WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

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IN THIS ISSUE

Workmen chip off loose rock high above the Colorado River at the actual location of Granby Dam, northeast of Granby, Colorado. A link in the Colorado-Big Thompson Project of the U. S. Reclamation Bureau, the structure will be 885 ft. long at the crest and rise 332 ft. above the river bed.

Photo by Zellers.

KEEP ENGINES CLEAN

assure trouble-free, economical performance

To keep your heavy-duty gasoline and high-speed Diesel engines operating more efficiently, use the oil that keeps engines *clean* — *Texaco Ursa Oil X**.*

*Texaco Ursa Oil X*** has strong detergent and dispersive qualities and high resistance to oxidation. It keeps rings free, assuring better compression and combustion — greater power and fuel economy. It protects alloy bearings, prevents scuffing of rings, pistons and cylinders — greatly reduces engine wear and maintenance costs.

For Texaco Products and Lubrication Engineering Service, call the nearest of the more than 2300 Texaco distributing plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

IMPROVED AIR COMPRESSOR OPERATION

Get more efficient performance from your air compressors by lubricating them with *Texaco Alcaid, Algol or Ursa Oil.* These world-famous oils keep rings free, valves active, ports open and air lines clear — assure fewer repairs and replacements, longer compressor life.

TEXACO

TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

Tune in . . . TEXACO STAR THEATRE presents the NEW EDDIE BRACKEN SHOW every Sunday night. See newspapers for time and station.

BIG DITCH

LITTLE DITCH...

—choose a Northwest for profit!

WHEN you are following a line of ditch somewhere back in the brush where dependability and steady operation really mean dollars, then you really appreciate the advantages of a Northwest Dragline.

That trouble-free crawler proved in years of drainage and sewer work takes you places where the ordinary crawler has trouble.

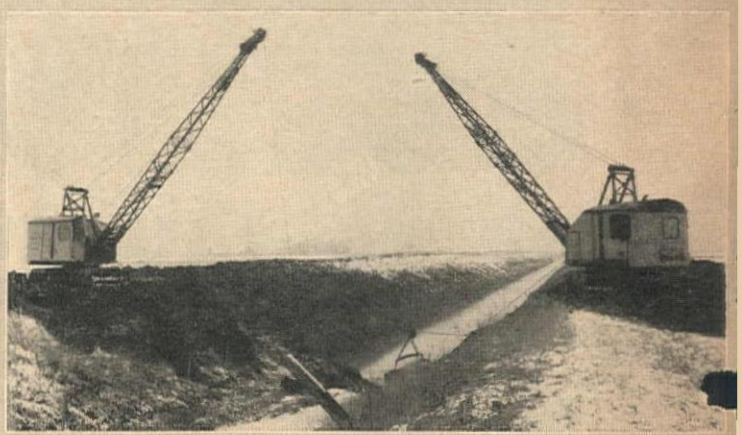
The "Feather-Touch" Clutch Control shifts heavy drum clutches through the power of the engine, assuring easy operation, yet giving the feel of the load. It's simple, positive and the machine can't be shut down because of control failures.

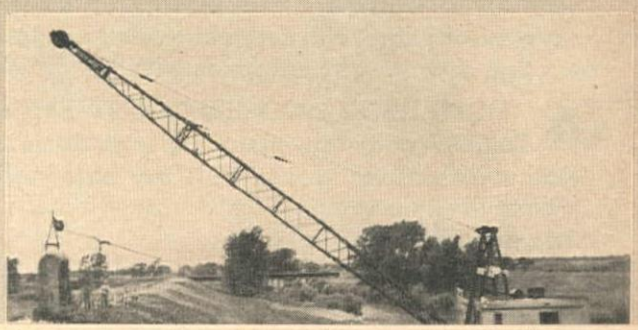
Uniform Pressure Swing Clutches give smooth swinging performance—no machine-wearing jerks and grabs. The Cushion Clutch eliminates the effects of shock overloads to parts under power when the bucket hangs up.

But most important of all is the trouble-free, dependable service that results from simplicity of design and high quality construction.

Cast steel bases with cast steel machinery side frames, the Helical Gear Drive, Splined Shafting, all high-speed shafts on ball or roller bearings and other advantages that assure longer machine life and easier upkeep pay out.

It pays to buy better equipment! You are planning ahead. Plan to have Northwest equipment on your job—follow the Northwest Crowd.





NORTHWEST ENGINEERING COMPANY
1736 Steger Building, 28 E. Jackson Boulevard
Chicago 4, Illinois.

cal NORTHWEST sales agents

BUTTE, MONT.
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State Tractor & Equip. Co.

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Balzer Machinery Co.

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Arnold Machinery Co. Inc.

SEATTLE, WASHINGTON—Northwest Sales Office: 1234 Sixth Ave., South

Follow the Northwest Crowd

THESE JOB-PROVED EUCLID features BRING HAULING COSTS DOWN

GREAT BODY AND FRAME STRENGTH Strong, rigid frame and sturdy body are designed and built to withstand the impact and wear of loading heavy excavation with large shovels and draglines, and traveling over rough haul roads with 15-ton loads.

POWERFUL AND EFFICIENT DRIVE AXLE Double-reduction, planetary type drive axle attains tremendous pulling power. Full rear axle load is carried on heavy-duty tapered roller bearings. Final reduction is taken at each wheel.

DEPENDABLE PERFORMANCE . . . Records from all types of mining and construction jobs are proof of the efficiency and long life achieved by proved design and painstaking production of every part.

Complete specifications and literature on all Euclid earth-moving equipment are available from your Euclid distributor or by writing direct.

Built for a wide range of off-the-highway heavy-duty hauling . . . 15-ton capacity . . . 9.7 cu. yds. struck measure . . . loaded top speed 22 m.p.h. . . . powered by 150 to 200 h.p. Diesel engines.

The EUCLID ROAD MACHINERY Co., CLEVELAND 17, OHIO

EUCLIDS *Move the Earth*

Brown, Fraser & Co., Ltd., Vancouver, B. C.; A. H. Cox & Co., Seattle, Wash.; Hall-Perry Machinery Co., Butte, Mont.; Lively Equipment Co., Albuquerque, New Mexico; Constructors Equipment Co., Denver, Colorado; Pacific Coast Branch: 3710 San Pablo Ave., Emeryville, Calif.; Intermountain Equipment Co., Boise, Idaho, and Spokane, Washington; Lang Company, Salt Lake City, Utah. REPRESENTATIVE: M. H. Johnson, W. 2411 Crown Avenue, Spokane, Washington.

WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

Covering the Western Half of the National Construction Field

Contents for November, 1946

J. M. SERVER, JR.
Editor

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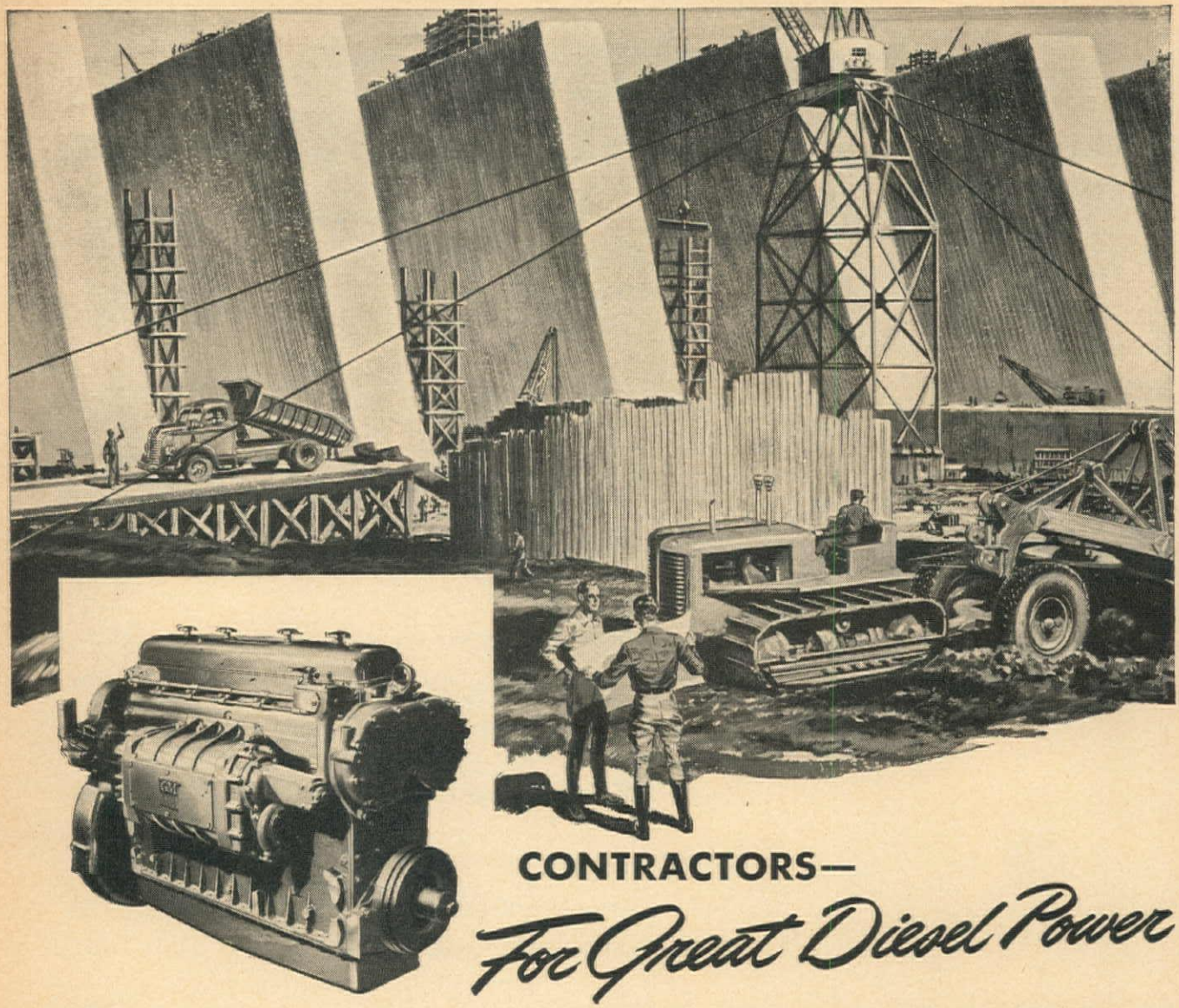


CONTRACTORS—

For Great Diesel Power

check what's going on in construction

MODERN construction projects grow on volumes of power. It has to be dependable, hard-hitting, low-cost power.

And what do you find providing that kind of power throughout the industry? General Motors series 71 Diesel engines. You find them in trucks and tractors, in welders and trenchers, in earth movers, graders, compressors, pumps and what-not.

Because these Diesels are compact as well as powerful. They're lower in weight as well as husky. They're easy to start and they stay on the job.

These are qualities that bring Diesel power advantages to operators who couldn't consider it before.

So whatever needs for power you may have in road-making machinery, crushers, shovels or any other construction equipment—look to GM Diesels.

Features of GM Diesels Important to Every User of Power

- ***QUICK TO START*** on their own fuel
- ***ECONOMICAL***—run on low cost fuel
- ***EASY TO MAINTAIN***—clean design plus accessibility
- ***LESS FIRE HAZARD***—no volatile explosive fuel
- ***COMPACT***—readily adaptable to any installation
- ***SMOOTH OPERATION***—rotating and reciprocating forces completely balanced
- ***QUICK ACCELERATION***—2-cycle principle produces power with every downward piston stroke

DETROIT DIESEL ENGINE DIVISION

DETROIT 23, MICH. • { SINGLE ENGINES . . *Up to 200 H.P.* / MULTIPLE UNITS . . *Up to 800 H.P.*

GENERAL MOTORS

GM GENERAL MOTORS DIESEL POWER

Evans Engine & Equipment Co. SEATTLE 9, WASH.
Moore Equipment Co. STOCKTON, CALIF.

Fred M. Viles & Company SPOKANE 8, WASH.
Mountain Tractor Co. MISSOULA, MONT.

Gunderson Bros. Equipment Corp. PORTLAND 9, ORE.
Olson Manufacturing Co. BOISE, IDAHO

Capitol Tractor & Equipment Co. SACRAMENTO, CALIF.
Anderson-O'Brien Co. LOS ANGELES 21, CALIF.

5 TOURNAPULLS handle 40,000 yards in 15 days on California Highway

TOURNAPULLS spread in smooth, even layers. Big tires aid compaction.

M. J. B. Construction Co., of Stockton, Calif., used 5 fast-moving Tournapulls to handle 80% of their 350,000-yd. highway job between Grant Line Road and Mossdale. Efficient job planning with Tournapulls enabled contractor to maintain a high production rate on the 3.8 miles of new highway construction, including a bridge approach fill on the east side of the Mossdale River.

Tournapulls average 6.5 loads each per hour on 3500′ haul

Working in fine, loose silt and mixed clay and loam, Tournapulls completed 7000′ cycles in less than 10 minutes. Contractor's production records showed 40,000 yards moved in 15 days, working a single 9-hour shift per day. Excellent haul road maintenance with a motor patrol and water sprinkler paid off in more trips per hour, more pay yards moved to the fill.

TOURNAPULLS get heaping loads, have quick get-away ability.

Drives in Tournapulls

A veteran LeTourneau owner and repeat buyer, the M. J. B. Construction Co. drove in 4 of their money-saving Tournapulls 60 miles from Sacramento. Large pneumatic tires allow Tournapulls to travel from job to job, without damage to road surface or interference with traffic.

Your LeTourneau Distributor can give you actual job proof of other Tournapull production records. Let him show you what Tournapulls can do for you.

TOURNAPULLS travel at high speeds, move big pay loads fast.

LETOURNEAU PEORIA, ILLINOIS

JOB-PROVED Over 4600 Built and Shipped

TOURNAPULLS

IH Presents

More Power
Greater Hang-on
Better Operating Economy

More Power! The horsepower of two models of International Diesel Power Units has been stepped up by 11% and 25% respectively — without increasing their size or weight — as the result of advanced engineering in the fuel combustion system. These are the 4-cylinder, 76-hp. UD-14A and 6-cylinder 125-hp. UD-18A Power Units. Power ratings are for *working* horsepower of the complete unit with fan, radiator and power take-off.

Greater Hang-on! When pulled down by overload, increased torque gives these Diesels greater "lug-ability." And they are built to take overloads in stride!

Better Operating Economy! Even with horsepower stepped up, these Diesels run cool under heavy loads and operate at new low cost per horsepower. A low rate of fuel consumption proves their efficiency.

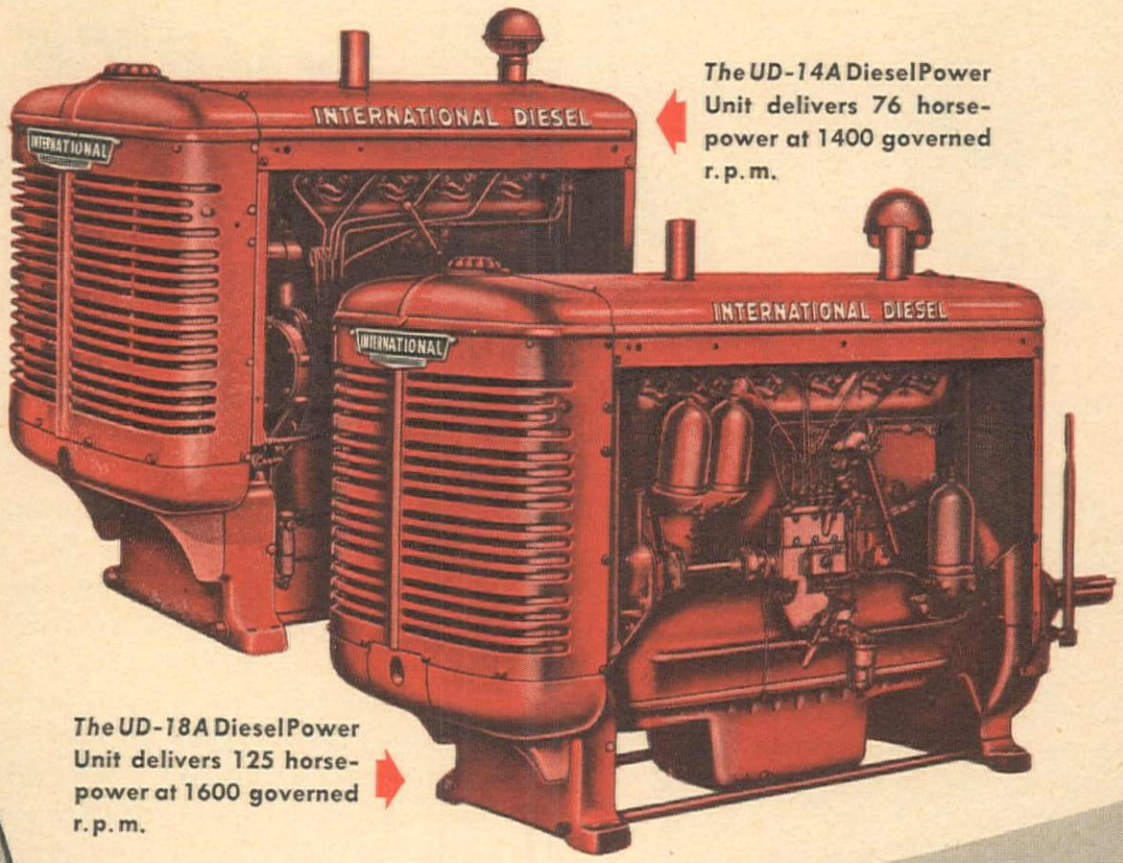
Available Soon! Look for these newest International Diesels in the powered equipment soon available through your International Industrial Power Distributor. And ask him for the facts and figures on these models. He has them now.

Industrial Power Division

INTERNATIONAL HARVESTER COMPANY

180 North Michigan Avenue • Chicago 1, Illinois

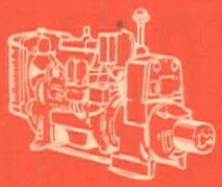
Another Advance in INTERNATIONAL DIESEL POWER



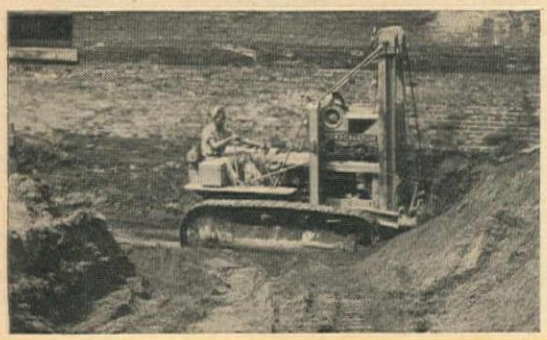
The UD-14A Diesel Power Unit delivers 76 horsepower at 1400 governed r.p.m.

The UD-18A Diesel Power Unit delivers 125 horsepower at 1600 governed r.p.m.

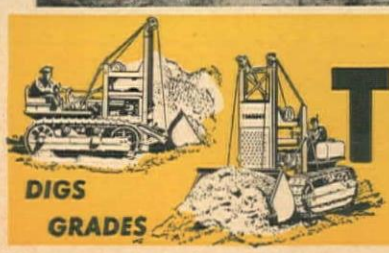
INTERNATIONAL *Industrial Power*



When there's WORK to do.. TRAXCAVATE!



Work is the word for TRAXCAVATORS! They're built to do *more* of it. Assign them to most any construction job and see the amazing number of tasks TRAXCAVATORS can perform. Pictured here is a Model IT4 ripping up and loading old concrete pavement and excavating for a new building; two T7s, with 2½ yard buckets, grading and leveling a tank site; an IT4 doing a close-quarter excavating job. There's versatility in TRAXCAVATORS — the kind that cuts corners on every contract — saves time and labor — turns an *extra* profit your way. Your TRACKSON-"Caterpillar" dealer can show you how it pays to *Traxcavate* and why TRAXCAVATORS do more work on more jobs at lower cost. He can help you select the size best suited to your particular needs. See him today, or write direct to TRACKSON COMPANY, Dept. WC-116, Milwaukee 1, Wis.



TRAXCAVATOR

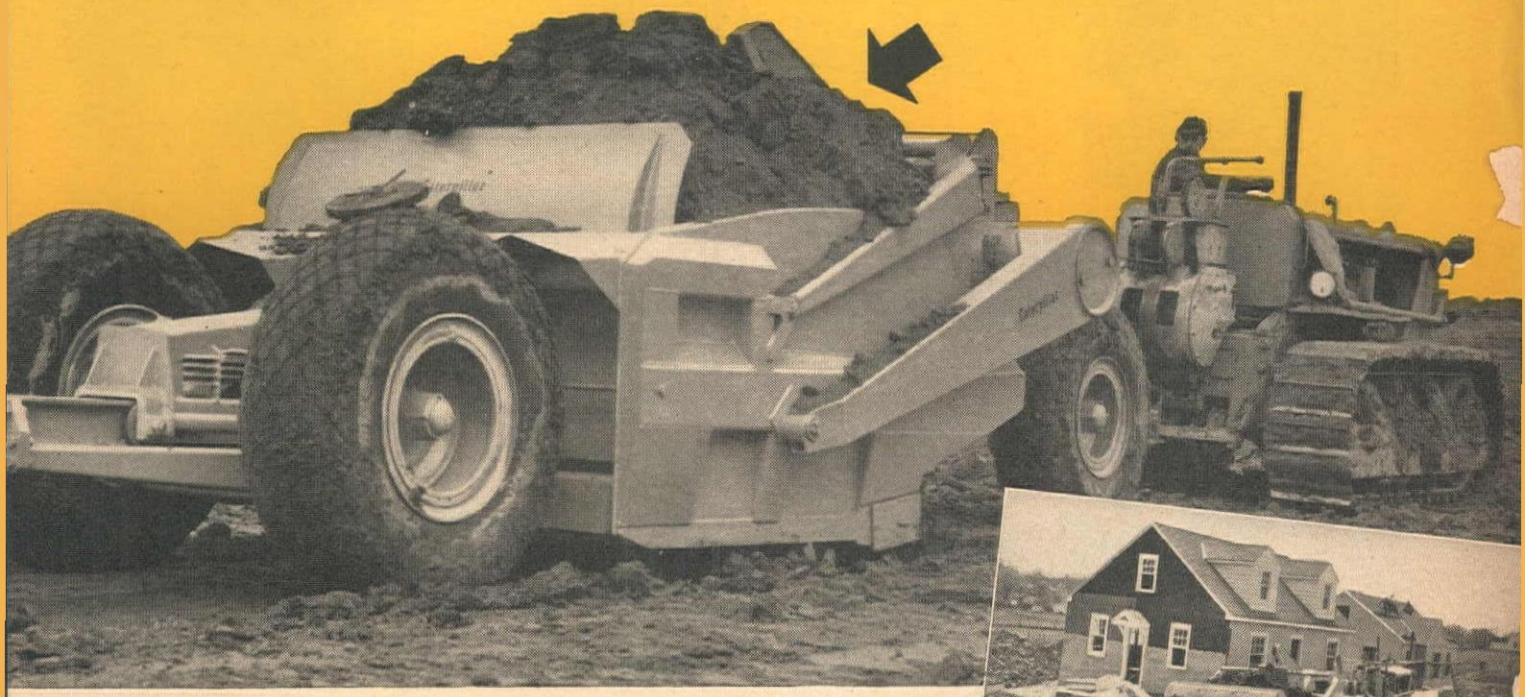
REG. U. S. PAT. OFF.

DIGS GRADES

THE ORIGINAL TRACTOR EXCAVATOR

LOADS · CARRIES

YOU'LL MOVE MORE YARDAGE WITH "CATERPILLAR" SCRAPERS



HERE are facts—proved on the job—that show why the new "Caterpillar" Scrapers move *more* earth—faster—at *lower cost*.

BOILING ACTION. The design of the bowl and blade-edge boil earth upward through the middle instead of forcing it up and over the sides before the middle is full. That's why "Caterpillar" Scrapers load easier, top out better. This feature means more yards per hour. The blade cuts faster and easier on hard ground and contributes to central boiling action in the bowl.

SPREADING. The big apron opening is another feature of "Caterpillar" design. It gives positive, clean ejection. Results in faster unloading—no hanging up or sticking—and more trips per hour.

OVERSIZE TIRES. Scrapers pull easier on bigger tires. "Caterpillar" recognizes this and equips its scrapers with oversize tires. On soft ground, off the road, the larger tires permit lower inflation, more tread area to absorb the weight, better flotation and higher hauling speeds. That means easier hauling, increased yardage and lower costs—plus extra tire life.

STRONG CONSTRUCTION. Rugged design, superior materials and expert workmanship increase durability. These scrapers are built to last. They have welded construction and high-tensile steels throughout. Rugged-rib bracing of the heavy double-bottom plate is provided for increased strength and wear.

NEW "CATERPILLAR" CABLE CONTROL. Sure-acting and fast. Matched to the load. Oversize machined and heat-treated sheaves and correct reeving give longer cable life.

OPEN BOWL. "Caterpillar" design achieves maximum strength without the drawbacks of an overhead frame. The operator has good visibility for loading and spreading, and the scrapers can be shovel-loaded, an important feature on many jobs.

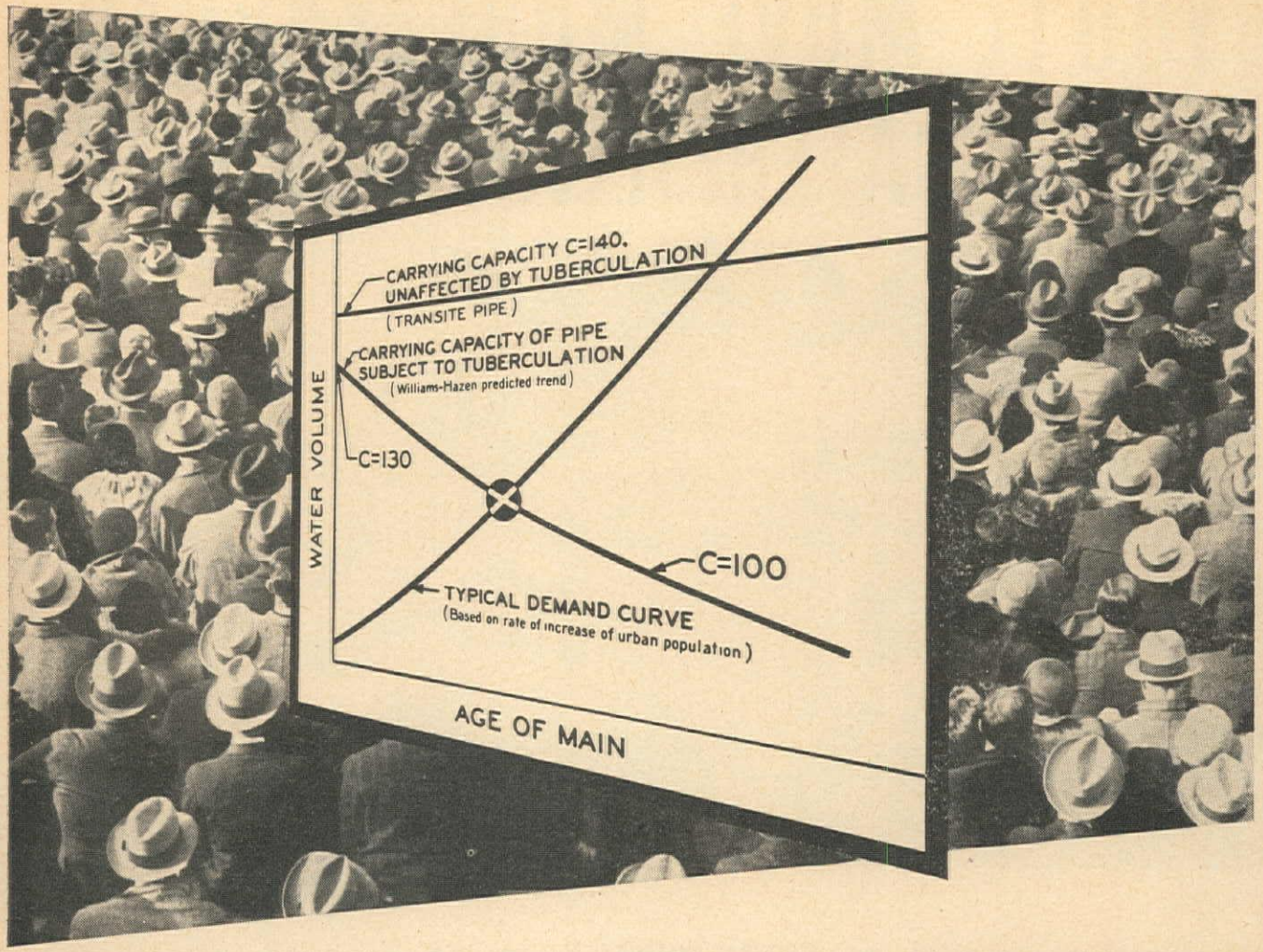
Factory production of the new "Caterpillar" Scrapers and Bulldozers is steadily increasing. See your "Caterpillar" dealer now—find out the advantages of a full line of matched earthmoving equipment—and get your order in early.

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

CATERPILLAR DIESEL

REG. U.S. PAT. OFF.

ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT



TUBERCULATION vs. GROWING POPULATION

. . . will the water pipe you install today meet TOMORROW'S needs?

FAR-SIGHTED PLANNERS are preparing *now* for future community expansion. Growing populations mean greater demands on water systems *tomorrow,* demands which must be anticipated *today.* The pipe you install is a major factor in meeting these demands—and it affects not only the initial cost of the system, but its *future operating* economy as well.

Can Volume Be Increased to Meet Demand . . . without installing "oversized" pipe now . . . or additional pipe later on? Yes, with Johns-Manville Transite Pressure Pipe. This modern water-carrier cannot tuberculate. No allowances are necessary to compensate for reductions in carrying capacity due to this costly form of interior corrosion . . . minimum-size pipe can be specified.

Will Excessive Pumping Costs Boost Water Rates . . . because tuberculation clogs up pipe interiors? The answer is "No!" when Johns-Manville Transite Pipe is used. Transite's high flow coefficient (C-140) can never be reduced by tuberculation. Pumping costs are held to a minimum . . . a definite saving for taxpayers.

How Will Maintenance Costs be Affected? Will it be necessary to resort to periodic cleaning . . . lining the pipe . . . or even replacing it with new mains? Reports from communities all over the country prove that Transite's non-tuberculating, asbestos-cement structure is an important help in eliminating these costs—providing economies that continue through the years.

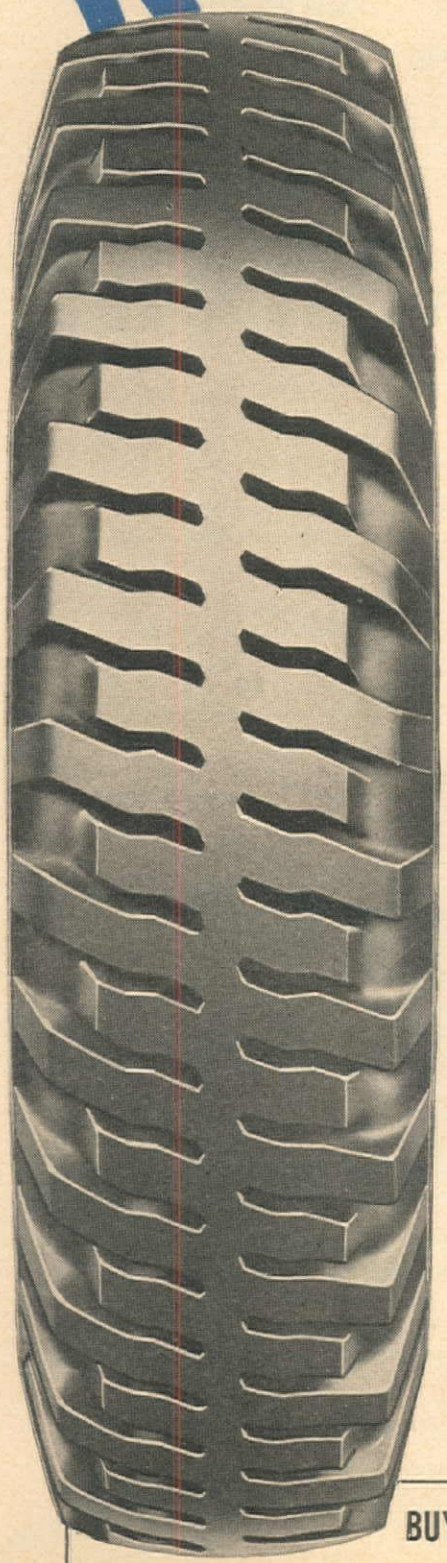
For full details, write for brochure TR-11A, Johns-Manville, Box 290, New York 16, N.Y.

JOHNS-MANVILLE JM PRODUCTS

Johns-Manville Transite Pressure Pipe

An Asbestos Product

NOW a great NEW tire to meet a great service need



LONG-LIFE SERVICE OFF THE ROAD and LONG MILEAGE ON THE HIGHWAY !

THIS is the new Road Lug tire — made to order by Goodyear for tough service operations demanding a tire built to go in OFF the road, bring out the load, then take the haul ON the highway.

In test after test — in strip mines, in rugged timber country, on tough access roads, and under punishing loads over the highway — this great husky *proved* brute enough to stand the gaff and gouging OFF the road, and roll up new mileage records ON the road. It *averaged* 33% longer tread wear and 25% longer tire life.

The reasons why are many. They include the specially designed tread that gives good traction and cut resistance OFF the road, and smooth rolling, longer mileage ON the highway. And they include heat-resistant, extra-strong rayon cord body which provides added stamina and bruise resistance in this great hauler.

See your Goodyear dealer now for full data on the NEW Road Lug — the tire that will give you new performance standards, and another big reason why "*more tons are hauled on Goodyear truck tires than on any other kind.*"

Road Lug—T.M. The The Goodyear Tire & Rubber Company

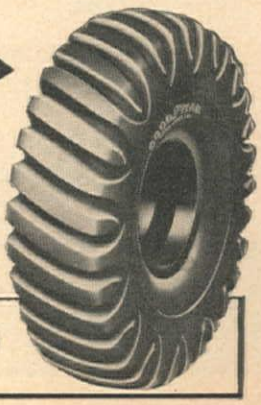
GOODYEAR

Road Lug Tire

— tough running mate for Goodyear's famous

HARD ROCK LUG

which is still the world's toughest work tire for straight brutal off-the-road service.



BUY and SPECIFY GOODYEAR — *it pays!*

6 Reasons Why

HENDRIX Lightweight DRAGLINE BUCKETS

ARE BETTER!

10% to 14% Manganese Steel Chains and Fittings are standard on all types and sizes.

3/8 to 30 Cubic Yds.

1. 20% to 40% lighter than other buckets, type for type.
2. All welded construction for greater strength and durability.
3. Manganese Steel chains, fittings, and reversible tooth points.
4. Full Pay Load every trip, even in wet diggings.
5. Perfect Balance; handles easier, fills faster, dumps cleaner.
6. Three Types; light, medium, and heavy duty. With or without perforations.

Write for descriptive literature or ask your dealer.

HENDRIX MANUFACTURING COMPANY
MANSFIELD INCORPORATED LOUISIANA

FORMERLY DESOTO FOUNDRY, INC.

Digs and Delivers 600,000 Pounds of Brick Clay Daily

The overwhelming demand for building materials led the Higgins Brick and Tile Company of Moneta, Calif., to enlarge their output last spring.

In April they purchased a four-yard, hydraulically operated K-B carrying scraper to increase their daily supply of clay. One man, using a D-4 tractor with the scraper now delivers to the conveyor more than 600,000 pounds of brick clay daily, some of which must be hauled quite a distance.

"The K-B Carrying Scraper has operated every day since we bought it with perfect satisfaction," says President Higgins. "The easy and exact hydraulic control is ideal for dumping the clay gradually on the belt conveyor. We have had no trouble since purchasing the K-B Scraper in maintaining a steady supply of clay to meet the needs of our present output of 10,000 to 12,000 bricks an hour."

Available with either hydraulic or cable control.

KAY-BRUNNER STEEL PRODUCTS, INC.
2721 ELM STREET, LOS ANGELES 41, CALIF.

BULLDOZERS ★ TRAILBUILDERS ★ RIPPERS ★ POWER CONTROL UNITS ★ TAMPING ROLLERS

SEE YOUR CHEVROLET DEALER

HE CAN SUPPLY YOU WITH CHEVROLET STANDARD TRUCKS AND SPECIAL EQUIPMENT FOR ANY HAULING JOB

Chevrolet produces 99 models on 9 wheelbases—with a range of standard bodies and payload capacities that covers the needs of the great majority of users. To meet special hauling requirements, your Chevrolet dealer can supply you with special bodies and equipment that extend the range of usefulness and payload capacity of Chevrolet trucks and tractor-trucks up to the maximum permitted by law.

THERE'S A CHEVROLET TRUCK TO DO YOUR *HAULING JOBS*

99 MODELS ON 9 WHEELBASES

Newly added models, of greater payload capacity than in previous years, now make available Chevrolet's famous operating economy, low upkeep and low first-cost to a still greater range of users in the heavy hauling field. Chevrolet trucks formerly classed as heavy-duty models are now Chevrolet medium-duty models; the new models that now make up Chevrolet's heavy-duty class comprise five series, with five wheelbases (from 109 inches to 160 inches), and include both conventional and cab-over-engine types. All are equipped with vacuum-power brake boosters and with new wide-base-rim wheels.

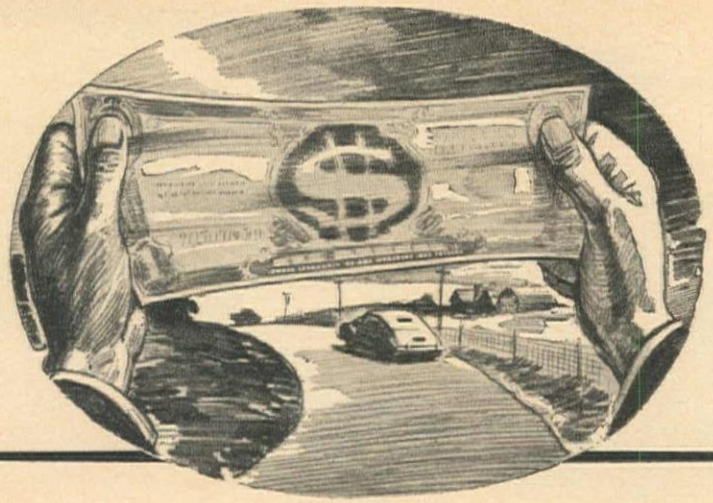
Operators of trucks in extra-heavy hauling jobs will cut costs three ways by using these massive Chevrolets . . . for they cost less to buy, less to run, less to keep.

CHEVROLET MOTOR DIVISION, *General Motors Corporation*, DETROIT 2, MICHIGAN

CHEVROLET TRUCKS

PICK-UPS | PANELS | STAKES | CAB-OVER-ENGINE | TRACTOR-TRUCKS AND CHASSIS FOR SPECIAL EQUIPMENT

99 MODELS • 9 WHEELBASES • THE RIGHT TRUCKS FOR ALL TRADES



S-T-R-E-T-C-H
your Highway Dollars

Soil stabilization has shown the way to lower road-building costs through the utilization of native, in-place materials. Now it is possible to definitely pre-determine strength . . . to really *engineer* such roads. The science of soil stabilization is ready to serve you.

The next step is ready, too — the machinery to perform the necessary operations in the most efficient manner. This is the problem solved by the *P&H Single Pass STABILIZER* which fulfills these 8 basic requirements in building stabilized roads:

1. Control processing depth for accurate proportioning
2. Pulverize the soil thoroughly
3. Blend materials uniformly
4. Create a true sub-grade
5. Disperse the liquid through the entire volume in measured quantity
6. Mix the coated material uniformly
7. Lay the completely processed material in a fluffy, even depth, ready for compaction
8. Do all these things in *one pass* — at a good rate of speed.

By reducing all these operations to one pass — with any type of admixture — the *P&H Single Pass STABILIZER* makes road dollars go further than ever before.

Highway Departments or contractors figuring on base courses, light traffic roads, streets, airport runways, etc., may obtain complete details by writing us.

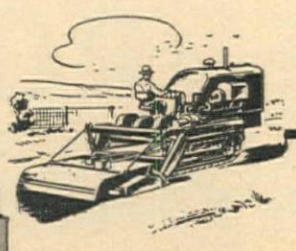
P&H

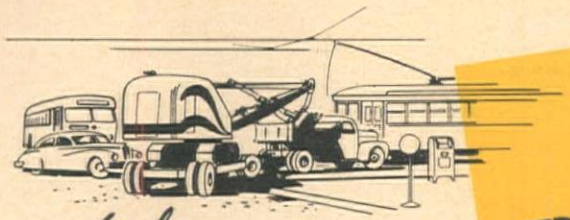
SINGLE PASS STABILIZERS

4490 W. National Avenue
Milwaukee 14, Wisconsin

HARNISCHFEGER CORPORATION

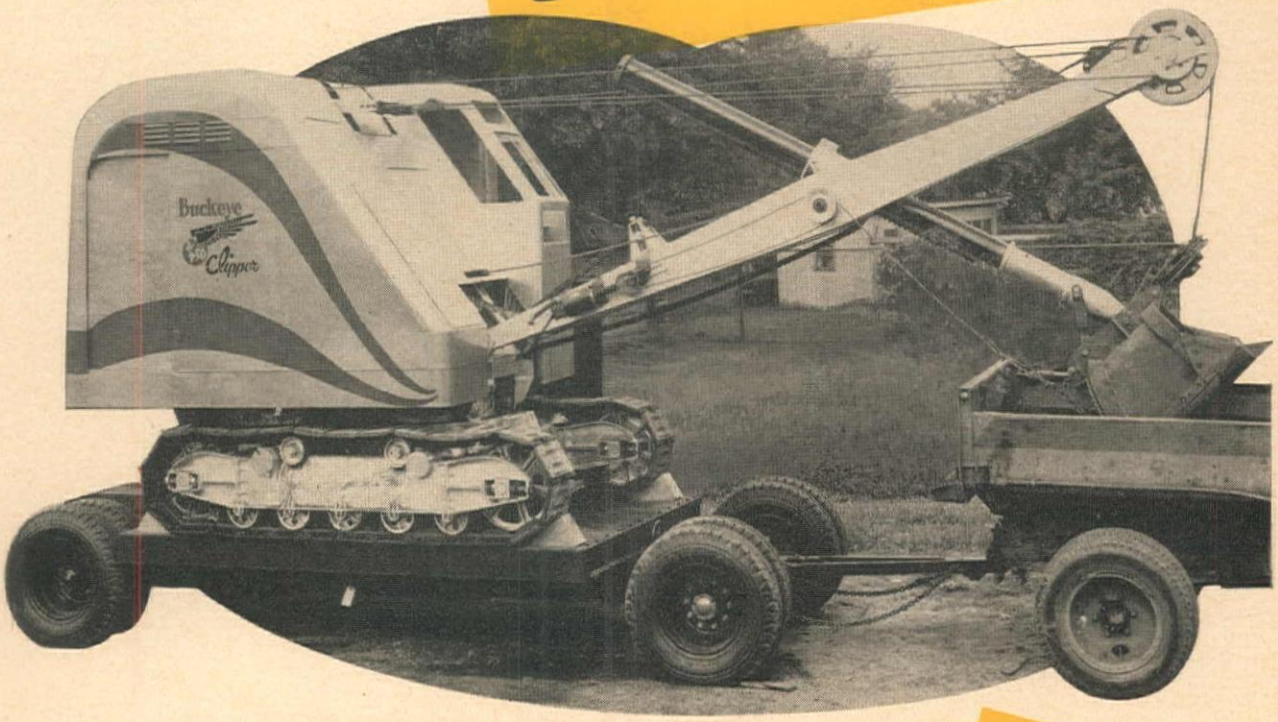
EXCAVATORS · ELECTRIC CRANES · ARC WELDERS · P&H · HOISTS · WELDING ELECTRODES · MOTORS





tight corners

EASILY PORTABLE



THE BUCKEYE MODEL 50 CLIPPER IS A "SNAP" TO MOVE FROM JOB TO JOB

If you're looking for a smooth-working shovel that will wipe away your inter-job transportation frowns, sail along with the graceful Clipper. Think of a ½-yd. shovel that you can load on a light trailer and haul behind a 1½-ton truck. That's the Buckeye Model 50 Clipper.

low clearance

light truck

Tops in portability, the Clipper also heads the list in convertibility. It's five machines in one... power shovel, trench hoe, dragline, crane, pile driver. From the ground up, Clippers are built for faster digging and material handling. All clutches are engaged and brakes applied by Mevac—smooth, vacuum power. Vacuum power trips the dipper, too.

The Clipper has many other superior features—direct automotive drive, full revolving, simultaneous crowd, swing, hoist and travel—offered by no other small shovel. Let us show you the Clipper's many advantages. Stop in today!

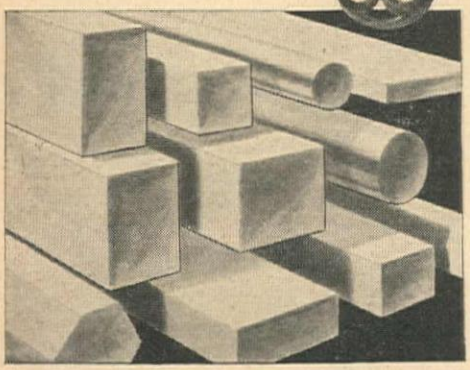
INDUSTRIAL EQUIPMENT COMPANY

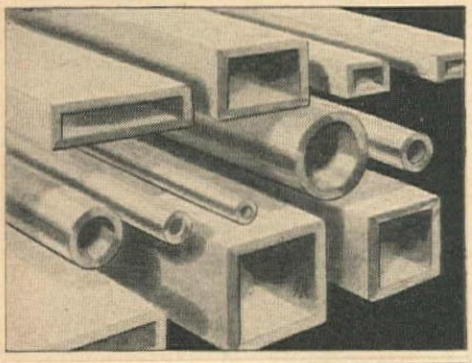
10911 RUSSET ST., OAKLAND 3, CALIF. • 4441 SANTA FE AVE., LOS ANGELES 11, CALIF.

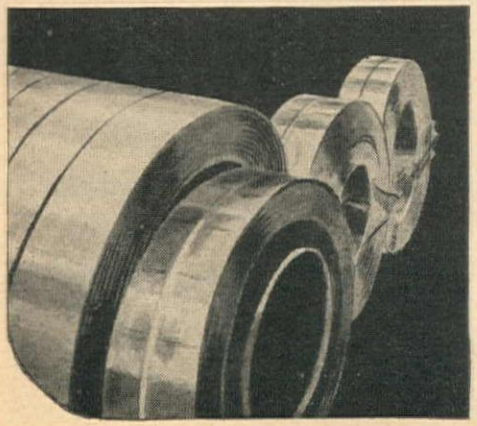
• SAN DIEGO • FRESNO • SACRAMENTO •

NOW

Brass Mill Products Quickly!







A large supply of brass mill products is now offered to the trade at unusually low prices. The entire inventory may be fabricated by normal production methods and is being sold in production quantities.

The inventory includes: Free Turning Brass Rod—1 inch diameter and larger; Copper and Brass Tubing—3 inch O.D. and larger; Naval Brass Rod—various diameters; Aluminum Bronze, Manganese Bronze and Silicon Bronze in various shapes.

• • •

This material is offered in the following sequence as provided by law: (1) Certified Veterans of World War II; (2) Subsequent priority claimants; (3) Non-priority purchasers. Federal agencies have had opportunity to fulfill their needs. VETERANS OF WORLD WAR II should apply to their nearest WAA Regional Office for certification; the case number assigned and the location of the certifying office must be stated in a Veteran's offer to purchase.

EXPORTERS: The War Assets Administration solicits your inquiries. Communicate with your foreign clients promptly.

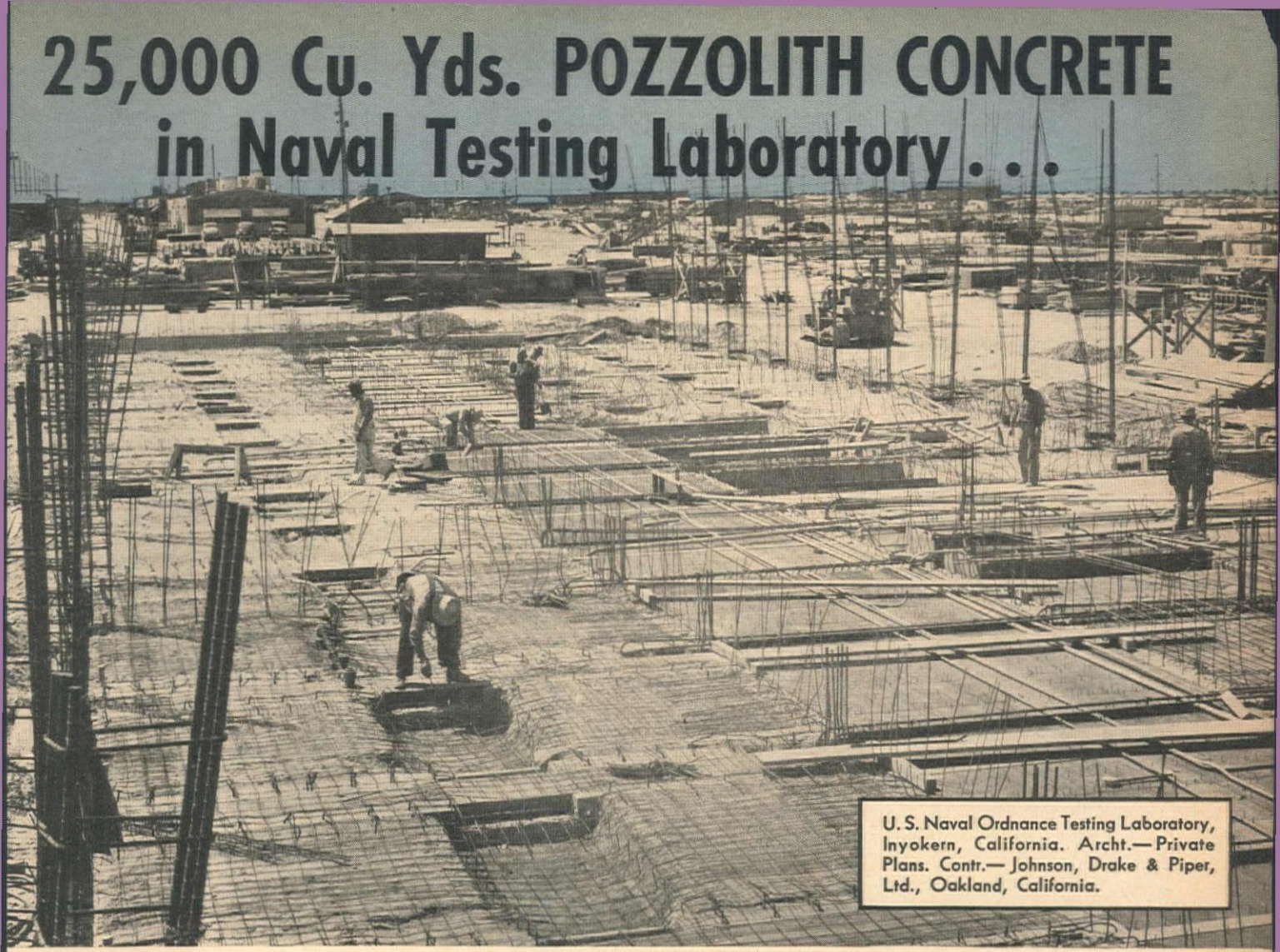
WAR ASSETS ADMINISTRATION

Offices located at: Atlanta • Birmingham • Boston • Charlotte • Chicago • Cincinnati • Cleveland • Dallas • Denver • Detroit • Fort Worth • Helena • Houston • Jacksonville • Kansas City, Mo. • Little Rock • Los Angeles • Louisville • Minneapolis • Nashville • New Orleans • New York • Oklahoma City • Omaha • Philadelphia • Portland, Ore. • Richmond • St. Louis • Salt Lake City • San Antonio • San Francisco • Seattle • Spokane

GOVERNMENT OWNED SURPLUS

157-8A

25,000 Cu. Yds. POZZOLITH CONCRETE in Naval Testing Laboratory . . .



