERS—**Ledeen Manufacturing Co.**, Los Angeles, has released a 12-page catalog giving the dimensions, weights, ratings, and limitations of the recently announced Medium Duty line of pneumatic and hydraulic actuating cylinders. The same data are available for the previously announced heavy and super duty lines of cylinders, including selection aid and advice and the rod and head attachments.

558

BLAST-HOLE DRILL—**Joy Mfg. Co.**, Denver, Colo., has released a 4-page bulletin on the Joy Champion, newly designed continuous blast-hole drill. Brief specifications, photographs, and list of local distributors are in the bulletin.

559

LEAF LOADER—**M. A. Elliotte**, Grafton, N. Y., has released three 2-page bulletins describing the firm's vacuum street-cleaner, leaf loader, and portable incinerator for municipal use. The vacuum leaf loader and street cleaner bulletins have brief specifications in addition to photographs and general descriptions.

Space is sold as advertisers' inches. All advertisements in this section are ⅛ in. short of contracted space to allow for borders and composition.

CLASSIFIED SECTION

Rates are $6.50 a column inch. Copy should be sent in by the 20th of preceding month if proofs are required; by the 1st if no proofs are required.

STATE RIVERS AND WATER SUPPLY COMMISSION VICTORIA, AUSTRALIA

BIG EILDON PROJECT

TENDERS are invited from organizations experienced in the construction of large civil engineering works for the construction of the **BIG EILDON DAM** at Eildon in the State of Victoria, Australia.

The construction of the dam will involve the excavation and placing of approximately 13,000,000 cubic yards of earth and rock-fill in embankment with a maximum height of about 260 feet, approximately 300,000 cubic yards of concrete work, outlet and control works and appurtenant structures, including a **PONDAGE WEIR** about three miles below the dam.

Contracting organizations are invited to submit **TENDERS** for:—

(a) A Schedule of Rate Contract;
or
(b) A Cost-Plus Contract based on a "Target Estimate" to be submitted by the tenderer.

EXHIBITION DOCUMENTS comprising **GENERAL CONDITIONS OF CONTRACT, PLANS AND SPECIFICATIONS AND CONDITIONS OF TENDERING** together with engineering and geological reports, and general information concerning prevailing wages, rates and employment conditions are available at £10.10.0 per set and will be forwarded to bona fide prospective tenderers on receipt of written applications, enclosing cheque, addressed to—

The Secretary,
State Rivers and Water Supply Commission,
100-110 Exhibition Street,
MELBOURNE, C.1.,
VICTORIA, AUSTRALIA.
or
The Agent-General for Victoria,
Melbourne Place,
Strand,
LONDON.

TENDERS endorsed "Tender for Construction of Big Eildon" will be received by the Secretary, State Rivers and Water Supply Commission at 100 Exhibition Street, Melbourne, until 12 noon on 30th June 1950. A preliminary deposit of £A1,000, payable at Melbourne, must be lodged with the tender and will subsequently be refunded to unsuccessful tenderers.

Lowest of any tender not necessarily accepted.

INDEX TO ADVERTISERS
★ IN THIS ISSUE ★

ADVERTISERS AND ADVERTISING AGENCIES
CHANGE YOUR RECORDS

Effective with the July Issue, *Western Construction News* will be published on the 1st of each month. Display advertising forms close on the 5th of preceding month, instead of the 10th.

NOTE:

All advertising plates and copy for the July Issue must be in San Francisco by June 5.

Thank you,
Advertising Department