U. S. Naval Ordnance Testing Laboratory, Inyokern, California. Archt.— Private Plans. Contr.— Johnson, Drake & Piper, Ltd., Oakland, California.

Proved Economical Method of Solving Difficult Placing Problem

Other Master Builders Products

EMBECO . . .
For grouting and reintegration.

MASTERPLATE . . .
Industry's toughest floor.

OMICRON MORTARPROOFING . . .
Stops shrinkage cracks, prevents leaky brickwork.

By using Pozzolith, cement dispersion, easy placeability was obtained with reduced water-cement ratio in the construction of this desert laboratory built with pumice aggregate.

These important advantages of Pozzolith resulted in:

1. Speed in construction.
2. Better concrete with economy.
3. Concrete with greater durability and watertightness.

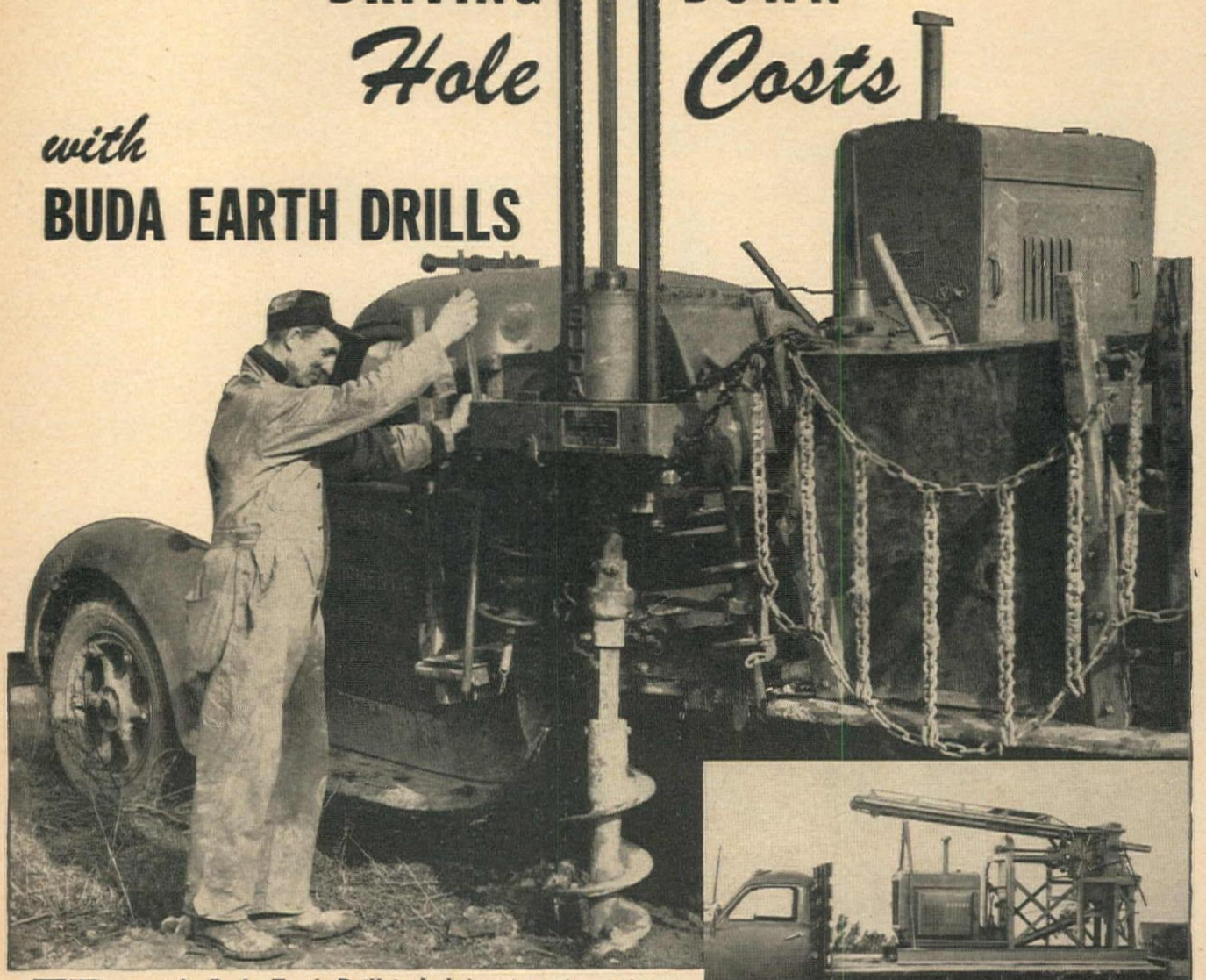
This project is typical of hundreds in which concrete designed with Pozzolith has proved to be the most economical for any given requirements.

Complete information on Pozzolith, cement dispersion, and illustrated booklet sent upon request.

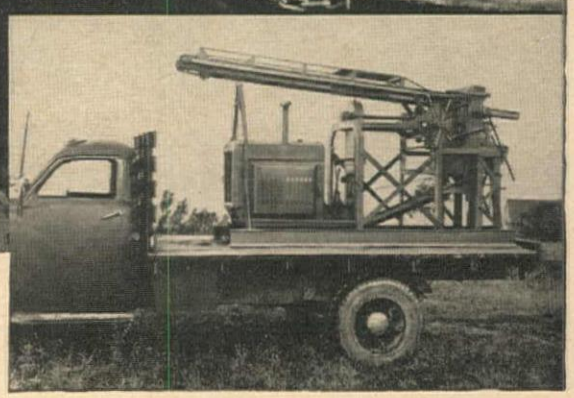
THE MASTER BUILDERS COMPANY
CLEVELAND 3, OHIO — TORONTO, ONTARIO

MASTER BUILDERS

DRIVING DOWN *Hole* *Costs* *with* BUDA EARTH DRILLS



THE versatile Buda Earth Drill is helping to cut construction costs on scores of jobs all over the country . . . drilling varied diameter holes for pre-fabricated house foundations—guard rail posts—pre-boring for piles—fence posts, and practically every other job where fast, low-cost drilling is a prime requisite. The Model HBD shown above, for example, is rushing through a large fence post job in Chicago. Note that drill is side-mounted on the truck for convenience in moving between holes. Get complete information from your nearest distributor, or write us.

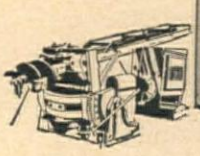


FASTER — PORTABLE

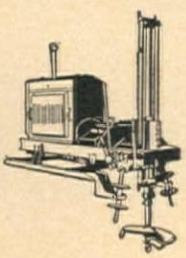
Above: Model HBH Deep Hole Earth Drill, for smaller diameter holes up to 100 ft. in depth. Unsurpassed for soil testing and prospecting.

Write for literature

Buda Model HBE Earth Drill. Cradle-mounted. Ideal for power pole work.



BUDA



Buda Model HBD Earth Drill. Rigid Head. Ideal for construction work.

15424 Commercial Avenue
HARVEY *(Chicago Suburb)* ILLINOIS

Earth Drill Distributors:

LOS ANGELES, CALIFORNIA.....**Fornaciari Company**	**DENVER, COLORADO**.....**Ray Corson Machinery Co.**
SAN FRANCISCO, CALIFORNIA.....**Coast Equipment Company**	**SALT LAKE CITY, UTAH**.....**Arnold Machinery Co., Inc.**
PHOENIX, ARIZONA.....**Brown-Bevis Equipment Co.**	**BILLINGS, MONTANA**.....**Western Construction & Equipment**

CHECK THESE PROFIT-POINTS
For Greater
TRACTOR-LOADER PERFORMANCE

A Hydraulic pressure actuates piston which drives cable drum — eliminates all clutches and gears.

B Long, long, (group 4F5510) track assembly on "Caterpillar" Diesel D4 Tractor assures correct balance, eliminating shock and untimely wear to track rollers and idlers.

C Single lever, convenient to operator, insures smooth, positive bucket control.

D More pay loads with new, faster-digging, cleaner-dumping bucket.

HERE'S a tractor-loader with greater digging and loading performance . . . with exclusive, simple, fast hydraulic control that enables you to hit new highs in production in most any materials. Its newly designed bucket makes it a capable digging unit — backed by the dependable power and traction of the "Caterpillar" Diesel D4 Tractor. Retaining the proved features of hundreds of Athey Mobi-Loaders in the field — adding new, exclusive features to increase production and ease of operation — the new Athey ML 4 MobiLoader is today's buy in the tractor-loader field! Ask your Athey "Caterpillar" Dealer about an early delivery of the *new* MobiLoader or write direct to

ATHEY PRODUCTS CORPORATION
Chicago 38, Illinois

Athey APCOR Products

New Athey ML 4 MobiLoader

when you buy a crushing

1 The Cedarapids Master Tandem—100 to 150 tons per hour of 1" material are easy for this big gravel crushing plant. 10" x 36" jaw crusher, 40" x 22" roll and 48" x 12' double-deck horizontal vibrating screen. Ask for Bulletin MT-1.

2 The Cedarapids Junior Tandem—Similar to the Master Tandem but smaller in size. 10" x 24" or 10" x 36" jaw crusher, 24" x 16" roll and 36" x 10' double-deck horizontal vibrating screen. Ask for Bulletin JT-2.

3 Cedarapids Junior Tandem and Portable Primary—The addition of a Cedarapids Portable Primary quickly converts a Master, Junior or Pitmaster from a gravel plant to a quarry plant.

4 Cedarapids Hammermill Plant—Here's one of the newest Cedarapids portable plants with a 4033 Cedarapids Hammermill for producing agstone and roadstone. Ask for descriptive literature.

5 Cedarapids Pitmaster Straightline—This is our smallest portable straightline plant . . . 10" x 16" jaw crusher, 16" x 16" roll and 30" x 9'6" double-deck horizontal vibrating screen. Ask for Bulletin PS-1.

6 Cedarapids Unitized Plant—Here's the most versatile, portable crushing, screening and washing plant ever offered because it fits *all* aggregate production requirements from riprap stone to agstone with almost any desired capacity. Ask for Bulletin Unit-1.

IOWA DEALERS

Iowa Dealers are qualified by training and experience to help you get real low-cost production in your crushing, screening and asphalt mixing operations—to recommend and sell equipment that will enable you to meet the strictest specifications at a good profit—and service your equipment to assure the minimum of lost time. There's a Cedarapids dealer in almost every important city ready for your call.

IOWA MANUFACTURING

CEDAR RAPIDS, IOWA, U. S. A.

The blow of the hammer rings clear, indicating that the pipe has reached the trench side from the foundry with its rugged quality unimpaired. After this final precautionary test, each length of cast iron pipe is lowered into the earth to begin its century or more of reliable and tax-saving service. Throughout its production cast iron pipe is tested at every step, from raw materials to final inspection, by modern laboratory and production controls. All manufacturers guard to the utmost the quality reputation of a product known for longest life with lowest maintenance cost. Cast Iron Pipe Research Association, T. F. Wolfe, Engineer, 122 S. Michigan Ave., Chicago 3.

CAST IRON PIPE

SERVES FOR CENTURIES

LOOK FOR THIS MARK IT IDENTIFIES CAST IRON PIPE

MEET THE J-50

THE NEW 55-POUND "JACKHAMER"

- NEW three-in-one backhead. (Wet, dry, or blower)
- NEW graduated throttle valve
- NEW "fighting-heart" valve
- NEW positive hole-cleaning
- NEW matchless drilling speed
- NEW ease of operation

Frontheads available for all standard drill steel sections.

SEVENTY-FIFTH ANNIVERSARY

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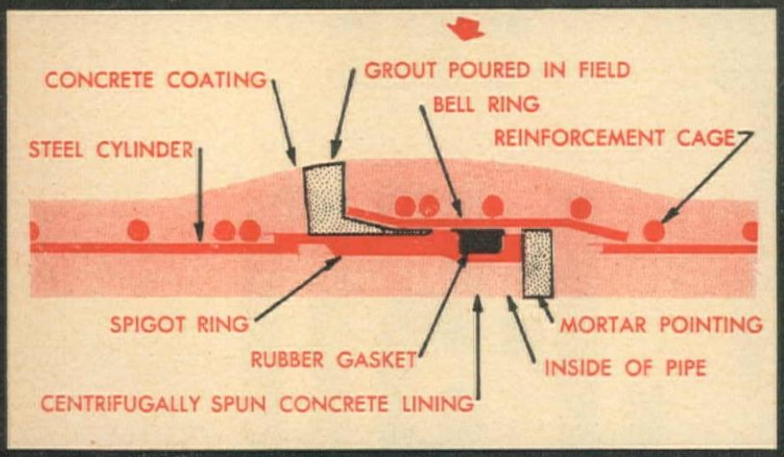
DEVELOPED BY American PIPE & CONSTRUCTION CO.

AMERICAN CONCRETE CYLINDER PIPE

with the Lock-Joint Rubber Gasket Joint



Cross-sectional view showing field joint assembly

Nearly 500,000 Feet in Use

High strength, durability and maximum carrying capacity! Ease and simplicity of installation! Low cost! These advantages of American Concrete Cylinder Pipe are being proven in installations throughout the West.

Sixteen years ago the company began development of this new type of pipe for small and medium diameter needs. Now available in diameters from 16" upwards, it is a significant contribution to the water works engineering field. You can depend on it for permanence and maximum performance. Descriptive literature available on request.

AMERICAN PIPE & CONSTRUCTION COMPANY

Concrete Pipe for Main Water Supply Lines, Storm and Sanitary Sewers, Subaqueous Pipe Lines

P. O. Box 3428, Terminal Annex, Los Angeles 54, Calif.

Main office and plant—4635 Firestone Blvd., South Gate, Calif.
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Specializing in the manufacture and installation of American Concrete Cylinder Pipe, Lock-Joint Concrete Cylinder Pipe, Pre-stressed Lock-Joint Concrete Cylinder Pipe, Hume Centrifugal Concrete Pressure Pipe.

TYPICAL INSTALLATIONS

FOR U. S. NAVY:

- Treasure Island Supply Line, San Francisco, 14" diameter.

FOR CITY OF SAN DIEGO:

- Thorn Street Pipe Line, 42" diameter.

FOR U. S. ARMY:
(Main Water Supply Lines)

- Camp Cooke, Santa Maria, Calif., 18", 21", 24", 27" diameters.
- Hanford Engineering Works, Pasco, Wash., 24", 30", 42" diameters.
- Camp San Luis Obispo, 24" diameter.

FOR CITY OF LOS ANGELES:
(Department of Water & Power)

- Gaffey Street Pipe Line, 34" diameter.

FOR CITY OF LONG BEACH:

- Wardlow Road and Alamitos Reservoir Pipe Line, 30" diameter.

FOR CITY OF PASADENA:

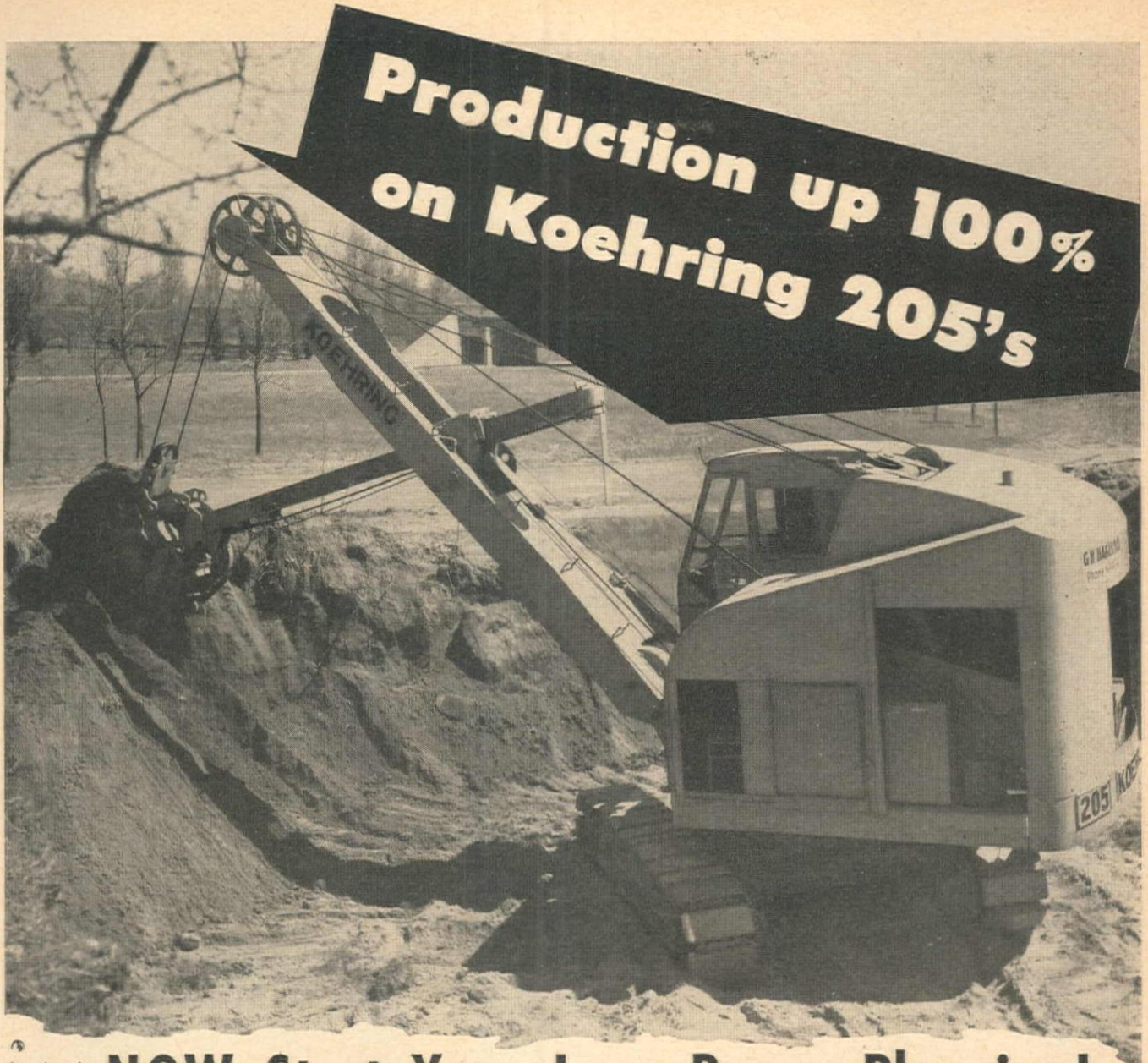
- Santa Anita-Calaveras Feeder Line, 20" diameter.

FOR ESCONDIDO MUTUAL WATER CO.:

- Bear Valley Pipe Line Extension, 21", 24", 27" diameters.

FOR SAN GABRIEL COUNTY WATER DISTRICT:

- Del Mar Avenue Transmission Main, 20" diameter.



NOW Start Your Long-Range Planning!

We're doing everything possible to whittle away the big backlog of orders for the new Koehring Half-Yard, the Koehring 205. Within the last few months, production has been stepped up 100%.

Like many another quality product, the Koehring 205 is still hard to get. But with production doubled, you won't have to wait nearly as long. That's why it's time NOW to start your long-range planning for the Koehring 205. Shovel, crane, dragline, pull shovel . . . on crawlers or on rubber. Get your catalog and complete specifications today.

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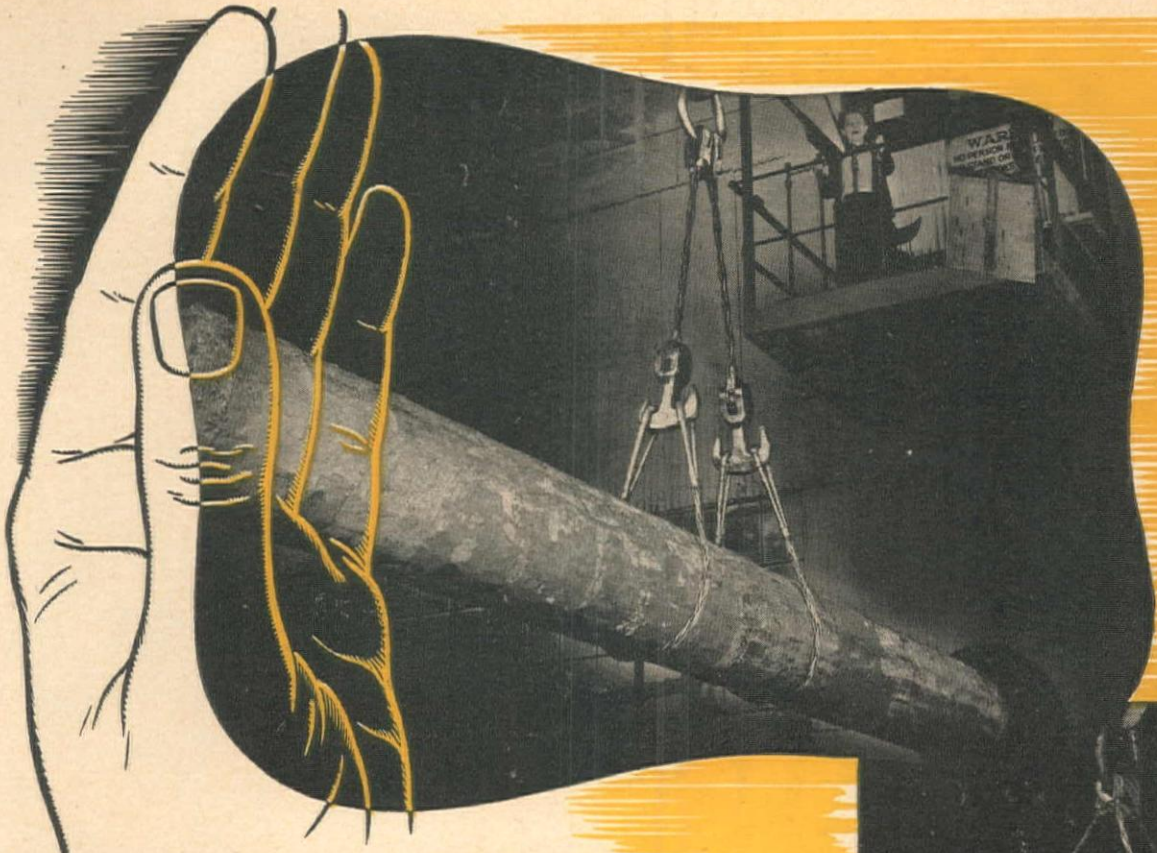


LET 'ER TRAVEL!

Materials move quickly... smoothly . . . carried by flexible YELLOW STRAND *BRAIDED* SLINGS*

When a job's moving on schedule, it's costly to have it slowed by sling equipment. What you want—in factory, shop, warehouse or yard—is *flow* in the handling of sling loads. Yellow Strand *Braided* Safety Slings promote this smoothness. Their flexibility, kink-resistance and light weight enable operators to give each lift more accurate control . . . to run a series of pickups without wasted time or motion.

Patented *braiding* puts added limberness into long-wearing Yellow Strand Wire Rope. The sling conforms to odd shapes, grips curved objects firmly, takes thimbles, turnbuckles and other fittings readily. Weighing less than chain, *braided* slings are easily carried, fastened and detached, using a minimum crew. Employees welcome their security on big tonnage lifts, their Manila-like convenience for small jobs.

Yellow Strand *Braided* Slings are practicable for loads ranging from a 40-lb. drum to a 300-ton locomotive. Send details of your application now and let B&B engineers offer a recommendation. Broderick & Bascom Rope Co., St. Louis 15, Mo. *Branches:* SEATTLE, Portland, New York, Chicago, Houston. *Factories:* SEATTLE, St. Louis, Peoria.

RIGGERS' HAND BOOK FREE
Shows sling types, fittings, capacities. Write for your copy.

*PATENTS: U.S., 1475859, 1524671, 2142641, 2142642, 2299668; CANADIAN, 252874, 256008

BRODERICK & BASCOM
Yellow Strand
***BRAIDED* SAFETY SLINGS**

CHOOSE FROM 3500 *Fastening* ITEMS

No matter what kind or size of fastening is called for, you may be pretty sure that Bethlehem Pacific can supply it.

For Bethlehem Pacific makes available a broad range of fastenings, comprising more than 3500 individual items and covering virtually every standard requirement.

You can count on dependability in any fastening you buy from Bethlehem Pacific. These fastenings are made by men who are specialists in fastenings manufacture, from materials selected by metallurgists of long experience as suitable for the purpose. Every operation is carried out under the watchful eyes of critical inspectors.

Bethlehem Pacific is the largest manufacturer of bolts, nuts, and allied products on the West Coast, with fastenings plants at Seattle, South San Francisco and Los Angeles.

BETHLEHEM PACIFIC COAST STEEL CORPORATION
General Offices: San Francisco

District Offices: Los Angeles, Seattle, Portland, Salt Lake City, Honolulu

Bethlehem Pacific for Fastenings

FOR TODAY'S TOUGHER JOBS, HERE'S A NEW TOUGHER MOTOR

WHERE IT'S WET Wet weather doesn't bother the new totally-enclosed Tri-Clad motor. Neither do frequent "washdowns" in food plants.

WHERE IT'S CORROSIVE Acids, alkalis, and fumes are kept out of these new Tri-Clads. Cast-iron enclosures are corrosion-resistant, extra strong.

WHERE IT'S DIRTY Dirt and dust can't get into these Tri-Clads to shorten their life. Smooth surfaces are convenient to clean.

WHERE IRON DUST FLIES Harmful iron dust and metal filings can't get past the inner wall. Bearings are protected from dust.

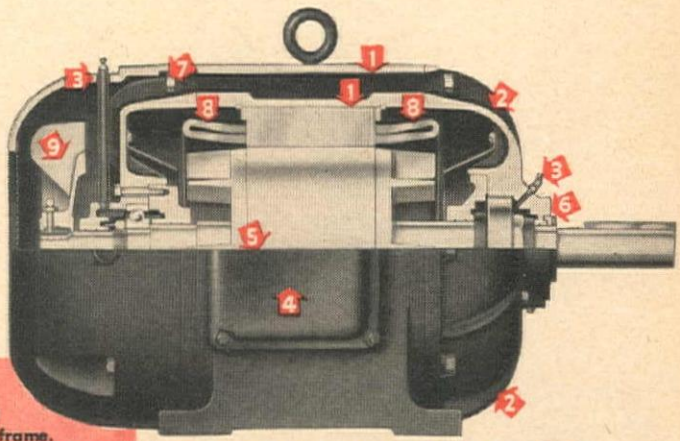
WHERE QUARTERS ARE CLOSE When space is limited for a totally enclosed motor, you'll like these trim, compact new Tri-Clads.

WHERE EXPLOSION HAZARDS EXIST The new Tri-Clad motors are available in explosion-proof constructions where needed.

THE G-E TRI CLAD TOTALLY ENCLOSED MOTOR

(1 TO 1000 HP)

In 1940 you welcomed the Tri-Clad open motor with it's *extra protection features*. More Tri-Clads have since gone into service than any other integral-horsepower motor. Now G.E. is ready with a new line of tough, totally enclosed Tri-Clad motors for use in adverse atmospheres. *We believe they are industry's most dependable motors*. Their longer life and lower maintenance will make them a sound investment on almost every job. Apparatus Dept., General Electric Co., Schenectady 5, N. Y.



10-POINT PROTECTION

1. A cast-iron, double-wall frame completely encloses and protects the windings and punchings.
2. Corrosion-resistant cast-iron end shields are machined to provide a tight seal, and protect the motor from dust, dirt, and moisture. Primer and finish coat of Glyptal* varnish affords high rust-resistance.
3. A pressure-relief greasing system, which can be packed with long-life lubricant, protects the bearings.
4. The cast-iron conduit box is diagonally split for easy wiring. Boxes are independently explosion-proof on Class I motors.
5. Nonshrinking compound around motor leads protects motor interiors from dust and moisture at the point where leads pass through the frame.
6. Rotating labyrinth seal further protects motor interior from damage by foreign matter.
7. Large air passages provide adequate protection from overheating. They're easy to keep clean and open, too.
8. Modern, "ageless" insulation treatment includes windings of *Formex magnet wire.
9. The powerful external fan is removable to simplify maintenance; nonsparking type in explosion-proof motors.
10. Individual dynamic balance of rotors and external fans protects against vibration hazards, even under severe operating conditions.

*Trade-mark Reg. U. S. Pat. Off.

FOR THE COMPLETE STORY

Apparatus Department, Section 750-278C
General Electric Company
Schenectady 5, N. Y.

☐ Please send me GEA-4400, which describes the new Tri-Clad totally enclosed motors.

☐ Please send me GEA-4131, "Motors and Control for Hazardous Locations."

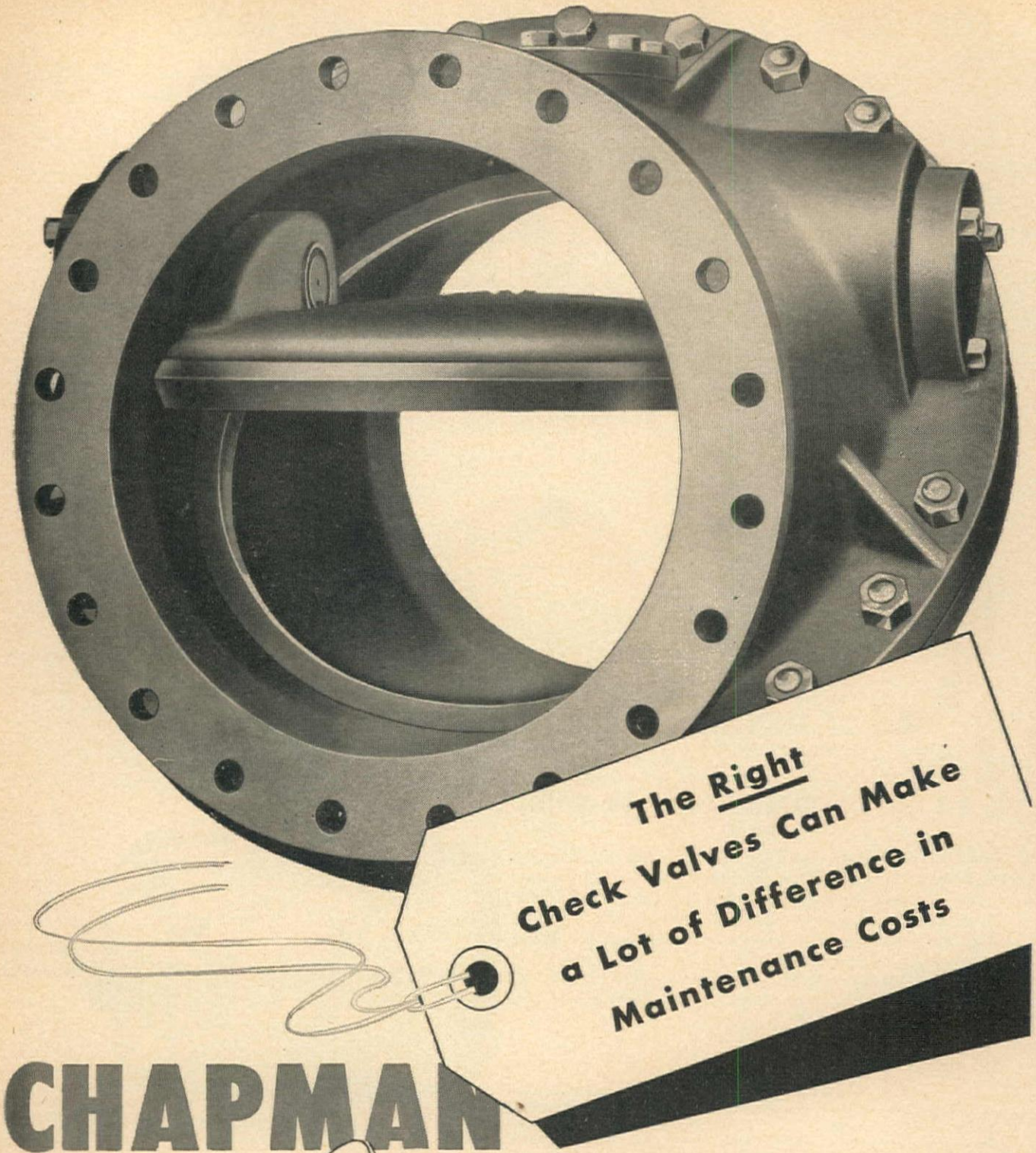
NAME.....

COMPANY.....

ADDRESS.....

8030

GENERAL ELECTRIC



The Right
Check Valves Can Make
a Lot of Difference in
Maintenance Costs

CHAPMAN

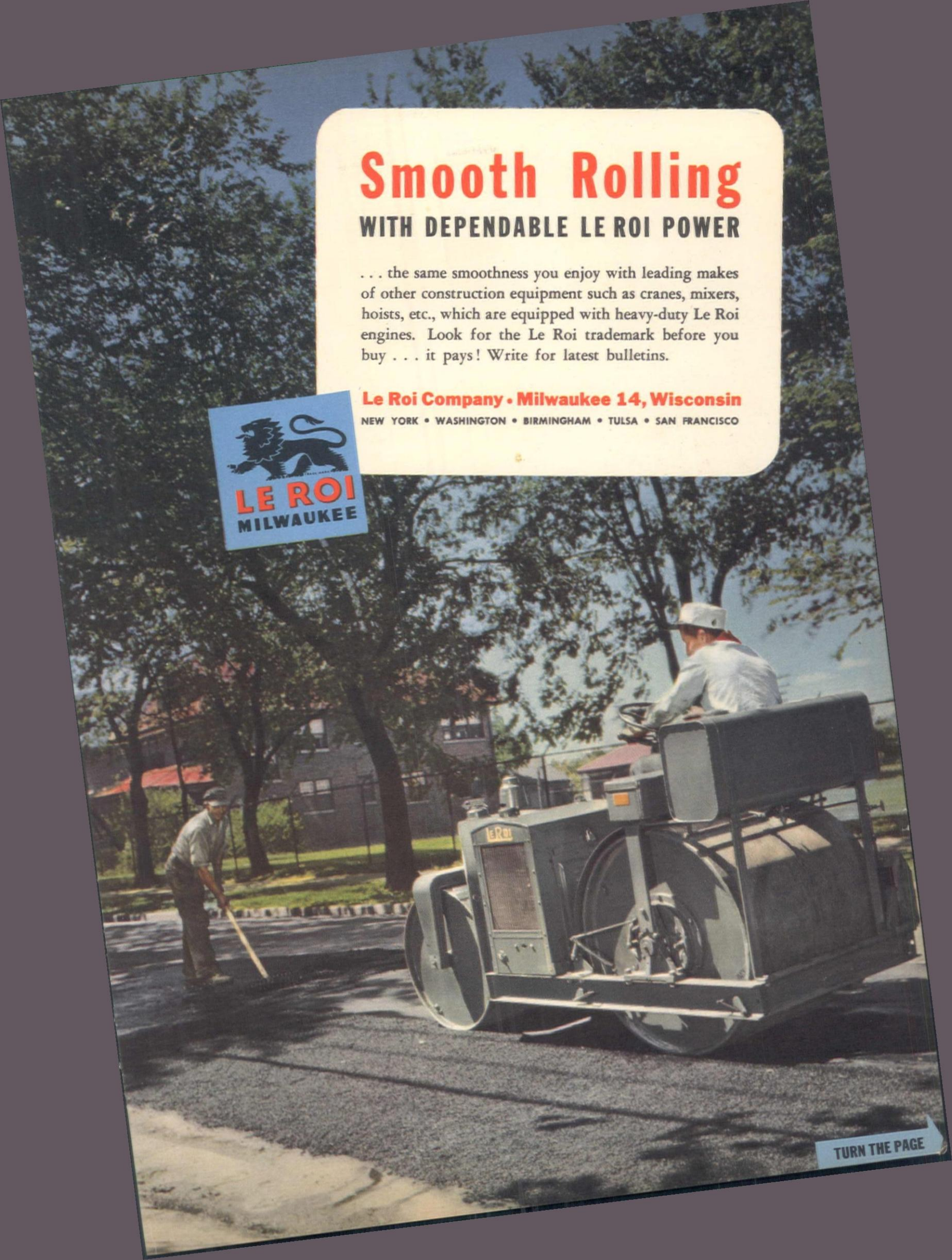
Tilting Disc

CHECK VALVES

The Chapman Tilting Disc Check Valve employs a balanced hinge-pinned disc which rides evenly in the flow when the valve is open and cushions quietly to a drop-tight seat when the flow slows down. By eliminating slamming, which jars pipelines, starts surging and opens up joints, maintenance costs are materially reduced. Head losses are cut 65% to 80% over convention type checks.

Chapman Tilting Disc Check Valves are obtainable in iron or steel. Send for free engineering data book.

THE CHAPMAN VALVE MFG. CO., INDIAN ORCHARD, MASS.


Smooth Rolling
WITH DEPENDABLE LE ROI POWER
. . . the same smoothness you enjoy with leading makes of other construction equipment such as cranes, mixers, hoists, etc., which are equipped with heavy-duty Le Roi engines. Look for the Le Roi trademark before you buy . . . it pays! Write for latest bulletins.
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LE ROI
MILWAUKEE
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LE ROI
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LE ROI "60"

Big Compressor Value in a Small Package—Plus Extra Compactness, Extra Mobility, Extra Economy, Extra Maneuverability....

You want to make a profit on the little jobs, too . . . and LE ROI 60 is a big help. Experienced users find it strong and rugged — with plenty of reserve power. Unit construction, quality valve-in-head engine, electric starting, and many other features are included as standard equipment. When you need a 60-foot compressor that cuts "dead" time and gives you more working time, ask for LE ROI 60.

See your nearby Le Roi distributor.

Le Roi Company • Milwaukee 14, Wisconsin

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RUGGED IS RIGHT!

7½ YEARS YOUNG . . . AND STILL ON THE JOB!

Five Allis-Chalmers HD-14's — Pennsylvania Turnpike veterans — owned by Fox Valley Construction Company, Appleton, Wisconsin, have been in continuous operation on tough work since June, 1939. Not until December, 1944 — 5½ YEARS LATER — was a major overhaul necessary! Now they are hurrying construction of U. S. Highway 8 in Rusk and Price counties, Wisconsin. This Is Rugged Tractor Power!

DOWN GOES A TOUGH SHALE CUT . . . QUICK!

Here eight hard-hitting Allis-Chalmers HD-14's with scrapers and bulldozers demonstrate their power and stamina on G. H. Yoxtheimer's tough stripping operation near Punxsutawney, Pennsylvania. Tough clay and shale are the materials . . . yet scrapers are heaped, bulldozer blades filled!

This is the kind of ruggedness that enables you to move the toughest materials and still put in a higher percentage of working time on the job. In addition, with 2-cycle Diesel power, exclusive in Allis-Chalmers tractors, you start instantly on Diesel fuel, maneuver easier, move more yards every working hour. Yes, Allis-Chalmers 2-Cycle Diesel Tractors Are Rugged — Rugged and Fast!

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

FAST, RUGGED!..
THAT'S A-C 2-CYCLE DIESEL TRACTOR POWER!

Let's clean house now— start scrap moving—

FABRICATORS NEED STEEL

STEEL MILLS NEED SCRAP

Here's what you can do to help get much-needed scrap to Steel Mills.

1 ***Check Your Plant and Property*** and appoint someone to earmark every piece of machinery and equipment that can be cut up for scrap.

2 ***Consult Your Local Scrap Dealer*** to learn what size scrap brings highest returns—then flame-cut to size all obsolete machines, structural shapes, pipe, old boilers, and other large pieces.

3 ***Classify and Segregate*** alloy steels and other special materials to be sure they are used to best advantage and to obtain higher prices.

4 ***Move Scrap Fast*** when it is ready. Sell it, ship it—keep it moving.

Linde can help you work out a practicable scrapping program—just call our nearest office.

•

To help you identify the common metals for proper scrap classification, we will be glad to send you, without charge, as many copies as you need of the wall charts "Identifying Metals by Spark Testing" (ask for form 4666) or "Simple Tests for Identifying Metals" (ask for form 2299).

THE LINDE AIR PRODUCTS COMPANY

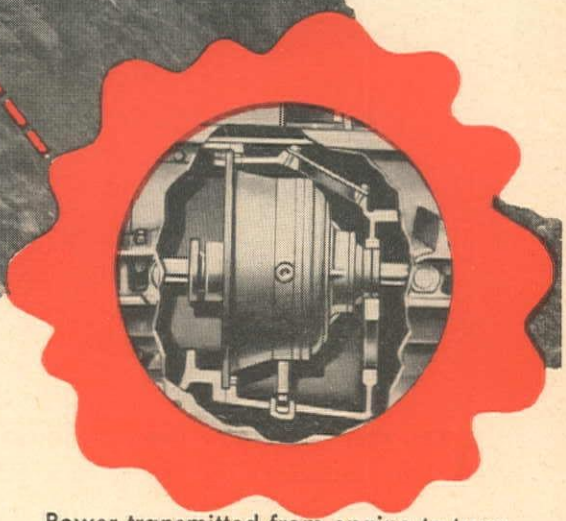
Unit of Union Carbide and Carbon Corporation

30 E. 42nd St., New York 17, N. Y. UCC Offices in Other Principal Cities

In Canada: Dominion Oxygen Company, Limited, Toronto

New Torque Converter Bulldozer

More Power
More Push
More Profit



Power transmitted from engine to transmission through three stage oil turbine, automatically balancing torque against speed to meet load conditions.

Here is extra power and push—extra capacity and production for any bulldozing job. A Baker bulldozer, powered by the sensational Allis-Chalmers HD14-C Torque Converter Tractor provides smooth cushioned power; automatic co-ordination of travel speed and maximum power to load and ground conditions; an infinite number of travel speeds with less gear shifting; increased torque; less operator fatigue, and easier, more accurate blade control. Exclusive, definite advantages which mean increased output, longer blade and tractor life and lower over-all operating costs.

Available with Baker Cable or Hydraulic Bulldozers and Gradebuilders—front or rear mounted controls.

BAKER MFG. CO., SPRINGFIELD, ILL.

BAKER

BAKER They go Together! A-C

"STRAIGHT THROUGH" ASSEMBLY LINE – ALLIS-CHALMERS TO BAKER TO YOU!

The modern Baker plant with its completely equipped fabricating, machining and blacksmithing shops adjoins the Allis-Chalmers crawler tractor plant. When you order an A-C tractor with Baker bulldozer or gradebuilder, your tractor leaves the A-C assembly line, crosses a narrow court and goes on the Baker final assembly line.

YES, that's what the *complete* International Line includes—the right truck for every job. And quality is the same in each, from the smallest truck in the line—the half-ton pickup—to giant off-highway haulers with a gross vehicle weight rating of 90,000 pounds.

Consider this overwhelming evidence of International Truck performance:

Every year for the last 15, American commerce and industry have purchased more heavy-duty Internationals than any other make.

And consider the service facilities that back International Trucks—specialized truck service, furnished by experts trained in every detail of economical truck operation.

This service is supplied by the nation's largest company-owned truck service organization—International Branches—and by International Dealers everywhere.

Yes, there's an International—the *right* International—for every truck job, backed by the nation's outstanding truck-service facilities.

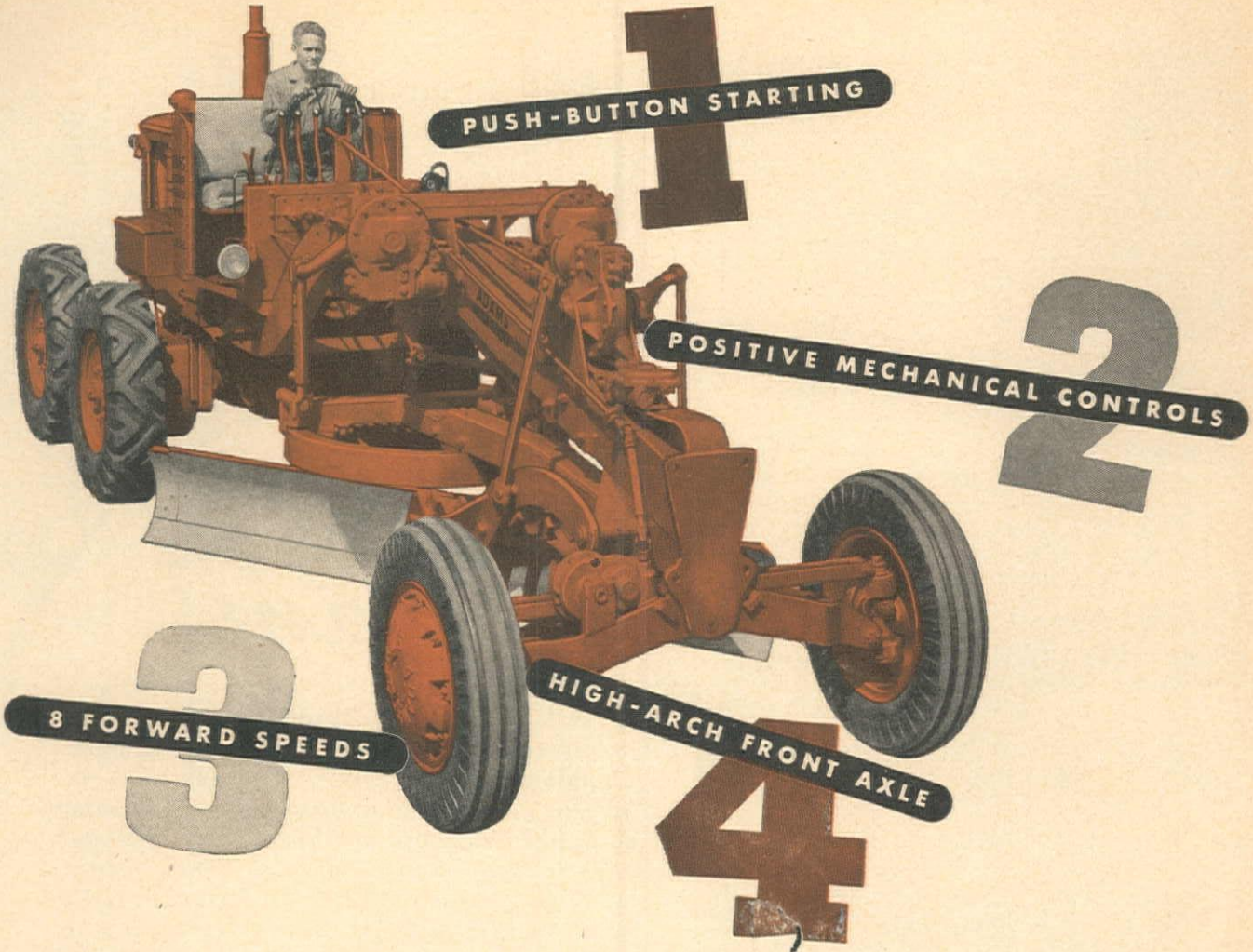
Motor Truck Division
INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue Chicago 1, Illinois

International Truck Branches located at San Diego, Los Angeles, West Los Angeles, Glendale, Fresno, Sacramento, Oakland, San Francisco, Portland, Tacoma, Seattle, Spokane, Salt Lake City, Denver, Cheyenne, Billings, and Great Falls.

Tune in "Harvest of Stars" Every Sunday, NBC Network.
See newspapers for time and station.

INTERNATIONAL

INTERNATIONAL Trucks



Only Adams Offers These 4 Big Features

Only in an Adams Motor Grader will you find *all four* of these important operating features—every one of which is essential to the kind of fast, efficient, economical performance you have every right to expect in the motor grader you buy:

1. **Push-Button Starting** starts big Diesel engines quickly, easily—even in the coldest weather.
2. **Positive Mechanical Controls** — Adams highly accurate and dependable mechanical control system operates all controls at constant, uniform speed—even when two or more adjustments are being made simultaneously.
3. **8 Overlapping Forward Speeds** provide exactly the right speed for every grading operation—plus high transport speeds for fast travel from job to job.
4. **High-Arch Front Axle**—A distinctive feature that enables Adams Motor Graders to straddle and move big windrows of earth and oil mix—without bulldozing material with axle—without waste of power or loss of speed.

These are only a few of the many major advantages that make Adams your best motor grader buy. See your local Adams dealer for complete information.

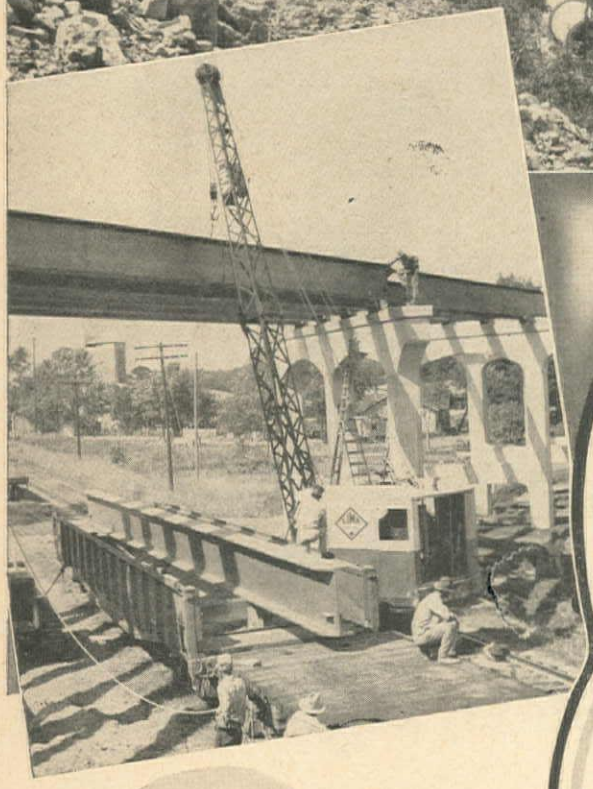
J. D. ADAMS MANUFACTURING CO. • INDIANAPOLIS, INDIANA

LOCAL Adams DEALERS

CALIFORNIA—Western Factory Branch
J. D. ADAMS MANUFACTURING CO.
230 7th Street, San Francisco 3
Adams Distributors at: San Francisco, Los Angeles, Sacramento, Redding, Riverside, San Jose, Fresno, Stockton, Salinas, Santa Rosa, Modesto, Visalia, Merced, Bakersfield, Santa Maria and San Diego

ALASKA—Glenn Carrington & Co., Fairbanks
ARIZONA—O. S. Stapley Company, Phoenix
COLORADO—McKelvy Machinery Co., Denver
IDAHO—Intermountain Equipment Co., Boise, Pocatello
MONTANA—Industrial Equip. Co., Billings, Missoula
Hi-Line Equipment Co., Great Falls
NEVADA—Brown Motors, Reno

NEW MEXICO—Hardin & Coggins, Albuquerque
OREGON—Howard-Cooper Corp., Portland, Eugene
UTAH—The Lang Company, Salt Lake City
WASHINGTON—Howard-Cooper Corp., Seattle
Intermountain Equipment Co., Spokane
WYOMING—Industrial Equip. Co., Billings, Mont.
The Lang Company, Salt Lake City, Utah



LIMA Cranes

LIMA cranes are in daily use on material handling jobs throughout the entire country. They are used for laying pipe, handling concrete and clamshell buckets, placing cut stone and structural steel, loading and unloading ships, log loading, magnet work and scores of other lifting jobs. Their modern design includes: INDEPENDENT OPERATIONS (hoist, swing, travel and boom up or down at the same time), AIR CONTROLLED CLUTCHES for easy and accurate control, LARGE DIAMETER DRUMS that accommodate long cables and effect maximum cable economy, and FAST, MOBILE CRAWLERS that steer from the cab with the cab in any position. LIMA gives you all of these important features—advantages so necessary for profitable crane operation. When you are looking for the most in crane value, why not look into the merits of LIMA cranes? *Bulletins are available on all types and sizes of* LIMA *cranes, shovels and draglines. Capacities given below.*

LIMA LOCOMOTIVE WORKS, INCORPORATED

Shovel and Crane Division . . . LIMA, OHIO, U. S. A.

Offices In Principal Cities

LIMA

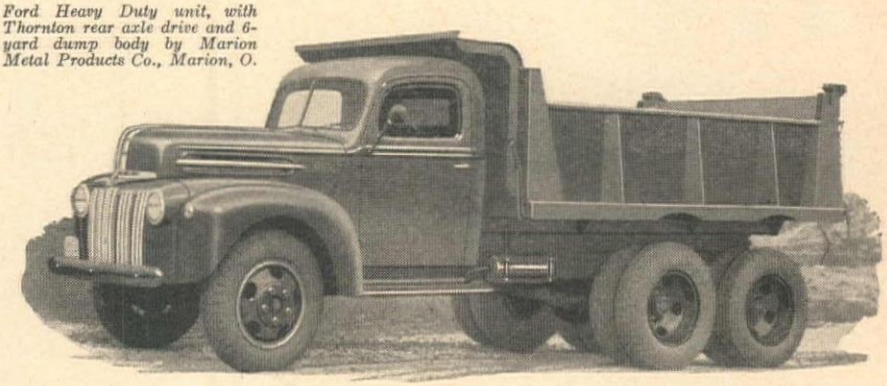
SHOVELS	DRAGLINES	CRANES
3/4 yd. to 5 yds.	VARIABLE	13 Tons to 100 Tons

Foulger Equipment Co., Inc., 1361 So. 2nd West, Salt Lake City 8, Utah; 1932 First Avenue South, Seattle 4, Washington, Wm. C. Champion, District Manager; Feenaughty Machinery Company, 112 S. E. Belmont St., Portland 14, Oregon, 600 Front St., Boise, Idaho; Garfield and Company, 1232 Hearst Bldg., 5 Third Street, San Francisco 3, California; Smith Booth Usher Company, P. O. Box 3578 Terminal Annex, Los Angeles 54, California; Held-McCoy Machinery Company, 3201 Brighton Blvd., Denver 5, Colorado; Smith Booth Usher Co., 1756 Grand Ave., Phoenix, Arizona; Contractors' Equipment and Supply Co., Springer Building, P. O. Box 456, Albuquerque, New Mexico; Modern Machinery Company, Inc., 4412 Trent Ave., Spokane 2, Washington; Jameson Engineering Sales, Fairbanks, Alaska.

REGISTRATIONS *SHOW* IT—OPERATORS *KNOW* IT!

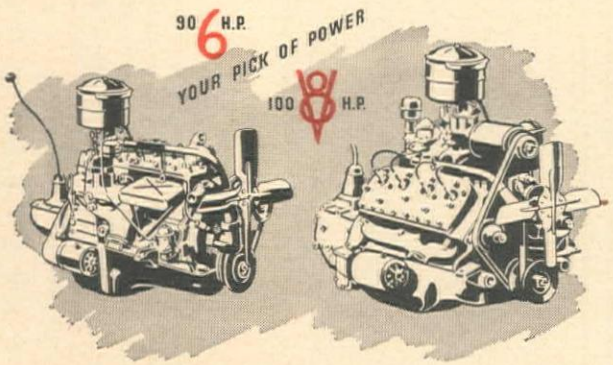
"FORD TRUCKS LAST LONGER!"

Ford Heavy Duty unit, with Thornton rear axle drive and 6-yard dump body by Marion Metal Products Co., Marion, O.



One big reason—

FORD ENGINES STAND UP!



Ford Truck engines—either the famous 100-H.P. V-8 or the extra-thrifty 90-H.P. Six—are world-famous for endurance in severe service. Here are some reasons why: They're of time-proved L-head type, quiet, simple, efficient—hardened valve seat inserts resist pounding and pitting—precision-set valves need no adjusting—valve springs are shot-peened and rust-proofed for long life—Ford alloy cast steel crankshafts are balanced and counterbalanced for enduring smoothness—Flightlight aluminum alloy 4-ring pistons maintain good compression, save oil. Full pressure lubrication, with positive, large-capacity oil pumps, plus effective crankcase ventilation, scientifically correct cooling and efficient oil- and air-filtering, all prolong Ford engine life.

Ford

There are more than fifty such long-life features throughout Ford Truck engines and chassis. NO OTHER TRUCKS BRING YOU ALL THESE IMPORTANT PLUS VALUES AT ANY PRICE. It is the extra worth which Ford alone offers that makes Ford Trucks Last Longer. This extra value tells you clearly why 7 out of 11 of all Ford Trucks registered since 1928 are still in service—why more than half of all Ford Trucks on the job are at least nine years old!

The best way to get a new Ford Truck is to get your order in. See your Ford Dealer now.

FORD TRUCKS

MORE FORD TRUCKS IN USE TODAY THAN ANY OTHER MAKE

Ask a dealer listed below to show you an Insley at work in your territory . . . doing a job such as yours.

EXCAVATORS ★ **INSLEY** ★ CONCRETE EQUIPMENT

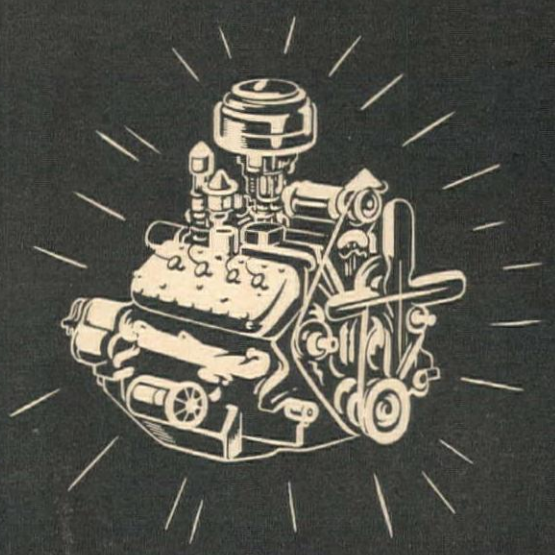
FOR INSLEY SERVICE AND SALES IN YOUR TERRITORY

ANDREWS MACHINERY.....404 N. W. Broadway, Portland 9, Oregon	CONSTRUCTORS EQUIPMENT CO.....3707 Downing St., Denver 4, Colorado
ANDREWS EQUIPMENT SERVICE.....126 South Walnut St., Spokane 9, Washington	MOTOR EQUIPMENT CO.....507 N. 2nd Street, Albuquerque, New Mexico
R. J. BOATMAN EQUIPMENT CO.....560 42nd Street, Oakland, Calif.	H. H. NIELSEN COMPANY.....541 W. 2nd Street, Salt Lake City 1, Utah
CHOGUILL TRACTOR CO., INC.....1748 Grand Avenue, Phoenix, Arizona	SERVICE EQUIPMENT CO.....300 Aurora Avenue, Seattle 9, Washington

SHAW SALES AND SERVICE CO...5100 Anaheim-Telegraph Rd., Los Angeles 22, Calif.

INSLEY MANUFACTURING CORPORATION • INDIANAPOLIS 6, INDIANA

maintains cleaner motors



IMPROVED Veedol Motor Oil

Improved Veedol Motor Oil retards the formation of sludge in your motors. Its magic new ingredient, an anti-oxidation additive, will maintain your fleet more economically, give you longer periods between overhauls. Available in SAE grades from 10 through 70.

Every single drop of Veedol Motor Oil you buy is *still* 100% Pennsylvania, from the world's most famous *quality* oil field, at Bradford. Veedol, as long as most of us can remember, has been the "Aristocrat of Motor Oils." Due to recent research, it is *now* at its all-time best—stands up where old-type oils break down, lasts longer under the most difficult job conditions, gives longer engine life at lower maintenance costs, positive protection against bearing corrosion. Buy *improved* Veedol Motor Oil. When you're paying for the best—you may as well get it.

Correct Lubrication is Machinery's Most Vital Need

Listen to Associated Football Sportcasts

TIDE WATER ASSOCIATED OIL COMPANY

Make Sure Your New Shovel Can Take It!

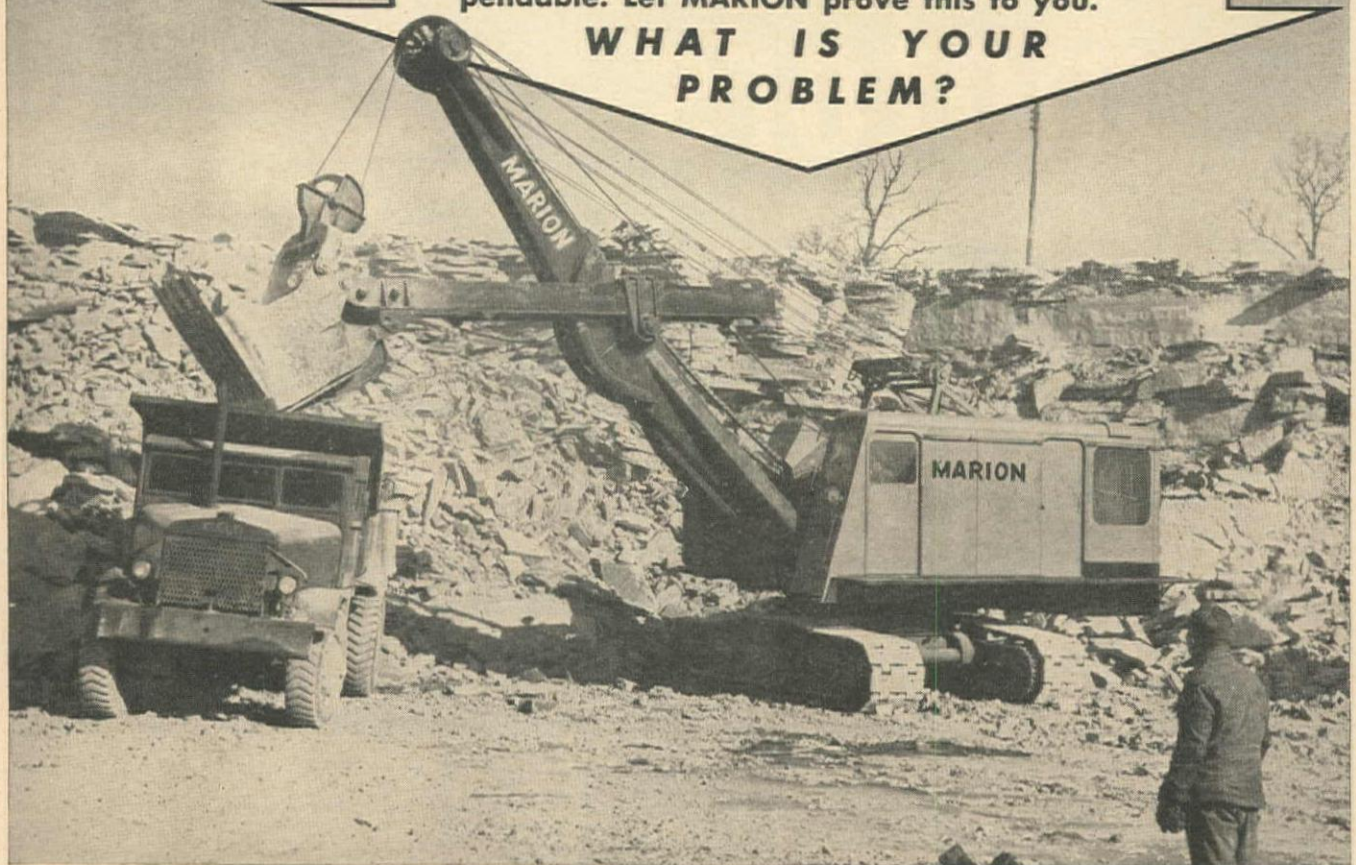
WITH A

MARION

YOU ARE SURE!

MARIONS are engineered and built for tough digging. They are fast, sturdy, powerful, dependable. Let MARION prove this to you.

WHAT IS YOUR PROBLEM?



SEE YOUR MARION DISTRIBUTOR

Edward R. Daley, Marion Power Shovel Company, 571 Howard St., San Francisco 5, Calif.; Joseph O. Reed, Marion Power Shovel Company, 2504 N. E. Hoyt St., Portland 12, Ore.; Star Machinery Co., 1741 First Ave., South, Seattle 4, Wash.; Shaw Sales & Service Co., 5100 Anaheim Telegraph Road, Los Angeles, Calif.; H. H. Nielson, 541 W. 2nd South St., Salt Lake City, Utah.

From 3/4 Cu. Yd. POWER SHOVEL COMPANY MARION SINCE 1884 To 40 Cu. Yds.

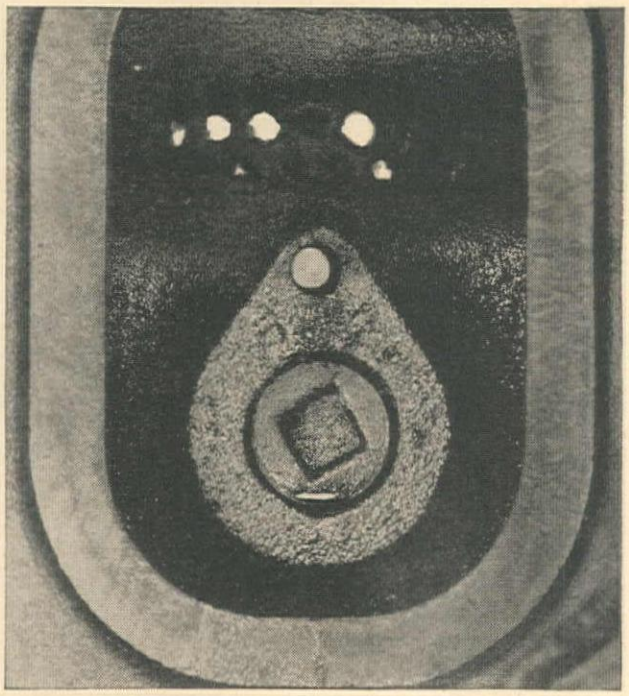
MARION

POWER SHOVEL COMPANY

MARION, OHIO, U. S. A.

Offices and Warehouses in all Principal Cities • Established 1884

Diesel Engine DANGER points



Air ports clogged after operation on uncompounded oil.

Clogged Ports Reduce Efficiency

To the operator of a two-cycle Diesel engine, the clogging of air ports can become a serious problem. Deposits on air ports are composed largely of fuel soot and oxidized products. These contaminants reach the lower cylinder when sluggish or stuck piston rings permit blow-by.

RPM DELO Oil Prevents Air Port Deposits

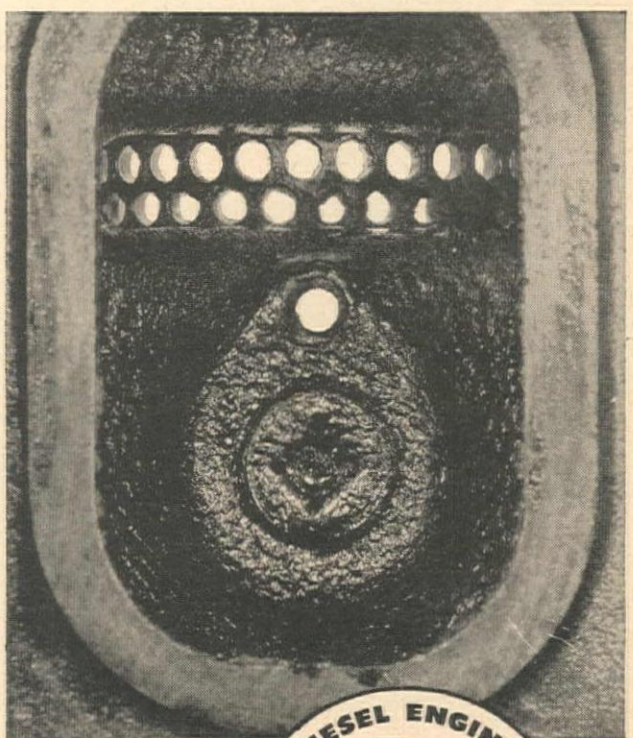
RPM DELO Oil keeps air ports clean three ways:

1. By reducing ring wear (RPM DELO Oil is compounded to cling to scorching wear points which most oils leave bare).

2. By preventing ring-sticking (a detergent in RPM DELO Oil eliminates the deposits which stick rings).

3. By preventing oxidation of the oil (RPM DELO Oil's anti-oxidant compound controls the gummy substances which act as a binder for deposits).

How RPM DELO Oil keeps air ports open.



DIESEL ENGINE RPM DELO LUBRICATING OIL

To match the fine performance of RPM DELO OIL, use these equally efficient companion products from the same famous "RPM" line—RPM HEAVY DUTY MOTOR OIL—RPM COMPOUNDED MOTOR OIL—RPM GEAR OILS AND LUBRICANTS—RPM GREASES.

Standard Fuel and Lubricant Engineers are always at your service. They'll gladly give you expert service—make your maintenance job easier. Call your local Standard Representative or write STANDARD OF CALIFORNIA, 225 Bush St., San Francisco 20, Calif.

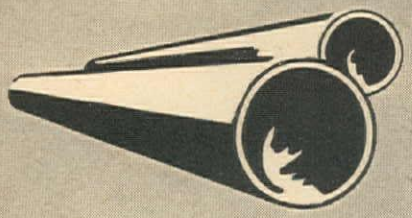
pressure regulators for all cylinder gases by victor . . .
your guarantee for dependable accuracy.

victor equipment company

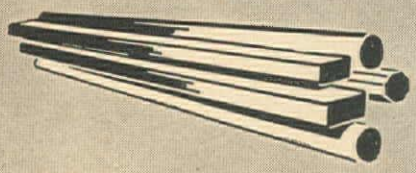
844 folsom street . san francisco 7

Ad 175

BARGAIN PRICES ON

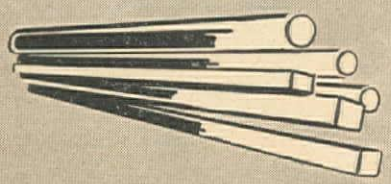


TUBING
Carbon, Alloy and some Stainless. Both Welded and Seamless.



TOOL STEEL
Water-hardening, Oil-hardening and High Speed Grades.

STRIP STEEL
Hot Rolled, Cold Rolled, Carbon, Alloy, and Stainless.



BAR STEEL
Hot Rolled and Cold Finished in Carbon, Alloy, and Stainless.

All steel is subject to priority regulations. VETERANS OF WORLD WAR II are invited to be certified at the War Assets Administration Certifying Office serving their area and then to purchase the material offered herein.

EXPORTERS: The War Assets Administration solicits your inquiries. Communicate with your foreign clients promptly.

NO WAITING FOR

HIGH GRADE *Steel*

Alloy steel billets, blooms, bars, plates, are all immediately available through your War Assets Administration. Bars include rounds, squares, flats and hexagons. Suitable for substitute and re-rolling purposes.

Low prices on this high grade steel make it practical for low-cost products.

For complete information on steel send this coupon to your nearest WAA Regional Office:

TO: WAR ASSETS ADMINISTRATION

Please send me, without obligation, full information on the availability, condition and location of the following checked items:

1. Billets, Blooms, etc. ☐
2. Carbon and Alloy Bars ☐
3. Wire Rope and Aircraft Cable ☐
4. Stainless Steel Bars, Strips, and Sheet Standard Types ☐
5. Valves and Fittings ☐
6. Mechanical Tubing, Carbon, Alloy, and Stainless ☐

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157-8

WAR ASSETS ADMINISTRATION

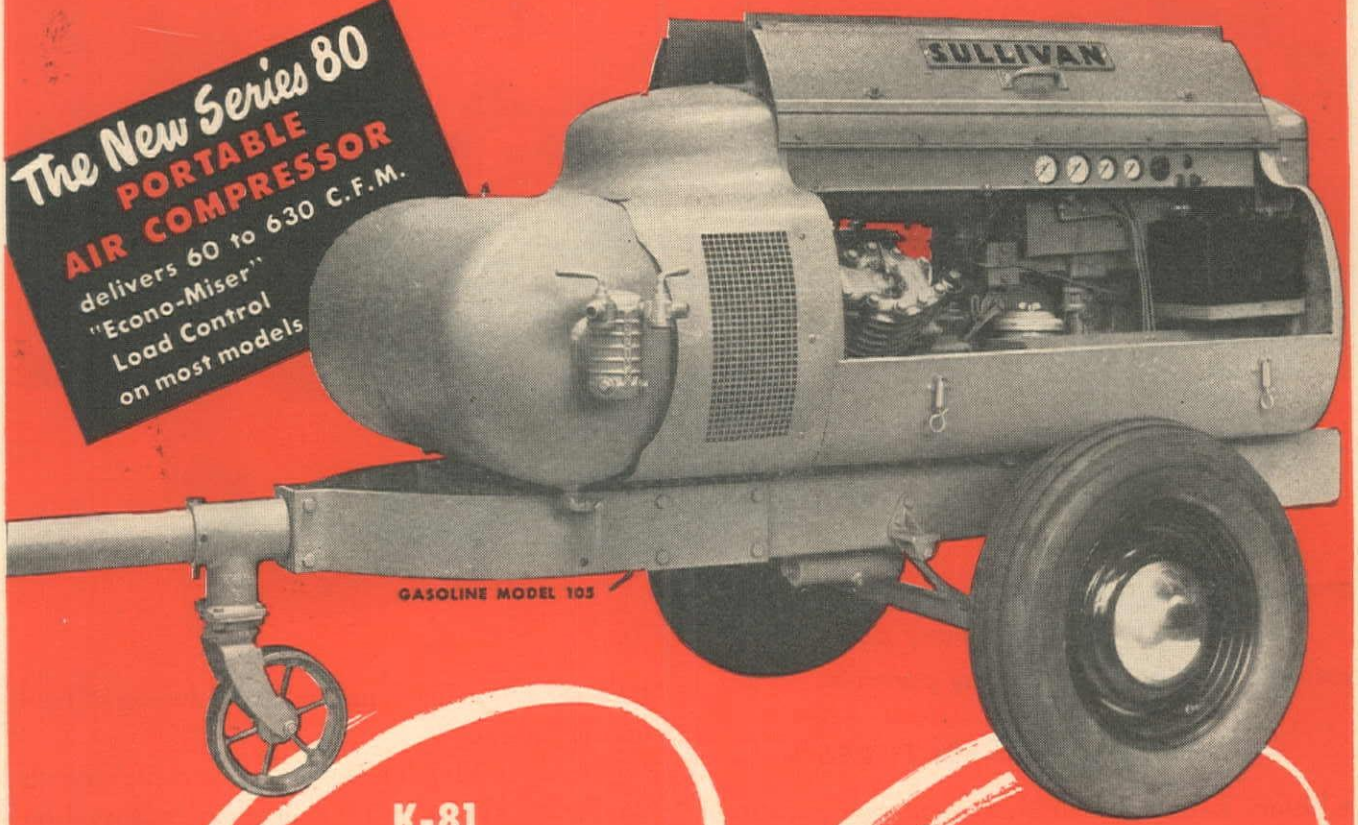
GOVERNMENT OWNED SURPLUS

Offices located at: Atlanta • Birmingham • Boston • Charlotte • Chicago • Cincinnati • Cleveland • Dallas • Denver • Detroit • Fort Worth • Helena • Houston • Jacksonville • Kansas City, Mo. • Little Rock • Los Angeles • Louisville • Minneapolis • Nashville • New Orleans • New York • Omaha • Philadelphia • Portland, Ore. • Richmond • St. Louis • Salt Lake City • San Antonio • San Francisco • Seattle • Spokane • Tulsa

157-8

Cash in on The Extra Air Power of SULLIVAN COMPRESSORS and AIR TOOLS

The New Series 80 PORTABLE AIR COMPRESSOR
delivers 60 to 630 C.F.M.
"Econo-Miser" Load Control on most models



GASOLINE MODEL 105

K-81 PAVING BREAKER

PUTS ADDED WALLOP AT THE STEEL WITH THE DUAL VALVE THAT MAKES AIR DO MORE WORK

SULLIVAN LIGHT WEIGHT

WAGON DRILL

GETS 50 TO 80% MORE FOOTAGE THAN SAME-SIZE HAND-HELD DRILL

Write for Bulletins giving full details

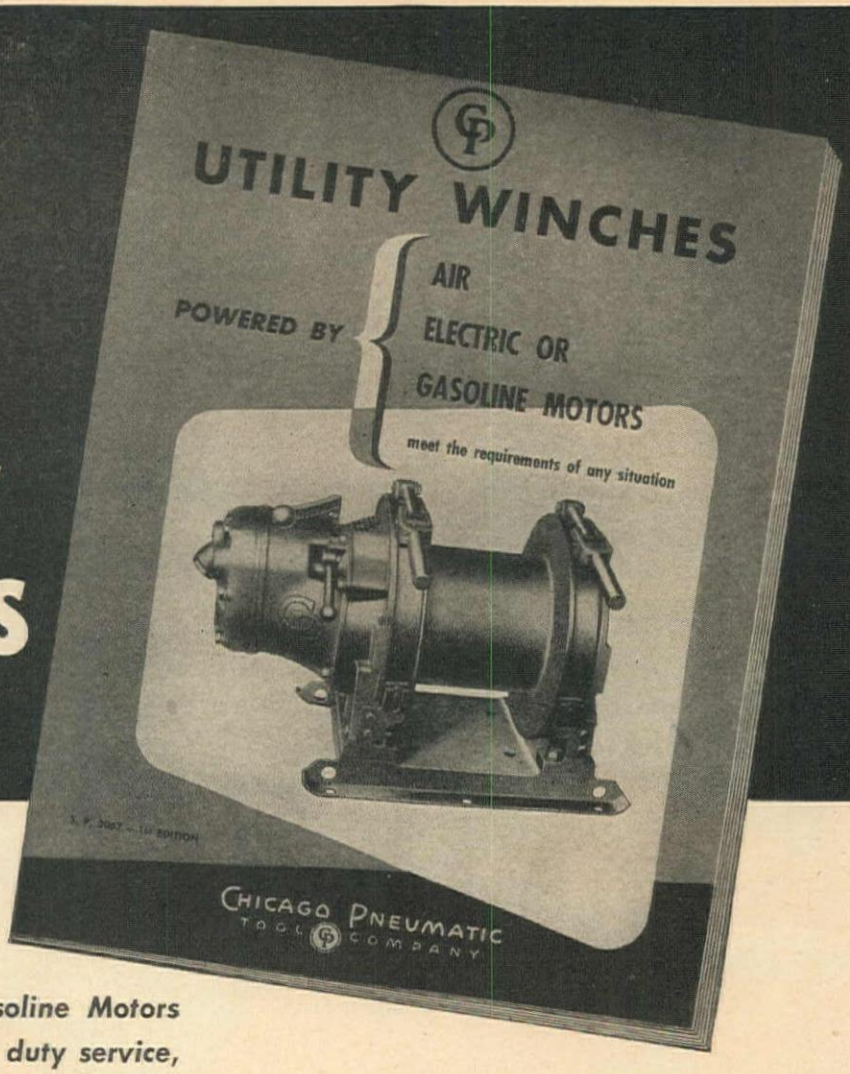
Consult a Joy Engineer

SULLIVAN DIVISION

JOY MANUFACTURING CO.

GENERAL OFFICES: HENRY W. OLIVER BUILDING • PITTSBURGH, PA. W&D C680

New CP UTILITY WINCHES



powered by Air, Electric or Gasoline Motors . . . Designed for extreme heavy duty service, yet light enough to be readily portable.

OUTSTANDING FEATURES

- Rotary Vane Type Air Motor — no reciprocating parts.
- Standard Flange Mounting of Motors — shift from air to electric drive with speed and minimum cost.
- Cathead Extension on Drum — rotates when drum load is held stationary. Use the cathead to "spot" your load.
- Compound Epicyclic Gearing — totally enclosed — trouble free — simplifies brake and clutch control.
- Power Lowering — minimizes bouncing of load on long cables.
- Extremely Flexible Control — permits smooth handling of the load with delicate inching quality. Drum is reversible on air and electric units.

A Full Assortment of Accessories is available, including mounting bracket with swivel base, adjustable bracket for mounting winch on trees, poles, pipes, etc.

For full information write for Bulletin SP-2057

CHICAGO PNEUMATIC TOOL COMPANY

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

Pneumatic Tools • Air Compressors • Electric Tools • Diesel Engines
Rock Drills • Hydraulic Tools • Vacuum Pumps • Aviation Accessories

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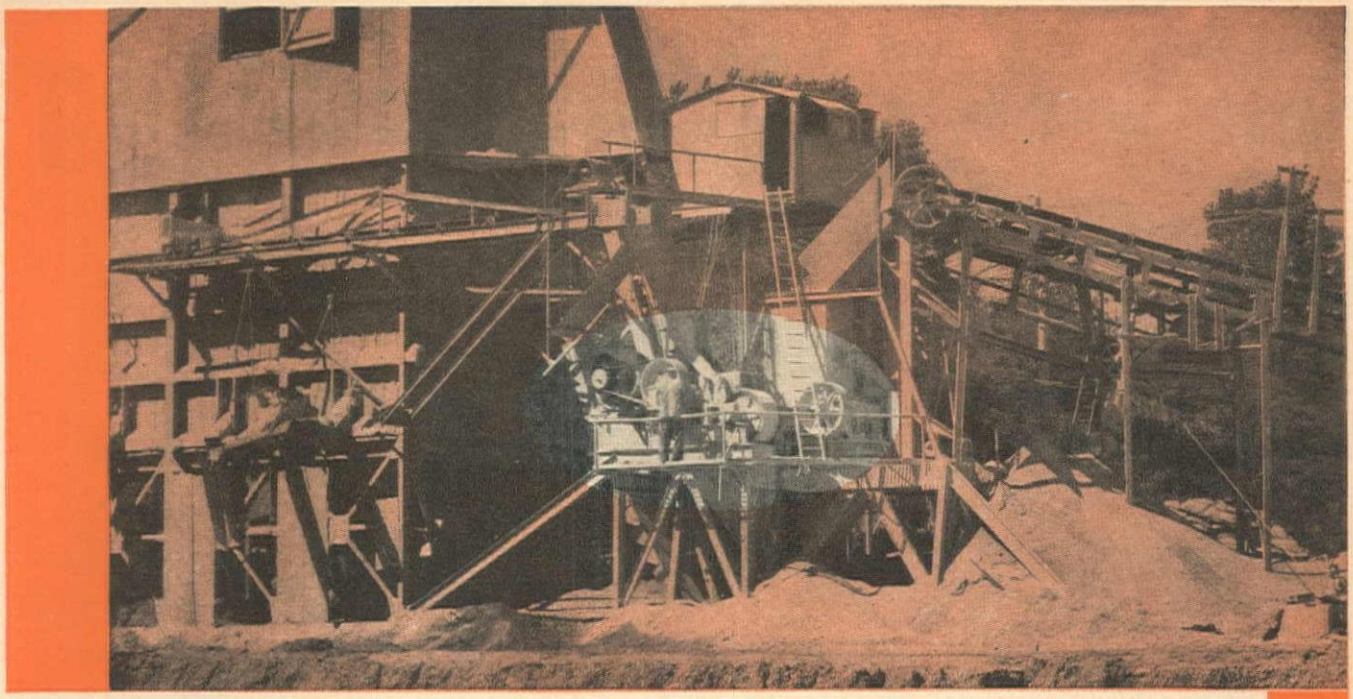


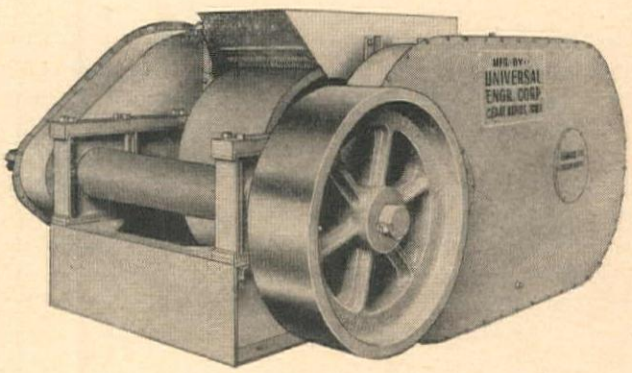
OVER A MILLION TONS

AND STILL ROLLING ON ORIGINAL MAIN BEARINGS

8 years ago the River Products Company, Coralville, Iowa installed a Universal 40 x 24 roller bearing roll crusher for secondary crushing at their plant. Up to September 1946 this crusher had reduced 1,092,376 tons of material. 30,609 tons passed through the rolls in August of 1946 and production for the year will better 250,000 tons. That's a lot of production. What's more, this crusher still rolls on the original main bearings. Two Universal 1836 Jaw Crushers and a Universal No. 4 Pulverizer are included in the plant set-up.

Universal Star Gear Drive Roll Crushers for Profitable Secondary Crushing

Featuring star gear final drive, surplus load rated roller bearings, double safety against tramp material, simplicity of design, and greater capacity, Universal Star Gear Roll Crushers are built to take punishment and keep rolling out high production year after year. Universal design includes drive shaft operating in a tubular steel housing which reinforces the frame and permits bearings to be spaced closer to loads, practically eliminating heavy bending strain on drive shaft. Ask your Universal Dealer or write for Bulletin 6A-2.



CONTRACTORS EQUIPMENT CORPORATION, 1215 S.E. Grand Avenue, Portland 14 Oregon; INDUSTRIAL EQUIPMENT CO., 4441 Santa Fe Ave., Los Angeles, Calif., 10,911 Russet Ave., Oakland 3, Calif., 150 N. Virginia St., Reno, Nevada; OLSON MANUFACTURING CO., P. O. Box 1487, Boise, Idaho; J. K. WHEELER MACHINERY CO., 171 West S. Temple, Salt Lake City 1, Utah.

UNIVERSAL

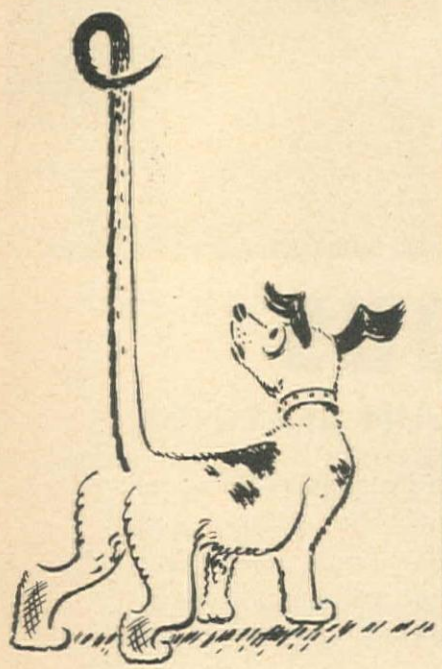
ENGINEERING CORPORATION

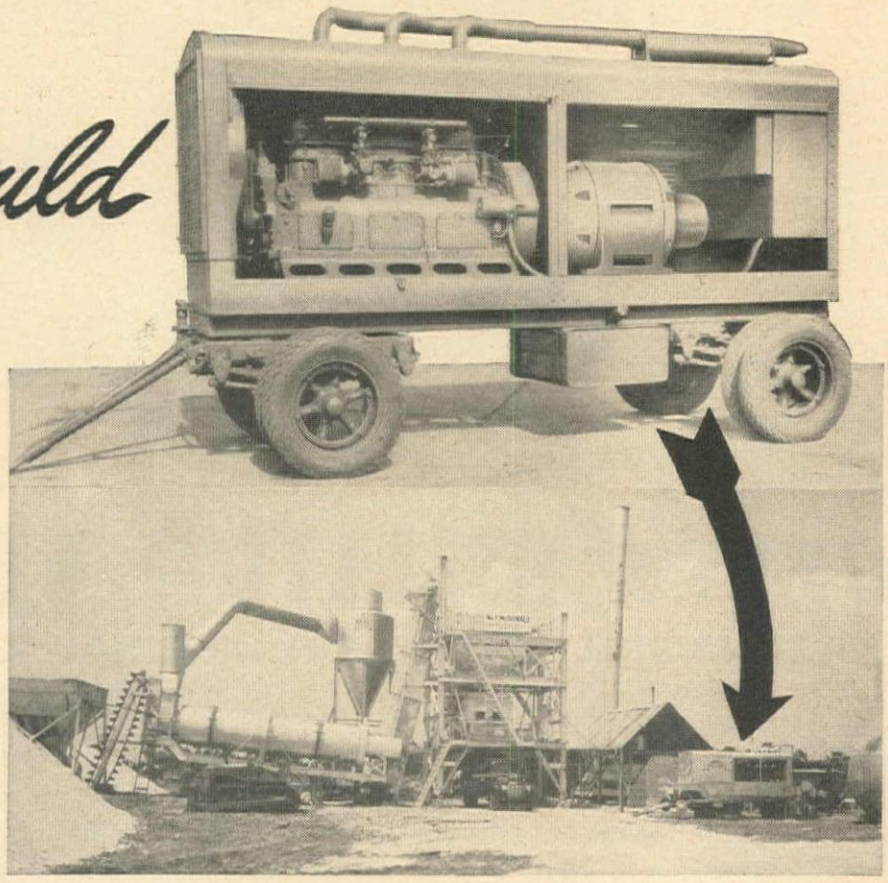
323 Eighth Street N. W., Cedar Rapids, Iowa

ROCK, GRAVEL AND LIME CRUSHING PLANTS • CONVEYORS
SCREENING OR WASHING PLANTS • APRON FEEDERS

This Tail Wags the Dog

and it should





Mobile asphalt plant built by Iowa Manufacturing Company and powered by General Electric engine-driven generator.

Electrification of your mobile asphalt plant with a portable engine-driven generator enables you to locate your engine *away* from the contaminating atmosphere immediately surrounding the plant, thus improving plant operation these four ways:

1. **Reduces combustion-engine maintenance**
2. **Simplifies mechanical transmissions**
3. **Provides automatic process control**
4. **Simplifies manual operations**

The power plant can be located in relatively cool, clean, air—out of the hot, adverse atmosphere which surrounds the conveyors, pug mill, and drying drum, thereby greatly reducing engine maintenance and facilitating adjustments and servicing. Power is supplied smoothly and efficiently to the individual electric motors on the machines through a flexible, protected cable. This electric cable is easily disconnected when the plant is moved. Individual motor drives of the plant components simplify the mechanical drive equipment—power is supplied where it is used. Increased mechanical reliability reduces shut-downs and costly delays.

Automatic electric control of the operating plant maintains the asphalt mix consistency to predetermined specifications. This control is reliable and accurate, resulting in fewer rejects by inspectors—more asphalt can be produced in each working day.

General Electric is prepared to supply all the proper electrical equipment for your mobile asphalt plant, including generator, motors, control, electronic weighing equipment, and cable. If you are designing a mobile asphalt plant, *now* is the time to find out what complete G-E electrification can mean to you and your customers. If you are now operating a mobile asphalt plant, these same advantages are available to you through conversion to electric drive. Investigate how electricity on your job can produce a *better product at a lower cost. Apparatus Dept., General Electric Company, Schenectady 5, New York.*

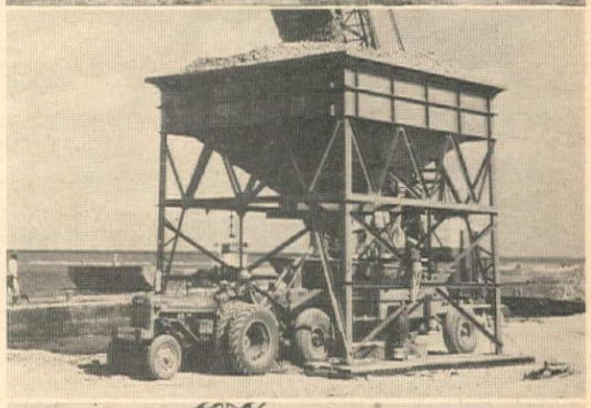
GENERAL ELECTRIC

655-53

ELECTRIFIED CONSTRUCTION

BETTER PRODUCT • LOWER COST

What is YOUR Hauling Job?



The chances are, it can be profitably handled with MISSISSIPPI WAGONS

In every part of the country, versatile MISSISSIPPI WAGONS are cutting costs and increasing profits for owners, on many different types of hauling operations.

Road, airport and levee construction; state and county highway maintenance; ON or OFF-the-highway hauling of dirt, gravel, sand, rock, coal, ore, slag, aggregates and industrial minerals . . . these are some of the assignments on which Mississippi Wagons have proved their ability to deliver cheaper yardage under a wide variety of operating conditions.

Whatever your hauling problem, it will pay you to investigate the profit possibilities offered by Mississippi Wagons. Your nearby distributor will be glad to furnish facts and figures.

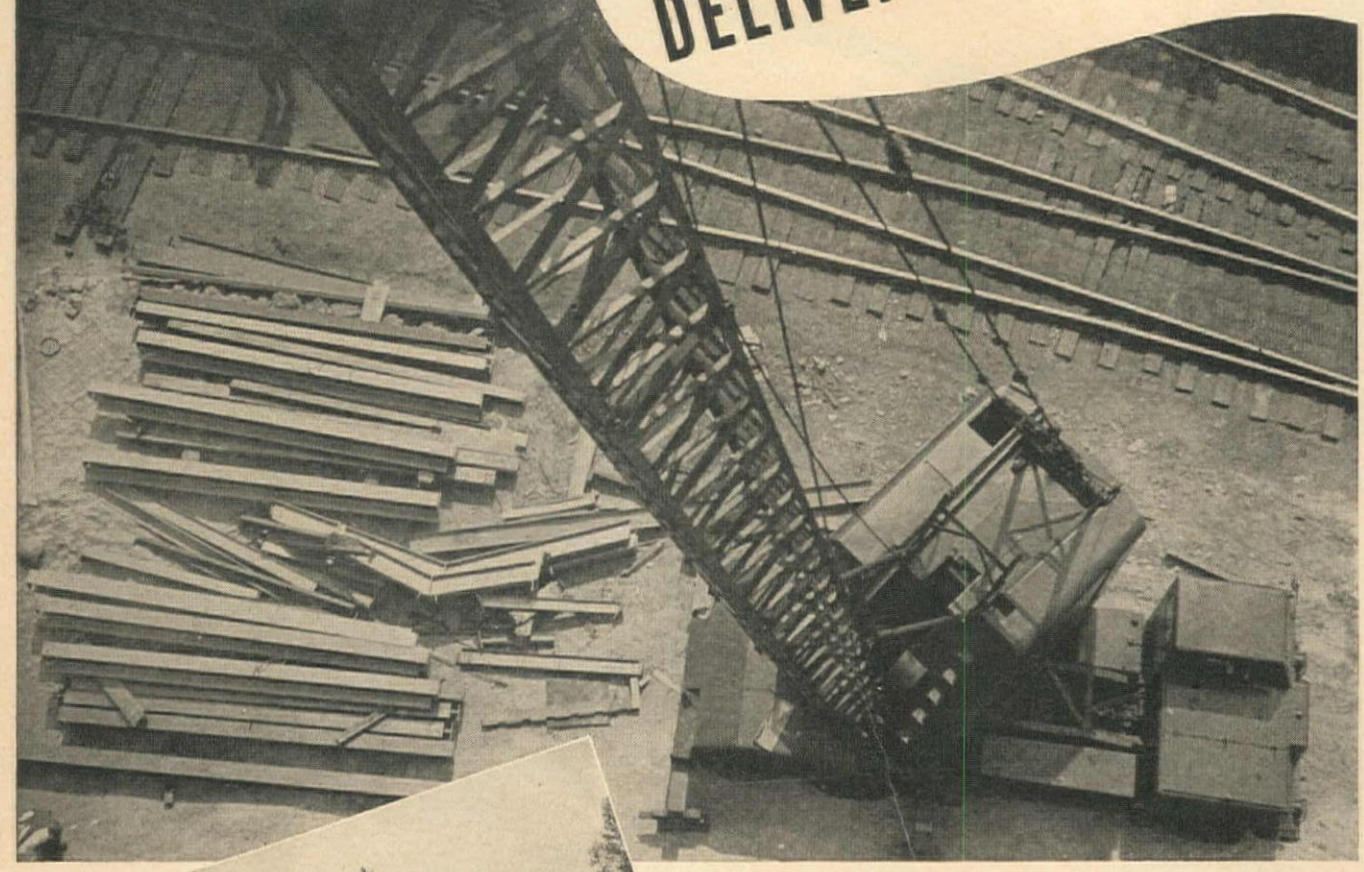
M-R-S MANUFACTURING COMPANY
JACKSON, MISSISSIPPI, U. S. A.

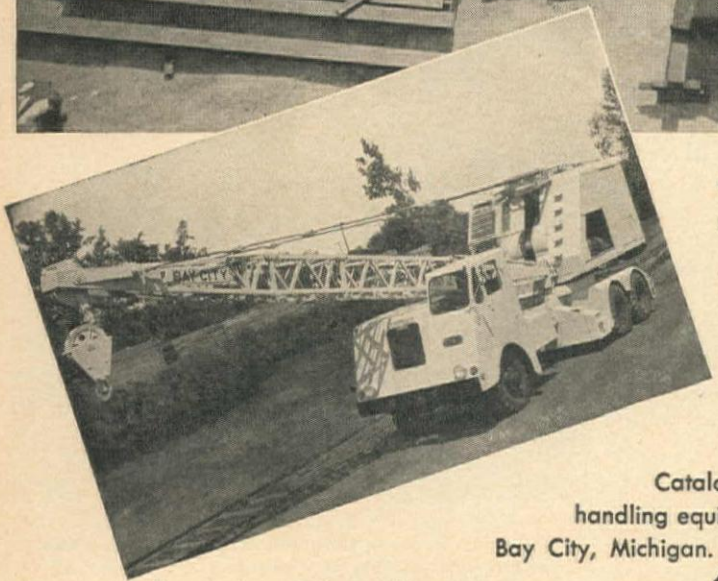
★ MISSISSIPPI WAGON

The pictures above show Mississippi Wagons being loaded with (1) dirt, on a drainage project in California, (2) phosphate rock, on a mining operation in Idaho, (3) oyster shell, on an airport construction job in Mississippi, (4) pit gravel, on a road-building job in Texas.

The World's Most Modern Hauling Unit

"from where I stand it's easy to see why BAY CITY DELIVERS THE GOODS!"





"Man! It's almost play, workin' up here while Joe downstairs in the CraneMobile swings the steel up. For me, the man on top, it's simple the way Joe hoists 'em high, wide and easy—practically into my mitts with the precision boom control. He says the way that CraneMobile handles makes his job a cinch. No matter where I work up here the CraneMobile gets the steel up and in place. And the boss says he never saw steel go up as fast as this has since we got that BAY CITY."

Catalogs on this and other BAY CITY excavating and material handling equipment available on request. Write BAY CITY Shovels, Inc., Bay City, Michigan.

Photograph at top shows a 20-ton capacity CraneMobile operated by Kenwood Erection Company of Chicago.

BAY CITY

SHOVELS • DRAGLINES
CRANES • HOES • CLAMSHELLS

SEE YOUR NEAREST DEALER: Brown-Bevis Equipment Co., Los Angeles-Phoenix; Feenaughty Machinery Co., Portland-Seattle-Boise-Spokane; G. M. Fletcher, Butte; Garfield & Company, San Francisco; Held & McCoy Machinery Co., Denver; C. H. Jones Equipment Co., Salt Lake City; Studer Tractor & Equipment Co., Casper, Wyoming.

A fleet of TERRA-COBRAS widening *Ignacio-Santa Rosa Highway* north of San Francisco for Harms Bros., contractors

Full loads of 18 cu. yds. on this 1800 ft. round-trip haul, trip after trip, are the rule rather than the exception, with Wooldridge Terra-Cobras. Steep climbs to the top of the cut—fast downhill loading—fast break-away and rapid acceleration to top speed contribute to maximum yardage efficiency. Power and speed combined with positive steering control make possible the handling of tons of earth in less time at a lower cost—and with greater safety to operators and equipment. Easier all-around handling of the Terra-Cobra results in less operator fatigue and higher hourly averages. Why not plan to key your earth-moving operations to Wooldridge Terra-Cobras? Get full details, today.

WOOLDRIDGE
MANUFACTURING COMPANY
SUNNYVALE, CALIFORNIA · U.S.A.

TERRA COBRA
Hi-Speed Self-Propelled ***EARTHMOVERS***

WOOLDRIDGE
EARTHMOVING EQUIPMENT
Includes

★ **SCRAPERS**
Tractor-drawn for handling heaping yardages from 6 to 28 cu. yards.

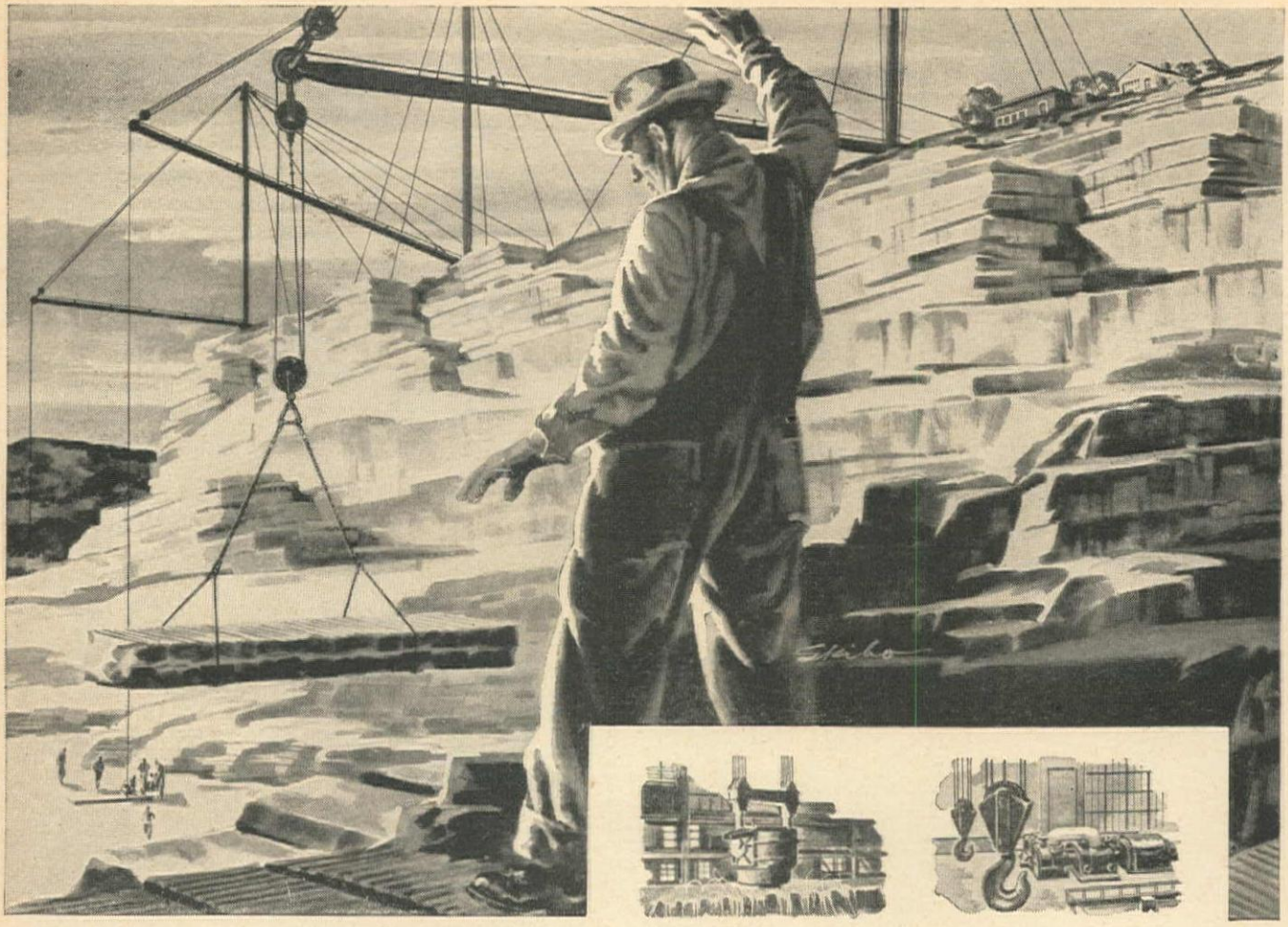
★ **POWER CONTROL UNITS**
Single and multiple drum with universal or roller fairleads.

★ **BULLDOZERS**
Tough and rugged design for standard makes of tractors.

★ **TRAILBUILDERS**
Adjustable angle-blades for standard tractor mounting.

★ **RIPPERS**
Available in light, medium and heavy duty models with two sizes to each model.

DISTRIBUTOR SALES & SERVICE FACILITIES IN ALL PRINCIPAL AREAS & FOREIGN TERRITORIES



This is how men get marble and granite out of the quarries. Derricks rigged with Preformed wire rope move heavy loads easily and safely. In rugged service like this, Preformed wire rope also lasts longer, thereby cutting costs of operation and replacement.

Wire rope transmits power to moving parts of machines. Preformed is ideal because it resists kinking and spools evenly.

Generating plants are big users of Preformed wire rope. They benefit from its longer life... its easier handling.

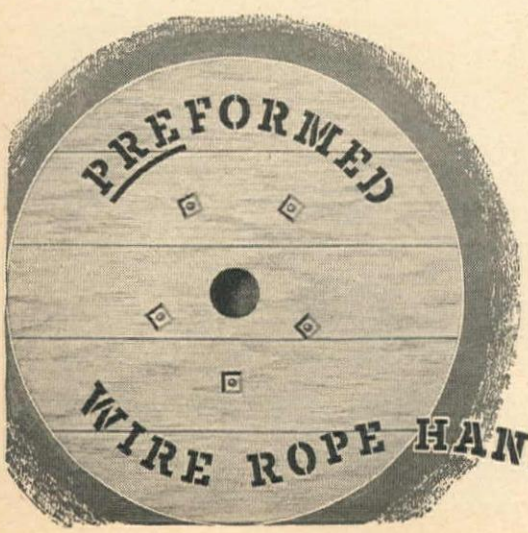
As You See, It Looks Easy

... *Thanks to Wire Rope*

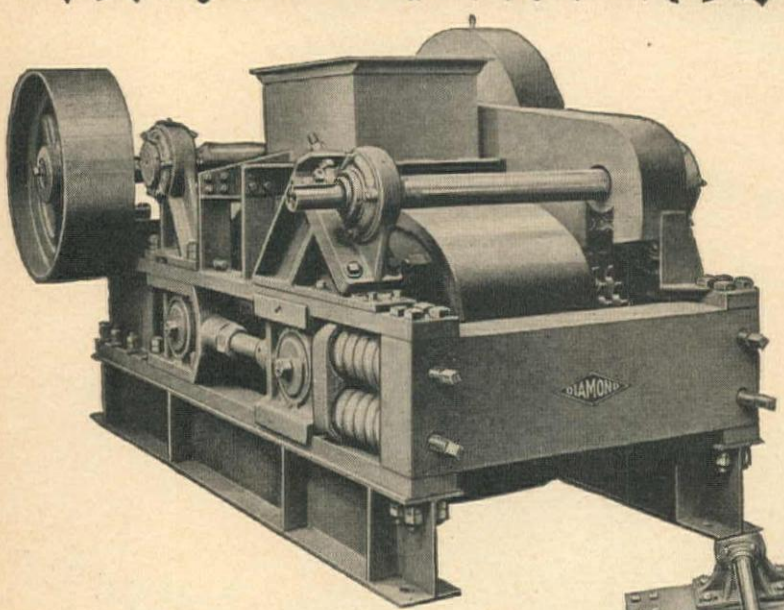
You never think of wire rope when you see granite blocks or marble slabs in buildings. You don't think of it when you push a light button or open your refrigerator door. But wire rope is used in providing you these and countless other everyday conveniences. Preformed is the wire rope preferred for many applications in almost every industry because it gives longer service and thus helps keep costs down.

Send for an interesting free booklet, "PREFORMED WIRE ROPE—WHAT IT IS—WHAT IT DOES." Write the Preformed Wire Rope Information Bureau, 520 North Michigan Avenue, Chicago 11, Illinois or

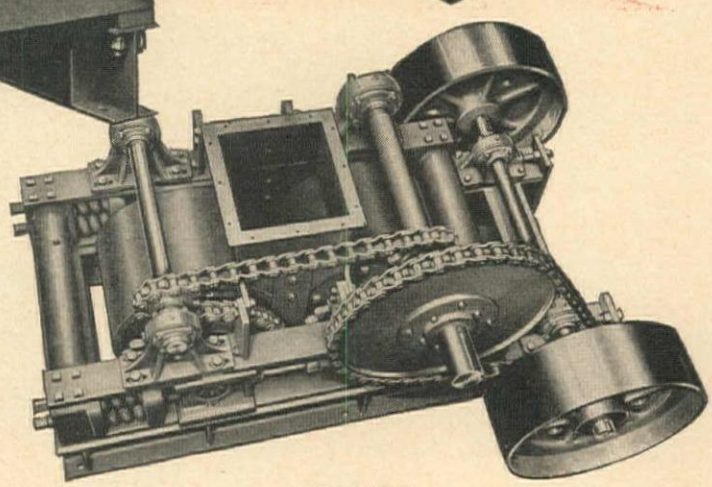
ASK YOUR OWN WIRE ROPE MANUFACTURER OR DISTRIBUTOR



For Profitable Secondary Crushing
SELECT THE RUGGED
DIAMOND ROLL CRUSHER



THERE'S NOTHING TOUGHER THAN A DIAMOND



TOP VIEW

Here's the "NO SHUT-DOWN" Staying Power You Want— Ask any DIAMOND OWNER

With a DIAMOND Roll Crusher you can often double or triple your net profits on finely crushed aggregate. DIAMOND Roll Crushers are brutes for punishment—they stay on the job and roll out high tonnage month after month, year after year. There isn't a weak spot in the whole crusher—every part is extra strong. Each size has ample margin over its rated capacity. We repeat—ask any DIAMOND Owner! Six sizes roller bearing—four sizes plain bearing. Ask your DIAMOND Dealer, or write us for Bulletin D-45C.

OTHER DIAMOND PRODUCTS

Portable Crushing & Screening Plants
Portable Primary Crushing Plants
Portable Screening & Washing Plants
"DUAL-ACTION" Crushers
Jaw Crushers
Hammermills
Conveyors
Vibrating Screens
Scalping Screens
Drag Washers
Feeders
Bins—Hoppers
Grizzlies

DIAMOND DEALERS

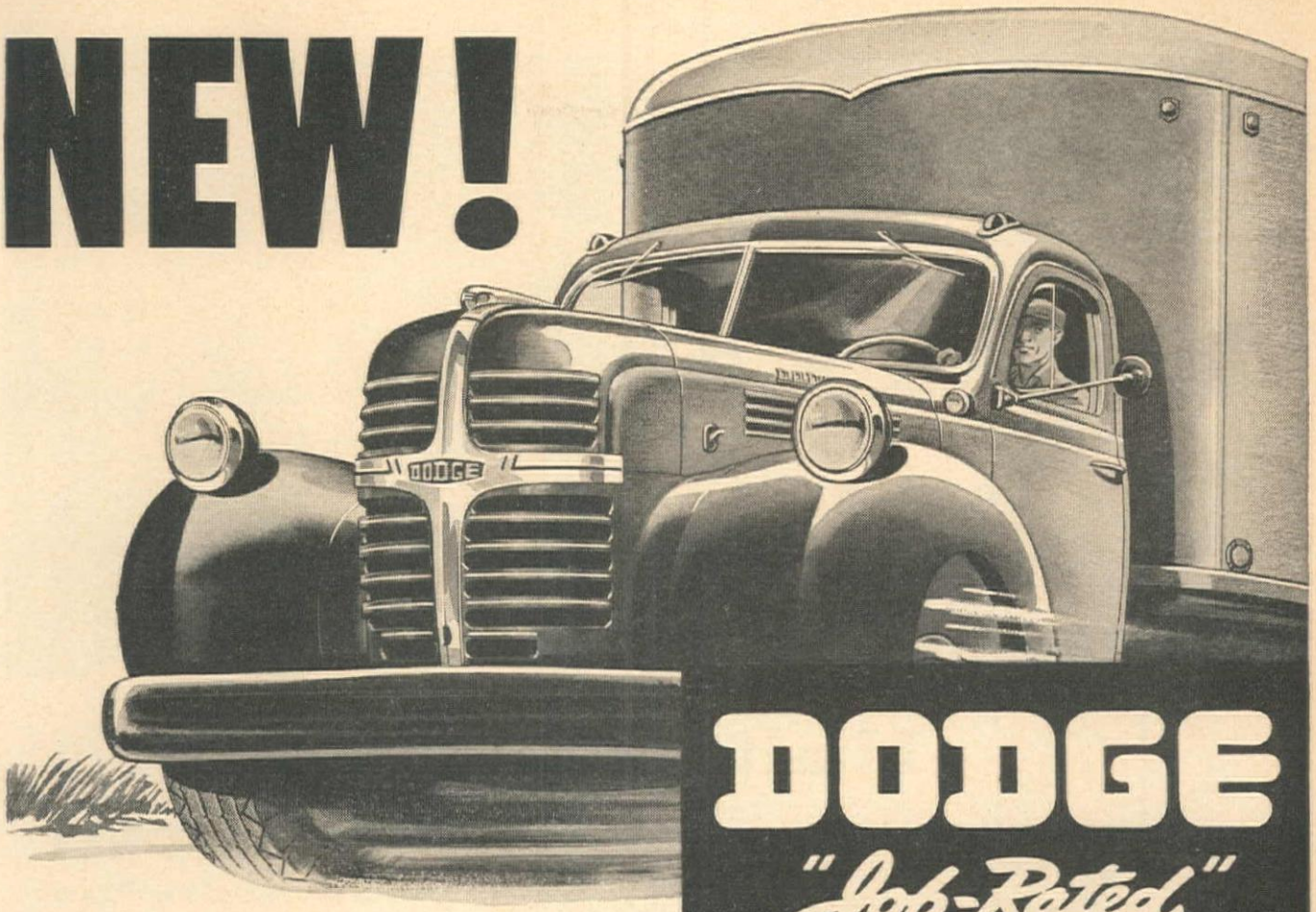
Oakland	SOULÉ EQUIP. CO.
Los Angeles	GARLINGHOUSE BROS.
Seattle	A. H. COX & CO.
Portland	LOGGERS & CONTRACT'S MACH. CO.
Boise	WESTERN EQUIP. CO.
Salt Lake City	C. H. JONES EQUIP. CO.
Phoenix	O. S. STAPLEY CO.
Albuquerque	CONTRACTORS' EQUIP. & SUP. CO.
Missoula	MOUNTAIN TRACTOR CO.

DIAMOND

DIAMOND IRON WORKS, INC.
AND THE MAHR MANUFACTURING CO. DIVISION

1818 SECOND STREET NORTH MINNEAPOLIS 11, MINNESOTA

NEW!



DODGE "Job-Rated" HEAVY-DUTY TRUCKS

Lower Cost Hauling up to 20 Tons "G. T. W."

WITH NEW 282 AND 331 CUBIC INCH POWER PLANTS—ENGINEERED TO SET NEW POWER AND ECONOMY STANDARDS!

We sincerely believe you'll find these great *new* Dodge *"Job-Rated"* 'heavyweights' the most *profitable* trucks you can operate for loads up to *20* tons (G.T.W.).

They're powered by two brilliant *truck* engines—of 282 and 331 cubic inch displacement—in which horsepower-to-weight ratios reach a new high!

These engines develop 225 and 270 pound-feet of torque respectively—and maintain a high torque output over a wide range of engine revolutions.

Engine cylinder walls, of chrome nickel molybdenum alloy cast iron, are *so hard* that wear is almost non-existent. Every valve is made of silchrome, one of the hardest metals known. Exhaust valves are sodium-cooled, and valves and valve seat inserts are stellite-faced.

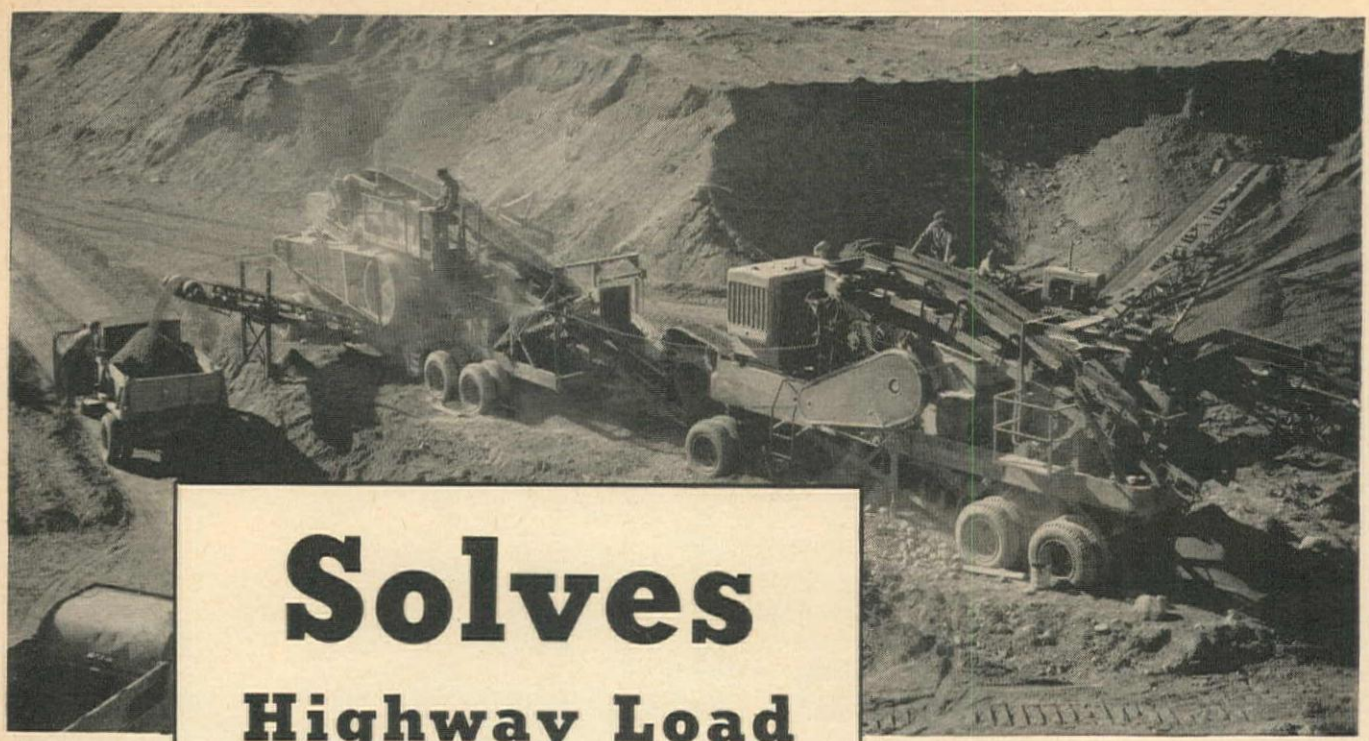
Everywhere, unnecessary surplus weight is eliminated by improved design and advanced metallurgy. New and strictly *heavy-duty* clutches, and a remarkably efficient five-speed transmission—coupled with rear axles of entirely new design—provide a highly efficient transmission of driving torque to the wheels.

Despite their husky construction and rugged, brute strength—these trucks handle with remarkable ease. It's a "cinch" to keep them rolling—even on steep grades with capacity loads.

If *your* transportation requirements fall within the 18,500 to 23,000-pound gross vehicle weight ranges (up to 40,000 pounds G.T.W.) . . . by all means get the *complete* story of these great new Dodge *"Job-Rated"* heavy-duty trucks. We believe you'll find them your long-awaited answer to *lower-cost hauling* in their capacity ranges!

ONLY DODGE BUILDS "Job-Rated" TRUCKS!

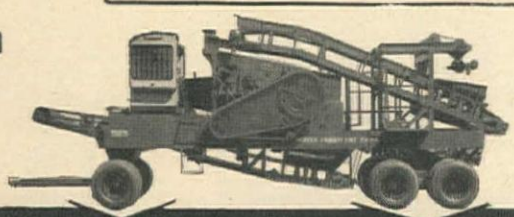
DODGE DIVISION, CHRYSLER CORPORATION



Solves Highway Load Limits

NEW 2-UNIT
Crushing and Screening Plant

1



21,470 LBS. 28,360 LBS.

2

15,020 LBS. 32,830 LBS.

Your "moving day" problems will be minimized with this new 2-Unit Plant. It moves in and out of the pit easier and, with few exceptions, meets highway load limits as to weight, width and height.

In addition to being highly portable, it has the high capacity and features previously found only in duplex plants. Primary and Secondary Units are mounted on separate 3 axle trucks. Each has its own power unit so it can be operated singly.

Two Primary Units are available—one for quarry and one for gravel. You have your choice of 3 sizes of jaw crushers—10″ x 36″, 15″ x 36″ or 20″ x 36″.

The Secondary Unit is standard with feeder conveyor, roll crusher—40″ x 22″, vibrating screen—4′ x 10′, return conveyor and power unit. Write today for complete details about this new 2-Unit Plant.

PIONEER ENGINEERING WORKS
1515 CENTRAL AVENUE • MINNEAPOLIS 13, MINNESOTA

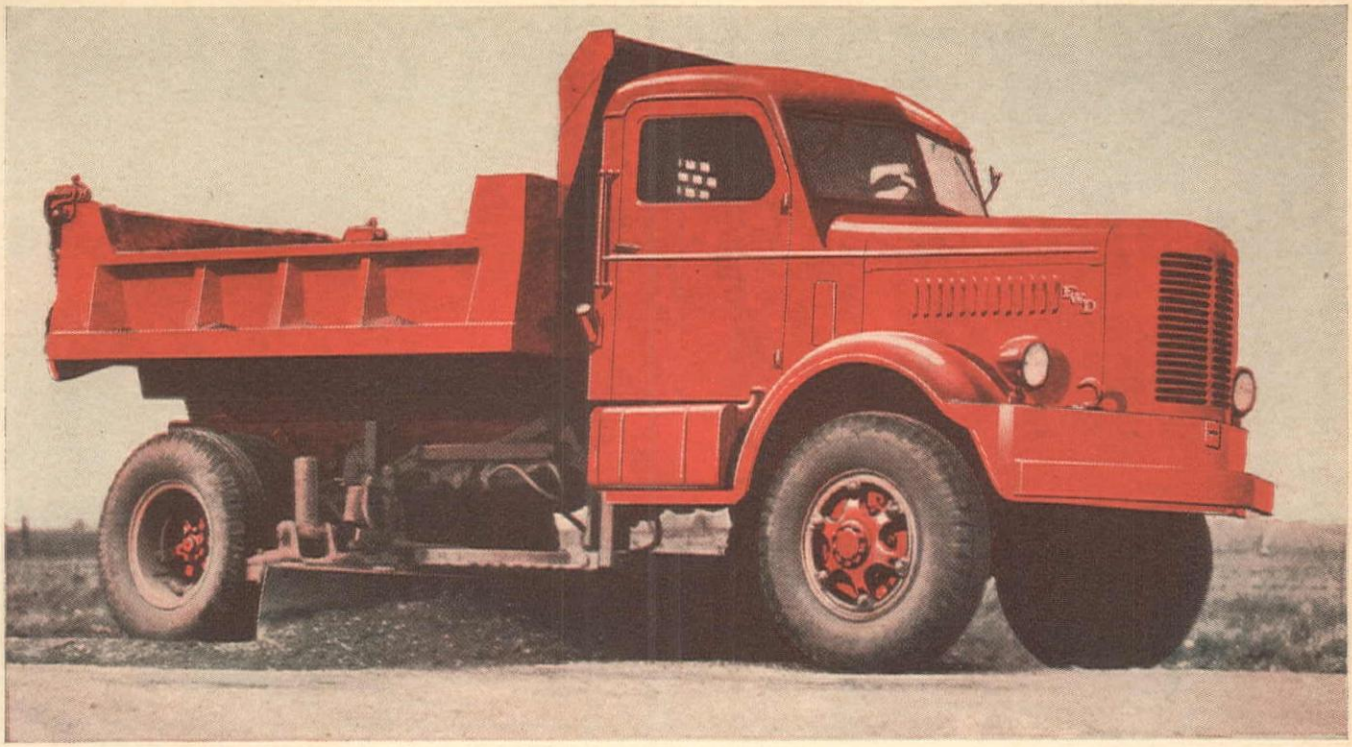
1. A PRIMARY UNIT built for gravel. Equipped with standard power unit and 10″ x 36″ jaw crusher. Height—12′6″, width—8′.

2. SECONDARY UNIT without power unit. Either gasoline or diesel units are furnished. Height—12′6″, width—8′.

Engineers and Manufacturers for Pit, Mine, Quarry, Bituminous, Materials Handling

PLAN WITH **Pioneer** ENGINEERING WORKS

Neil B. McGinnis Company, Phoenix, Arizona; Pioneer Machinery Company, Idaho Falls, Idaho; Sanford Tractor & Equipment Company, Reno; Tractor & Equipment Company, Sidney, Montana; Westmont Tractor & Equipment Company, Missoula, Montana; Coast Equipment Company, San Francisco; Connelly Machinery Company, Billings and Great Falls, Montana; Elton T. Fair Company, Denver; Feenaughty Machinery Company, Portland, Seattle, Spokane, Boise; Harron, Rickard & McCone Company of Southern California, Los Angeles; The Lang Company, Salt Lake City.



FWDs *"Make the Grade"*

FASTER—AT LOWER COST

Patrolling roads—blading, grading, maintaining—is just one of the many highway jobs FWD four-wheel-drive trucks do faster—at lower cost.

On new highway construction or seasonal maintenance—heavy hauling—snow clearing—or emergency jobs requiring better than usual truck performance, rely on FWDs to do the work with speed, safety, and at low cost.

With driving power fed to all wheels FWD trucks are superior to conventional rear-wheel-drive trucks for work on or off the highway, in severe weather or under difficult road conditions. FWD trucks have ability to carry or tow heavy loads through mud, sand and over mountainous country often impassable to ordinary trucks. On highways they can be operated at higher speed and with greater safety because driving power on all wheels gives the operator better control of truck and load.

THE FOUR WHEEL DRIVE AUTO COMPANY, Clintonville, Wisconsin

Canadian Factory: KITCHENER, ONTARIO

THE ONE TRUCK FOR MANY JOBS

Fast, low-cost snow clearing is another highway job in which FWDs excel. Four-wheel-drive power and traction provides the "push" needed to clear roads fast.

America's FWD Foremost Heavy-Duty Truck

FWD Distributors: ARIZONA—Arizona-Cedar Rapids Co., 401 N. First St., Phoenix, CALIFORNIA—The Four Wheel Drive Auto Co., 1339 Santa Fe Ave., Los Angeles 21, and FWD Pacific Co., 469 Bryant St., San Francisco 7; COLORADO—Liberty Trucks & Parts Co., P. O. Box 1889, Denver 1; IDAHO—Intermountain Equipment Company, Broadway at Myrtle St., Boise; MONTANA—Steffeck Equipment Co., 11 E. Cutler St., Helena; NEVADA—Allied Equipment Co., Reno; NEW MEXICO—The Myers Company, Las Cruces; OKLAHOMA—Halliburton Oil Well Cementing Co., P. O. Drawer 471, Duncan; OREGON—Feenaughty Machinery Co., 112 S.E. Belmont St., Portland 14; UTAH—Cate Equipment Co., 49 E. 9th So., Salt Lake City; WASHINGTON—Feenaughty Machinery Co., 1028 6th Ave., So. Seattle 2, Glenn Carrington & Co., 91 Columbia St., Seattle and Feenaughty Machinery Co., 715 N. Division St., Spokane; WYOMING—Wortham Machinery Co., 517 W. 17th St., Cheyenne; ALASKA—Glenn Carrington & Co., Nome, Fairbanks, Anchorage.

"IF THAT TOP KICK COULD JUST SEE ME NOW!"

VETERANS! WHY NOT RUN YOUR OWN BUSINESS?

You can cash in on what you learned in the army about welding. Thousands of 200, 300 and 400 Ampere AC and DC Arc Welding units are surplus and available to you on veteran priority. There are large quantities of Hobarts and Lincolns, quite a few Westinghouse and fair amounts of other makes for sale now. Most of the equipment is used and in good operating condition. Best of all, it is being sold at prices you can afford in setting up your own repair shops or for contract work. Write, wire or phone the nearest War Assets Administration Regional Office below or come in and ask for the special veterans' service section.

FREE INFORMATION

For full information clip and mail this coupon to War Assets Administration:

Please send me complete information on the availability, condition and location of the following types of equipment:

☐ Hobart Arc Welders
☐ Lincoln Arc Welders
☐ Westinghouse Arc Welders
☐ Electrodes and Welding Rods

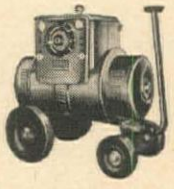
Arc Welding Equipment: AC.... DC....
Electric Motor Driven: Volts....Phase....Cycles....
Transformer Type: Volts....Phase....Cycles....

Name.....

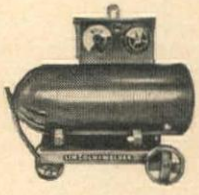
Firm.....

Address.....

City.....State.....



Hobart — Standard models of this make available in large quantities and most ratings.



Lincoln—In all models and most ratings. Hundreds in the popular 300-400 Ampere size.

EXPORTERS: Most surplus property is available to the export market. Merchandise in short supply is withheld from export, and if such items appear in this advertisement they will be so identified by an asterisk.

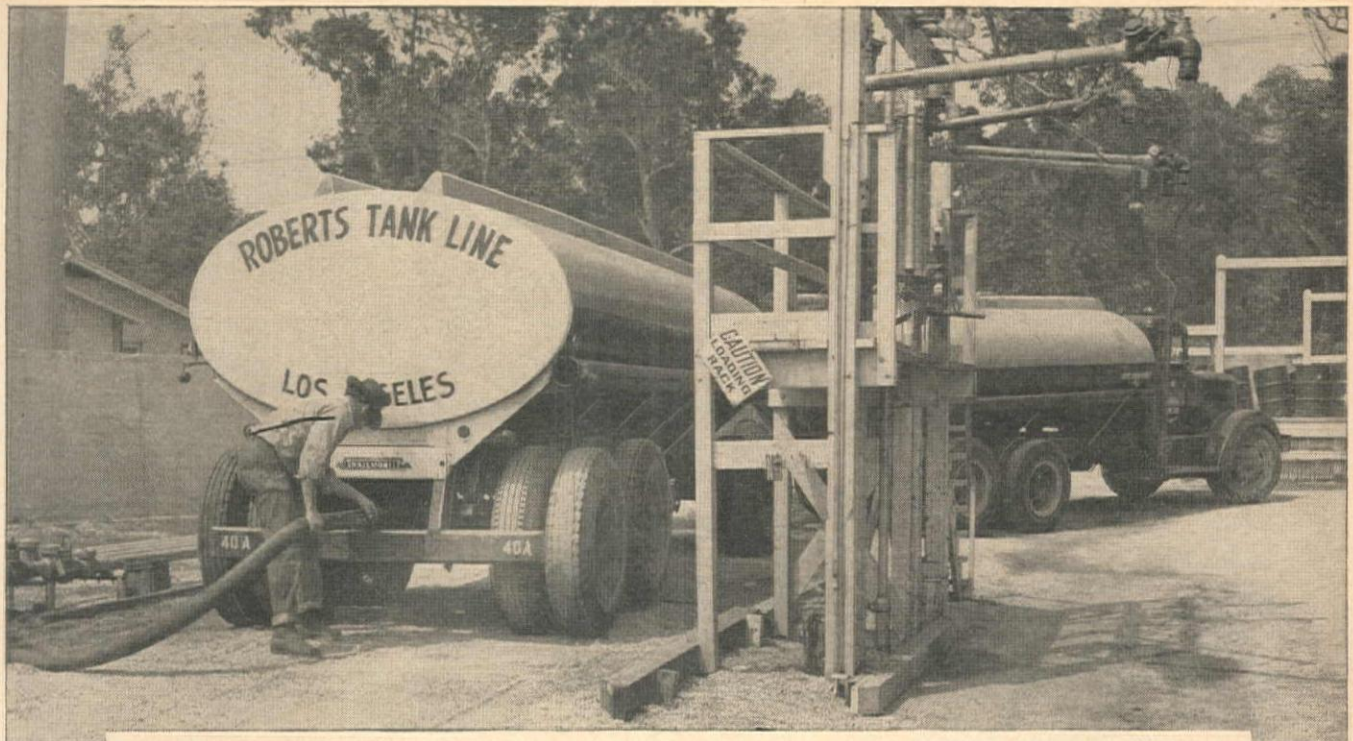
All arc welders are subject to priority regulations. VETERANS OF WORLD WAR II are invited to be certified at the War Assets Administration Certifying Office serving their area, and then to purchase the material offered herein.

WAR ASSETS ADMINISTRATION

GOVERNMENT OWNED SURPLUS

Offices located at: Atlanta • Birmingham • Boston • Charlotte • Chicago • Cincinnati • Cleveland • Dallas • Denver • Detroit • Fort Worth • Helena • Houston • Jacksonville • Kansas City, Mo. • Little Rock • Los Angeles • Louisville • Minneapolis • Nashville • New Orleans • New York • Oklahoma City • Omaha • Philadelphia • Portland, Ore. • Richmond • St. Louis • Salt Lake City • San Antonio • San Francisco • Seattle • Spokane

649-2



100% TRAILMOBILE Tanker Fleet

The Roberts Tank Line of Los Angeles, like many other tanker fleets throughout the country, is 100% TRAILMOBILE. Like other petroleum transporters, they have found that there is economy, convenience and profit in standardization of rolling stock.

TRAILMOBILE tankers are ruggedly constructed so that heavy loads of valuable and inflammable cargo may be quickly and safely transported over public highways. If you are hauling bulk petroleum from the oil fields to the refineries, or from the refineries to bulk distributing plants, filling stations, industrial plants or construction projects—investigate TRAILMOBILE, known throughout the nation as the easy pulling trailer.

Among petroleum transporters, the trend is toward TRAILMOBILE.

THE TRAILMOBILE COMPANY • BERKELEY, CALIFORNIA

TRAILMOBILE

Los Angeles • Berkeley • Sacramento • Santa Rosa • Fresno • San Jose • Bakersfield • Stockton • Ogden • Seattle • Honolulu • Santa Barbara • Portland • Spokane

DISTRIBUTORS

ALABAMA
Birmingham—YOUNG & VANN SUPPLY CO.
ARIZONA
Phoenix—MINE & SMELTER EQUIP. CO.
ARKANSAS
North Little Rock—STANDARD EQUIP. and SUPPLY CO.
CALIFORNIA
Oakland and Eureka—BURAN EQUIP. CO.
Los Angeles—GARLINGHOUSE BROTHERS
COLORADO
Denver—GUNDERSON-KRINGEL CO.
CONNECTICUT
Stamford—M. F. TAYLOR CO.
FLORIDA
Jacksonville—FARQUHAR MACHINERY CO.
Miami—GENERAL EQUIP. & SUPPLY CO.
Tampa—EPPERSON & CO.
GEORGIA
Atlanta—GILL EQUIPMENT CO.
ILLINOIS
Chicago—CENTRAL CONTRACTORS SERVICE
Rock Island—WESTERN EQUIP. & SUPPLY CO.
INDIANA
Indianapolis—BOCK EQUIPMENT CO.
Rochester—DEEDS EQUIPMENT CO.
IOWA
Cedar Rapids and Des Moines—GLOBE MACHINERY & SUPPLY CO.
KENTUCKY
Louisville—NATIONAL EQUIPMENT CO.
Paducah—HENRY A. PETTER SUPPLY CO.
LOUISIANA
Baton Rouge, Monroe and New Orleans—DUNHAM-PUGH CO., INC.
MAINE
Portland—EASTERN TRACTOR & EQUIP. CO.
Presque Isle—ROY C. THOMPSON CO.
MARYLAND
Baltimore—MARYLAND SUPPLY & EQUIP. CO.
MASSACHUSETTS
Boston—PERRIN, SEAMANS & CO., INC.
MICHIGAN
Detroit—W. H. ANDERSON COMPANY, INC.
Grand Rapids—E. K. S. EQUIPMENT CO.
Marquette—MARQUETTE PUBLIC SERVICE GARAGE, INC.
Sault Ste. Marie—STRAITS ENGINEERING CO.
MINNESOTA
St. Paul—BORCHERT-INGERSOLL, INC.
MISSISSIPPI
Jackson—WATKINS-ALDRIDGE EQUIP. CO., LTD.
MISSOURI
Kansas City—CONTRACTORS SUPPLY CO.
St. Louis—MISSOURI-ILLINOIS TRACTOR & EQUIPMENT CO.
MONTANA
Butte—MONTANA HARDWARE CO.
NEBRASKA
Omaha—FEHRS TRACTOR & EQUIP. CO.
NEVADA
Reno—NEVADA TRUCK SALES
NEW JERSEY
Union—SMITH TRACTOR & EQUIP. CO.
NEW MEXICO
Albuquerque—HARRY CORNELIUS CO.
NEW YORK
Albany—VAN NOUHUYS PUMP & SUPPLY CO.
Buffalo—WHEELER EQUIPMENT CO.
New York—H. O. PENN MACHINERY CO.
Rochester—HAVERSTICK & CO.
Utica—CREOLE EQUIPMENT CO.
NORTH CAROLINA
Charlotte—CONTRACTORS SERVICE, INC.
NORTH DAKOTA
Fargo—MYHRA EQUIPMENT CO.
OHIO
Cincinnati—THE FINN EQUIPMENT CO.
Cleveland—PATTERSON EQUIPMENT CO.
Columbus—BLAKE EQUIPMENT CO.
Marietta—NORTHWEST SUPPLY & EQUIP. CO.
Toledo—EDMUND SUPPLY CO.
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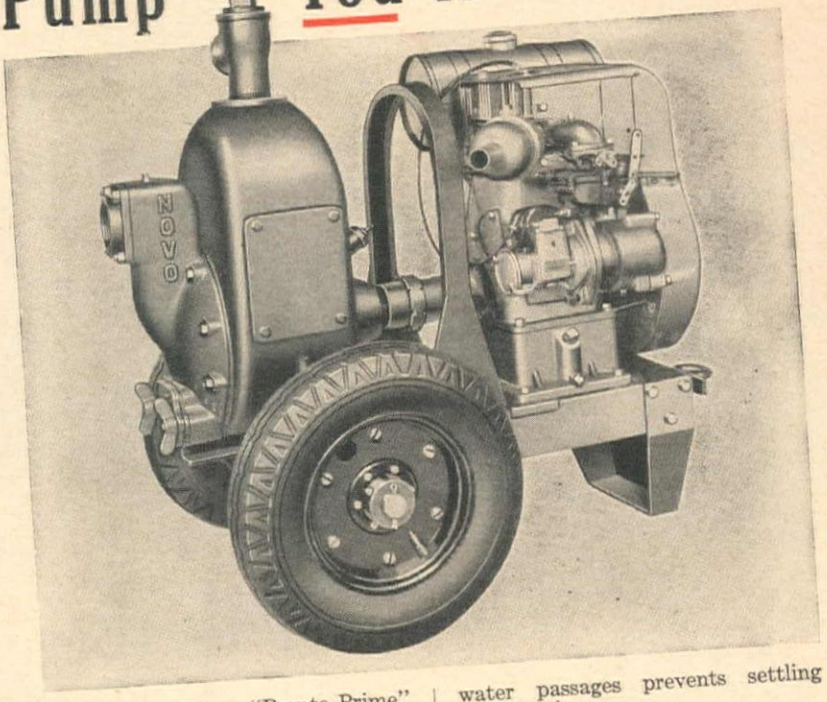
Waco—CONTRACTORS EQUIPMENT SALES & SERVICE, INC.
UTAH
Salt Lake City—THE LANG CO., INC.
VIRGINIA
Norfolk and Roanoke—TIDEWATER SUPPLY CO.
Richmond—INDUSTRIAL SUPPLY CO.
WASHINGTON
Seattle and Spokane—COLUMBIA EQUIP. CO.
WEST VIRGINIA
Bluefield—BLUEFIELD SUPPLY CO.
Charleston—CLYDE W. BECKNER, INC.
WISCONSIN
Milwaukee—STONE MANUFACTURING CO.

NOVO NEWS

NOVEMBER, 1946

CONTRACTORS: Here's the Self-Priming Centrifugal Pump You Asked For!



The new Novo "Pronto-Prime" Self-Priming Centrifugal Pump was literally designed to *your* specifications. We asked hundreds of contractors exactly what features they wanted in their new pumps. The Novo "Pronto-Prime" pump is the direct result of this survey; it includes every important feature that *you*, from actual experience, have found necessary to efficient, trouble-free operation.

Super Speed Positive Priming—new improved design.

Long-lived "Stout-Hearted" rotating Neoprene seal—self-aligning, self-adjusting, oil lubricated.

Self-Cleaning—turbulence through oversized, streamlined water passages prevents settling and clogging.

Independent Pump Unit—permits servicing pump without removing power unit.

Serviceability—all wearing parts quickly accessible.

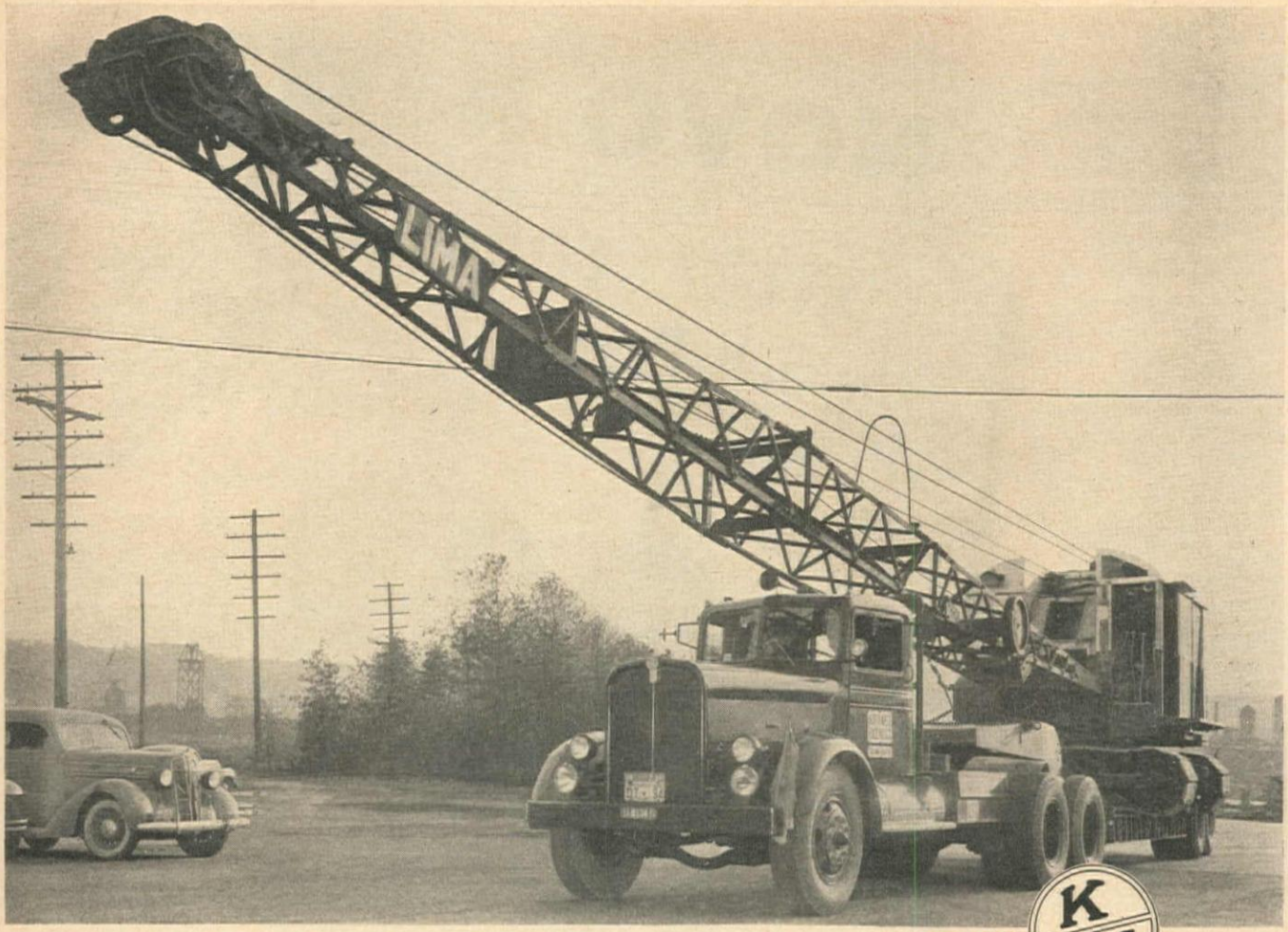
Many Mechanical Advantages—Two roller bearings. Universal base. Line-bored pump case. Adjustable wear plate. Replaceable cut-off. Wear resistant Novite alloy parts. Raised suction. Large drains.

Guaranteed to Meet AGC Standards. "Pronto-Prime" performance is second to none.

Your nearest Novo distributor will gladly furnish more details.

Allied Member of A.E.D.

NOVO
ENGINE COMPANY
LANSING 5, MICH. U.S.A.
CONTRACTOR'S EQUIPMENT
· GRAY IRON CASTINGS ·
ENGINES



MODEL 524

Every Day Job

Moving giant crawler cranes, houses and heavy duty contracting equipment weighing up to 75 tons aboard big Kenworth trucks is all in the day's work for Northwest Hauling Company, leading heavy movers in the Pacific Northwest.

Not only are huge and clumsy loads a commonplace, but nearly every job is a rush call for equipment needed immediately. The Kenworth fleet gets its big loads on the job in a hurry, operating both on and off the highway, saving thousands of construction hours and dollars yearly. Mr. Don Cooney, president of Northwest Hauling Company, says: "We chose Kenworths because we needed trucks big and tough enough to stand up under heavy hauling day after day. We now have more Kenworth trucks on order."

Kenworth's specialized engineering and advanced design assure you the right truck to do the job. Consult Kenworth for the answer to your trucking problems.

KENWORTH

TRUCKS ★ BUSES

FACTORY AND HOME OFFICE: SEATTLE • *DISTRIBUTORS IN* **PRINCIPAL WESTERN CITIES AND HAWAII**

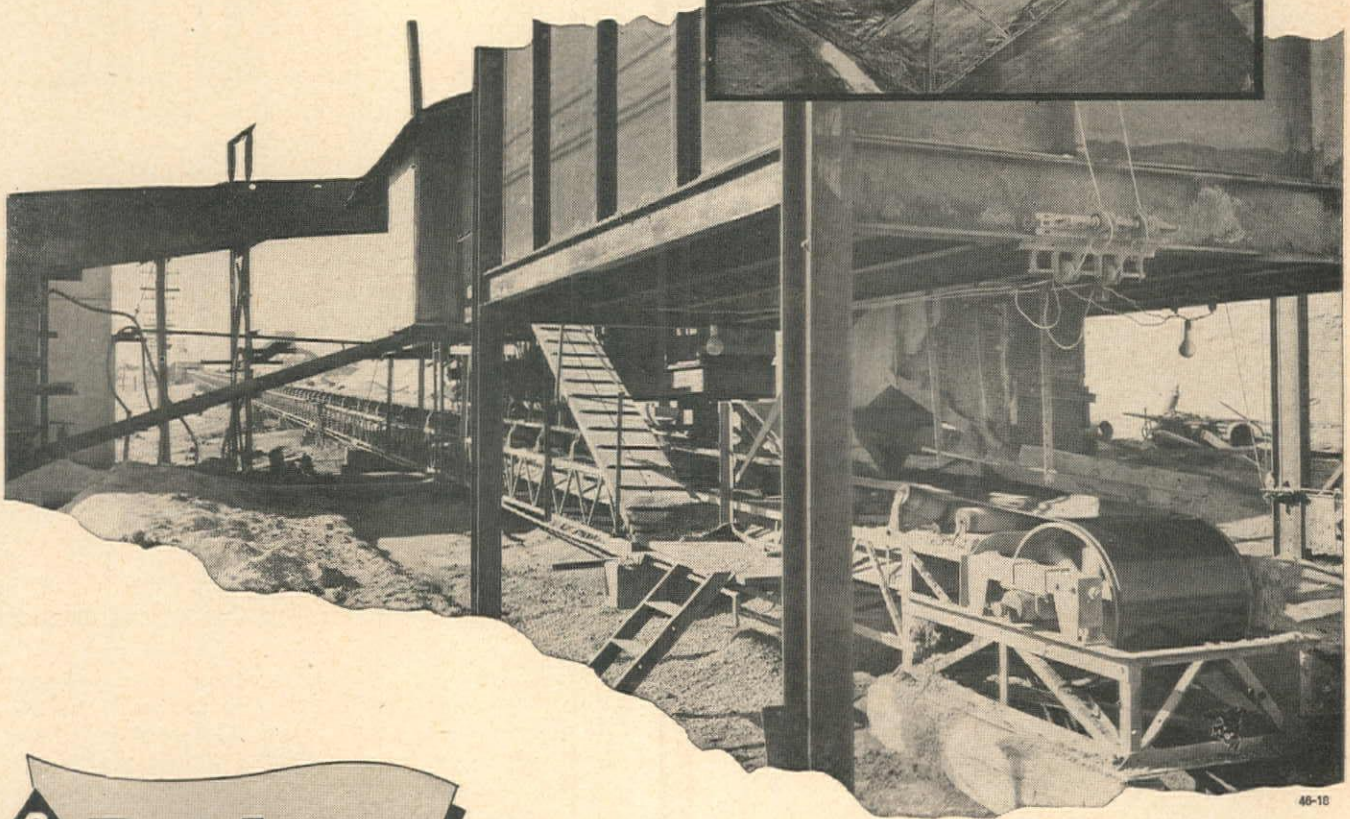
How B-G Belt Conveyors Can Cut Your Hauling Costs!

• If you've bulk materials to haul between your job and stock pile, railroad siding or mixing plant, don't overlook B-G belt conveyors.

These pre-engineered belt conveyors are widely preferred for short hauls uphill and down, across gullies, tracks, rivers and other obstructions. Wherever used, they carry a constant flow of materials at a cost per yard so low that other methods seldom can compete with them successfully.

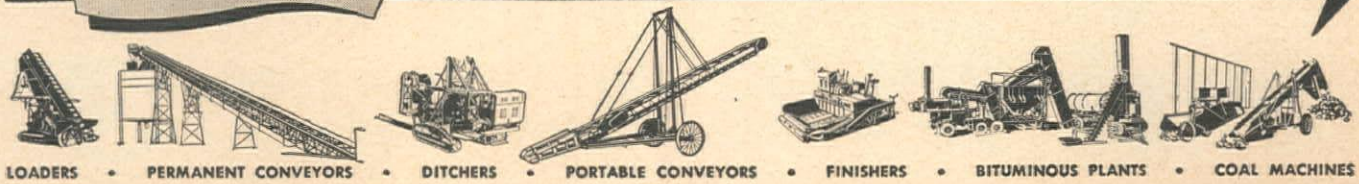
Barber-Greene belt conveyors are prefabricated, "packaged" units—simply built, easily erected. They often pay for themselves by eliminating the cost of rail or roadbed preparation. And they may be easily lengthened or shortened; they are not a "one-job" proposition.

If you want to reduce haulage problems and save appreciable expense—while speeding up your entire job—why not check up on Barber-Greene belt conveyors yourself? Barber-Greene Company, Aurora, Illinois.



48-18

B-G Barber-Greene CONSTANT FLOW EQUIPMENT



LOADERS • PERMANENT CONVEYORS • DITCHERS • PORTABLE CONVEYORS • FINISHERS • BITUMINOUS PLANTS • COAL MACHINES

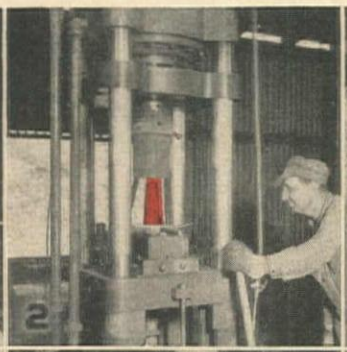
Brown-Bevis Equipment Co., Los Angeles 11, California; Brown-Bevis Equipment Co., Phoenix, Arizona; Columbia Equipment Co., Spokane, Washington; Columbia Equipment Co., Seattle, Washington; Columbia Equipment Co., Boise, Idaho; Columbia Equipment Co., Portland 14, Oregon; Contractors Equipment & Supply Co., Albuquerque, New Mexico; Ray Corson Machinery Co., Denver 2, Colorado; Jenison Machinery Co., San Francisco 7, California; Western Construction Equipment Co., Billings, Montana; Western Construction Equipment Co., Missoula, Montana; Kimball Equipment Company, Salt Lake City 10, Utah.

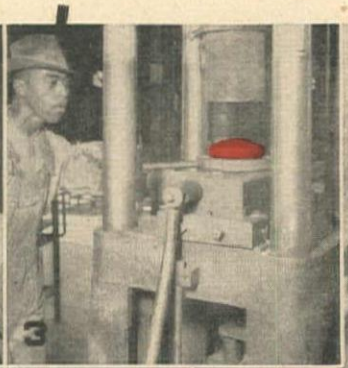
Another Reason

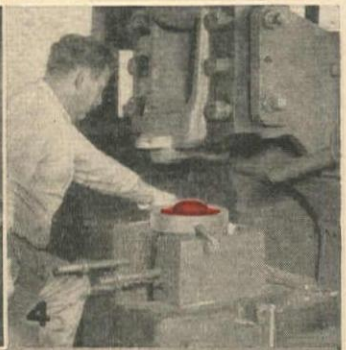
WHY COOK·UNITS ARE SO TOUGH!

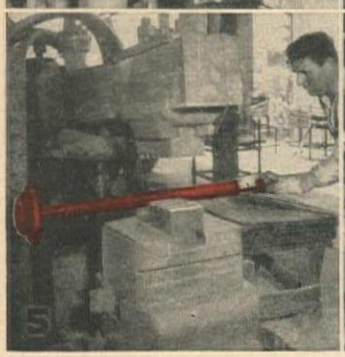
ONE-PIECE ALLOY STEEL FORGED JACKSHAFT

PHOTOS BELOW COURTESY OF FOOTE AXLE & FORGE CO., LOS ANGELES



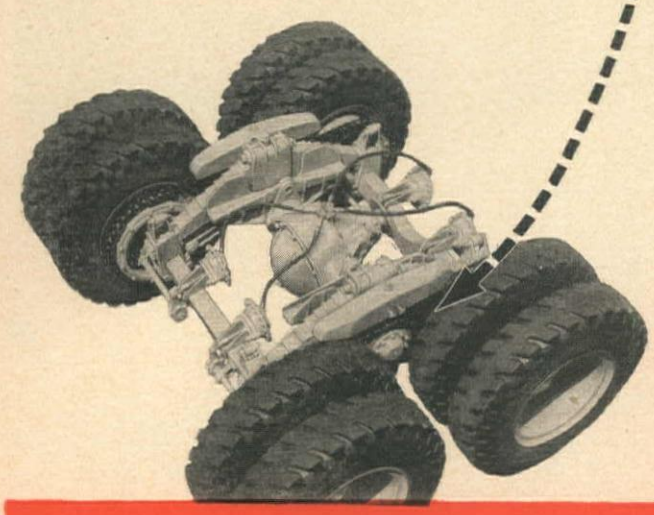






— THE PHOTOS —

1. Steel shaft being inserted in press.
2. Shaft after first coning operation
3. Shaft after second coning operation.
4. Final coning operation forges flange to size.
5. Swedging operation forming body of shaft to size.
6. Machining jackshaft flange on lathe.
7. Splines are being cut in the shaft.

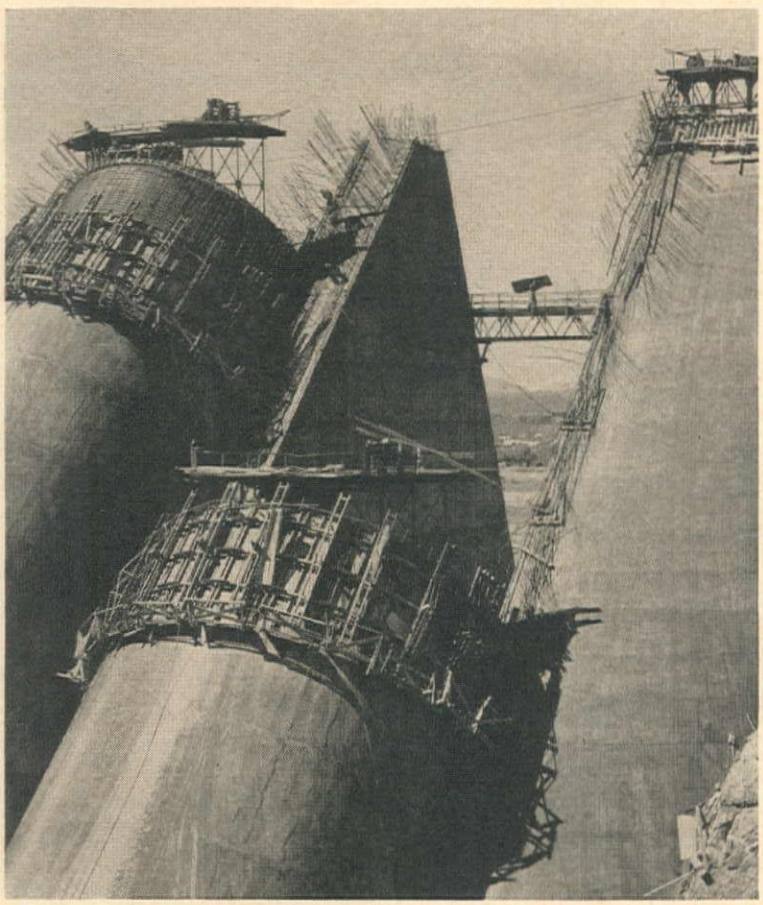


COOK BROS. one-piece forged jackshaft is the result of extensive engineering, testing and proving. So it's plenty tough. Has to be! Because C-B rugged Chain Drives haul all the way from 15, 20 to 30 tons and more! Hauling logs or concrete, and the dump truck, crane and oil field service are only part of the tough jobs. For further particulars see: L. H. PIERCE AUTO SERVICE, 1306 S. E. Ninth Ave., Portland, Ore., or COOK BROS. EQUIPMENT DISTRIBUTORS, 416 East Eighth Street, Oakland, California.

COOK BROS.
EQUIPMENT CO.
3330 SAN FERNANDO ROAD
LOS ANGELES 41, CALIF.

COOK BROS. C·B TRUCK EQUIPMENT

STEEL FORMS for Concrete Construction



Tapered arch forms used in constructing Arizona dam.

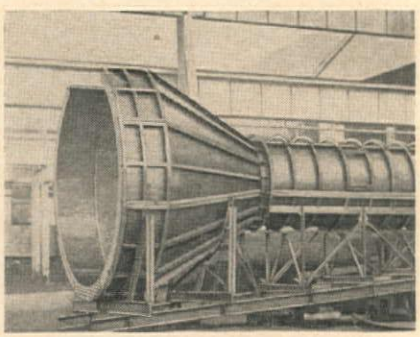
Designed and Engineered To Your Requirements

★ Steel forms, designed and engineered for the job, can greatly accelerate the pouring of concrete and lower construction costs. They also make it possible to work to a predetermined schedule; remove forms from concrete sooner, and cut handling time to the minimum.

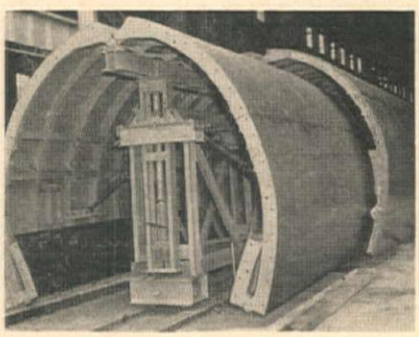
Western Pipe & Steel Company has for years been the source of steel forms in the West. Among the forms designed and fabricated by Western are: telescoping tunnel and conduit forms; tapered and standard arch forms; caisson, precast pile and wall forms.

★

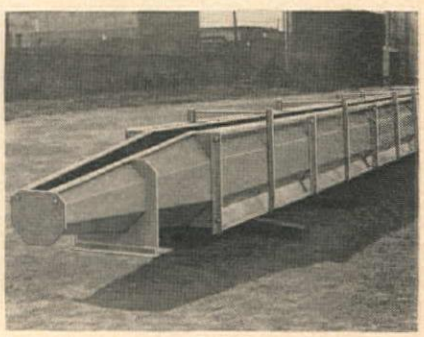
Steel forms are among the more than 300 different steel products fabricated by Western's five plants. Write your nearest Western office for detailed information.



CAISSON form designed for use in building pier for Navy Department at San Diego, California.



TELESCOPING forms used in tunnel and conduit construction have long been a Western specialty.



PRECAST concrete pile form used to make piles driven into foundation to support structure of dam.

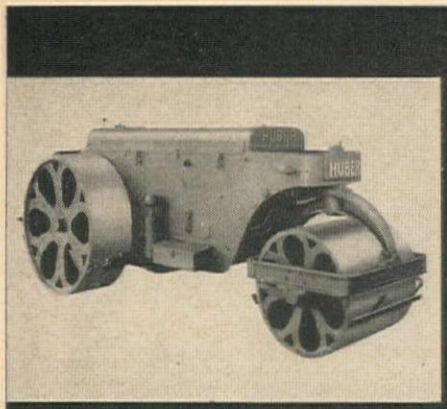
WESTERN PIPE & STEEL COMPANY OF CALIFORNIA

Fabricators • Erectors

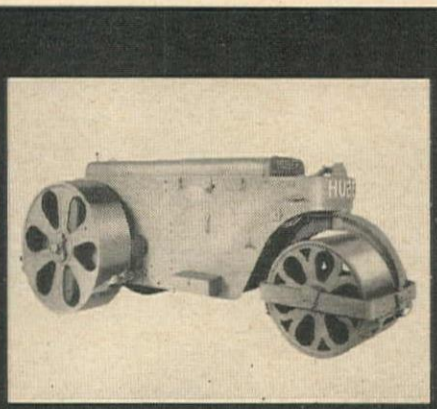
P.O. Box 2015, Terminal Annex
5717 Santa Fe Ave., Los Angeles 54

200 Bush Street
San Francisco 6

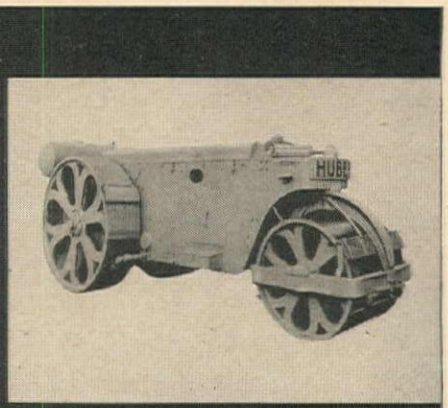
BAKERSFIELD, FRESNO, SOUTH SAN FRANCISCO, TAFT, CALIF.; PHOENIX, ARIZ.



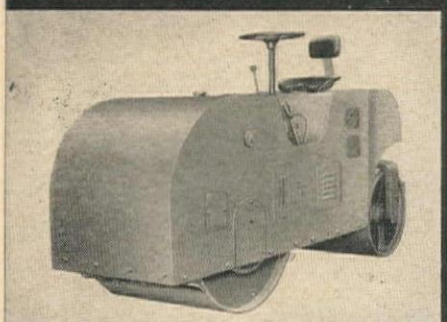
● HUBER 5 and 6 TON — 3 Wheel Roller



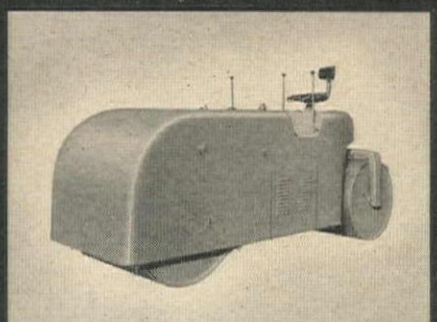
● HUBER 8 TON — 3 Wheel Roller



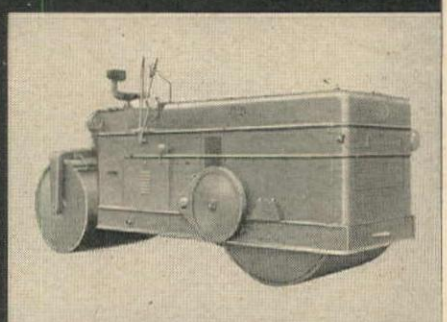
● HUBER 10 and 12 TON — 3 Wheel Roller



● HUBER 3-4 TON Variable Weight Tandem Roller



● HUBER 5-8 TON Variable Weight Tandem Roller



● HUBER 8-12 TON Variable Weight Tandem Roller

What Do You Need in a ROAD ROLLER?

CHECK THESE 3-WHEEL HUBER ROLLER FEATURES

- Hydraulic steering, quick and easy.
- Short wheel base for easy maneuvering—easy handling.
- Simplified design for a minimum of maintenance.
- Plenty of speed, power, and stamina.

It is just good judgment on the part of everyone responsible for building or maintaining good roads to answer this question by saying, "We want rollers that will do the job BETTER than it has ever been done before." Right! and HUBER, with a seasoned and practical knowledge of your needs, has built just such a line of 3 wheel and tandem rollers.

So, no matter what your job is, there is a HUBER Roller, either 3 wheel or tandem, of the right size to do the work better, faster, and more economical.

Ask your Huber Distributor about this.

THE HUBER MFG. COMPANY ● MARION, OHIO, U. S. A.

LEE & THATRO EQUIPMENT CO.	Los Angeles, California
JENKINS & McCLOUD	Reno, Nevada
THE MINE & SMELTER SUPPLY CO.	Denver 17, Colorado
CONTRACTORS' EQUIPMENT & SUPPLY CO.	Albuquerque, New Mexico
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FEENAUGHTY MACHINERY CO.	Spokane 2, Washington
WESTMONT TRACTOR & EQUIPMENT CO.	Missoula, Montana
EDWARD F. HALE CO.	Hayward, California
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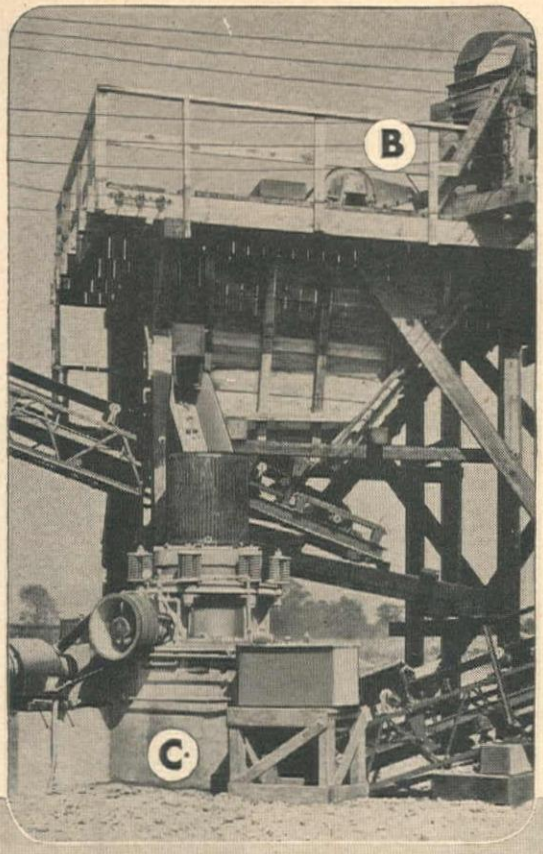


TELSMITH

designed and equipped

The Waupaca Sand & Gravel Co. plant at Custer, Wis., will handle about 175 tons per hour—producing concrete aggregate, 1½" to ¾"; ¾" to ⅜"; pea gravel and concrete sand. It is owned and operated by F. F. Mengel Co., Wisconsin Rapids, Wis.

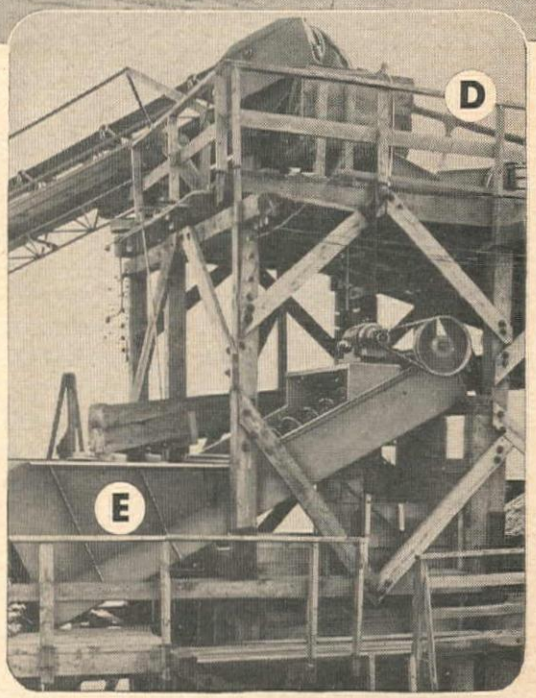
TELSMITH EQUIPMENT INCLUDES:

• (A) 30" x 5'-6" Special Plate Feeder • (B) 5' x 12' Single Deck Pulsator Scalper • (C) 28" Intercone Crusher • (D) 4' x 12' Triple Deck Pulsator • (E) 20" x 15' Twin Screw Sand Classifier • 24" x 203', 18" x 60' and 24" x 111' Belt Conveyors • Twelve Bin Gates

READ WHAT MR. F. F. MENGEL OWNER AND OPERATOR SAYS ABOUT TELSMITH COMPLETE PLANT SERVICE

"We wish to express our satisfaction with the gravel washing and screening plant you sold us. Each separate unit does exactly the work it was purchased for, with ample capacity and quiet running which makes for long life. Thank Elmer Kraig for the very fine drawings he made. We built each unit separate and when we set the conveyors and machines they were just where they should be with no changes necessary."

Telsmith's 40 years of engineering *know-how* is at your disposal. *Consultation without obligation.* Send for Equipment Guide G-30.



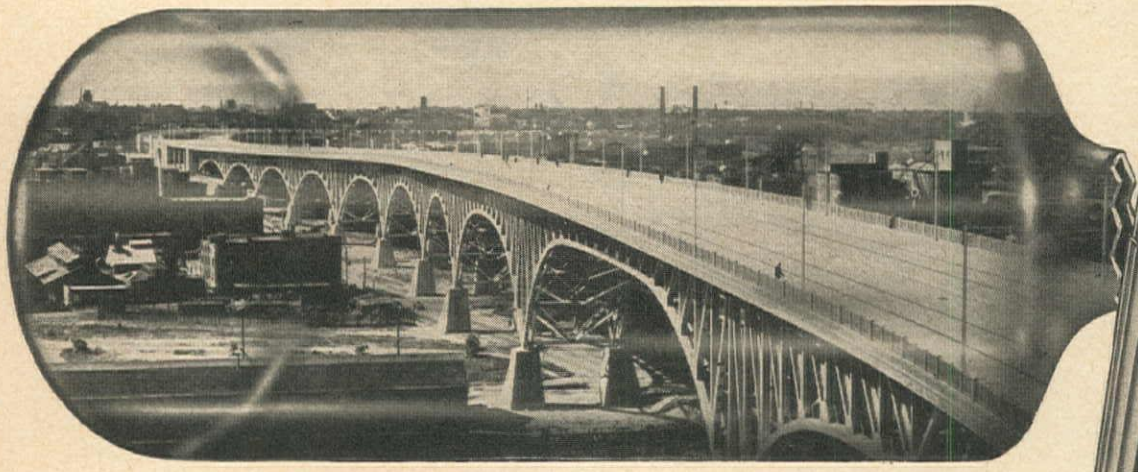
G-14

SMITH ENGINEERING WORKS, 4010 N. HOLTON STREET, MILWAUKEE 12, WISCONSIN

Mines Engineering & Equipment Company, 369 Pine St., San Francisco 4—811 W. 7th St., Los Angeles 14

Clyde Equipment Co. Portland 9, Ore.
Clyde Equipment Co. Seattle 4, Wash.
General Machinery Co. Spokane 1, Wash.
Gordon Russell, Ltd Vancouver, B.C.

How they broke a bottleneck



with steel MONOTUBES

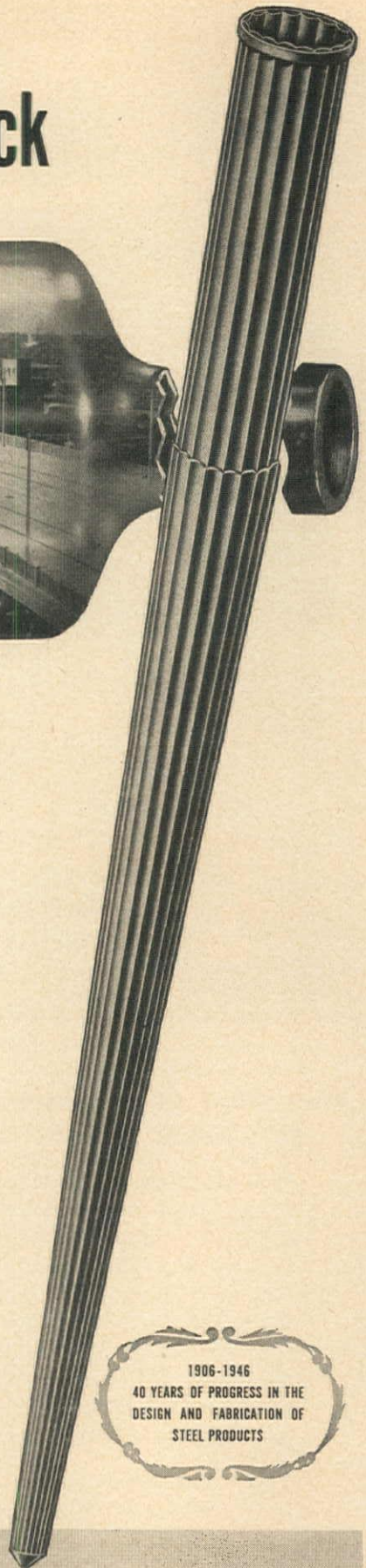
IN a large, midwestern city a deep river valley divides the east and west sides. Every day many hours were wasted in traffic tie-ups, slow-downs over winding streets.

County authorities voted to break this bottleneck with a bridge . . . at that time one of the largest undertakings in the country. It had to be high to allow clearance for freighters. It had to be strong to withstand heavy traffic. It had to be durable, a lifetime investment.

For this structure architects and engineers sought the best materials. Monotube tapered steel piles were their choice for pier foundations.

Monotube's easy extendibility provided the variance in length necessary to meet the requirements of grade and valley soil. Their light weight, easy handling, tapered sections made quick work of a big job. Their tubular construction allowed complete inspection before concreting. Today, the sound condition of the bridge testifies to Monotube's strength.

Maybe you have a foundation bottleneck that needs breaking. Union Metal engineers will be glad to contribute their real job experience to the solution of your problems. Wire, call or write The Union Metal Manufacturing Co., Canton 5, Ohio.



1906-1946
40 YEARS OF PROGRESS IN THE DESIGN AND FABRICATION OF STEEL PRODUCTS

UNION METAL

Monotube Foundation Piles

ALL THESE JOBS *with* THIS ONE TOOL!

Breaking Concrete, Rock, Ice, etc.

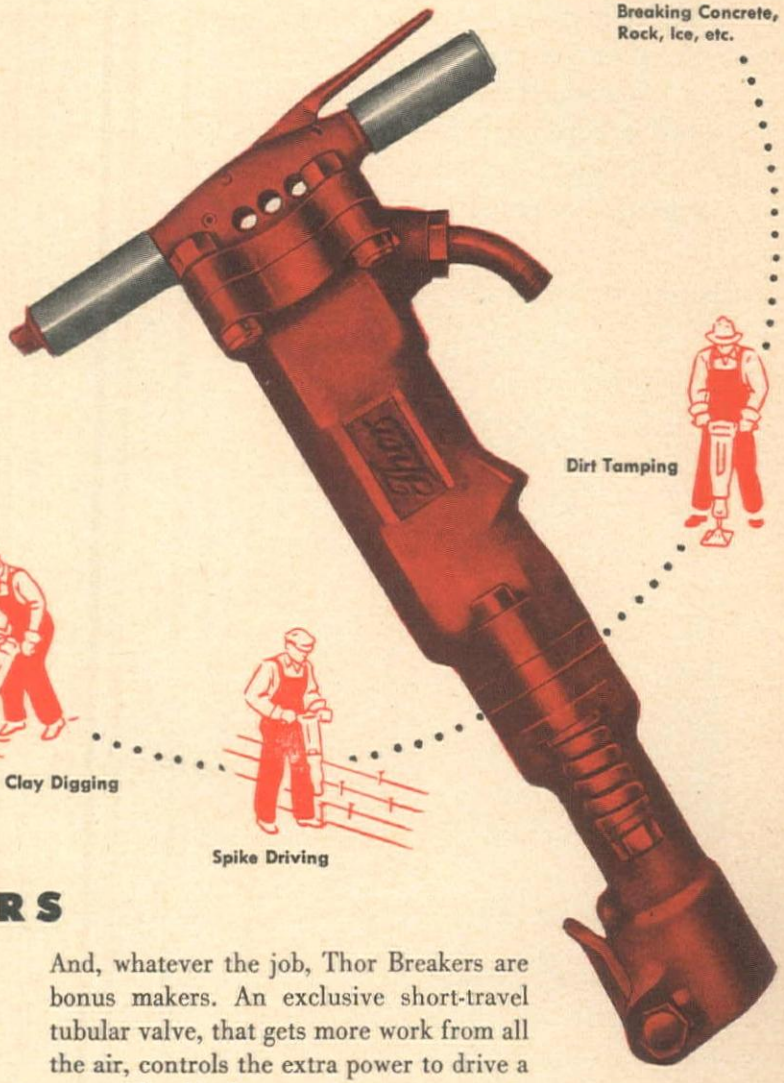
Asphalt Cutting

Sheeting Driving

Clay Digging

Spike Driving

Dirt Tamping



Thor

PAVING BREAKERS

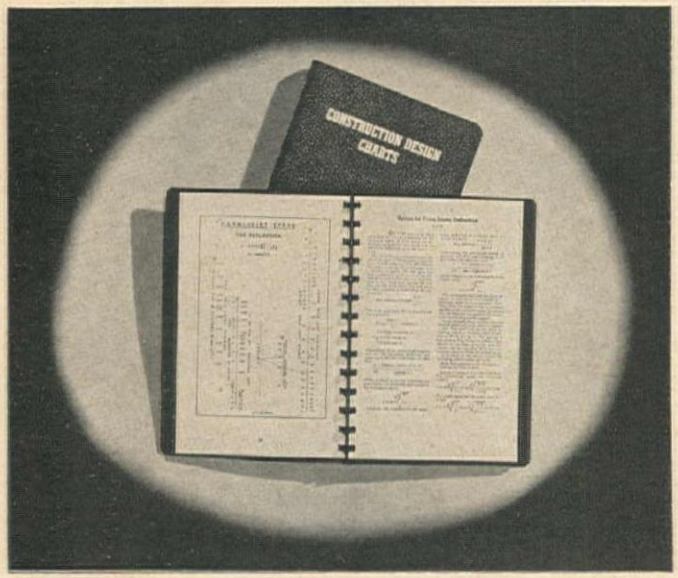
More than just a Buster is a Thor Paving Breaker! With moil points, chisels, wedges, and broaches in 7 styles it breaks concrete, rock, ice, and other materials. With wide-bladed spades it digs clay and hard-pan; cuts asphalt; splits timbers. With a tamper tool [illegible] backfill. With an inter-

And, whatever the job, Thor Breakers are bonus makers. An exclusive short-travel tubular valve, that gets more work from all the air, controls the extra power to drive a reversible, block-type piston in smooth blows. Rugged construction, full air-cushioning and automatic lubrication reduce

ENGINEERS — CARPENTERS — CONCRETE MEN — FOREMEN — SUPERINTENDENTS:

SOLVE ENGINEERING PROBLEMS . . . . . at a Glance!

There is no time to waste these days on tedious figuring of routine problems! This popular edition of CONSTRUCTION DESIGN CHARTS, by Professor James R. Griffith, gives countless engineering shortcuts—gives the answers to engineering and preliminary design problems in a flash! Engineers—carpenters—concrete men—foremen—superintendents—there's a whale of a value in this book for every man engaged in construction today!



This is the third reprinting of the CONSTRUCTION DESIGN CHARTS, and the contents are exactly the same as those which appeared in the original enlarged edition of 1943. This book contains 72 charts and has 150 pages filled with valuable information that will help you. Covered in sturdy black fabrikoid, stamped in gold, the book has a special metal binding that allows each page to lie flat for easy reference.

THIS NEW EDITION IS LIMITED—ORDER TODAY

The original edition of CONSTRUCTION DESIGN CHARTS disappeared like magic, so there's no time to lose in getting your order in for this book. The latest reprinting of this popular book is now available and our supply is definitely limited. We suggest placing an order immediately.

Price

$3.00

Postpaid

Add 8c Sales Tax if ordering from a California address.

Loaded Mack FCSW's climbing the 8% grade from the pit to the crushing plant.

International Nickel Company operates 33 Macks!

An all-Mack operation at Frood-Stobie open pits since 1938!

33 Mack trucks have done all the hauling at International Nickel's Frood-Stobie open pits, Copper Cliff, Ontario, since work began there eight years ago . . . and the original Macks are still on the job!

At peak production the pits' output reached 37,500 tons a day . . . and these Mack 30-ton haulers carried the load up an 8% grade to the crushing plant.

To handle off-the-road loads of this size required big trucks with plenty of ability to keep producing under tough conditions.

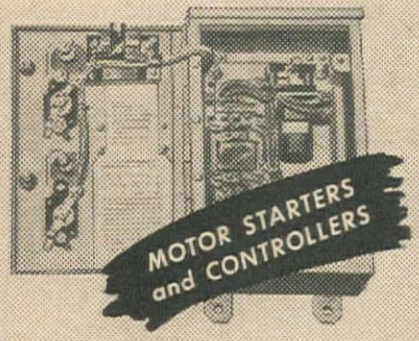
Here again is proof of Mack's outstanding heavy duty qualities. Macks have always been leaders in handling the most gruelling jobs. They *work harder, give economical service* and *last longer!* Consider Mack for *your* hauling problem.

Mack International Motor Truck Corporation. Los Angeles, Sacramento, San Francisco, Seattle, Portland, Salt Lake City. Factory branches and dealers in all principal cities for service and parts.

Mack
TRUCKS
FOR EVERY PURPOSE

PERFORMANCE COUNTS!

ELECTRICAL SUPPLIES *for* JOBBERS–CONTRACTORS–INDUSTRY



General Electric, Westinghouse, Cutler-Hammer, Ward Leonard and other makes, built to both commercial and Navy specifications. 115 and 230 volt DC; 220 and 440 volt AC; 60 cycle, 3 phase. Drip-proof, water-proof, manual and magnetic types. Unused and used.

ATTACHMENT PLUGS
Composition and rubber in a variety of grips. Fine quality.

CONNECTOR BODIES
Bakelite and composition, parallel slots, "T" slots, rugged construction.

KNIFE SWITCHES
Fuse, non-fuse—2 and 3 pole—single and double throw.

CONDUIT FITTINGS
All types, for all purposes.

The electrical supply items shown here are but a fraction of the total surplus inventory. Use the coupon to indicate other items in which you are interested.

A huge inventory of government surplus electrical supplies is now available to dealers, jobbers, contractors and industrial users. Many scarce items are included in this sale—items which continue to be in short supply and are now offered at prices well below today's market for similar products.

***Act Now*—secure needed supplies and build up depleted stocks. Simply fill in the attached coupon and mail to your nearest War Assets Administration Regional Office.**

Send this coupon to your nearest WAA Regional Office:

I am interested in the following:

ITEMS	*DESCRIPTION*
.....	.....
.....	.....
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Name .....

Firm .....

Address .....

City ..... State .....

691-3

All electrical supplies are subject to priorities. VETERANS OF WORLD WAR II are invited to be certified at the War Assets Administration Certifying Office serving their area and then to purchase the material offered herein.

EXPORTERS: The War Assets Administration solicits your inquiries. Communicate with your foreign clients promptly.

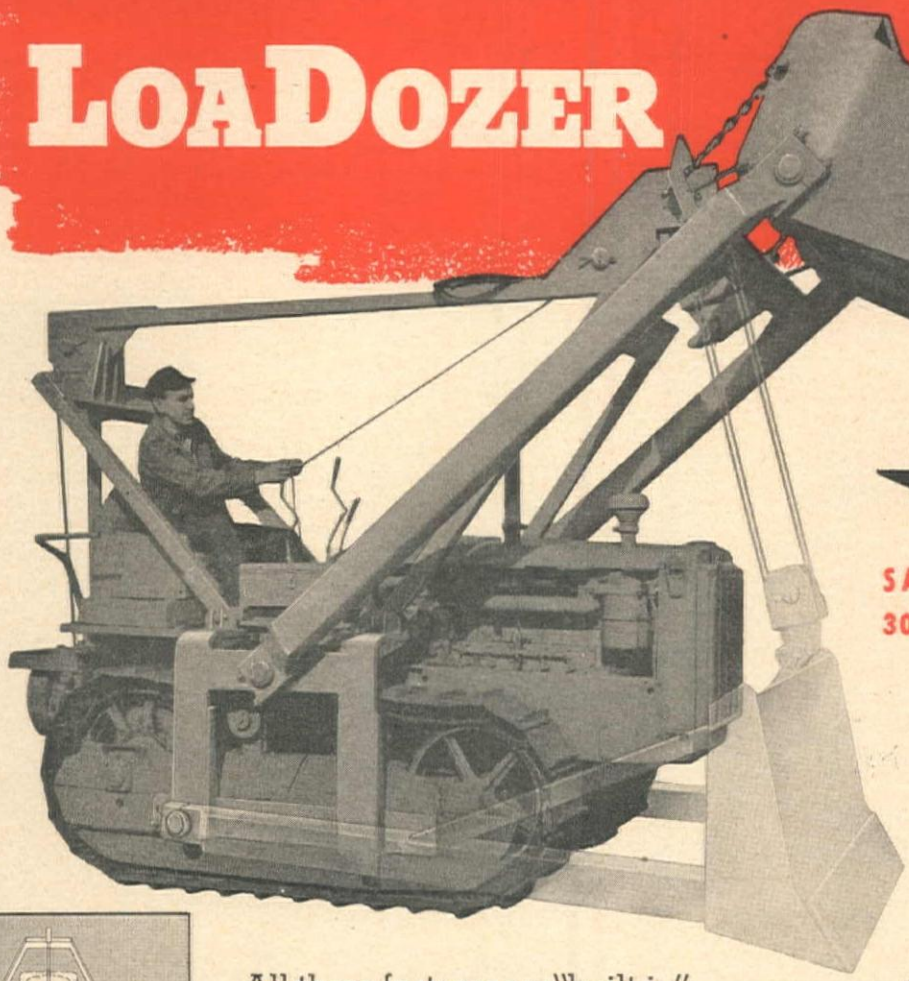
WAR ASSETS ADMINISTRATION

GOVERNMENT OWNED SURPLUS

Offices located at: Atlanta • Birmingham • Boston • Charlotte • Chicago • Cincinnati • Cleveland • Dallas • Denver • Detroit • Fort Worth • Helena • Houston • Jacksonville • Kansas City, Mo. • Little Rock • Los Angeles • Louisville • Minneapolis • Nashville • New Orleans • New York • Omaha • Philadelphia • Portland, Ore. • Richmond • St. Louis • Salt Lake City • San Antonio • San Francisco • Seattle • Spokane • Tulsa

691-3

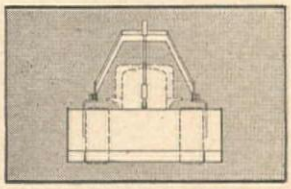
NOW-THE SOUTHWEST LOADOZER

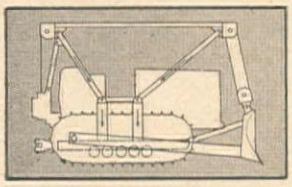


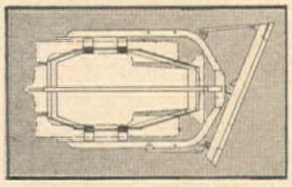
All this

SAVES ONE TRACTOR
30 MINUTE CHANGE-OVER
EASY OPERATION

Balance
Economy
Ruggedness
Speed
Versatility







"Over Center Track Mounted" design gives perfect balance

ANOTHER EXAMPLE OF *Southwest's* LEADERSHIP

All these features are "built-in" qualities of the new SOUTHWEST "LOADOZER"—Extra values that mean greater efficiency and economy in Loader and Bulldozer operations. Remember—you SAVE ONE TRACTOR—it takes only 30 MINUTES TO CHANGE OVER this combination Loader-Bulldozer unit.

- Built for all four makes of track type tractors.
- See your equipment dealer about the complete line of SOUTHWEST CONSTRUCTION EQUIPMENT.
- For complete specifications on this Loader-Bulldozer combination unit—WRITE FOR BULLETIN CM-11.

CONSTRUCTION MACHINERY DIVISION

Southwest Welding & Manufacturing Co.

ALHAMBRA, CALIFORNIA

SCOOPS BULLDOZERS CRANES WINCHES DUMP WAGONS RIPPERS TAMPERS SCRAPERS

300,000 Gallons More!

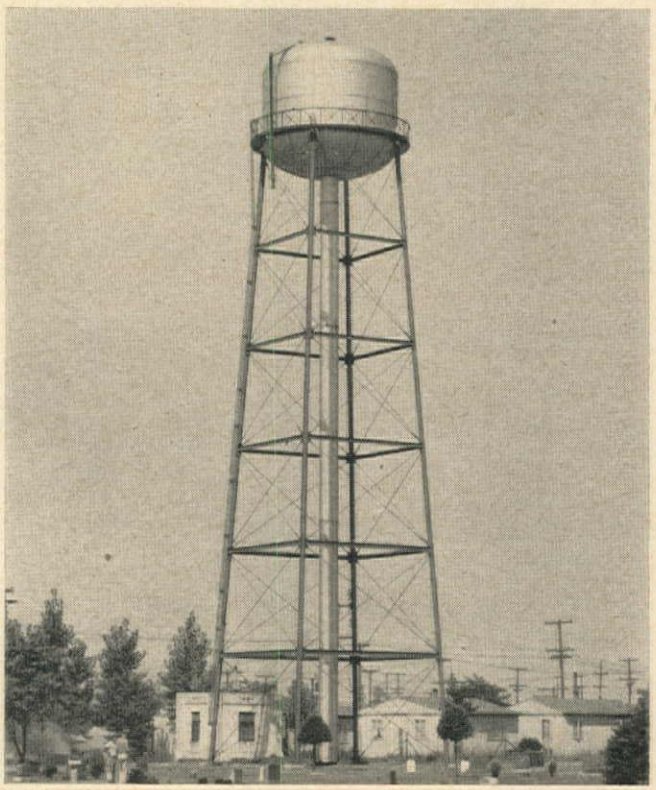
The Horton elevated tank shown above holds 250,000 gals. and is 76 ft. 2 in. to bottom. The one at the right holds 50,000 gals. and is 94 ft. 6 in. to bottom. There are two other elevated water tanks with a total capacity of 300,000 gals. and 5,100,000 gals. of storage capacity in reservoirs in the Vancouver water system.

Two Horton elevated water tanks increase capacity to 600,000 gallons in the Vancouver distribution system

WHEN A MUNICIPALITY has once experienced the benefits gravity water pressure provides, chances are it will turn to elevated tanks when additional water storage facilities are needed in its water supply system. The Vancouver, Washington, distribution system now has four elevated tanks.

Water is taken from wells and springs and is pumped into the tanks with 2,000 gpm turbine pumps. There are 105 mi. of 2-in. to 18-in. distribution mains and 5 mi. of transmission mains in the system. The average daily consumption is 7,000,000 gals. with 6870 domestic meters and 684 commercial users. Pressure at the pumping plant is approximately 45 lbs. per sq. in.

Elevated storage and gravity water pressure provides for pumping during off-peak periods which generally lowers pumping costs and adds life to pumping equipment. It also provides for a reserve of water immediately available for fire protection. We design, fabricate and erect Horton elevated water tanks in standard sizes and in special designs to meet requirements. Write our nearest office for estimating figures.



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WESTERN CONSTRUCTION NEWS
WITH WHICH IS CONSOLIDATED WESTERN HIGHWAYS BUILDER
November, 1946 Vol. 21, No. 11

Krug's Cat Out of the Bag

ON THE FIFTEENTH of October, 1946, just three days after the close of the annual convention of the National Reclamation Association in Omaha, Secretary of Interior J. A. Krug showed his true colors, and deliberately repudiated the "weasel worded" statement he made before the Senate Committee on Public Lands and Survey, when they were examining him prior to his confirmation as Secretary, by confirming at a press conference his statement made at Seattle, that he favored a Columbia Valley Authority, and would recommend legislation in Congress to create it.

The National Reclamation Association composed of practical irrigation farmers, many of them from the Columbia and Missouri basins, had come to place considerable confidence in Krug, and counted on his support of their strongly-worded and unanimously-adopted resolution against such Authorities. Obviously their confidence was misplaced.

At the time of his examination he tried (and successfully) to lull to sleep the opponents of the Authority proposition, by saying "I certainly do not think that the Authority is the soundest way to develop every section of the country."

In Seattle, speaking in behalf of the candidacy of his leftist comrade, Sen. Hugh Mitchell, he stated, "The idea of that bill (Mitchell's CVA bill) is sound, the principles are right, the objective is not only desirable, but—in my opinion—essential to the rapid development of this region. I wish to endorse the idea, principles and objective."

Arnold Kruckman, Western Construction News Washington observer, in his letter on page 113, written just before the recent election, predicts that as soon as Nov. 5 is past, Krug will attempt to back out of the Authority position he has assumed, but whether he does or not, thinking Westerners can no longer have any confidence in his actions as Secretary. It will probably be possible for him to find some loophole in what appears to be an unequivocal statement, through which he will attempt to drag the credulity of Americans.

But loophole or not, he cannot again be regarded seriously. Every statement he makes in the future on whatever side of whatever question, will be subject to suspicion. By indorsing the Authority idea he has indorsed what Comrade Stalin laughingly referred to a few days ago (in connection with Germany) as "Democratization" of the people.

Certainly government of the people of a given area not by officials of their own selection, but by a board of three persons (which means control by one) who may be utterly unacquainted with the problems, people, products, geography, or ideals of the region, is that same kind of "democratization." That the activities of these governors, and their spending of the people's money is utterly uncontrolled, is uncontrolled by Congress, the States, the people, or anyone else, is certainly that sort of "democratization." To disregard and discard the fine surveys and studies, the well-laid plans, and the cooperative agreements of the existing engineering agencies which are making such splendid progress in developing the Valley, and to set up an entirely new engineering organization to start from scratch, is a close relative of "democratization" as practiced in the Russian-occupied slave nations. To regard the people of an area as so ignorant and retarded that they cannot think for themselves, but must have their lives planned by bureaucratic theorists, must be told what they may produce, how much land they may own, whether or not they may have electric power, where they may build their homes, is clearly Russian "democratization."

Krug, in his examination last March, further said, "I feel strongly that the TVA was a sound way to develop the TVA area." The editors of Western Construction News cannot agree that the TVA is a sound way to develop **any** area, but we confess it was more nearly justified in the Tennessee Valley than anywhere else in the United States, that being an area of "eroded land and eroded lives," as described by Marshall N. Dana of the Oregon Journal at the National Reclamation Association meeting (page 98, this issue). We feel sure that the citizens of the free, open, progressive Columbia Basin are flattered when a federal bureaucrat from the East, traveling at government expense to make a purely political speech within their boundaries, classes them with the ragged, discouraged, distressed tenant farmers of the Tennessee Valley.

Someone ought to tell Mr. Krug that in America we do not need "democratization" by the sword and the OGPU; someone ought to tell Mr. Krug that the great Western valleys, and particularly the Columbia Basin, have developed into some of the richest, happiest, and most productive areas of the nation **without** Marxist "democratization." Someone ought to tell Mr. Krug that "weasel-worded" statements, even though they may have been practiced liberally by some of the most exalted of his patron saints, still do not become an American government official, or inspire confidence in him among the people of the country; someone ought to tell Mr. Krug that the position of Secretary of the Interior is vacant again.

Highway Safety Battle

A MINE DISASTER and the nation clamors for more mining safeguards. A plane crash or a railroad wreck calls for searching investigations. The public looks with horror on a restaurant, hotel or theatre fire and demands that something drastic be done about it. Yet these men and women who lament calamities in the news are often only casually interested in a far greater menace to public safety.

Highway traffic accidents kill and maim tens of thousands each year, and cost many millions in damages, lost time, doctor bills, hospitalization, insurance and such items. The figures on this death toll are appalling, but the average citizen refuses to be shocked by them as he is by a dozen miners trapped in a shaft. "What can I do about it?" he'll say if you mention it.

There are several things he can do. Drive carefully at all times is one. Observe all traffic rules is another. But there is a third vital element in the famous safety combination of Education—Enforcement—Engineering. By insisting, the public can obtain safety design in road construction, and this can be the most important of all.

According to Charles M. Upham, engineer-director of the American Road Builders' Association, engineers have demonstrated that by separating traffic streams; providing at least two broad traffic lanes in each direction; eliminating all highway and railroad crossings; providing firm wide shoulders excluding pedestrians; introducing specially designed access and exit facilities; utilization of the "freeway and parkway principle," and adequate design standards to take care of present speeds and allow for increases in the future, a 76 per cent reduction of traffic accidents is possible.

Thus, the engineer, by removing highway defects that contribute to accidents, more than offsets the peril of the careless drunk or reckless motorist and the car that's fated for a smash-up. The same safety principles and designs should be a "must" for every new road that is built. The public should see that this is done.

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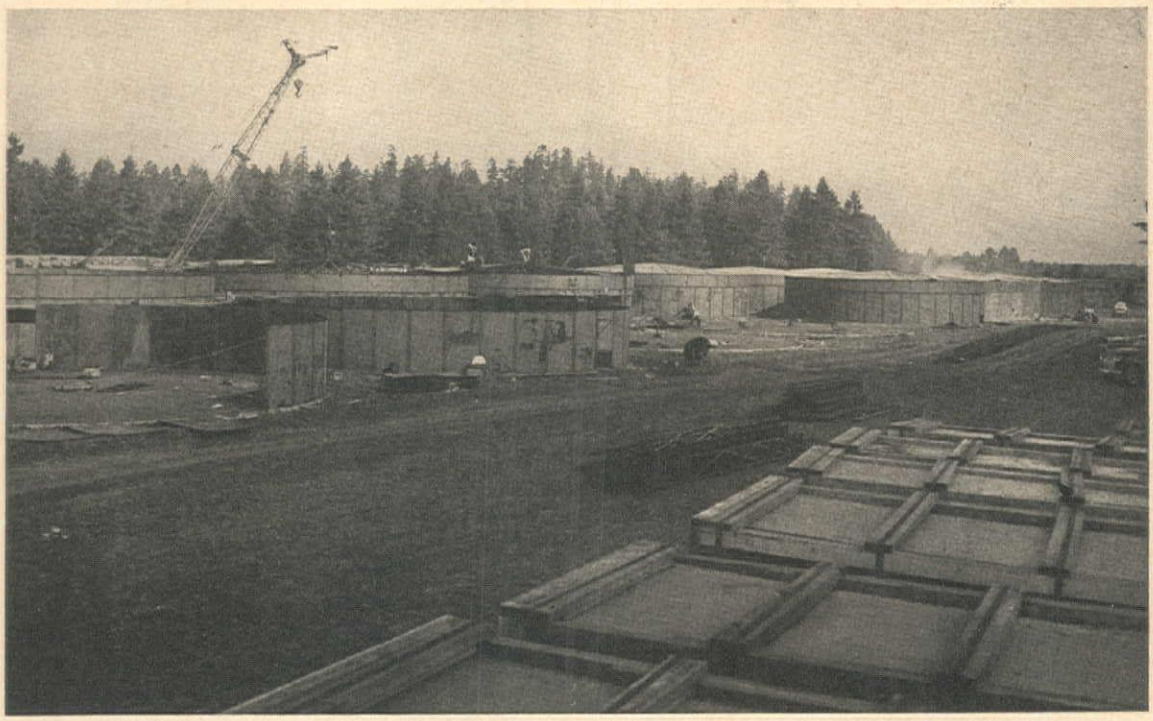


MATERIEL STORAGE tanks in various stages of erection at the Mt. Rainier Ordnance Depot, Tacoma, Washington. At right, steel wall sections in bundles as they are received from war surplus. At left, the first wall sections are being set on poured concrete bases, while near the center of the picture, roofs are being built, and in the background, completed tanks are seen.

Oil Tanks to Store Ordnance

Surplus fuel tanks being erected at eight sites to test storage of Ordnance materiel under controlled atmospheric conditions—Original steel bottoms of tanks being replaced by concrete with special damp-proof seal, and special dehumidifying equipment provided for each tank

FUEL OIL STORAGE tanks from surplus overseas supplies are being erected at eight Army Ordnance Depots throughout the United States, of which four are in the West, as experimental storage units for Ordnance materiel. When completed the projects will closely resemble any tank farm unit, a familiar sight in the vicinity of any oil refinery. Of the three principal differences between the ordnance materiel storage tanks and the ordinary oil storage tanks, only one, the decreased height, will be noticeable after completion. In addition to this the tanks will also have concrete bases with special damp proofing treatment in place of the customary steel floor, and the tanks' contents are placed inside prior to completion of the erection procedure.

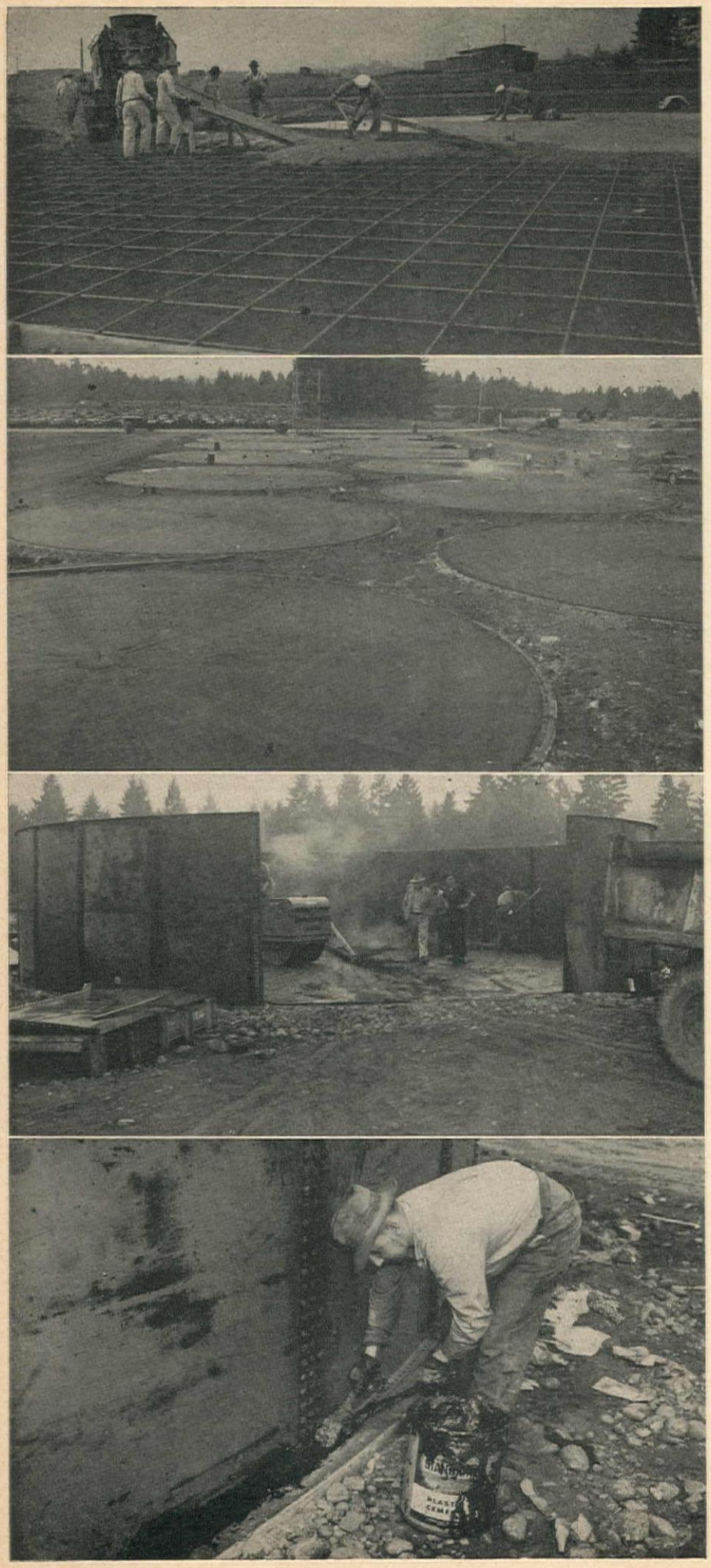
Of the eight installations of this type being made, four are in the West. Pictures and text for this article come from the project at the Mt. Rainier Ordnance Depot, near Tacoma, Wash. Other Western installations are being made at the Sierra Ordnance Depot, Herlong, Calif., Tooele Ordnance Depot, Tooele, Utah, and the Red River Arsenal, Texarkana, Tex. All of the projects are of an experimental nature involving the storage of ordnance vehicles in sealed containers for preservation under controlled atmospheric conditions.

Steel from surplus supplies

The tanks being erected on these projects were originally intended for bulk fuel storage at overseas stations. Those being erected at the Mt. Rainier Ordnance Depot were designed for capacities of 10,000 bbl. and 5,000 bbl. The larger size, of which eighteen are being erected, have a diameter of 55 ft., and the smaller size, of which fifteen are being erected, have a diameter of 38 ft. Both sizes were identical in structure, being comprised originally of three rings of 8-ft. steel plate to make a total height of 24 ft. The 8-ft. steel plate sections come in widths of 4-ft., being joined by a triple line of bolts. For the purpose of vehicle storage, the structures were altered to decrease the height to 11 ft. from base to roof by using only a single ring of the 8-ft. plates and making up a special ring of 3-ft. plates to be placed as the top section.

This change resulted in decreases in cubic content to about a half of the original. The larger tanks, originally designed for 57,000 cu. ft., now have about 26,000 cu. ft., and the smaller, originally designed for 28,500 cu. ft., have about 13,000 cu. ft. as erected.

The thirty-three tanks at Mt. Rainier Ordnance Depot have been laid out in staggered parallel rows at the east end of the depot in an area served by a rail spur. The steel bottoms originally intended for use with the tanks have been eliminated and replaced by concrete bases. In selecting the site, attention was given to drainage since it will be imperative that the equipment stored within the tanks be completely dry. The site



chosen has excellent natural drainage and a gravelly soil. As a preliminary to construction of the bases, the site was graded on a slope of 2 per cent, which was considered adequate to permit run-off of rainwater.

Concrete base construction

The foundation slabs were laid directly on the graded foundation. Reinforcing in the slab consists of ½-in. rods on 18-in. centers, and slab thickness is 6 in. Finishing of the concrete surface is accomplished with a radial wooden float, one end of which is bolted at the center of the tank floor, permitting the float to be rotated over all of the slab area.

To provide a connection for the wall, a 1 by 4-in. groove was formed in the slab 4 in. inside the edge with anchor bolts placed at 3-ft. centers in the circumferential groove. After curing the concrete was given a prime coat of RC-3 followed by an application of asphaltic mastic compound. The mastic was struck off by a radial screed similar to the float used for the concrete, and then compacted to a final ½-in. thickness with a small power roller.

Erection of the 8 by 4-ft. steel plate wall sections was the next step in the tank erection. Because the tanks must be completely air tight, all joints were sealed with neoprene gaskets. When the 8-ft. sections were in place, the groove in the base was filled with a bituminous sealing material.

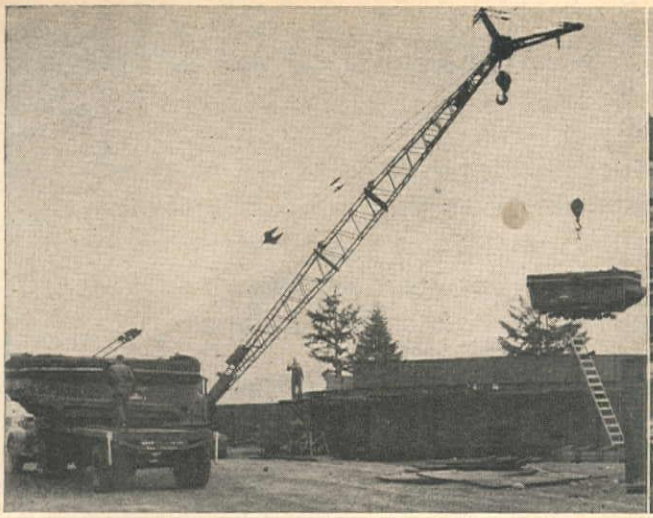
At this point in the erection, the vehicles intended for storage were loaded into the tanks. The vehicles had previously been processed by Army crews, and during the loading and remainder of the erection were covered by tarpaulins for protection. Following the loading of the vehicles, the 3-ft. wall sections were placed and the steel roof trusses and plates bolted into place.

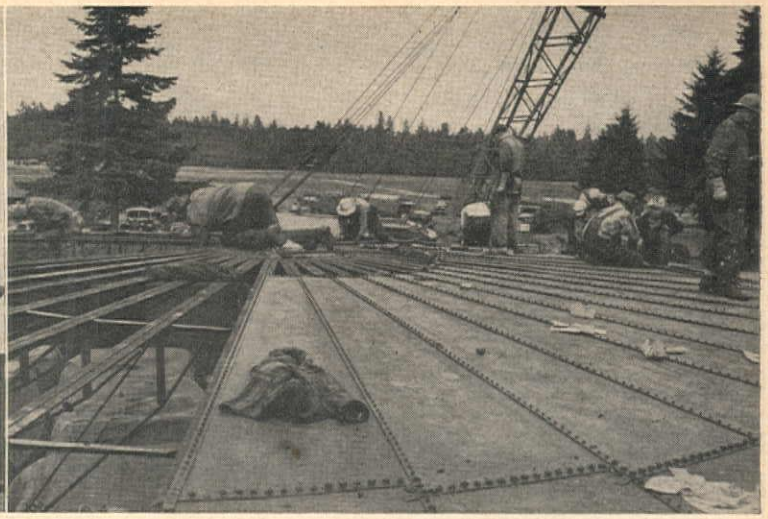
Dehumidifying equipment

An extension to the existing primary power line was required to service the area, primarily for operation of the dehumidifying equipment. Three 15-kva., 13200/240/280-volt transformers provide 3-phase power to two 500-cu. ft. per min. dehumidifiers. A single 25-kva., 13200/120/240-volt transformer provides single phase power to thirteen 20-cu. ft. per min. dehumidifiers, and to the area lighting service.

Ten of the larger tanks are connected in series to one of the 500-cfm. dehumidifiers, and ten of the smaller are connected in the same manner to the other. Each of the remaining tanks will be equipped with an individual 20-cfm. unit. The large units are to be set in separate shelters while the smaller units will be mounted on the tank sides. The large units, weighing 1,350 lb., are 6 ft. 2 in. long, 5 ft. 6 in. high, and 23 in. wide. The

ERECTION STEPS in construction of vehicle storage tanks at Mt. Rainier. Top, placing concrete for 6-in. floor slab; next, radial float finishing for floors; next, asphaltic mastic damp-proofing material is spread and rolled; bottom, bituminous sealing compound applied to base.





WEASELS BEING loaded over tank sides into place for long term experimental storage of processed vehicles, upper left. Tank roof is bolted to trusses and joints are sealed with neoprene gaskets to keep tanks air tight, upper right. Below, project engineer C. OSCAR NELSON and construction inspector D. W. McBETH check progress of tank construction.

smaller units, weighing only 34 lb., are 12¾ in. long by 14½ in. high.

Following completion of the erection work each tank is completely sealed. The outer surface of the tank is then cleaned of rust, oil, and dirt, and treated with a phosphoric metal conditioner. The conditioner is flushed off, and outside surfaces given one coat of rust-inhibiting enamel and one coat of aluminum paint to complete the work.

Organization

Supervision of the tank erection is under the Seattle District of the U. S. Engineer Department. Col. L. H. Hewitt is district engineer, and Lt. Col. R. E. Snetzer, operations officer for the district. C. Oscar Nelson, Fort Lewis project engineer supervised the construction

until Nov. 1 when he resigned from the district and was succeeded by Walter J. Murphy. Leonard G. Estey is supervising engineer for the district.

Contract work in the erection of the tanks is being done by Sam Bergesen, general contractor of Tacoma. Hugo Gronlund is job superintendent for the contractor with William LeTrace as steel foreman.

Three subcontractors are engaged under the general contractor. They are: Holaday and Edworthy, sheet metal; Electrical Contracting Co., electrical, and Antonsen Painting Co., exterior painting. All are of Tacoma.

Dehumidifying equipment is supplied by the Cargocaire Engineering Corp., New York City, and the Schape Manufacturing Co., Baltimore, Md.

Canada Railroad Development Awaits Peace River Resource Survey Result

ONLY HOPE of salvaging heavy Canadian government investments in the Pacific Great Eastern Railway Co. lies in the expansion of that line to the Peace River country, Premier John Hart of British Columbia told members of the Vancouver Board of Trade in a recent address. He stated that the government was determined that the railway would be extended into the Peace River area so that it could secure tonnage necessary for profitable operation. He said no final decision on the route of the extension from its present terminus at Quesnel to Dawson Creek, in the heart of the Peace River area, would be reached until two government surveys were correlated. One of the surveys concerns the most suitable grades for the proposed extension and the other concerns the natural resources of the Peace River territory.

The Premier definitely said the government would not extend the railway 80 mi. from Quesnel to Prince George until such time as the further extension to the Peace River territory was undertaken. He said the government had given a franchise to the P.G.E. to transport freight and passengers by road over the new $6,000,000 highway from Prince George to Dawson Creek because it would be incongruous to construct a highway with public funds and then allow private interests to use it to compete with a railway owned and operated by the public. He said that as soon as the highway was completed the P.G.E. would establish a passenger and freight system.

The Premier stated the indebtedness of the P.G.E. to the government, including construction advances and compound interest, to be $121,000,000. Experts estimate it will cost $20,000,000 to extend the railway as far as Hudson Hope, Hart said. Extension of the road to Dawson Creek, including $18,000,000 for equipment, would amount to $50,000,000, he added.

Before carrying out an undertaking involving an expenditure of 50 million dollars the government deemed it wise to spend $250,000 or more if necessary in estimating the resources of the Peace River and in locating the best railway route, the Premier said.

Grand Coulee Contract Case Review Is Refused

MASON - WALSH - ATKINSON - KIER CO., the joint venture organization which undertook the first major construction contract for Grand Coulee dam in eastern Washington, was refused a review of its case for an additional claim of $5,000,000 against the United States by the U. S. Supreme Court. The company, which received about $40,000,000 for the construction of the first lift of Grand Coulee dam, stated in its petition that it had waited more than seventeen months for the Secretary of the Interior (then Harold L. Ickes) to make a decision on the claims before filing suit with the U. S. Court of Claims in May, 1939. The Court of Claims ruled that the contractor must secure a firm decision from the secretary before bringing suit, and the action of the Supreme Court confirms this ruling.

Salt Lake Streets Remodeled

Streets resurfaced and marked—13 mi. of street car tracks and obsolete loading zones removed—new type stop lights installed and pedestrian cross walks improved, with emphasis placed on safety, in fast-moving modernization program

SALT LAKE CITY has joined the ranks of those Western cities initiating improvement programs. It has resulted in the modernization of city streets, with an emphasis on safety and beauty features.

Designed to adequately handle maximum traffic loads in Utah's capitol city, the task was achieved by use of modern engineering, construction and surfacing methods, combined through the cooperation of public utility, state and city officials and local contracting firms.

In a sweeping, fast moving modernization program, street car tracks and trolleys have been removed, dangerous center of the street loading zones have been eliminated, specially constructed curb loading zones have been installed, and the streets of the entire downtown area have been completely resurfaced with natural rock asphalt.

Gibbons & Reed Co., Salt Lake City contracting firm which removed the tracks and old loading zones and constructed the new curb loading zones, completed the job far ahead of schedule and won commendation from the public, city officials, and from officials of Salt Lake City Lines, Inc., which awarded the contract.

Street cars removed

Elimination from service of Salt Lake City's last street car line in August, 1945, was the signal for preliminary steps which led to this summer's street rehabilitation program. As soon as the street car line was abandoned at the end of the war, with buses being substituted, crews of Salt Lake City Lines removed the overhead trolleys, and plans were made for removal of all tracks, many of which remained in various parts of the city, especially the downtown area, even though street car lines had previously been abandoned.

In all, approximately 13 mi. of street car tracks were removed and the streets repaved between May 27 and August 17, with the bulk of the work credited to Gibbons & Reed.

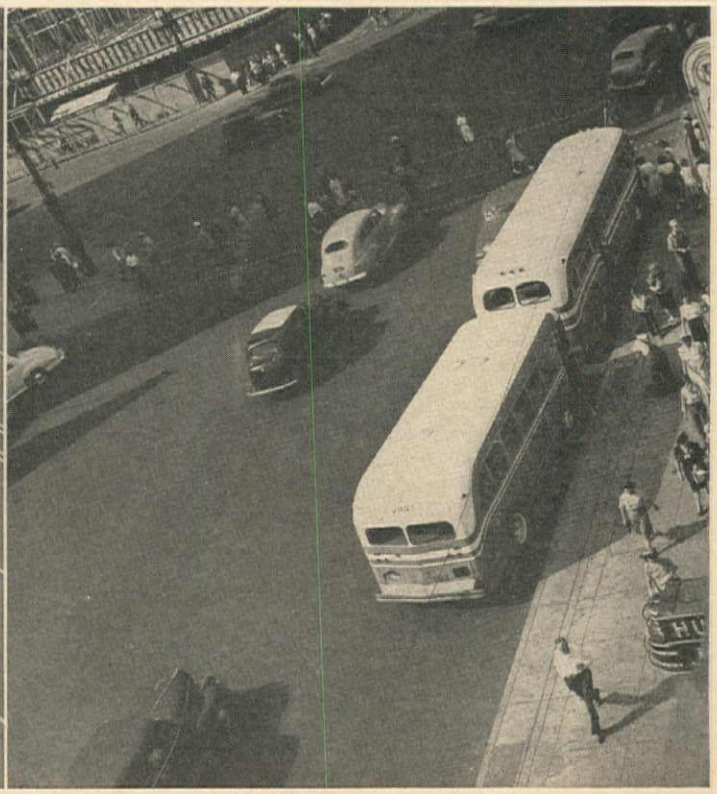
In removing the rails, Gibbons & Reed utilized a tractor to pull a one-tooth rooter which served as a gouger to loosen pavement adjacent to the tracks. Working a block at a time, the rooter made eight passes to gouge up the four rails in the street. After this operation the rooter was disconnected and a hoist was hooked on the rear end of the tractor. Grapsed in tongs, the rail sections, which had been cut into 30-ft. lengths, were lifted up and hauled away on trucks.

Debris resulting from the operation was loaded into the trucks and hauled away with the rails. Grooves left by removal of the rails were filled in with asphalt to the height of the concrete and covered with a leveling course of asphalt mixture.

Specifications for the track removal and construction job were drawn by the Salt Lake City engineer's office. Plans called for the complete removal of the rails when they were set in a gravel base. When the rails were set and tied in concrete, the contractors were required only to cut off the rail at its ball, then to cover the rails with a 2-in. sealcoat.

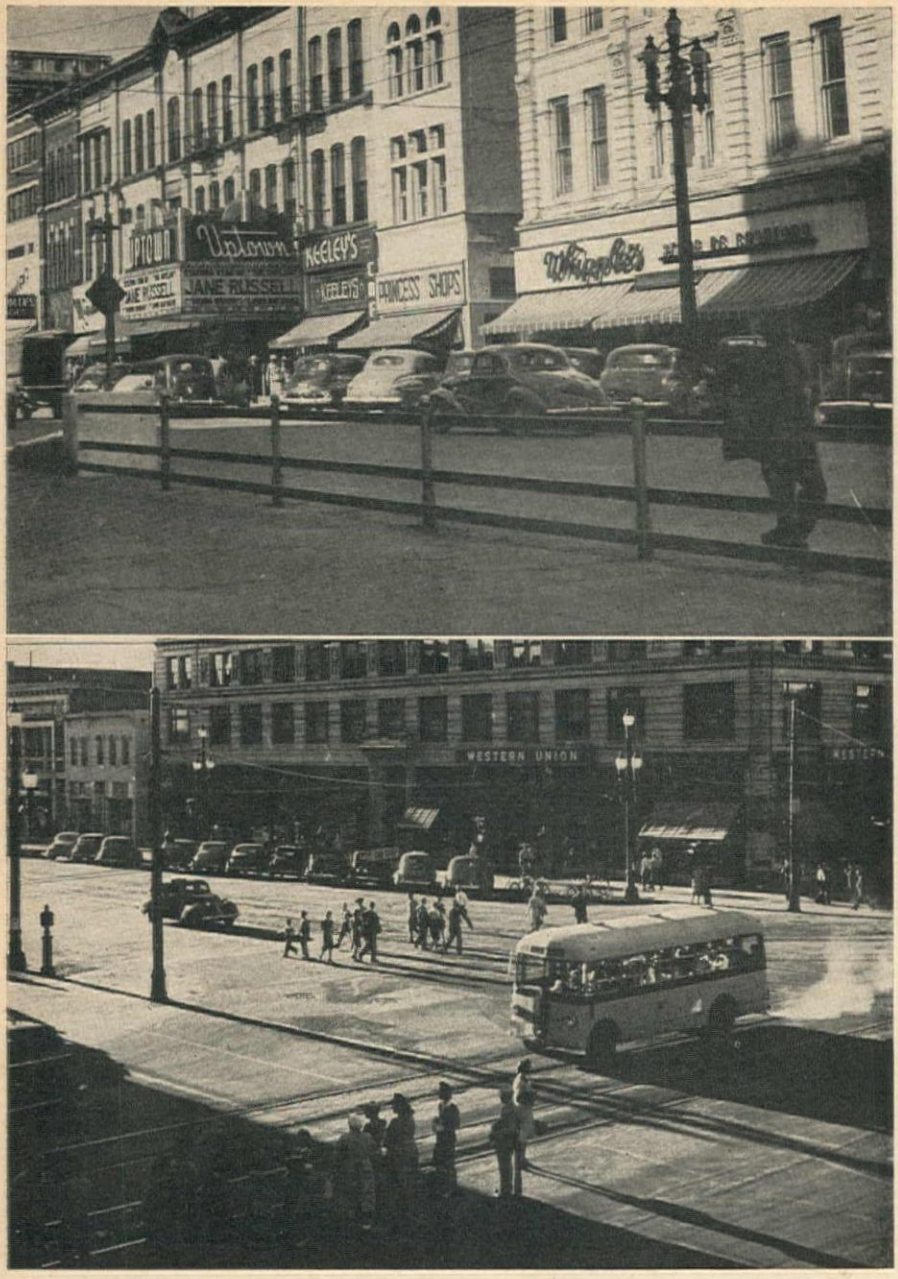
Salt Lake's Main Street offered a slight additional problem in the track removal project because cement blocks 4 in. thick, 16 in. wide and 3 ft. long had been laid along the rails during a rebuilding program several years ago. These concrete blocks were gouged out with the gouger and removed by a power shovel.

In all, the contractor used 125 men on the job, working 8-hr. shifts. The traffic division of the Salt Lake Police Department allowed erection of barricades



SOUTH TEMPLE Street (left) after completion of resurfacing and installation of pedestrian neutral zone. Right, view of a downtown intersection after removal of tracks and installation of pedestrian walks.

SEQUENCES in construction of Salt Lake City Streets; top left, Tractor pulling rooter which dug up the city's imbedded street car tracks; right, top wearing coat of rock asphalt being applied on Second South street; center, left, cutting rails into lengths which can be loaded into trucks and hauled away; right, tractor equipped with scoop cleans debris from new surface; bottom left, burner being operated over newly laid top wearing coat of rock asphalt to speed up drying of new surface; right, mobile street painter laning the new streets.



IRON FENCES (top) now removed, were a typical hazard of midstreet loading zones; (bottom) car tracks in place and passengers waiting in the center of the street.

wherever needed as a safety measure and provided extra men to handle traffic and divert it past the points of heaviest construction activity.

As a safety precaution, Main Street was blocked off a block at a time to ordinary vehicles while the rails were being removed. However, buses and emergency vehicles were permitted to use the streets at all times during the operation.

Loading zones

Two additional operations on downtown streets and intersections were handled by Gibbons & Reed under contract with the utility company. These consisted of (1) taking out the midstreet raised concrete loading zones, and (2) building new bus-loading curb extensions from city sidewalks which extend along the sidewalks from each corner to distances ranging from 51 to 146 ft. The sidewalk extensions, of which seventeen were built, are so constructed as to allow passage of gutter water under the loading zone area. The main reason for construction of the loading zones, which extend about 3 ft. into the street beyond the curb line, was to facilitate the movement of the buses and to eliminate the deep, dangerous step from the curb over the gutter to the bus door.

Elimination of the heavy concrete and steel street-center loading zones removed a major traffic hazard from Salt Lake's wide downtown streets. Many cars had been damaged, and several drivers injured when they had sideswiped or ran head-on into the heavy concrete ramp. In addition, many pedestrians attempting to reach the center loading zones had been struck by cars. The new curb loading system eliminates that hazard.

Resurfacing and marking

After all tracks and loading zones had been removed, the streets of the entire downtown area were planed and burned, and then resurfaced with rock asphalt. Top wearing coat of the street repaving operation was put on by the Rock Asphalt Company of Utah, using its own rock asphalt produced at the company's plant near Sunnyside, Carbon County, Utah. Twenty-six of Salt Lake's large blocks were resurfaced with a 2-in. layer of rock asphalt under the city-utility company contract, while an additional 28 blocks were resurfaced through a contract let by the Utah State Road Commission, which has under its jurisdiction most of the arterial roads in Salt Lake City.

The resurfacing was accomplished with an Adnun Black-Top Paver, and other standard equipment. One block was resurfaced each day, with the street being closed until the asphalt had been laid and rolled to specified hardness before any traffic was allowed on it.

Manholes were not raised to bring them up to the level of the new surfacing, owing to the extremely high bids offered for the necessary brickwork. Whenever either municipal or public utilities have been required to enter manholes since the resurfacing was completed, it has been necessary to locate the manhole by surveys or reference points, and then remove the asphalt, either in a groove around the edge of the cover or over its entire surface. Adapter rings for raising the openings were not available in the Salt Lake City market.

Pedestrian zones

Keeping pace with the construction program for the city's modernized streets, the Salt Lake Police Department, under the direction of Sgt. F. Clark Sanford, commanding traffic, is currently engaged in a scientific zone marking program on the resurfaced streets.

Already under way, the program has seen the installation of broken lines of white blocks, 6 in. long and 3 in. wide, to outline the pedestrian cross-walks of the city. A product of the Armstrong Cork Co., these blocks have great durability.

The blocks are but ⅛ of an inch thick, but when placed on top of the road bed while still hot and allowed to fully set, afford a pedestrian lane offering greater safety than the more common painted strips and are believed to have the added feature of outwearing a great many paint jobs.

The advisability of installing broken lines in pedestrian lanes instead of a continuous line has been shown beyond any doubt, according to Sgt. Sanford. To the night motorist, he declares the broken white line is much more noticeable; especially is this true in rainy weather.

In addition to the broken lined pedestrian lanes, a large block of about 2½ ft. x 10 in. is imbedded in the street on each end of the pedestrian lane and admonishes pedestrians to "WAIT FOR LIGHT." According to the city traffic department official, the tendency for pedestrians to "fudge," to creep further and further onto the street and away from the sidewalk in anticipation of the change of light, has been noticeably reduced.

Street width problem

Biggest problem in the safety zone marking program has been the question of what to do about the hazard created by the great width of some of the city streets. The unusual width of Salt Lake City streets, while unquestionably lending added beauty to the city, also adds danger to the pedestrian in his effort to travel from one sidewalk to the other during the brief time between changes of the traffic signal.

To counteract this hazardous situation, the traffic division of the Salt Lake City Police Department is currently installing painted 4-ft. neutral zones in the center of streets greater than 60 ft. in width. This neutral zone is designed to provide pedestrians with a "stop-over" between lights. It enables the pedestrian to make the width of the street in two jumps instead of one.

Directing the street modernization program for Salt Lake City has been W. D. Beers, city engineer, and Glen L. Stanley, general manager of Salt Lake City Lines, Inc.

For the contractors, J. P. Gibbons, general manager of Gibbons & Reed Co., had overall supervision, with L. W. Hanson superintendent in the field. Ed M. Shea was office manager. For Rock Asphalt Co. of Utah, Henry H. Jones, general manager of the company, was in charge of all the mining and spreading operations.

California Water Works Men Meet

First postwar conference best attended in many years — Wide variety of important papers feature "Share the Information" program — Relation of utilities to expanding freeway system arouses greatest interest and discussion at meeting

THE FIRST FULL-SCALE postwar conference of the California Section of the American Water Works Association was held in San Francisco Oct. 22-25, with a registration of over 750 delegates and their ladies.

On the opening day, a golf tournament was held, in which 44 men participated, H. C. Medbery, of San Francisco, being the winner. At the same time, an interesting exhibition of the limited supply of materials and equipment now available was opened by various manufacturers in the water works field.

Other social activities included the Purification dinner on the evening of the 23rd, the business dinner on the 24th, and a dinner dance on the last evening, sponsored by the Water Works Manufacturers Association. In addition, some special activities were arranged for the lady guests of the convention.

At the opening sessions, President Carl M. Hoskinson presided, and three interesting papers were presented, one of which produced more discussion than anything else on the program. These papers were: "Water Development Plans in California," by Edward Hyatt, State Engineer; "Effect of Owens Lake Litigation on Water Appropriation in California," by C. T. Waldo, Deputy City Attorney, Los Angeles; and "State Highway Expansion and Its Effect on Public Utilities," by Fred J. Grumm, Assistant State Highway Engineer.

Grumm's paper produced the most discussion at the round table held on the last day of the meeting, and from this discussion was born a resolution urging the Legislature to amend the state freeway law, so as to permit the State to pay for any relocation of utilities made necessary by the construction of limited access highways. Such authority is lacking in the present law and all changes must be paid for by the owner of the utilities.

On the 24th, parallel sessions were held in the morning and a combined session in the afternoon by the Purification and the Plant Management and Operation Division. The Purification session heard addresses on pertinent subjects by Carl Wilson, Los Angeles; Dr. I. Pearlman, University of California, Berkeley; Loren C. Blakeley, Santa Ana, and Henry C. Myers, California Water & Telephone Co., Palm City.

The M. & O. session had talks by H. P. Wenrick, Palo Alto; T. V. Ackerman, Pasadena Water Department; and Byron C. Doll, Deputy City Engineer, Huntington Park.

At the joint session, N. J. Kendall, California Water Service Co., San Jose, described the most satisfactory methods of waterproofing concrete; Blair I. Burnson, Eastbay Municipal Utility District, Oakland, discussed reclaiming wash water from a rapid sand filter; W. R. Schneider, Pacific Gas & Electric Co., San Francisco, told of methods of electric protection of pipes; and E. W. Barbee, San Francisco Water Department, related tuberculation and corrosion.

At the business dinner on the 24th, Robert C. Kennedy, Eastbay Municipal Utility District, was elected chairman for the next year, Arthur Price, Los Angeles, was elected vice-chairman, and Ray L. Derby, Los Angeles, was again named secretary-treasurer. Wendell R. La Due, national president of AWWA, delivered the principal address, on "Public Relations."

J. R. Rossum, San Jose, was named chairman of the Purification Division, and H. F. Jerauld, Pasadena, acting chairman last year, was elected chairman of the M. & O. Division.

The final day of general sessions heard morning speeches by Oscar G. Goldman, San Francisco Water Department, on "Detection of Water Leaks in Pipe Systems" and J. E. Flaa and W. C. Renshaw, of the same department, on "Fee Title vs. Easement for Rights-of-Way." These papers were especially well received and elicited much interest and discussion. Other speeches were by G. L. Williams, on "Testing of Water Meters," and H. A. Knudsen, Eastbay District, on "Booster Pumping."

In the afternoon, W. J. Ritzel, Pasadena Water Department, told of "Water Works Tools and Their Care," and Dean M. Van Norman, Los Angeles, spoke of "Power Tools and Their Care." Also C. G. Ekstrom, Yuma, Ariz., explained the Yuma Water Supply from the Colorado River. The final programmed event was the round table discussion under the direction of Lauren Grayson of Riverside, and this proved to be one of the most valuable parts of the whole convention.

The manufacturers' big dinner dance, with over 800 in attendance, was the final event of the conference.

Equipment Manufacturers Win New Price Increase

MANUFACTURERS of construction and road maintenance machinery and equipment have been given a price increase factor of 13.5 per cent over base date prices by the Office of Price Administration, effective Sept. 17, 1946. The new price increase factor replaces an interim increase factor of 10 per cent granted on April 10, 1946, so that this action represents only an additional 3.5 per cent advance in ceiling prices.

The new increase factor is necessary to enable manufacturers to earn their 1936-39 ratio of profit to net worth and is based on a survey of 31 companies. Included in the survey were the operations in the last quarter of 1945 of both large and small companies with sales covering the entire country. These figures were raised to reflect labor and material cost increases since then and reduced to reflect savings in overtime pay and increased volume of production. Price increases for steel, castings, bearings, engines, power transmission equipment and other materials used by the industry have increased manufacturers' costs. In addition, data show that producers of 80 per cent of total production have given approved wage increases.

At the same time, OPA authorized resellers of this equipment, which includes cranes, loaders, road maintainers, graders, mixers, pavers and many similar products to pass on the manufacturers' price increases by increasing their prices the same percentage amounts as their costs are raised. The previous interim price increases were passed on in the same way. This pass-on is required by the Price Control Extension Act of 1946 which bans a reduction of resellers March 31, 1946, percentage margins.

Unique Flat Roof Designed for New Sewage Digester Tank at Soap Lake

By JAMES R. GRIFFITH
Structural Engineer,
Formerly with James W. Carey & Associates,
Seattle, Wash.

WHEN DESIGNING the sewage disposal plant for the town of Soap Lake, Wash., the limit of bonded indebtedness made first low cost a vital consideration. Instead of simply following a conventional design it therefore became necessary to save on every possible item where that saving could be done without affecting operating efficiency.

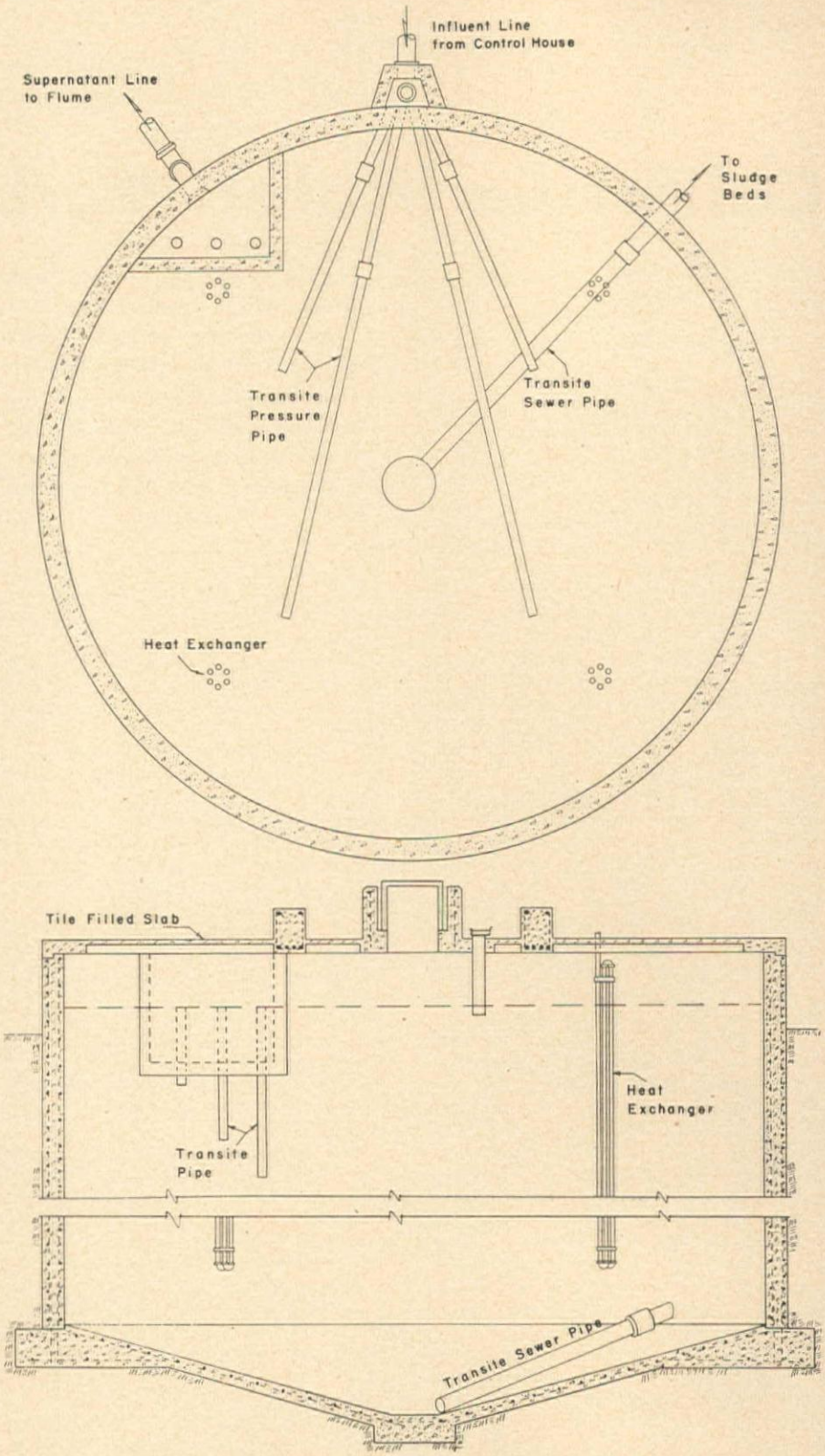
It is a recognized fact that temperature is an important factor in sludge digestion. Artificial means are therefore usually provided for maintaining the optimum temperature necessary for accelerated digestion. This is generally accomplished by use of hot water coils served by a boiler which is fired by sludge gases. The dome shaped roof appears, at least on the drawing board, as the ideal arrangement for collecting gases released by the digestion process.

While the concrete shell is economical as to the quantity of materials used, it is a poor insulator where low outside temperatures are experienced such as in eastern Washington. In order to prevent excessive heat losses an earth fill is frequently placed over the dome. Under such uniform symmetrical loading a dome is an ideal supporting structure since it may be designed for direct stress alone. The dome shaped digester roof would therefore at first appear to be an entirely logical development without considering construction costs.

Flat roof suggested

Regardless of the small quantity of steel and concrete utilized in the dome shaped roof, construction costs are relatively high. A level working platform must first be built capable of supporting the variable height shores and segmental dome forms on which will be placed the reinforcing steel and concrete. Under present difficulties of obtaining lumber of any kind this excessive use of form lumber becomes objectionable. In addition to the high forming costs, it is also difficult to vibrate the concrete in the shell satisfactorily. Under vibration the green concrete tends to creep outward and downward. Many a foreman has worked far into the night patching the dome so that it will pass inspection the next morning.

Harvey Smith, estimator and construction man for James W. Carey & Associates, Seattle engineering firm, suggested that designs be made for an economical flat roof for the Soap Lake digester in order to reduce construction costs. He had had enough construction experience with the dome type to be cognizant of their inherent complications. Actually a flat roof with no un-



PLAN and CROSS-SECTION of the Soap Lake, Wash., sewage digester tank, as designed to give maximum capacity at lowest cost. Flat roof, made of tile-filled concrete, has much lower construction cost than conventional domed roof, requires less material, and retains heat without necessity for earth blanket. Transite pipe was chosen for conveying sewage because of resistance to metal-corrosive acids in the sewage. Still another unique design development in the Soap Lake plant was the use of heat exchangers fabricated in the shop and capable of quick and easy removal through roof.

desirable projections is as practical for gas collection as the dome shaped roof. The idea is not new, and many have been so built.

Tile filled slab selected

The low winter temperatures experienced at Soap Lake precluded the use of a solid concrete slab unless insulated by an earth fill. The 26-ft. clear span, required by the digester, supporting both an earth fill and the possible snow load would result in design of an uneconomical solid slab. When a solid slab proved to be uneconomical, investigations turned to a joist and girder type of construction. Although unconventional as judged by standard sanitary engineering experience, the same logic was followed as used in building design.

Pan formed joists would give the required economy, but would not increase the insulating qualities over those of the solid concrete slab. Cost of the earth backfill was to be avoided, if possible. The logical result was a tile filled slab, a type common in eastern apartment and office building construction. In order to reduce the maximum joist span for shear, two concrete girders projecting above the slab, were provided.

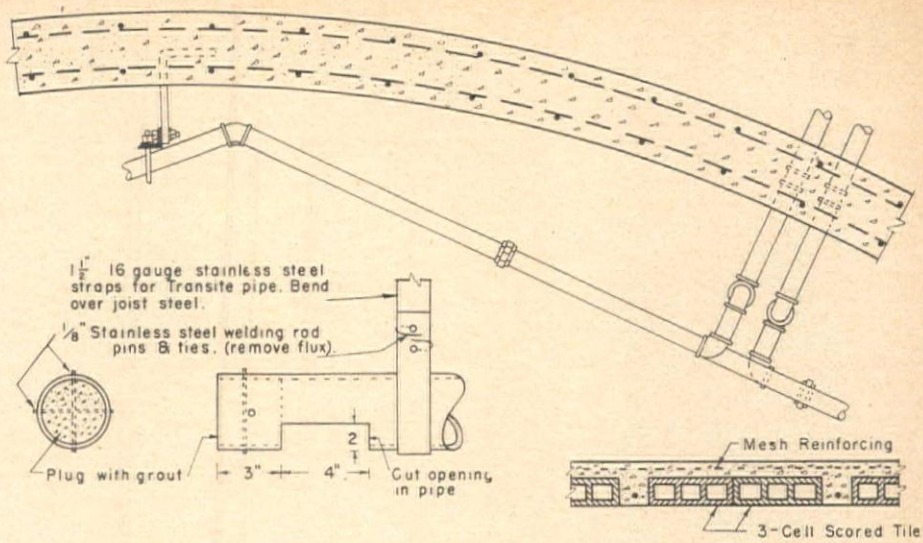
When the proposed roof slab design was first sketched, questioners wanted to know what would prevent the tiles from falling down into the digester when the forms were stripped. While scored tile was specified, actually the adherence of concrete to even smooth tile is remarkable. Those who have tried to clean bricks which have been laid up in cement mortar will verify that point. In construction, a level platform of shiplap is built to form the underside of the slab. This is fundamentally the working platform of the dome shaped roof. The tiles are laid directly on this platform without mortar. When the concrete is poured, the tile acts as an economical light weight filler to form the joists and slab. Thus, it derives its name as a tile filled slab. Likewise the tile and its dead air space increased the insulating properties to prevent excessive heat losses.

Asbestos cement pipe chosen

Fixed heating coils, attached to the inside walls of the digester, are objectionable from several standpoints. They are troublesome to fabricate and install, and deteriorate rapidly. A shutdown of the digester becomes necessary when repairs to the coil are made. Consequently, instead of the fixed coils, heat exchangers were designed which could be completely fabricated in the shop and inserted through the roof slab. When inspections or repairs are required, such units may be disconnected at the roof and lifted out by means of a tripod hoist.

Since metal deteriorates rapidly under the chemical action of sludge digestion, it was considered desirable to avoid the use of metal pipes which could not be removed without a shutdown. In the manufacture of Transite pipe, two inorganic materials are intimately mixed and built up in thin layers under pressure on a smooth steel mandrel. The high strength fibers of asbestos act as a reinforcing and bonding agent to the cement and the result is a tough homogeneous structure remarkably resistant to destructive agencies. The inert nature of cement asbestos in the Johns Manville Transite pipe made it a logical material for the influent and effluent lines.

In order to better break the scum layer which normally forms in the digester, the ends of the influent lines are to be plugged with cement grout, causing a downward discharge through an opening cut in the Transite pipe. The same pipe was also specified for the supernatant overflow lines.



PARTIAL PLAN (top) of typical fixed heating coil installation and difficulty which must be met to repair it. In Soap Lake tank, heat units are simply lifted through the roof. Lower right, tile-filled roof slab. Lower left, detail of influent line discharge.

Organization

The design of the entire project was carried out under the direction of Harrison Kramer, a member of the firm of James W. Carey & Associates. David Livingston, one of the younger engineers in the firm, was responsible for working out the miscellaneous details. The writer carried out the structural design. A contract for construction of the Soap Lake sewage treatment plant was recently awarded to Morrison-Knudsen Co., Inc., Boise, Ida., who submitted the low bid of $235,583.

Permanente Cement Opens Seattle Plant, Ups Production

THE PERMANENTE Cement Co., operators of the world's largest cement plant at Permanente, Calif., opened its new half-million dollar plant in Seattle, Wash. for operation on Oct. 25.

The modern Seattle division has a storage capacity of 80,000 bbl. and will provide additional cement for use in western Washington, Canada and Alaska. Situated on 11 ac. of Seattle waterfront property which was purchased in 1944, the plant is within easy access of main arterials and close to the industrial activity of South Seattle.

Costing more than $500,000, facilities include a dolphin pier, silos, storage facilities, a sacking plant, railroad spurs, truck loading accommodations and an office building. Kaiser Engineers, Inc., designed and supervised erection of the new plant, which was constructed by Kuney-Johnson Company of Seattle, general contractors.

Bulk cement will be pumped from ships into silos by a Fuller-Kinyon pneumatic pumping system. Located under the silos are tunnels used to house the pumping equipment and transfer cement from silo to bag packer bins or bulk loading bins.

The packhouse contains one four-tube packing machine and bagged cement will be transferred by belt conveyors to railroad cars or the storage warehouse.

Permanente Cement Company is owned by the following stockholders: General Construction Company of Seattle; Morrison-Knudsen Company, Inc.; Pacific Bridge Company; J. F. Shea Company, Inc.; Claralel Company; The Utah Construction Company; and The Kaiser Company.

The new division will be under the direction of E. H. Kendall, with offices at the Seattle location. Kendall joined Permanente Cement Company in 1943 and has been associated with the cement industry since 1933, when he was employed by Pacific Coast Aggregates Company during construction of the Golden Gate Bridge. He is a graduate of the University of Oregon.

Simultaneously with opening of the Seattle division, the company announced expansion of its facilities at Permanente to provide 2,000,000 more sacks of cement annually. This constitutes a 10 per cent increase in production at the plant, and the new facilities required will cost about $1,000,000.

Burner Rig Curbs Ditch Weeds

The Imperial Irrigation District weed burner rig offers possible solution to ditch drain problem in other western irrigation areas—Oil flame keeps ditches open with 2 passes annually

By WILLIAM W. DONNAN
Associate Civil Engineer, Division of Irrigation and Water Conservation, Soil Conservation Service, El Centro, Calif.

WEED CONTROL has always been a major problem of irrigation farming. In the irrigated areas of the West, where the farmer must convey water to the land in canals, laterals and head ditches, the weed problem is magnified because of the persistence with which weed seeds are carried to canal banks and fields by the irrigation water.

A method of controlling weeds in the farm and district irrigation systems of Imperial Valley, California has been developed, which merits consideration for wide application in other irrigated areas of the West.

Weed control in irrigation systems is, perhaps, more difficult in Imperial Valley than anywhere else in the West. There are many types and kinds of weeds which are either indigenous to the area or have found a favorable environment there. The almost continuous growing season is characterized by favorable temperature, abundant moisture, and high humidity. Furthermore, about 75 per cent of the land utilized is in alfalfa, flax, and grain crops, which tend to foster weed growth.

Increased weed growth

Prior to construction of Boulder Dam and the advent of clear water in the irrigation system, the heavily silt-laden water produced the need for periodic cleaning of ditches. This cleaning process tended to keep down the weed growth in the laterals and head ditches. However, with the use of clear water, removal of silt became less frequent, and the canals became choked with weed growth.

To combat these weeds and to keep the channels free-flowing, a weed burner rig has been developed which has found increasing favor with farmers.

Nearly half of the ranchers in Imperial Valley are now using similar weed burner rigs. In addition, the Imperial Irrigation District, which has approximately 3000 mi. of irrigation canals and drains to maintain, uses the burner exclusively to clear banks and to keep them free of weeds.

These outfits are mounted on trailers or truck beds. It is not unusual to find the complete unit mounted on a 3x12-in. plank which can be bolted on the bed of a truck for operation and then removed when the burning is completed.

There are many variations of the weed-burning device, but the general pattern consists of the following three items: (1) A pump to provide pressure to the burner oil, (2) a motor to run the pump and (3) a set of sprays mounted on a counter-balance boom to spray the oil.

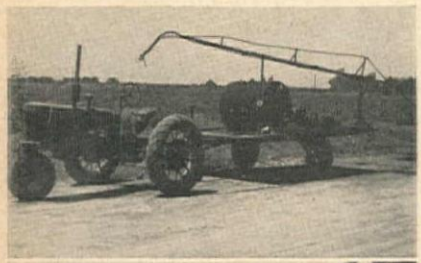
Typical design

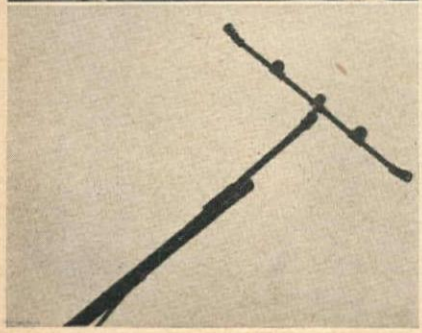
A typical rig includes a small rotary pump driven by an auxiliary gasoline engine and high pressure ½-in. hose or ⅜-in. pipe through which the oil is fed, under pressure, to a set of four or six Chipman spray nozzles. These sprays are arranged on the end of a 15 to 20-ft. counter-balance boom swung from a boom stand. The boom is fitted on the stand to allow considerable lateral and vertical movement. The oil used is ordinary orchard heater oil or diesel oil, and may be pumped either from barrels on the truck or from special tanks.

The Imperial Irrigation District built and owns ten truck units, operates them throughout the year, and burns about 18,000 mi. of ditch bank yearly at a cost of roughly $10 per mi. While these units are not recommended for individual farmers, they are well-adapted to the solution of irrigation district maintenance problems.

To build a farm type burner costs from $100 to $300. Its operation cost is low compared to ordinary hand-labor cleaning methods. A weed burner rig can burn, on the average, a mile of ditch in three hours at the rate of 100 gal. of diesel fuel per mile of farm ditch (3 ft. deep, 6 ft. wide).

When weeds are lush and green, best





TRAILER MOUNTED weed burner outfit, for small farm, top left; motor to generate pump pressure, middle left; set of sprays mounted on counter-balance boom, bottom left. Privately-built burner rig for 1,000-acre ranch, pictures to right.

results are obtained by making one spraying of oil without burning. After a 3- or 4-day wilting period, the ditches are sprayed with flaming oil. A clean job is usually the result.

Periodic burning

Periodic burning has given the best results in tests made by the Imperial Irrigation District. The District has developed a method of performing an initial heavy burning, which stunts or kills heavy brush, willows, arrow weeds, cane and other hardy plants. The burning is followed by periodic light, quick runs along the ditch banks, which keep them clean at a minimum cost. A schedule of burning the canal banks twice a year is sufficient to keep out all growth.

In farm ditch maintenance, the burning requirements are more frequent, owing to more favorable growing conditions. Most ranchers burn their head ditches about four times a year. Burning four or five days after the head ditch has been used tends to stunt growth, while any unburned oil falling on the plants kills tissue and is not washed off until the next irrigation.

ONE OF the Imperial Irrigation District truck units at work. Cost of the weed burning by this method is about $10 per mi. and is recommended for use by irrigation districts. Approximately 18,000 mi. of ditch bank is burned yearly in a section of the country where weed control is very difficult.

Preconstruction Work for Hungry Horse Dam Underway

PRECONSTRUCTION work is in full swing on Hungry Horse Dam on the south fork of the Flathead River near Kalispell, Mont. Work on contracts totaling more than two million dollars will be followed by construction of the dam.

Diamond drill crews are taking core samples of earth and rock formations, and other Bureau of Reclamation crews are charting the pre-glacial channel of the river. Still other crews are helping to build roads and towns which will figure in the construction work later on.

Despite the warnings of the Kalispell Chamber of Commerce and the Bureau that construction on the dam is not yet started, five new "boom" towns have sprung up in the vicinity of the dam site and residents are daily flocking to the area.

Most of the influx consists of World War II veterans. Life in the boom towns has a pioneering aspect, since few modern conveniences are available to the new settlers. Dwellings range from small trailers to prefabricated houses.

Five jobs are currently under way. One contractor is building a four-mile access road from U. S. Highway 2 to the dam site. Another is constructing prefabricated houses in the government town of "Hungry Horse," and other crews are busily engaged in putting up 25 new five-room duplexes. Work on curbs, gutters, sewers, water distribution system and paved streets for the government town is also progressing. Work has begun on an office, warehouse, concrete testing laboratory and other buildings.

The Bureau hopes most of the preconstruction work will be finished by this winter so that bids on construction of the structure may be called by July 1, 1947, if appropriations are made available.

Hungry Horse Dam will be a key unit in the long range program of full utilization of the waters of the Columbia River and its tributaries. Preliminary studies, subject to change, indicate the structure will be between 340 and 500 ft. high and will contain between two and three million cubic yards of concrete. It will store between 1,000,000 and 3,500,000 ac. ft. of water, depending on the height of the dam, and support a total power installation at the site of between 179,000 and 266,000 kw. Some 85,000 ac. of potentially irrigable land in the Kalispell area may be served through the project. Besides providing stream regulation to increase the firm output of downstream plants, including Grand Coulee Dam, it will also give flood control and navigation benefits.

Paul A. Jones is project engineer for the Bureau and is in charge of preconstruction activity. He hopes to move headquarters from Kalispell to the new government town by spring. Last winter he and his men pushed field surveys through the coldest months, spending much of their time on skiis and snowshoes.

Studies of irrigation possibilities in the Flathead Valley are under the direction of Charles S. Hazen, Bureau project planning engineer. Increased agricultural productivity will amount to $2 million annually as a result of irrigation, he estimates.

Two Generators Used at Grand Coulee During War Are Moved to Shasta Dam

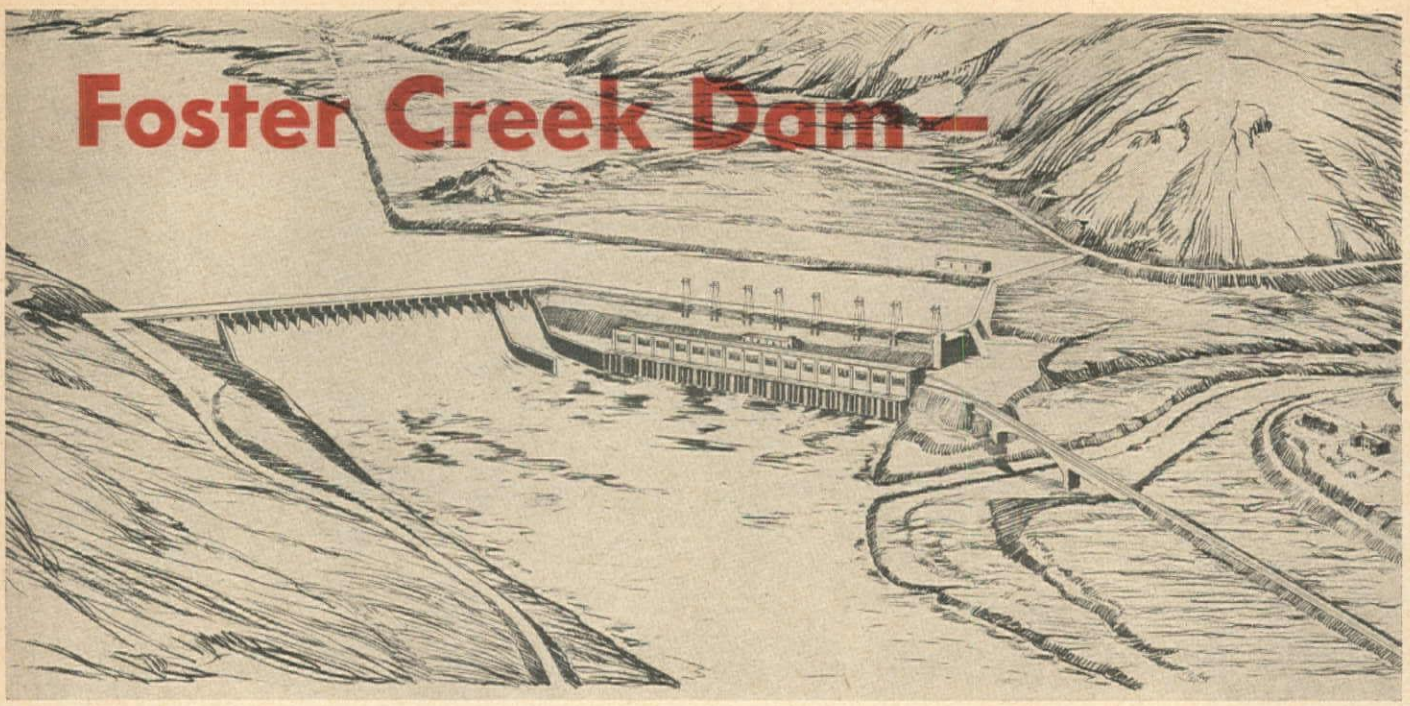
TWO BIG generators that helped supply Grand Coulee Dam power to war industries of the Pacific Northwest have now been "demobilized" and will soon be at work on their peacetime job at Shasta Dam, major unit of the Central Valley project in California.

Award of a $181,080 contract to General Electric Co., Schenectady, N. Y., for installing the two 75,000-kw. main generators at the Shasta plant, has been announced by the Bureau of Reclamation.

Already dismantled at Grand Coulee Dam, the big generators have now been moved to Shasta Dam, near Redding, Calif. The generators were originally built for Shasta, but war needs in the Northwest caused the Bureau to install them temporarily at Grand Coulee.

Shasta Dam ultimately will have five main generators and two station-service generators, with a total capacity of 380,000 kw. Two 75,000-kw. generators and two 2,500-kw. generators are already in operation 24 hours a day.

Under the contract, one of the generators moved from Grand Coulee must be in place at Shasta within 200 days after the contractor receives notice to proceed with the work, and the second must be in place 200 days after that. Fabrication of the fifth generator, halted during the war, has now been resumed.



Plans for Columbia Basin Power Unit

Hundred million dollar concrete structure on Columbia River below Grand Coulee has been authorized, and pre-construction and geology reports are now being studied—Plans call for 220-ft. dam, with first power installation of three 64,000-kw. generators—Access roads to be first construction activity

PLANS FOR THE construction of Foster Creek dam, now under consideration, contemplate a concrete gravity structure of the overflow spillway type about 220 ft. high. The powerhouse would contain ultimately sixteen 64,000 kw. generators with provisions included for extension of power generating facilities if additional storage should be made. The estimated cost of the complete project has been tentatively set at $104,000,000.

Foster Creek dam site is situated on the Columbia River 50 mi. downstream from Grand Coulee dam, and about 1½ mi. upstream from the town of Bridgeport, Wash. Study of the site has been in progress by the U. S. Engineer Department for a number of years, a suggested site having been included in the well known "308" report on the Columbia Basin. At the last session of Congress authorization for construction of the project was approved, but no funds have as yet been appropriated for the work. The next step in the program will be submission of the final report to the Chief of Engineers by the Seattle district engineer, and on the basis of this work Congress is expected to provide funds for the final design and construction of the project.

Geology of dam site

The following report, covering location, geology, preliminary design, river control, and utilities, is taken from two sources. The geology of the site is from a paper prepared by A. S. Cary, geologist for the Seattle District, U. S. Engineer Dept., who investigated the geological conditions. The remainder is from a paper delivered before the Columbia Basin Interagency Committee by Col. L. H. Hewitt, district engineer at Seattle.

The Columbia River at Foster Creek dam site follows the northern border of the Columbia Plateau basalts with the Okanogan highlands to the north. A northern extension of the basalt forms the Omak Plateau directly north of the site. The Okanogan River enters the Columbia about 15 mi. downstream from the site with the town of Brewster near the confluence. Foster Creek enters the Columbia near the site.

The south bank and the bed of the Columbia River at the site have been proven by some 50 diamond drill holes to be of excellent quality grandiorite with basalt overlying it directly to the south. There is no basalt under the dam or north abutment. The grandiorite is generally fresh and sound although closely jointed and sheeted in zones. It contains schistose inclusions as large as 50 ft. in greatest dimension, and is cut by scattered lamprophyre and pegmatite dikes. The rock is of about the same quality as the foundation rock at Grand Coulee dam with no serious engineering problems involved. The rock is not soluble, and is not subject to erosion by seepage water.

At the proposed axis the geology of the north bank presents a striking contrast to the south bank. The north bank is a smooth sagebrush covered slope rising about 250 to 300 ft. above the river to a gently rolling area extending about ¾ mi. north where an abandoned high level channel of the glacial Columbia River cuts across a granite knob. Numerous drill holes, trenches, test pits, and tunnels, plus seismic surveying and field studies have conclusively demonstrated that bedrock extends in a nearly level floor across the river and continues north with a slight rise to outcrops 4,000 ft. north and 340 ft. above river level. Lying directly over bedrock is a 110-ft. stratum of pervious sand and gravel directly overlain at the site by 150 to 200 ft. of very compact impervious till or hardpan. The surface is generally covered with ground moraine with local deposits of windblown sand.

In addition to the two major units of gravel and till at the axis there is one further unit upstream that lies between the gravel below and the till above. This member consists of huge basalt erratics with a maximum dimension of 80 ft., blocks of laminated flood plain silts exceeding 10 ft. in greatest dimension, pockets of openwork gravel, and masses of broken basalt resembling talus, and large masses of black peat and clay that have been shoved and squeezed into fantastic contortions. The stratum is exposed in a river cut cliff for about a mile along the river, starting about ½ mi.

upstream from the axis. It is thought to be a dump moraine deposited at the front of an advancing ice tongue in the valley and is overlain by the same sheet of till that covers the gravel at the proposed axis.

Other minor dispositional members include sloping bodies of stream bedded sand showing both horizontal laminations and ripplemarks. Blocks of glacial till surrounded by stream deposited sand and gravel, and slope wash and creep material are found in the excavations. An abrupt vertical cliff cut in the till, but buried under slope wash and horizontally bedded sand, was found in each of seven trenches excavated along the slope and is exposed both upstream and downstream from the site. The accompanying drawing shows details of materials exposed in a trench 1,500 ft. upstream from the dam axis on the north bank. Notice the two sloping lenses of stream laid sand.

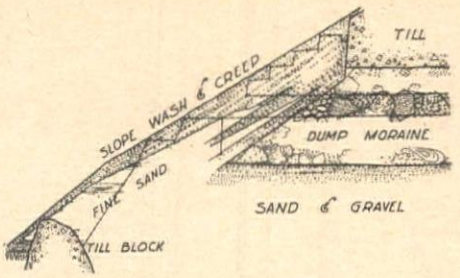
Right bank problems

Two points will be of interest on the right bank, (1) What will be the quantity and quality of leakage around the north abutment, and (2) what will be the danger of slides into the reservoir above the dam and into the stilling pool below the dam when 165 ft. of head is imposed on the gravel stratum. Extensive field and laboratory tests have determined that seepage through the gravel can be controlled by a cut-off wall extending horizontally 500 ft. into the gravel and an impervious earth blanket on the exposed slope of the gravel stratum 500 ft. upstream from the dam. This would reduce seepage loss to 35 cfs., and would impose such a long seepage path that the seepage velocity would be well below the critical velocity for the materials involved. Seepage can be entirely eliminated by installing a complete cut-off wall the full height of the gravel stratum and extending 2,600 ft. horizontally into the abutment to intercept bedrock at pool level.

A careful study of the existing till and gravel slopes for 1,500 ft. upstream from the dam indicates that they will be stable under all normal operating conditions of reservoir level. It is expected that slides will occur in the dump moraine upstream from the dam when the silt blocks become saturated, but since the dump moraine is more than 1,500 ft. upstream, no danger of damage to the structure is feared.

Dam and spillway design

The dam will be a concrete gravity structure with a spillway section 1,192 ft. long and a maximum height of 220 ft. above bedrock in the river. Non-overflow sections 390 ft. and 94 ft. long at the north and south ends, respectively, will extend the structure in a straight line across the valley. On the south side the structure will join the intake wall at an angle of about 66 deg., diverging from the left bank in a downstream direction. The dam and intake structures will be topped by a concrete deck on which a gantry crane will be used for installing and servicing taintor gates and stop logs. The spillway gates will be the USED standard taintor type 32 ft. high by 40 ft. wide. They will be individually operated, and set so that the maximum flood in passing beneath them will clear the trunnions. Twenty-five gates will be required to pass the spillway design flood of 1,250,000 cfs. An additional capacity of 55,000 cfs. will be provided through permanent sluices controlled by slide gates. As a flood might occur before all units are installed in the powerhouse, the hydraulic capacity of the turbines is not included in the spillway capacity. The spillway is of standard ogee section.



CROSS-SECTION of materials composing river bank near damsite. Seepage in this porous material can be stopped by cutoff wall, laboratory tests show.

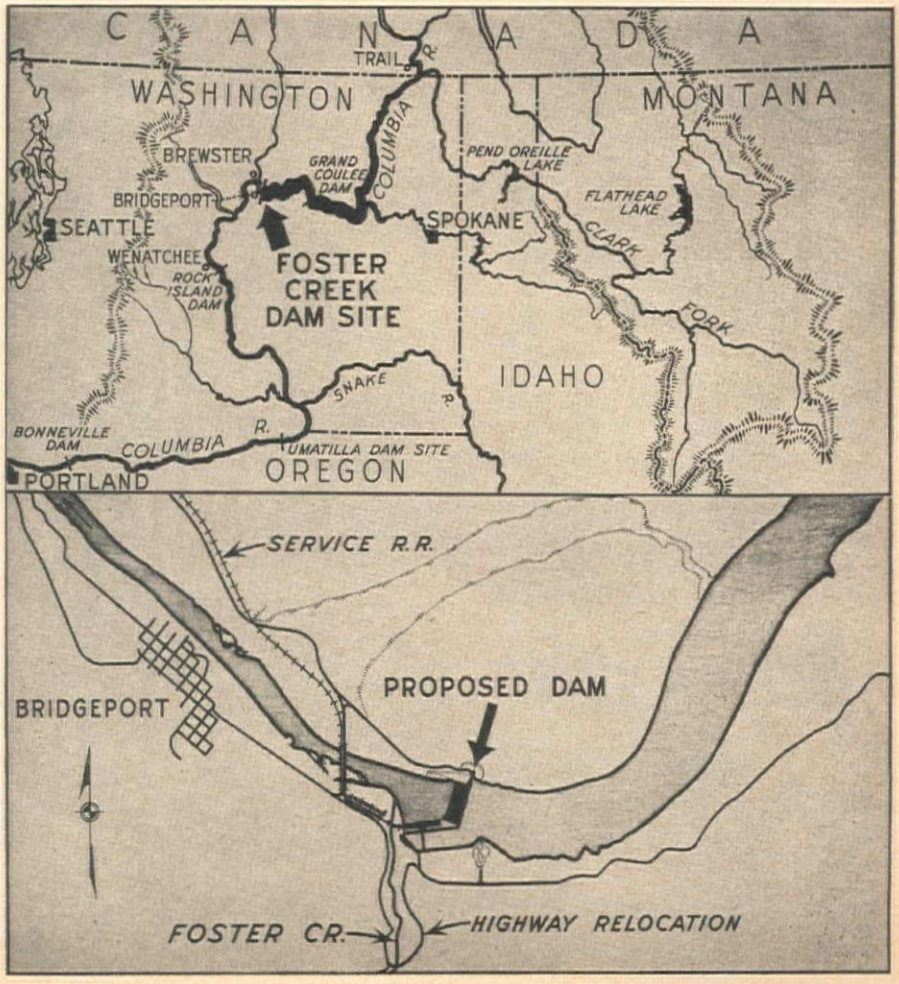
The intake canal will be formed partly by excavation in rock and partly by a concrete wall which will be of the same section as the non-overflow sections of the dam, and in places almost as high. The canal thus formed will convey 45,000 cfs. for the complete installation in the first powerhouse, and practically double that amount when the future extension is made. The low velocity required by the 90-deg. change in direction of the flow at the penstock entrances dictates the use of a large cross-section and a consequent large volume of rock excavation.

The trash rack structure on the face of the intake will extend the full length of the 16-unit powerhouse. The racks will be inclined slightly from the vertical to facilitate raking. The entrance to each penstock will be a bellmouth very much enlarged vertically and formed in concrete. They will be controlled by intake gates, each operated by a fixed hoist on the intake deck. The penstocks, of steel plate about 23 ft. in diameter, will be relatively short and of extra thickness over that required for the static head to withstand the water hammer effect without requiring surge tanks. The control house will be a 4-story structure at the base of the intake wall.

Powerhouse, turbines, and generators

The generator room will be 70 ft. wide. Turbines will be vertical shaft Francis type with runner diameter tentatively set at 16 ft. The capacity will be 87,000 hp. at the rated head of 162 ft. Each draft tube will be of the elbow type

REGIONAL and local location maps of the Foster Creek project. The lake to be formed by the dam will back up to toe of Grand Coulee Dam. No irrigation is involved.



with a vertical splitter in the horizontal leg. The tentative hydraulic capacities at the rated head are 4,400 and 5,600 cfs. at best gate and full gate, respectively. The powerhouse will extend toward the intake to provide spaces for control cables, busses, low tension circuit breakers, storage of transformer oils, machine shops, and pipes for water and air. The deck above will carry railroad tracks and the transformer platform.

The transformers can be moved laterally from their platform to a transfer truck that will move parallel to the powerhouse to a large door where another track will permit the transfer truck to move laterally into the powerhouse. This will permit a transformer to be brought under the main cranes for untanking. On the river side the powerhouse will also extend so that the stop log groove for the draft tube will come up vertically at the outer edge of the platform. A small gantry crane will travel along this deck to handle the stop logs. Space below the generator floor will be provided for governors, piping, access to turbines, drainage pumps and other auxiliaries. The overall width of the building will be 162 ft., and its length 1,162 ft. Two large bridge cranes will be provided, together with the usual lifting beams for heavy lifts.

The generators will be 3-phase, 60-cycle, 13,800-volt, tentatively rated at 64,000 kw. with overload characteristics enabling a generator to operate at the full output of the turbine. Stator frames and rotors are planned for assembly on the job. The weight of assembled rotor and shaft will be about 1,150,000 lb., and will be the heaviest piece the crane will be required to handle.

Three 2,500-kw., 4,160-volt station service generators will be provided with one unit to supply station service, one to supply outside power at the project, and the third to serve as standby. In emergencies station service and local power can be obtained by stepping down voltage from transmission or main generator potential. Space will be provided just across the canal from the powerhouse by filling rolling ground with spoil from excavation, but detailed planning of the yard, equipment, and outgoing lines will be handled by the Bonneville Power Administration.

Future powerhouse extension

Provision will be made for a future addition to the power plant when and if additional storage warrants construction. The addition would be accomplished by extending the intake wall across Foster Creek Canyon and far enough downstream to provide penstocks for the new units. Construction details of the original structure will be planned to facilitate the extension. The added powerhouse would be in somewhat the same relation to the extended intake wall as the first powerhouse is to its intake wall. The second powerhouse would be served by the same railroad tracks as the first and the layout would be similar. Space for an additional switchyard for the second powerhouse will be provided on the bench west of Foster Creek.

Estimates of load growth, and power market studies for the Northwest, conducted by the Federal Power Commission and the Bonneville Power Administration, have shown that the power output of the first three units of the Foster Creek project will be needed by 1953 to serve the power requirements of the area. Indications are that three generating units will be included in the program when the dam is constructed. For this first portion the cost is estimated at $71,000,000.

Model studies

Extensive hydraulic model studies, not yet started, will be required for the project. Model studies of the overall layout, including spillway intake, canal intake, penstocks, tailrace, and the river downstream will be made. Detailed model studies of the stilling basin, into which the spillway will discharge and in which the energy of the falling water will be dissipated by a hydraulic jump, will be required. Another problem is created by the intake where the water flowing in the canal must change direction by 90 deg. to pass through the trash racks and into the upper end of the penstocks. It is believed that a model study will provide valuable data for a complete solution of this problem.

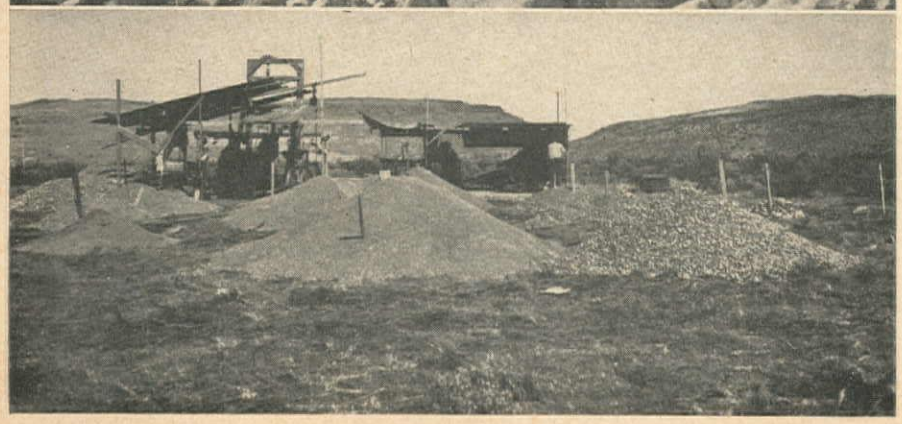
Access, general layout, and housing

The project will be served by a railroad line with a connection to a branch line of the Great Northern at Brewster. Grading for the project railroad will be rather heavy along the side hills, but it will be in sand and gravel. It is believed that curves can be limited to 10 deg., and grades to one per cent. A new highway will parallel the railroad to Brewster. It is proposed to construct a hard-surfaced, two-lane road which can handle heavy loads at high speeds in all weather.

In order to provide access to both sides of the project by both rail and highway a combination railroad and highway bridge will be required about a half mile downstream from Foster Creek. By placing some of the piers on the reef at this point only one channel pier will be required. This will be on rock in shallow water at the rapids. Such a bridge with a concrete roadway two lanes wide and a railroad track in one of them would be a major structure.

A similar structure, but considerably shorter, would be required for the Okanogan River crossing, and a still shorter one to cross Foster Creek at the powerhouse at a level about 20 ft. higher than the present highway bridge. Inasmuch as access facilities will be required by the main contractor from the beginning of his work, it is proposed to let separate contracts for them so that their construction can be accomplished during

PERMEABILITY TEST tank at the Foster Creek damsite, top. Percolation of water through native soil is determined by rate at which it passes through selected samples in the tank. Below, investigations uncovered several good aggregate sources.



the period of preliminary investigation and planning.

Two sites capable of furnishing sufficient aggregate for the entire job have been investigated. Both lie along the proposed railway and highway. It is proposed to study a third source which might provide satisfactory material on an all downhill haul to the job.

Ample space is available on the right bank for railroad and lumber yards, form building sheds, and other features that require either segregation or large space. If either a cableway or a light bridge for pipe lines and conveyor belt is used by the contractor, the brow of the terrace would be an excellent location for the aggregate stock piles, cement silos, and the main concrete mixing plant. The left bank will be used for small shops and compact storage, for building and launching ways, for cribs, cofferdams, and for the contractor's working spaces.

Buildings for government offices, which will later be used for housing permanent employees, will be built on the bench just west of Foster Creek. The contractor's housing, mess hall, and offices will be between the government offices and Bridgeport on the bench. Filtered river water will be supplied for domestic use and fire protection. Sewage disposal and chlorination of the effluent is required by state law.

River control

The river at the dam site is wide and deep with a smooth and uniform current. The nature of the bottom dictates the use of timber cribs for cofferdams, as the small amount of loose material in the river consists mainly of cobbles and boulders. Probably each individual who studies the problem of laying out the work will arrive at a different solution. Nevertheless, there are certain controlling conditions that will affect any layout.

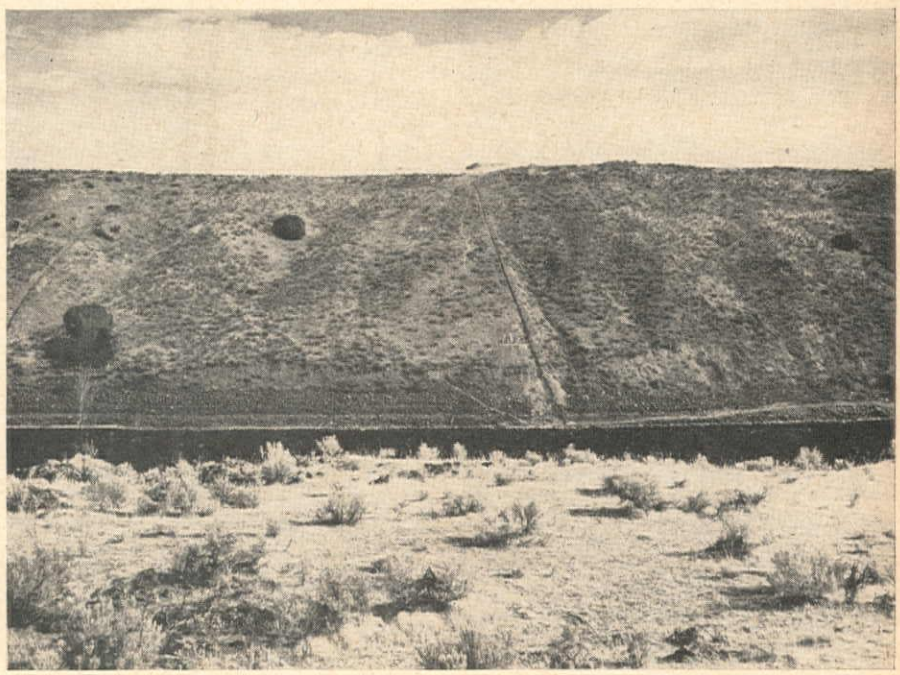
At least two months out of each year must be allotted to the annual flood. In the studies thus far made three months of the first year's construction program have been allotted to building cofferdams, pumping out, and plugging leaks. During this period about a half mile of cribs, individually tailored to fit the bottom where they are to rest, will be placed. Allowances for bad weather and correction of leakage will account for two more weeks. Ten days or so will be required to move out construction equipment and prepare for the next succeeding flood. Six months working time is the most that can be anticipated in the first year of diversion.

It will be impractical from the standpoint of economy to build the cribs high enough to withstand more than two floods out of three without overtopping. The construction of the channel alongside the cofferdam will result in creating a head on the upstream side and excessive velocities (up to 20 or 30 cfs.) in the restricted channel. Protection of the bank against possible erosion by putting in the shore sections of concrete first may be required. Throughout the anticipated six-month working period, activity within the cofferdam will be concentrated on getting the rock cleaned off to solid bearing material and the concrete placed to a workable height before the next flood.

Organization

Construction of Foster Creek dam and powerhouse will be under the supervision of the Seattle District, North Pacific Division of the U. S. Engineer Department. Col. Theron D. Weaver is division engineer with headquarters at Portland, and Col. Leland H. Hewitt is district engineer with headquarters at Seattle. Final design of the project will be completed in the Seattle District.

TRENCHING OPERATIONS in the vicinity of the damsite, for the purpose of studying foundation materials. Prominent boulders of basalt may constitute major excavation and foundation problem when construction gets under way at the dam. Construction activities, also transformer yard will center on foreground plateau.



Reclamationman Warne Chairman of San Diego Aqueduct Finance Group

ASSISTANT COMMISSIONER of Reclamation William E. Warne has been designated by President Truman to serve as chairman of the recently reconstituted President's Committee on Methods of Financing the San Diego Water Supply Project.

The extent and possible readjustment of the financial burden of the city of San Diego (Calif.) and of the San Diego County Water Authority in connection with the completion of the water supply aqueduct will be explored by the Committee. Under an existing contract, the city of San Diego or its assignee is obligated to lease or purchase the system.

The Committee was originally appointed by President Roosevelt on Oct. 3, 1944, and included representatives of the War, Navy and Interior Departments, the Federal Works Agency, and the San Diego County Water Authority. The last agency will no longer participate inasmuch as it is a potential assignee of the existing contract commitments between the United States and the city of San Diego. This contract was executed after conclusion of the Committee's earlier report.

Although not represented on the Committee, the city of San Diego, the county of San Diego, and the San Diego County Water Authority will be given opportunity to present their views.

Announcing reconstitution of the Committee in a letter to Secretary of the Interior J. A. Krug, President Truman directed that the Committee make recommendations on the following subjects of inquiry:

(1) The existing and potential financial burden of the city of San Diego or the San Diego County Water Authority in connection with the San Diego Aqueduct and the extent to which a readjustment of that burden would be proper.

(2) Such additional legislation as may be required to carry out the recommendations of the Committee.

(3) Any matters relating to the abovementioned subjects which the Committee may deem pertinent.

The aqueduct taps the Metropolitan Water District of Los Angeles supply line from the Colorado River and is now being completed by the Navy, under designs and specifications prepared by the Bureau of Reclamation. The entire structure will be 71 mi. long, extending from the vicinity of San Jacinto to the San Vicente Reservoir near San Diego. It will be capable of delivering 50 million gallons of Colorado River water daily.

Reclamationists Eye Future Policies

National Reclamation Association meeting in Omaha earnestly considers Bureau power policy and its effect on Western reclamation—Authorities denounced—New Manager welcomed

AN ATTENDANCE of over 800 sober and sincere delegates made the 15th Annual Convention of the National Reclamation Association, held at Omaha, Neb., Oct. 9 to 11, an outstanding success.

The delegates ranged all the way from humble irrigation farmers to high ranking government officials, and included engineers, Bureau of Reclamation officials, irrigation district officers, Army men, press representatives, and people from many other walks of life. The convention was an earnest one. Numerous observers commented on the sobriety of the delegates and the large and attentive attendance at convention sessions impressed the observer with the seriousness of the gathering.

Outstanding addresses

Important speeches on a wide variety of subjects of interest to the irrigationists were delivered by a host of qualified speakers. Among the most significant addresses were those by Lt. Gen. R. A. Wheeler, Chief of Engineers, U. S. Army, on "The Importance of Our Water Resources"; Harry W. Bashore, former Commissioner of Reclamation, on "What Irrigation Means in the Great Plains Area"; Brig. Gen. Lewis A. Pick and W. G. Sloan, Assistant Regional Director, Region VI of the Bureau of Reclamation, who spoke on the Army and Bureau plans for developing the Missouri River Basin; and William E. Warne, Assistant Commissioner of Reclamation, on the "Plan for Development of the Colorado River Basin."

Other principal speakers were John R. MacNicol, member of the Canadian Parliament, who spoke on "Irrigation in Canada"; Col. Gerald FitzGerald, of the Geological Survey, who told of "Reclamation and the National Topographic Mapping Program"; Merrill Bernard, who explained "The National Weather Services in Support of Reclamation"; N. E. Dodd, Under-secretary of Agriculture, speaking on "Irrigated Agriculture in the Postwar Period"; and Warner W. Gardner, Assistant Secretary of Interior, who spoke on "Reclamation as a National Investment."

Especially significant

These impressive and informative addresses, however, were topped in importance by three other speeches. These were the report of Floyd O. Hagie, secretary-manager of the association until May 31; Michael W. Straus, Commissioner of Reclamation; and Marshall N. Dana, editor of the Oregon Journal, Portland, Ore., and first president of the association.

Dana, who spoke at the luncheon on Oct. 10, entitled his remarks, "What has Reclamation to Fear?" His message is regarded as so timely by the editors of *Western Construction News*, that it is printed nearly in full at the close of this report. Omitted from the reprinting are his opening remarks summing up the formation of the National Reclamation Association at the request of Dr. Elwood Mead, then Commissioner of the Bureau of Reclamation, because reclamation in the arid West was threatened with complete cancellation. After citing figures to show the extent to which irrigation farming has grown in the intermediate fifteen years, Dana urged with all the force of his dynamic personality, that the association not allow itself to become the tool of scheming politicians, and that it not permit such persons to embroil the Bureau or the reclamation program in politics, or Authorities, or in a war against private power.

Hagie's report, one of three by the men who had served as secretary-manager during the year (Hagie to May 31, E. W. Rising to Aug. 31, and Don McBride for the balance of the year) explained the break over principle and policy which arose during the year between the Association and the Bureau. In clear, concise and direct words, he carefully outlined and severely censured the Bureau's proposals, which, he said, "seek a subsidy, by subterfuge, from the national taxpayer, for the commercial power features of federal reclamation projects. Such a procedure is economically unsound, morally unfair, and politically short-sighted. Because they seek all this in the name of the Federal reclamation program under the Federal Reclamation Act, our whole program might be jeopardized, if not completely lost."

Summarizing those activities of the Bureau which he found objectionable, Hagie listed: "The Bureau seeks, by misinterpretation if possible, otherwise by complicated legislation, to have extended from fifty years, to its own estimate of what might be the life of the property (100 or 200 years), the amortization period under which the Secretary of the Interior can authorize, without congressional approval, construction of commercial power plants in connection with reclamation projects.

"The Bureau hopes to avoid the necessity of repaying the principal invested in the commercial power features of any future reclamation projects.

"Another scheme of the Bureau's is to find a way of avoiding the necessity for investments in power paying any interest to the federal government for use of the money so invested."

He told the history of the 1939 revisions to the Reclamation laws, which provided that federal reclamation power should be sold at rates sufficient to repay:

1. Operation and maintenance, and reserves for replacements;
2. Amortization of commercial power investments in fifty years;
3. Three per cent interest on the commercial power investment; and
4. To repay in fifty years the irrigation investment which is not paid by water users, but which is allocated to power, and repayable out of power revenues.

He then outlined the campaign of subterfuge undertaken by Harold L. Ickes and his followers to circumvent these provisions and sell power at less than cost to the government in order to wage their private battles against the private power companies.

ROBERT W. SAWYER, Bend, Ore., publisher, re-elected president of NRA.

Straus' speech

On the following day, Commissioner Straus delivered an address in which he asked the association's assistance in "liberalizing" the reclamation laws, and making legal the practices which Hagie had previously demonstrated were already either in operation or the desire of the Bureau officials in connection with reclamation power.

He also urged support for the passage of additional laws similar to Public Law 732 of the last session of Congress, which permits assignment of a certain proportion of the cost of an irrigation project to fish and wildlife development on a non-reimbursable basis, suggesting recreation, silt control, salinity control and flood control as other possible items for like treatment.

Even before the convention adjourned, irrigationists who are paying the full cost of their project were discussing the inequalities which would arise for them if other farmers on adjacent but newer projects were obligated to pay but a small proportion of their construction cost, as a result of large credits to non-reimbursable items. And responsible reclamation leaders in the states were commencing to question whether the whole program might not be threatened with extinction when Eastern congress-

men are asked to make large non-reimbursable appropriations for developing farm land which may be competitive with that of their constituents.

Other activities

During the course of the convention, several films on pertinent subjects were shown, including one on the present program for development of the Missouri River Basin. Numerous governors and congressmen were introduced and made short addresses. Delegates from each state held caucuses to elect directors.

At the association's banquet, Sen. Carl Hatch of New Mexico was chosen as speaker. Most of the delegates believed this to be a splendid choice, the senator being a strong and long-time advocate of Western reclamation. Only one unfortunate and unforeseen circumstance marred the well attended affair—the senator pulled from his portfolio the wrong speech. He delivered his address on foreign policy instead of his speech on reclamation.

Business and resolutions

The convention was most efficiently handled throughout by Acting President Robert W. Sawyer of Bend, Ore., who had been elevated to that position in mid-year, following the death of President Ora Bundy. At the convention, Sawyer was elected president for the ensuing year and Harry E. Polk was made

DON McBRIDE, who recently assumed office as Secretary-Manager.

vice-president. J. A. Ford was re-elected treasurer.

The new secretary-manager, Don McBride, was warmly received by the delegates, and although he had small part on the actual program, indicated a desire to be of real service to the association and its members.

Because of increased costs generally and a desire to increase the activities of the organization, each of the seventeen states comprising its membership agreed to 15 per cent boost in financial support.

Phoenix, Ariz., was selected as the site for the 1947 meeting, but no date was named, that being left for consideration.

A total of 25 resolutions were presented to the convention for adoption by Charles S. Kaupke of California, resolutions committee chairman, and all but one were adopted unanimously. That was rejected on the basis that it was a virtual duplication of another proposal. The principal resolutions covered the following subjects:

Tributes to President Bundy and Director Fauver, who died during the past year, to Floyd Hagie for his years of service ended on May 31, and to those who contributed to the success of the convention; urging President Truman to withdraw his construction curtailment order; support for mapping and watershed research programs of the Geological Survey and Forest Service; condemnation of the "9-E" water contracts of the Bureau of Reclamation, whereunder farmers are rented the water for a term of forty years; reaffirming its opposition to the land-use limitation provisions of the reclamation law, and appointing a committee to make recommendations; strongly condemning the regional Authority plan; asking the Bureau of Reclamation to establish a small projects division; and demanding that the Bureau of Reclamation power policy be operated within the letter of the law and not according to the vague interpretations of the Solicitor of the Department of the Interior.

What Must Reclamation Fear? Asks First President of NRA

By MARSHALL N. DANA
Editor, Oregon Journal,
Portland, Ore.

THE TOTAL NUMBER of acres irrigable on December 31, 1945, under the Bureau of Reclamation was 5,030,336 of which 4,195,732 acres were actually irrigated. Much of the difference between the former figure and the latter was taken up by farm buildings, highways, rights-of-way and land temporarily suspended as to use or that was dry farmed. The additional number of acres expected to become irrigable in 1946 is 121,853, and the number to be irrigable after the projects presently under construction or authorized for construction are completed is 15,120,242.

The total gross value of crops for 1945 was $435,184,395; the total number of tons of food and forage crops produced on the irrigated acreage in 1945 was 11,814,337; the inventory of livestock on farms as of Nov. 1, 1945, showed a total value of $67,005,355, and motor vehicles and farm equipment on hand at that time was given a value of $62,417,625.

The total number of irrigated farms reported for 1945 on all reclamation projects was 91,662 of which the population amounted to 349,854. This number represented an increase of 1.6 per cent in the farm population since the end of 1944. The population of those towns adjacent to or located on these projects increased 3.5 per cent during 1945. The census at the end of 1945 showed 1,050 schools, 1,429 churches and 146 banks serving the project farms and towns.

Be watchful!

It would be a mistake to assume that reclamation has grown so well and gone so far that momentum will carry it on or that blunders will not cut it down. Although I would rather talk in affirmatives, it has seemed to me that some one who participated in the beginnings of the National Reclamation Association could be useful here in speaking on the subject, "What has reclamation to fear?"

Reclamation has principally to fear:

1. That reclamation as a national policy will be superseded by regional policies set up as Valley Authorities.

2. That reclamation will be required to haul the public power trailer into its present position as a national policy.

Marshall N. Dana, editor of The Oregon Journal, Portland, Ore., and first president of the National Reclamation Association, delivered as a luncheon address a warning and challenge to the organization, which because of its clarity of vision and challenge to complacency, is published herewith for every Westerner to read.

3. That reclamation will forget arithmetic in the grandiose nature of future projects.

4. That reclamation will travel too fast, over-allocating water supplies, which are insufficient for the full area of arid and semi-arid land in the West, without necessary application of the tests of permanent economic development.

Reclamation has also to fear politics, confusion of tongues; its alleged friends who would take it down dead end roads of regimentation and strange theory; ignorance by the industrial East that half of every soundly made reclamation appropriation is spent in the East for machinery, equipment and supplies; lack of emphasis upon the fact that while reclamation produces only about one-fiftieth of the nation's food, its products are the vitamin-bearing elements of human nourishment that are extremely important in the present period of food deficiency coupled with rapidly growing population.

Two other paramount considerations I would rather present as affirmatives than as negatives, as determination rather than fear:

1. That cooperation is the key in the relationships of reclamation with all other agencies of growth and recreation.

2. That the supreme goal of reclamation is neither money nor land, nor the combination of water and the land, but the production of better Americans with opportunity and incentive for initiative, self-reliance, enterprise and the other qualities essential to preserve the liberty, strengthen the personality and build the

character of individual Americans in these days of radar, electronics, rocket propulsion, and the explosive atoms.

Watch out for Authorities

The Tennessee Valley Authority need not be either the horrible example or the proof of the pudding for proposed Valley Authorities in the West. Eroded soil combined with eroded lives to make the Tennessee Valley its own problem and TVA that problem's unique solution. Erosion of soil and of life has not proceeded far enough in the West to render desirable the same character of exterior animating organization as TVA in the drainage areas West of the Mississippi. On the contrary we have to fear the repressive and regimenting effect upon the very qualities that compose the bone and fiber of the American spirit if sub-national authorities are set up to govern without the consent of the governed through appointees who are not selected by aid of the ballot box and whose qualifications may be predominately political. Reclamation officially represented by the Bureau of Reclamation logically is set up to represent the national policy in reclamation. But with Valley Authorities reclamation as a national policy cannot continue but will be superseded by as many non-popular variable and perhaps antagonistic regional policies as there are Valley Authorities. As one Westerner I am not ready to abandon the tried and proved effectiveness of the Bureau of Reclamation, the Army Engineers, the Forest Service and other agencies of national federal policy for feudal and irresponsible Valley Authorities.

Watch out for power

The Reclamation Act of 1902 was passed for the reclamation of arid lands. Of late there has been a distinct tendency to involve reclamation and the National Reclamation Association in the contest between public and private power. Reclamation and the association will serve their permanent interests best by staying out of the power fight. Stick to the text—the reclamation of arid and semi-arid land. In so advising, I am not unmindful that from an impounding dam electric current may as naturally flow through wires as water through canals and ditches. The settlers may properly list incidental power in their resources. The generation of power through public agency is as proper as is the conveyance of water. Furthermore, the transmission lines are a part of the power plan. But I am an old-fashioned American who is deeply apprehensive of the trend to exchange democracy for bureaucracy, and I think that retail distribution of power belongs to private enterprise and is best effectuated thereby, unless poor service and extortionate rates lead to a contrary decision. And, in any event, I believe that decision should be made locally by the people.

Watch out for arithmetic

The recommendation that I have been temerarious enough to make, that arithmetic not be forgotten in the grandiose nature of future projects, is aroused by announcements I have seen of proposals to spend approximately $3 billion to irrigate, as a post-war program, 6.7 million acres of new land and to provide supplemental water for 10 million additional acres. Divide this amount arbitrarily $2 billion to new work and $1 billion to supplemental water and it brings the cost of new irrigation roundly to $300 an acre and for supplemental water to $100 an acre. The cost estimates which reached a total of $3 billion were based upon 1940 prices which now look diminutive in contrast with the actualities of present prices, not to mention material shortages. In my earlier contacts with reclamation, a project was deemed feasible at a construction cost of about $100 an acre. This base had to be elevated in the recovery program experience, but it did not erase the challenge to a $300 or more per acre construction cost. The test of a good project is its repayment from production while permitting its settlers to make their homes, rear and educate their children and provide for the future. Revenues from power that belongs to the project may well be considered in providing for repayment. But an uneconomic project will either break the backs of its settlers or foist a continuous subsidy upon the nation which certainly should not be taken from economic farming elsewhere. Criteria are sane and excellent; let not reclamation lose its perspective and block its future by adding the straw that breaks the camel's back.

Watch out for over-planning

In a fine rash of enthusiasm to reclaim and ever to reclaim and to provide homes for veterans and to release the population tension of the East's congested centers, reclamation might go headlong if the congress permitted. But the water supply is not enough to irrigate all the lands, and river basin studies such as are now being made ought to be controlling in the selection of future projects. Let the successful permanency of the whole irrigated community and its contribution to the strength of the nation be the pre-eminent test.

Remember: The West must farm or be completely out of economic balance and irrigation is the required major method of farming. The nation also must eat or know the pangs of devastated Europe, and irrigation while it competes little with the great staple crops does provide the national consuming public with the dairy products, the foods and fruits that mean good eating.

Watch out for politics

I am forced to speak with what may be deemed brutal bluntness when I warn the National Reclamation Association against sticking its feet in the bear trap of politics. The association must not be a lobbying agency. It must escape the stigma of becoming a high pressure group. Let its representatives furnish information and success records as the basis of the expansion of irrigated land and the continuance of national reclamation policy. I warn the National Reclamation Association against getting tied up with special interest groups no matter how appealing. Let it play its own game.

Then the National Reclamation Association will be in a position to help keep the Bureau of Reclamation free of purely political appointees, and of theorists and bureaucrats who entertain strange notions of government. The engineering and administrative traditions of the reclamation bureau are high; keep them high.

When I warn against confusion of tongues it is with the hope that reclamation will not consent to worship strange gods of special interest and theory, but that the West shall continue to speak with one voice.

The fight ahead

There is a fight ahead for the National Reclamation Association to make with all the aid it can enlist. It is a fight to take the vacillation out of national reclamation policy. Loss, harm, despair and permanent injury result from the beginning of projects and then from the lack of continuing authorization, or it may be because of a whim in the White House, letting projects deteriorate half completed and wholly useless.

There is a campaign ahead for the National Reclamation Association and that is education, not only of the East but of the West and of the nation as a whole that national obligation to reclaim lands by the artificial application of water results from the majority ownership of Western lands by the federal government, and that reclamation makes Western states the best of cash customers for the products of industry.

A fight with the sane proponents of a national wild life program is wholly unnecessary. The storage of water, the watering of the land, the creation of reservoirs and the modifying of climate all make conditions more tolerable for fish, birds and animals.

The dollars in reclamation are good dollars multiplying and bringing forth more dollars. The water diverted to reclamation is more gold than the discoveries of '49. The land reclaimed is truly known as the West's real frontier. Reclamation creates new states by turning the waste places into homes, farms, industry, transportation, trade, essential products and opportunity for Americans. Reclamation has tied Western states to the Union by making them economically balanced and sufficient, fit members of the greater American commonwealth.

Stick to the text!

My friend, John W. Haw, who is a valiant champion of agriculture, insists that reclamation is at the crossroads. (*Western Construction News*, August, 1946). I will go farther. Reclamation is at the border of a labyrinth across which runs one true, straight road to one essential goal—the reclamation of arid land.

Earnestly, I recommend to the National Reclamation Association: Stick to that great text. Play only that game. Follow no by-paths. Win friends and supporters by demonstration and facts. Keep close to the people on the projects. Encourage them to have full voice in the Association. Build the land to build men.

Horizontal Control at Shasta Dam

A system of control targets was set up from triangulation points laid out as a series of quadrangles—From these targets control lines were established at 10-ft. intervals parallel with the axis of the dam, and at 1-ft. offsets from the radial or transverse block lines

By C. M. HIRST
Engineer
Bureau of Reclamation
Redding, Calif.

SHASTA DAM, key structure of the Central Valley Project in California and second largest concrete dam in the world, is a massive concrete gravity type dam with a straight spillway section at the center and curved abutment sections at 2500-ft. radius. Accurate and continuous horizontal control was an essential during construction of the huge dam.

When excavation was started, control points were established by Bureau of Reclamation surveyors from either a base line or triangulation points. As the excavation of the keyway progressed it became increasingly difficult to use these methods because it was necessary to be continually establishing new working points.

As the keyway excavation neared completion, considerable thought was given to determine a procedure for staking out the concrete blocks of the dam. A triangulation system was considered, but triangulation had not proven satisfactory during excavation stages. The terrain of the immediate dam area did not lend itself advantageously to such a system, and the necessity for storage space, trucking roads, and space for operating equipment, added to the difficulty of using it.

Control targets

A system of targets which would define the lines desired was proposed and laid out. The transverse targets were set on a line 1 ft. inside and parallel to the radial or transverse block line on each side of each high row and were located both upstream and downstream from the dam. On the right abutment the actual curve center was located with targets set 1 ft. off on each side so that it could be used from any block in the abutment. The curve center for the left abutment was not located until the concrete was within about 40 ft. of the crest as it could not be seen until then.

For the longitudinal control or stationing downstream from the axis a series of targets were set on each abutment. These targets were set on a line parallel to the straight or tangent section, the first or No. 1 line being 10 ft. downstream, the others at 10-ft. intervals, extending as far as number 38, or 380 ft. downstream from the axis.

In the spillway section these longitudinal lines were normal to the transverse control lines, but on the abutments they crossed at constantly varying angles. A block book was prepared for each high row for use of the field parties, to show this angle and the distance from the intersection of the longitudinal and transverse lines to the longitudinal block line or the axis of the dam.

Triangulation points

To establish this control system a series of triangulation points were established in the areas where it was proposed to set targets by extending them from known points in the vicinity of the dam. Some of these points were a mile upstream from the dam. These triangulation points were laid out as a series of quadrangles. The angles were determined with an ordinary transit with plates graduated to 20 min. and verniers reading to 30 sec. Each angle was repeated 12 times, 6 readings with telescope direct and 6 with it reversed. The quadrangles were then adjusted and solved by the method outlined in the Oct. 29, 1931 issue of "Engineering News-Record."

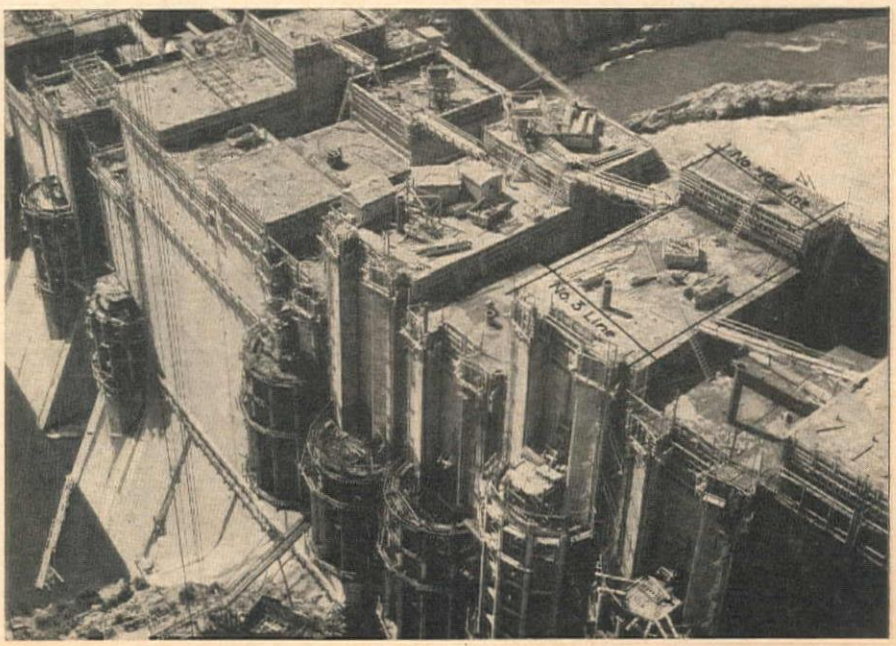
After these triangulation points were established, a precise chained traverse was run, beginning at a triangulation point and running toward another point as near normal as possible to the control lines. For chaining points 2x4-in. stakes were driven securely into the ground at approximately 50-ft. intervals, from 2 to 3 ft. of the stake being left above ground. After driving, the battered top was sawed off and a copper strip, on which the centerline and chaining point could be scribed, was nailed on. The tape used was a Lufkin "Hiway' tape which was compared with a tape which had been standardized by the United States Bureau of Standards and the difference, if any, noted so that a correction could be made. Temperatures were measured with a pocket thermometer. Tension was kept uniform by the use of a spring balance tension handle.

The traverses were all chained two or more times, usually on different days, and care was taken to keep the tape off the ground at all times. As these traverses were made over extremely rough ground, levels were run over the chaining points and difference of elevation recorded between each chaining point. These traverses usually tied into another triangulation point, but when it became necessary to stop a traverse with a loose end, the last chaining point was used as a temporary triangulation point and tied into other points of the system in order to avoid chaining errors. The notes were then reduced to true horizontal distances to check the closure of the traverse, and the actual intersection of the traverse and the control lines was computed.

Markers

The survey party would then locate this intersection and set a permanent point, usually a galvanized pipe about 18 in. long driven into the ground, filled with lead and a hub tack set in the lead.

CENTRAL BLOCK of Shasta Dam, with two transverse and two outside longitudinal control lines shown. From these known lines, corners or other points were found.



As the target was usually set a few feet off the traverse line the transit would be set on this point and the proper angle turned to set the target.

The target was a 2x12-in. plank 5 ft. long, painted orange and black with a white stripe down the center. The stripe varied in width from ½ to 2 in. depending on the distance from the dam. The target was mounted on an A-frame held in place by 2x4-in. stakes and braces. The A-frame had two slotted cross pieces. Bolts through these slots held the target in place and made it easier to adjust to true line. To identify the transverse targets the appropriate row number was painted on a piece of plywood and nailed to the A-frame so it would be on the side toward the center of the row, or an arrow was painted pointing to the center of the row. The longitudinal targets were numbered consecutively from 1 to 38, the number being nailed to the top of the target.

Locating the blocks

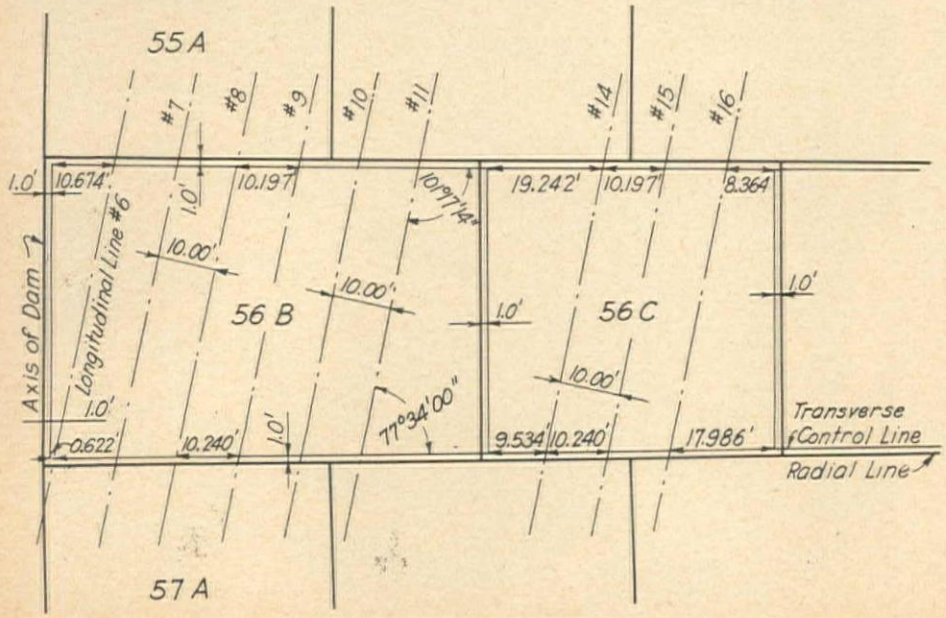
When preparing to stake out a concrete block, the transit was set up on the appropriate longitudinal line, a straddle board was nailed to the transverse form on each side of the block, and the line given by the transitman was marked. The transit was then in turn set up on each transverse line and the intersection made with the longitudinal line on the straddle board. With the information from the block book the corners of the block were located and points set, the corner points being 1 ft. off the joint in both directions. In the case of a face block the transitman set up on one corner and ran in the actual curve points. The chord or distance between corners longitudinally was always measured in order to check the transitman on his set up. (Set ups on the target lines were made by the familiar "wiggle in" procedure which consists of a trial set up as near on line as possible and then repeated adjustments, as indicated by sighting the targets, until the transit is on line between the two targets.)

WELL-BRACED framework held the survey targets in place. They were 2x12-in. planks painted brightly. Transverse targets had identification numbers at the side, longitudinal targets at top.

This method proved to be quite rapid and comparatively accurate except where both targets were a considerable distance from the dam. Slight variations were sometimes noticed, possibly due to refraction. When extreme accuracy was required this condition was overcome by setting one target, usually the downstream, as close as possible. As an example, in the spillway section the downstream targets were carried on the longitudinal joint between the "B" and "C" blocks or within 98 ft. of the axis. In this area there were gate-frame anchor bolts and gate guides to be embedded in the concrete along with numerous other installations. As the adjoining abutment blocks were considerably higher than the spillway it was necessary to carry the longitudinal targets on the concrete.

Also it was found desirable to use the transverse center line in staking out the upstream face blocks. A longitudinal target at 2.20 ft. downstream from the axis was located, then one transitman would set up on this line while another would set up on the transverse centerline, a point being set where the two transit lines intersected. These two lines were also used in checking out embedded anchor bolts and gate guides both before and after placing concrete. Very satisfactory results were obtained by this method.

TYPICAL PAGE from the block book prepared in the office to assist field parties in locating block corners and other points. Transitman located himself on the control lines by "wiggling in" and with angles and distances known, experienced no difficulty in locating required points. Transverse lines were offset 1 ft. from block line.



Idaho Group Asks Small Projects Planning Office

A PROPOSAL to form a small projects division within the Bureau of Reclamation to handle irrigation developments where heavy overhead and engineering cost would adversely affect the feasibility of the project was submitted to Interior Secretary J. A. Krug and Reclamation Commissioner Michael W. Straus by directors of the Idaho Reclamation Association.

Mark R. Kulp, state reclamation engineer, presented the proposal at a special directors' meeting attended by Krug and Straus. Kulp stated that there were 115 small projects in Idaho with an estimated 100,000-ac. area that required additional storage and rehabilitation of existing distribution facilities. Not only do these small, scattered projects find it difficult to get the attention of the Bureau, but the present organization of the Bureau adds heavy engineering costs.

The directors proposed, instead, that the Bureau establish a small projects division that could concentrate exclusively on such problems, and cut engineering costs by reducing and simplifying the investigation, design and construction.

In addition, the association presented a written statement to Krug covering its members' views. Four main points were: (1) primary purpose of the Bureau should continue to be reclamation of arid and semi-arid lands of the West; (2) Reclamation projects must have engineering feasibility, be economically sound, provide that repayable allocations to irrigation, power and municipal water supply, when added to flood control, navigation and recreation allocations, equal the total estimated cost; and provide for irrigation costs to be repaid by users over a definite period; (3) power should be only incidental to reclamation on multiple purpose projects, and should be sold on a basis fair to private industry; and (4) unalterable opposition to the creation of a Columbia Valley Authority.

The directors added the opinion that subsidization of power by the government "under the guise of reclamation" will eventually "sound the death knell to reclamation in the West."

Western Equipment Dealers Confer

National Officers of Associated Equipment Distributors meet in two-day conferences with local members at Denver, Seattle, and Boyes Springs, Calif. to discuss urgent problems presently facing the industry — Problems of surplus equipment and operation of federal controls on the selling business thoroughly considered

THE UPSURGE of construction activity in the West is creating many new bottlenecks in construction machinery selling and servicing. To meet these new problems before they become too acute was the purpose of three regional conferences of Associated Equipment Distributors recently held, one at Boyes Springs, Calif., another at Denver, Colo., and the other at Seattle. The conferences had great significance to the construction industry of the West.

Distribution of construction equipment emerged some years ago from the status of machinery peddling, and is now a vital, integral part of the construction industry itself. Equipment distributors have made an important contribution to the greater efficiency and lower costs which have caused construction in the West to be a pattern for the world to follow. These three conferences of A. E. D., therefore, were serious, hard-working affairs. Each of the eleven Far Western states was effectively represented. A fair share of conference time was occupied with discussion of such normal business subjects as taxes, credits, rentals, costs, labor relations and similar topics.

Of greatest interest at the conferences were two currently important subjects: Disposal of Federal surplus, and the operation of Federal controls. The conferences were fortunate in having F. G. Moyer conduct the discussions on surplus equipment. Moyer is the surplus specialist from the Washington, D. C.,

FRANK McBATH, Portland, Ore., national president of A.E.D., left, confers with national director A. F. GARLINGHOUSE, Los Angeles. The latter was in charge of arrangements at Boyes Springs meeting and presided at it.

headquarters of A. E. D., and he did a penetrating job of pointing up the hurdles which must be jumped if current surplus is to become effectively available.

Controls and surplus

According to Moyer, it would be an understatement to say that the current handling of surplus is fouled up. Under the Act, as passed by Congress, there appear to be "57" varieties of preference and restriction on almost every item of equipment now in surplus depots. Moyer points out that in spite of the apparent fact that veterans' preferences have been met in surplus distribution, the War Assets people cannot deal effectively with distributors until the Act is amended; also, that until members of Congress are properly informed by their constituents of the unworkability of the Act in its present form little improvement is to be expected in availability of surplus.

Federal controls, especially under O. P. A., came in for their share of the discussion. At Boyes Springs George Thatro, of Los Angeles, led the discussion; and at Seattle the discussion leader was William Danner. Equipment rentals cause a typical headache under the present system of Federal controls. Many items of equipment have been decontrolled as to selling price, but rental ceilings remain. Thus, an equipment distributor or a contractor with machinery to rent must not be misled into believing rental ceilings have been removed just because the selling price of a given item has been decontrolled.

Since adjournment of the three A. E. D. conferences the whole structure of Federal control has appeared to go into eclipse, but many Federal agencies have a way of maintaining controls while not appearing to do so. Accordingly, state A. E. D. officials privately, every equipment distributor and contractor is well advised to check and double check the rental ceilings on each item of machinery he rents.

Meeting personnel

The Boyes Springs conference, Oct. 9, 10 and 11, was organized by A. F. Garlinghouse, of Garlinghouse Brothers, Los Angeles, a director of A. E. D. He was ably assisted by a program committee composed of Robert A. Hughes, Standard Machinery Co., San Francisco; Jack H. How, Edward R. Bacon Co., San Francisco; George Thatro, Lee & Thatro, Los Angeles; and Roland Taylor, Industrial Equipment Co., Los Angeles and San Francisco.

A number of national officers and directors of A. E. D. were present at both the Boyes Springs and Seattle conferences, among them Frank B. McBath, Columbia Equipment Co., Portland, president of A. E. D.; Wm. A. Danner, Parker-Danner Co., Hyde Park, Mass., executive vice-president; C. F. Halladay, Western Materials Co., Sioux Falls, South Dakota, vice president; W. W. Bucher, R. L. Brooks Co., New York, treasurer; and Carol F. Winchester, Washington, D. C., executive secretary.

WINCHESTER

On the lighter side, at Boyes Springs, were a group of social affairs, headed by a cocktail party, Wednesday evening, with Northern California members of A. E. D. as hosts. Between sessions, Thursday afternoon, a group led by Tracy Herron, a past president of A. E. D., made a motor tour of the Sonoma Mission country. And there were golf, bridge and elbow-bending contests, to say nothing of the boys at the green baize in the back room.

At Seattle, only one social gathering was scheduled, that being cocktails and dinner on Oct. 15. At the closing session, plans were laid to arrange for special cars for Northwest members who will attend the annual convention of the association in Chicago in February, 1947.

The Seattle conference, Oct. 15 and 16, was in charge of Fred M. Viles, of Fred M. Viles & Co., Inc., Spokane, Wash. Others who appeared on the pro-

FRED M. VILES, Spokane, Wash., made arrangements for and presided at conference in Seattle, held Oct. 15-16.

IN ATTENDANCE at the A.E.D. Conference at Boyes Springs were: (front row, left to right) C. A. WINROD, Standard Machinery Co., San Francisco; LLOYD HAIGH, Marysville Tractor & Equipment Co., Marysville, Calif.; J. R. ROBINSON, State Tractor & Equipment Co., Phoenix; C. D. PRICE, Peterson Tractor & Equipment Co., Hayward, Calif.; E. T. COVE, Soule Equipment Co., Oakland; PAT LAMB, Industrial Equipment Co., Los Angeles; A. B. HARTLEY, Edward R. Bacon Co., San Francisco; BERT B. FORNACIARI, Fornaciari Co., Los Angeles; LARRY PILJ, C. P. Concrete Equipment Co., Los Angeles; (second row, left to right) JOE EDGERS, Daily Pacific Builder, San Francisco; RON WILLIAMS, Electric Tool & Supply Co., Los Angeles; CAROL F. WINCHESTER, Executive Secretary, A.E.D., Washington, D. C.; W. W. BUCHER, R. E. Brooks Co., New York, Treasurer, A.E.D.; C. F. HALLADAY, Western Materials Co., Sioux Falls, S. D., Vice-President, A.E.D.; FRANK B. McBATH, Columbia Equipment Co., Portland, President, A.E.D.; A. F. GARLINGHOUSE, Garlinghouse Brothers, Los Angeles, Vice-President, A.E.D. and Director of Region II; W. A. DANNER, Parker-Danner Co., Hyde Park, Mass., Executive Vice-President, A.E.D.; G. E. HILLSMAN, Hillsman Equipment Co., Chicago, Finance Committee, A.E.D.; F. G. MOYER, Headquarters Office, A.E.D., Washington, D. C.; FRANK LLOYD, Electric Tool & Supply Co., Los Angeles; (third row, left to right) H. L. STILLEY, Soule Equipment Co., Oakland; S. H. WADE, Daily Construction Service, San Francisco; N. W. WITHERS, Daily Construction Service, Los Angeles; C. H. JEFFRIES, Garlinghouse Bros., Los Angeles; R. A. HUGHES, Standard Machinery Co., San Francisco; GEO. W. THATRO, Lee & Thatro Equipment Co., Los Angeles; O. N. BARR, Wooldridge Mfg. Co., Sunnyvale, Calif.; R. M. TAYLOR, JR., Edward F. Hale Co., Hayward, Calif.; TRACY W. HARRON, San Francisco; E. R. BACON, Edward R. Bacon Co. of Hawaii, San Francisco; BOX FOX, Six Wheels, Inc., Los Angeles; W. C. ALLEN, Brown-Bevis Equipment Co., Los Angeles; H. G. BALLOU, C. P. Concrete Equipment Co., Oakland; (fourth row, left to right) HARLAN PILJ, C. P. Concrete Co., Los Angeles; W. H. HUDSON, Hudson-Tucker, Inc., San Diego; HERB TANNER, Daily Pacific Builder, San Francisco; ARTHUR F. KING, publisher, Western Construction News, San Francisco; D. F. FORSTER, Western Construction News, San Francisco; VERNON R. FEE, Harron, Rickard & McCone Co. of Los Angeles; FRED ELDER, State Tractor & Equipment Co., Phoenix; JACK HOW, Edward R. Bacon Co., San Francisco; F. J. FITZPATRICK, Parker-Danner Co., Hyde Park, Mass.; BEAL SHAW, Shaw Sales & Service Co., Los Angeles; G. G. CURTO, Western Machinery Co., San Francisco; ROLAND H. TAYLOR, Industrial Equipment Company, Oakland, Calif.

gram were Robert D. Vial, Construction Equipment Co., Portland; W. H. Booth, Sullivan Machinery Co., Seattle; E. J. Simons, Jr., General Machinery Co., Spokane; and L. E. Jones, Hall-Perry Machinery Co., Butte, Mont.

The Denver conference, October 18 and 19, was attended by national officers Bucher, Winchester and Moyer. Dealers from Utah, Wyoming, Colorado and New Mexico were represented, and the meeting was arranged under the direction of W. A. Norris, Cheyenne, Wyo., who also presided.

Bids for Oregon Hydro Plant

CALL FOR BIDS on three units of a $3,375,000 hydroelectric power development on the North Umpqua River in Douglas County, Oregon, is expected to be issued by the California-Oregon Power Co., Medford, Ore., about midwinter. The three units involved will be a 5,600-ft. concrete lined tunnel estimated to cost $800,000; an earthfill diversion dam 350 ft. long and 36 ft. high, estimated to cost $300,000; and a concrete powerhouse and 125,000-volt transmission line.

Portland Sanitary Fill Combines Garbage Disposal and Landscaping

TWO PURPOSES were well served recently when the Portland City Council decided to make a sanitary landfill and at the same time hide an abandoned railroad cut, having a maximum depth of about 30 ft., that made an undesirable break in the natural contour of the land in a residential district of Portland.

Local residents vigorously protested the fill and because of this, special endeavor was made to minimize objectionable odors or other nuisances. The garbage was never left exposed overnight.

Cover material was brought in daily by an 11-cu. yd. carrying scraper. The scraper and garbage trucks, which brought in the 8-cu. yd. loads, effected a great deal of compaction in moving over the fill because of the arrangement of vehicle routes and the amount of hauling to be done.

The approved plan was to place four layers at a thickness of about 10 ft. per layer. Each layer after being rolled was less than 8 ft. thick including the cover material which totaled about 20 per cent of the compacted volume.

The fill required a total of 24,000 loads of garbage at 8 cu. yd. a load, and the operation continued for more than 13 months before the job was completed. Adjoining property which was excavated to the same depth, supplied cover material for this job. The excavated land was then refilled with garbage and cover material stockpiled for that purpose, as well as a good amount of cover material received from private excavation projects.

The average weight of the garbage before compaction was about 500 lb. per cu. yd., and the cost was $21,120 for the required 192,000 cu. yd. The cost of garbage per ton was 44 cents. Depreciation or investment charges on the equipment are not included in these figures.

W. G. Helber is superintendent of the Bureau of Refuse Disposal.

Construction Design Chart

LXXVII . . . . . Reinforced Brick-Masonry Beams

By JAMES R. GRIFFITH
Birch-Johnson-Lytle
Seattle, Wash.

THE LACK of knowledge concerning reinforced brick masonry among engineers and architects, generally speaking, never ceases to astound me. Yet its use actually dates back more than 100 years when it was first applied in a major way in the construction of the Thames Tunnel in 1825. The general reaction to any suggestions for its use is "what holds it up?" My stock reply has always been "have you ever tried to clean bricks which have been laid up in cement mortar?"

There was some excuse for the non-use of this material when little published data were available. Such excuses have no longer been valid since the publication of that excellent Handbook of Design, Principles of Brick Engineering[1] in 1939. Tucked away and easily overlooked, one will usually find provision for the use of this material in most standard building codes. I know that the Uniform Building Code[2] has included it for many years.

Investigators have long agreed that the same assumptions and formulas used in the design of reinforced concrete are applicable to reinforced brick masonry. In order to develop adequate joint strength, it is necessary to use either cement grout or lime-cement mortar.

It is entirely possible to use this material for all structural elements as was done in the model brick house on display at the Century of Progress in Chicago. I for one would however certainly not insist on its use to the exclusion of other materials better suited. When brick is used for building construction as dictated by either economy or architectural treatment, I believe it can be reinforced advantageously.

The use of reinforced brick masonry lintels is one very pertinent application. I have repeatedly had architects come to me with the problem of designing massive rolled steel or reinforced concrete lintels for store fronts, which must then be carefully hidden from view. While it has usually required some arguments on my part, in every case a substitution has been made using a few small reinforcing bars, a different mortar mix, resulting in a financial saving.

The available section of the wall or spandrel is invariably so large that shear and bond stresses are low. However, these factors should always be checked. The accompanying chart has been designed to determine the flexural strength of reinforced brick-masonry beams with balanced tensile reinforcing. I have used a conservative value of $f_s = 16{,}000$ psi, and those from the Seattle Code for lime-cement mortar:

$f_b = 400$ psi.

$n = 25$

Table No. 78, Brick Handbook[1], for the above values gives the following:

$p = 0.0048$

$k = 0.3846$

$j = 0.8718$

$K = 67.06$

On the accompanying chart I have drawn a solution line for the assumed conditions:

$b = 13$ in.

$d = 20$ in.

from which the following values will be noted:

$M = 29.1$ ft. kips $= 349{,}000$ in. lb.

$A_s = 1.24$ sq. in.

Dead-load of $(bd) = 210+$ lb. per ft.

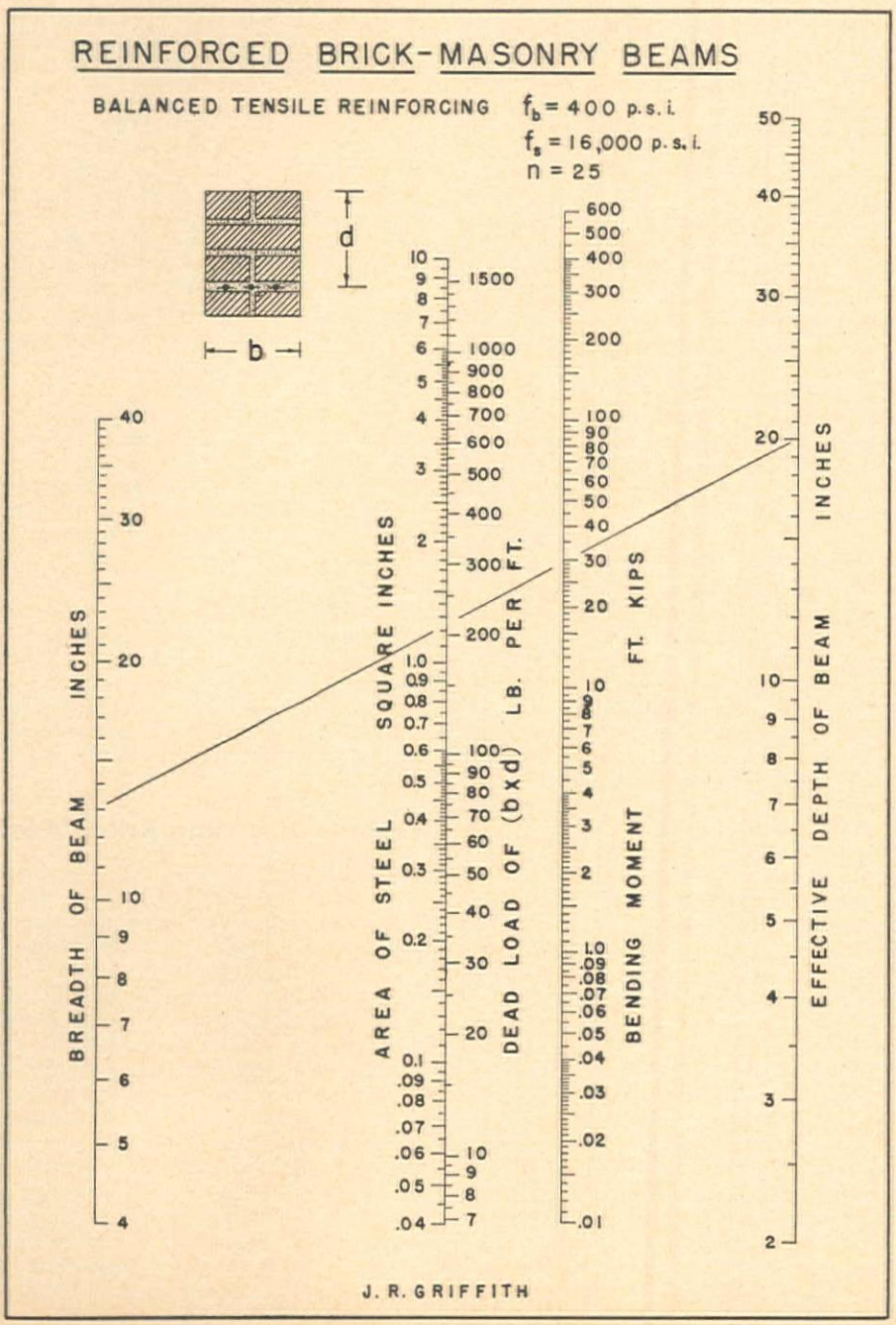
Checking these values using the constants obtained from the handbook, we have:

$M = K b d^2 = 67.06 \times 13 \times 20^2 = 349{,}000$ in. lb.

$A_s = p b d = 0.0048 \times 13 \times 20 = 1.245$ sq. in.

The reinforcing is usually placed in one joint although it is possible to distribute it through several joints using the average effective depth. The joint containing the reinforcing steel should have a thickness at least twice the bar diameter used. Thus ¼-in. bars will require ½-in. joints. Right now with the difficulty, if not impossibility, of obtaining small deformed bars, it is usually necessary for the architect to work in a wider joint. I have recently designed such an installation utilizing ⅜-in. round bars, requiring a ¾-in. joint. The saving in construction cost well justified the necessary revision.

[1] Structural Clay Products Institute.
[2] Pacific Coast Building Officials Conference.



Mount San Jacinto Tramway Is Rugged Construction Job

THE WORLD'S largest capacity aerial passenger tramway is now being designed for the Mount San Jacinto Winter Park Authority of California by the Tramway Division of the American Steel and Wire Co., New Haven, Conn. It will be built in Chino Canyon on the east slopes of Mt. San Jacinto near Palm Springs, Calif. Morrison-Knudsen Co., Inc., Los Angeles, is associate contractor with the steel company.

This ultra-modern passenger tramway will be capable of transporting 400 passengers per hour in each direction. The Valley Station will be located at the mouth of Chino Canyon, elev. 2670, and will extend along a ridge in a southwesterly direction for a distance of 6,720 ft. to an angle and transfer station at elev. 5660. Passengers will be transferred to a second section at this point, and will travel up a ridge in a southerly direction 6,400 ft. to the edge of Long Valley at elev. 8550.

Each tramway section will be equipped with two 55-passenger cabins, traveling along 2¼-in. special grade, locked coil track cables. During World War II, cables of this design were in great demand, and were shipped in huge tonnages to Russia, Turkey, North Africa, and India. They are manufactured at the Trenton, N. J. plant of the American Steel and Wire Co. The locked coil cable, so named because of its interlocking outside wires, presents a perfectly smooth surface for the passage of the cabins.

The passenger cabins will travel at a normal speed of 1,200 ft. per min. Each cabin will be equipped with sixteen carriage wheels, which results in a low individual wheel load and a minimum of track cable bending. These wheels will be rubber grooved, to eliminate wear on the track cables, and give a smooth and noiseless passage. The cabins and their supporting members will be manufactured of light weight, high tensile steels. They will be of duodectagonal shape, to provide the greatest visibility for passengers and to measurably reduce wind surface. The cabins will be equipped with headlights, baggage racks, and outside ski racks. Swing dampers will be used to keep the cabin stable while passing over intermediate structures. The floors of the cabins are always level.

The 2¼-in. track cables will be manufactured in one length to eliminate intermediate cable connections. The upper end of each cable section will be warped around a reinforced concrete cylinder lagged with hard wood. The lower end will be counterweighted with a floating concrete block to adjust automatically for mechanical stretch in the cable, change in length due to temperature, and deflection in the cable span due to the different positions of the loads. Large diameter flexible ropes and swivel sockets form the connection between the locked coil cable and these counterweights. Sufficient track cable is furnished so that it can be unwound from the upper anchorage at intervals of time, thus presenting new bearing surfaces at the intermediate structure supports.

The track cable spans will vary from 100 to 2,500 ft. in length. The heights of the intermediate structures will be from 60 to 150 ft. These structures are surmounted by long radius steel saddles with bronze grooves for the support of the track cables.

Driving power

The tramway driving units will be located at the Angle Station for the lower section, and at the Mountain Station for the upper section. Alternating current will be brought to each of these points, and will operate 400-hp. AC motors, which will drive DC generators, exciters, and modern units of variable voltage control. The current thus furnished will drive the tramway sections at 1,200 ft. per min. through 300-hp. DC motors, gear reducers, ring gears, and a 13-ft. rubber-grooved driving sheave. If for any reason the 300-hp. motors cannot be used, an auxiliary 100-hp. DC motor can be quickly connected to the tramway driving sheave. In the event of electric power failure, a heavy duty internal combustion engine will be used to operate the DC generator set, and either the main DC motor or the auxiliary motor.

Four brakes are provided, each capable of bringing the tramway to a stop. Two of these brakes are fully automatic; a third can be tripped by the operator; and the fourth, a 13-ft. diameter quadrant brake is located adjacent to the operator's position. An over speed device brings the tramway automatically to a smooth and normal stop. Hot motor bearings are instantly brought to the attention of the operator by bells and lights.

A well lighted position indicator, automatically kept in adjustment, notes the exact location of both cabins with respect to survey stations and tower locations. While the line is in motion, the operator must keep his foot on a "dead man" switch; otherwise, the tramway comes to a slow and normal stop. Unless the operator keeps his hand on the controller, it returns to the off position and the tramway comes to a normal stop. Once the operator opens the electrical circuit, after receiving proper signals from both terminals, the speed is automatically taken care of. As the cabins approach the terminals, their speeds are automatically reduced to a final stop without benefit of the operator.

The cabin carriages are equipped with powerful brakes which automatically act on the track cable, the strongest and most permanent part of the design, if the traction rope should break or lose tension due to some other cause. This brake can also be set by the conductor in the cabin.

If for any reason the cabin becomes stalled on the track cable, or the main traction rope cannot be used, an auxiliary traction rope is lowered by power to a position where it can be attached to the cabin, or small auxiliary cabins, provided at each terminal, can be attached to the auxiliary traction rope for removing passengers from the cabins.

Construction tramway

The terrain in Chino Canyon is extremely rugged along the tramway line, and precludes the use of pack animals or caterpillar roads. It will be necessary to build a construction tramway to transport workmen and all materials used in the tramway. Light weight ropes will first be strung to pull up heavier wire cables until the proper cable sizes are in place to form the construction tramway circuit.

It is realized that this project is one of the most difficult ever undertaken by construction crews. Many of the machinery items and construction units must be dismantled into individual weights of about 4,000 lb. to suit the carrying capacity of the construction tramway.

The American Steel & Wire Co., acting through the Columbia Steel Co. of California, both subsidiaries of the United States Steel Corp., are bringing all of their tramway engineering experience into this project. They designed and built the only other similar installation on this continent, the passenger tramway at Cannon Mountain, New Hampshire, which has proved a success financially.

The Directors of the Mt. San Jacinto Winter Park Authority are: Earl Coffman, Palm Springs, chairman; John R. E. Chaffey, Palm Springs, secretary; Jack McKenzie, Los Angeles, treasurer; V. W. Grubbs, Riverside; J. G. Nusbaum, Idyllwild; Harold English, Los Angeles, and Leonard Firestone, Los Angeles.

For the contractors, J. P. Frien is contract manager for Morrison-Knudsen Co., Inc., and Floyd Erickson is Chief of Party. Saram Vandervoort is construction superintendent, and Gordon H. Bannerman is chief bridge and tramway engineer for American Steel & Wire Co.

Resume Montana Road Work

BID OPENINGS for highway construction were resumed last month by the Montana Highway Commission after a halt in the state's $46,000,000 postwar federal aid highway improvement program caused by the August presidential order banning construction of a non-housing type and a request from the Montana Contractors Association that the commission halt highway construction. The association has now assured the commission that labor and materials will be available for highway construction in the state. The commission has on its books $13,000,000 worth of highway construction projects which have been approved by the Public Roads Administration, but for which contracts have not as yet been let.

Construction Rapid on Mexican Dam

NOW APPROXIMATELY fifty per cent complete, work on Hermosillo Dam, an earth and rock fill structure being built by the Mexican Commission of Irrigation at the confluence of the Rio San Miguel River and the Rio Sonora, near Hermosillo, Sonora, Mexico, is progressing rapidly, and it is anticipated that the dam will be complete in from nine months to a year.

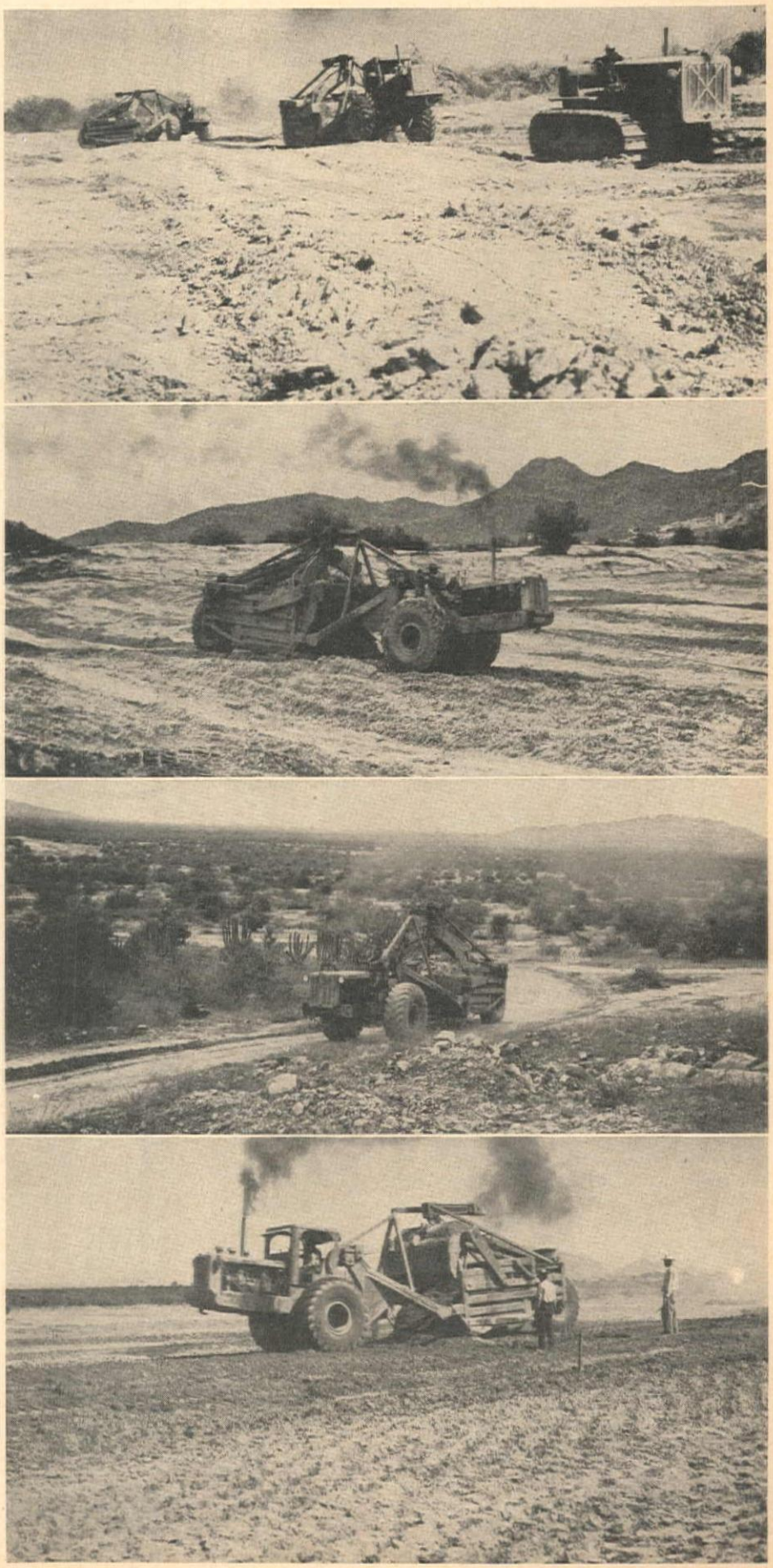
Nearly 4,000,000 cu. yd. of material are involved in construction of the dam, which when completed will be 4,500 ft. long on the crest, and 80 ft. high. Water impounded will irrigate between 45,000 and 50,000 ac. of rich agricultural land in the vicinity of Hermosillo. This will be the second major irrigation system in the state of Sonora, the Angostura project on the Rio Bavispe, being already in operation.

Specifications call for a rock keyway core, which is in turn covered with compacted clay to afford imperviousness. Both up and down stream from this core, zones of compacted sandy clay will compose the main body of the dam. Blankets of rock facing on both slopes of the structure will complete the earth placement. Compaction was performed by tractor-pulled sheepsfoot rollers and by the weight of the loaded vehicles.

Earth for the main body of the fill is being obtained from a borrow pit 3,700 ft. distant from the dam, and the material is being hauled over well-maintained ramp roads up the face of the dam to the point of placement, these roads having a maximum grade of 10 per cent. To transport the material, the contractors are employing a fleet of 14 Tournapulls, along with tractors and other equipment. For boosting power to the Tournapulls when required during loading, tractors are used as pullers, through cable attachments to the nose of the power unit, rather than as pushers, the usual procedure in similar cases in the United States.

The contract for the construction of Hermosillo Dam was awarded to Cia. Mexicana Constructura Azteca S. A., and Cia. Utah, S. A. Practically all labor, both skilled and non-skilled, is performed by native workers, although American mechanics were imported at the beginning of the project to instruct native operators for mechanical equipment.

Engineering of the project was performed by the Mexican Commission of Irrigation, of which Sr. Orive Adolfo Alba is chief engineer.



EARTHMOVING at Hermosillo Dam by the Contractors, Cia. Mexicana Constructura Azteca and Cia. Utah, using a fleet of Tournapulls. The top two pictures are from the borrow pit, showing scraper bowls being loaded with the slightly cemented sandy clay; third, a Tournapull starts up the ramp on the face of the dam; bottom, discharging the load of earth in thin layer on the top of the dam. Marks of sheepsfoot compaction are visible.

Public Works Funds Advanced To Western States by FWA

FUNDS ADVANCED by the Federal Works Agency, Bureau of Community Facilities during the past month to assist in planning public works in Western cities, include the following amounts. These advances are loans to assist in the costs of planning and are to be repaid to the government, without interest, when actual construction is begun.

Arizona

Williams was advanced $3,200 for a municipal hospital, estimated to cost $100,000.

California

Alhambra has been allotted $27,196 for a new Laguna Wash storm drain system, estimated to cost $704,800, and $19,680 for a new Second Street storm drain system, estimated to cost $523,216; Berkeley Unified School District has obtained three advances: $15,500 for a new Columbus Elementary School, estimated to cost $280,500; $16,500 for a new Franklin Elementary School, estimated to cost $297,500; and $15,500 for a new LeConte Elementary School, estimated to cost $280,500; Burbank Unified School District has received four loans, all for junior high school construction: $9,000 for classroom additions, estimated to cost $200,000; $5,500 for cafeteria additions, estimated to cost $125,000; $5,500 for a gymnasium addition, estimated to cost $125,000; and $10,000 for an auditorium addition, estimated to cost $225,000.

Delano Joint Union High School has been granted $12,480 to plan a new school, estimated to cost $246,640; Del Mar School District was advanced $4,080 to plan a new elementary school, estimated to cost $98,109; Dunsmuir was allotted $3,600 to design sewage treatment plant improvements, estimated to cost $66,000; Elk Grove High School District was given an advance of $13,615 for additions to the existing high school building, estimated to cost $245,097; Fresno School District has received $10,080 to plan an elementary school, estimated to cost $193,000; Lindsay Unified School District has been allotted $10,181 for an elementary school, estimated to cost $185,463; Long Beach was granted three advances: $3,375 for an Admiral Kidd Park recreation building, estimated to cost $81,050; $5,085 for a MacArthur Park recreation building, estimated to cost $119,069; and $14,850 for a city health clinic, estimated to cost $337,790; Westside Union School District has been allotted $4,750 for planning an elementary school at Lancaster, estimated cost $109,964; Manteca High School District has been granted $12,200 for additions, including music building, agricultural unit, swimming pool and gymnasium, total estimate $296,000; Mariposa County was advanced $8,920 for preparation of plans and specifications of a sanitary sewage collection system and treatment plant, and development of a new complete water system, total estimate $200,960; Middletown Unified School District has received $4,400 for a high school, estimated to cost $81,000; Redding has been advanced two loans: $12,000 for a swimming pool, estimated to cost $215,000; and $9,600 for a new city hall, estimated to cost $172,800.

Colorado

Rifle Union High School District was allotted $8,325 for a new high school building at Rifle, estimated to cost $257,350.

Idaho

Payette County has obtained a loan of $6,250 toward an estimated $133,750 courthouse; Payette received $4,000 for reconstruction of sewers and sewerage system additions, estimated to cost $80,000; Salmon was advanced $2,900 for a community hall and auditorium and a fire station, total estimated cost $52,000.

Kansas

Lakin was allotted two advances: $1,900 for waterworks improvements, estimated to cost $52,550, and $600 for a sanitary sewer system, estimated at $17,600.

Montana

Boulder has received $2,500 for a sanitary sewerage system, including treatment plant, estimated to cost $55,500; Cascade County was allotted $4,500 for estimated $142,680 improvements at the Great Falls fair grounds; Conrad High School District has been advanced $10,580 for a new high school at Conrad, estimated to cost $281,000; Flathead County High School District was granted $16,000 toward a physical education building and an industrial arts building, both at Kalispell, estimated cost $460,000; Froid has been advanced $5,231 to prepare plans for a new waterworks system, including supply well, reservoir and distribution system, estimated to cost $115,993.

Nevada

Las Vegas was advanced $19,500 for sanitary sewer system extensions and improvements, including disposal plant, estimated cost $966,500; the Board of Regents of the University of Nevada has obtained a loan of $20,100 for an estimated $446,800 experimental laboratories building at Reno; Yerington has been granted $7,281 for curbs, gutters and asphalt pavement, estimated to cost $311,649.

New Mexico

Clovis has been allotted $9,880 for grading and paving, including curbs and gutters, estimated to cost $393,180; Hot Springs was advanced $11,000 to plan sanitary sewer system extensions, including a treatment plant, estimated cost $277,200; Taos received $4,375 for sanitary sewer system extensions, including a disposal plant, estimated cost $105,425.

Oklahoma

The Jackson County Commissioners have been allotted $10,000 for a 60-bed general hospital at Altus, estimated to cost $300,000; Lawton was granted $17,900 for a storm sewer system, estimated to cost $496,850.

Oregon

Josephine County School District was advanced $3,442 for a new grade school at Grants Pass, estimated to cost $102,150; Rainier, acting by and through the City Water Commission, received $2,000 for a new main supply line and reservoir, estimated to cost $75,000.

Texas

Amarillo has been allotted $1,080 to extend plans for a building remodeling job to provide a community center in Alamo Park, estimated to cost $21,800; San Benito was advanced $1,995 for sanitary sewer system improvements, estimated to cost $45,494; Texarkana Junior College District received $16,147 toward a $400,000 building expansion program, which includes ten classrooms, an auditorium-gymnasium, cafeteria and related facilities; The Tarrant County Water Control and Improvement District No. 3 has been granted $4,900 to finance the plan preparation of sanitary sewer system extensions, estimated to cost $110,000.

Utah

Davis County was allotted $10,830 for exposition grounds and buildings at Kaysville, estimated to cost $314,550; Coalville received $570 for reconstruction of a swimming pool and installation of equipment, including bath house, estimated to cost $17,000; Huntsville has been advanced $1,900 for a new sanitary sewer system, including treatment plant, estimated to cost $53,500; Milford was granted $1,400 toward a new town hall to house the jail, fire apparatus, offices and meeting hall, estimated to cost $42,300; Nephi received $7,300 for the first unit of a sanitary sewer system, estimated to cost $151,300.

Washington

East Sound Water District has been granted $6,468 for a waterworks system, including a supply line from Mountain Lake and distributing system, estimated to cost $193,482; Evergreen School District received $14,065 to prepare a new building expansion program of a junior-senior high school near Vancouver, estimated to cost $689,458; Clallam County School District has been advanced $4,353 for an addition to the existing grade school building at Port Angeles; Kent School District was allotted $15,000 for additions to the existing high school building and shop building at Kent, estimated to cost $475,000; King County Water District has been granted $4,860 toward preparation of plans and specifications for a new waterworks system near Kirkland, estimated to cost $136,000; Oakesdale School District has received $12,000 for planning an estimated $340,000 high school at Oakesdale.

HOW IT WAS DONE

JOB AND SHOP TIPS FROM THE FIELD

Wrecking Time Cut By Ingenious Tool

A BOARD LIFTER which utilizes the principle of the lever has been invented by Stanley Carlson, Benicia, Calif. It reduces labor costs by 50 to 75 per cent and lifts boards or planks from joists, studs or rafters without injury to the board.

Here the inventor shows how the lifter is used. The handle is 48 in. long, and is jointed about midpoint for light boards requiring less leverage. This pipe handle is joined to an arm spreader and fulcrum which are made of 1¼ in. x 1¼ in. angle iron. Joints are welded.

STANLEY CARLSON

The lifting shoes are variable as to length, suiting widths of boards to be lifted. The lifting arm itself is ½ in. by 1 in. bar stock.

Operator uses lifter with the lifting arm facing toward him. As he pushes the lifter away, a force of 20 pounds exerted by him results in a lifting force of some 140 pounds on the lifting shoes, greatly in excess of the force required to overcome nail resistance.

Boards are lifted without injury, nails are free from the joist, stud or rafter. Inventor claims 90 per cent of all boards salvaged will be useable.

REDUCING TIME LOST ON STALLED CONSTRUCTION

TRACTOR PARTS are sped by air to customers of the Boardman Co. of Oklahoma City, Okla.—Allis-Chalmers tractor dealer. Company estimates it may save customers several hundred dollars in expensive delays. Company plans purchase of additional planes.

ANGLED PEDESTRIAN WALK SAVES PARKING SPACE

WHITE BLOCKS, 6 in. long and 3 in. wide outline the pedestrian cross-walks at Salt Lake City, Utah. Blocks are placed on top of the asphalt while still hot and allowed to fully set. Cross-walks angle to conform to diagonal street parking which is used in Salt Lake City, thus taking up the space of only one car.

NEWS OF WESTERN CONSTRUCTION

NOVEMBER, 1946

CAA Opens Western Offices For Federal Airport Program

THE OPENING of 44 new district offices for the administration of the Federal Airport Program has been announced by the Civil Aeronautics Administration. In addition to these 44 offices, branches have been set up in the CAA Regional offices in Honolulu, T. H., and Anchorage, Alaska.

Although some of the offices are located in temporary quarters until permanent office space can be arranged, all are in operation in anticipation of the flood of project requests for Federal aid under the airport program. Project requests from states and communities are now being accepted for consideration by CAA district offices.

District offices in the West are listed:

New Mexico: District Airport Engineer, CAA, New Mexico Publishing Company Bldg., Santa Fe, New Mexico.

Oklahoma: District Airport Engineer, CAA, Room 405, Municipal Building, Oklahoma City, Oklahoma.

West Texas: District Airport Engineer, CAA, Army Building T-46, Municipal Airport, Big Spring, Texas.

Kansas: District Airport Engineer, CAA, 27th Floor, City Hall Building, Kansas City, Missouri.

Nebraska: District Airport Engineer, CAA, P. O. Box 1788, Lincoln, Nebraska.

Colorado: District Airport Engineer, CAA, 409 City and County Building, Denver, Colorado.

Southern California: District Airport Engineer, CAA, 1500 Fourth Street, Santa Monica, California.

Northern California: District Airport Engineer, CAA, S. F. Municipal Airport, South San Francisco, California.

Arizona: District Airport Engineer, CAA, P. O. Box 789, Prescott, Arizona.

Utah: District Airport Engineer, CAA, Municipal Airport, Salt Lake City 3, Utah.

Nevada: District Airport Engineer, CAA, c/o General Delivery, Carson City, Nevada.

Washington: District Airport Engineer, CAA, Room 604, Smith Tower Annex, Seattle, Washington.

Montana: District Airport Engineer, CAA, Montana Building, Helena, Montana.

Oregon: District Airport Engineer, CAA, 460 N. High Street, Salem, Oregon.

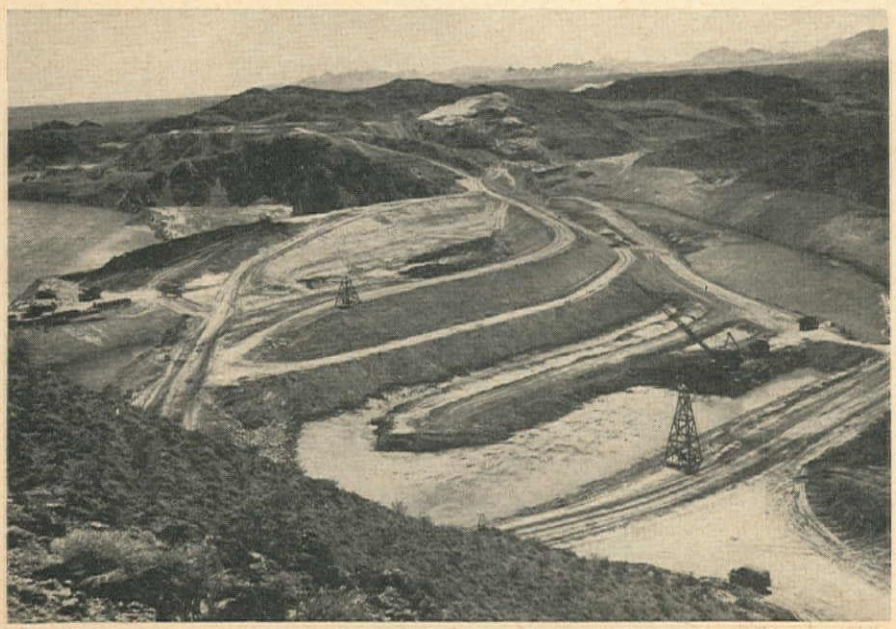
Idaho: District Airport Engineer, CAA, State Forest Office, 801 Capitol Blvd., Boise, Idaho.

Alaska: Superintendent of Airports, CAA, Anchorage, Alaska.

Hawaii: Superintendent of Airports, CAA, P. O. Box 4009, Honolulu 12, T. H.

DIVERSION CHANNEL EXCAVATION UNDER WAY AT DAVIS DAM

FIRST AND one of most difficult construction jobs at Davis Dam, now under construction on the Colorado River by Utah Construction Co. for the Bureau of Reclamation, is the diversion and forebay channel, with cuts up to 220 ft. in depth, a channel width of 75 to 200 ft., and a length of 4,500 ft. Side-slopes, to be lined with concrete 18 in. thick, will have a side slope of ½:1. It is anticipated that the river can be diverted by 1948. The canal will carry 60,000 cu. ft. per sec. of river flow.



National Group Formed For Engineer Bargaining

TWENTY REPRESENTATIVES of associations of professional employees from various cities on the Pacific Coast met in San Francisco on October 5, 6 and 7 for the formation of a national professional employees association.

Associations from Los Angeles, San Francisco, Sacramento, Portland, Olympia, Seattle, and Spokane were represented. Sterling S. Green of Los Angeles presided, Trygve W. Hoff of Seattle was vice-chairman, and Donald B. Slawson of Portland was secretary.

These associations are comprised of engineers, architects, industrial scientists and similar professional employees. Their purposes are to promote and protect the economic welfare and professional status of their members and the right of professional employees to bargain collectively through agencies of their own choosing.

The purpose of the proposed national association is to bring such groups throughout the country together in one organization for mutual aid in solving their common problems, to achieve agreement as to general principles of purpose and procedure, and to gain the advantages of concerted effort and na-

tion-wide recognition in the attainment of their objectives.

The basic questions of policies, objectives, qualifications for membership, structure of the organization and scope of its activities were debated at length in day and night sessions of the whole group and of special committees, and agreements were reached as the basis for drafting a constitution. The task was assigned to a committee to draft a constitution for submission to the constituent organizations.

The name adopted for the proposed national organization is "National Professional Association of Engineers, Architects and Scientists."

Transmission Line to Aid In Dam Construction

A SURVEY has been started for location of a power transmission line from the proposed Garland No. 2 substation near Garland, Wyo., to the site of Yellowtail Dam, 35 mi. south of Hardin, Mont., H. D. Comstock, director of Region 6, Bureau of Reclamation, announces.

John R. Walker, regional power manager, said that the line, of 69 kv. capacity, will be used initially to furnish power for construction of the dam, and will follow a general route along the west side of the Big Horn river south to the vicinity of Lovell, Wyo., thence eastward to the Garland substation.

Power for construction of Yellowtail Dam will be transmitted over this line from the generating facilities at Shoshone power plant and Heart Mountain power plant, the latter now being under construction.

Yellowtail dam, where preconstruction activities are currently under way, is part of the Hardin unit of the Missouri Basin Project. The 1,116,000-ac. ft. multiple-purpose reservoir will make possible irrigation of 45,000 ac. of new land and will provide supplemental water to 1,800 ac., in addition to power generation and silt control features.

The section of the line from Lovell to Yellowtail will be "part of a backbone high-voltage system" and will ultimately be extended from Lovell up the Big Horn river to a substation at Thermopolis, Wyo., and connection will be made to the power plant at the proposed Boysen dam, a unit of the Missouri Basin Development Program located 20 mi. south of Thermopolis.

Texas Company to Back Waterproofing Research

DR. C. W. BORGMANN of the Engineering Experimental Station of the University of Colorado has announced that a research project for study of the waterproofing of mortar and concrete through the use of petroleum derivatives has been established by The Texas Company.

According to Professor Warren Raeder, head of the Department of Civil Engineering at the University of Colorado, it is suspected from published works that even small amounts of asphalt and related petroleum derivatives may greatly increase the water resistance and flexibility of the resulting concrete structure. Already it is known that the petroleum materials increase the amount of air that can be incorporated in the concrete mix. This entrained air increases the resistance of concrete to freezing and thawing.

Professors Raeder and William H. Thoman will supervise the project, assisted by D. G. Kretsinger, Associate Research Engineer of the Experiment Station. Several graduate students in Civil and Architectural Engineering will work on the project.

Anti-Earthquake Roller Bearings Installed in L. A. Building Addition

ANTI-EARTHQUAKE roller bearings, enabling a building to "roll with the punch" of an earth tremor, are being installed in Los Angeles for the first time in construction history as a novel solution to a difficult engineering problem.

The bearings are being used to permit addition of three floors to a six-story portion of the Sears, Roebuck & Co. plant built in 1929. The engineering technique being applied is to allow the 1929 building to carry only the vertical load from its three-story addition, while an adjoining structure with an 8-in. separation, built in 1940, will absorb both the earthquake rockings of its own mass and any shocks suffered by the addition.

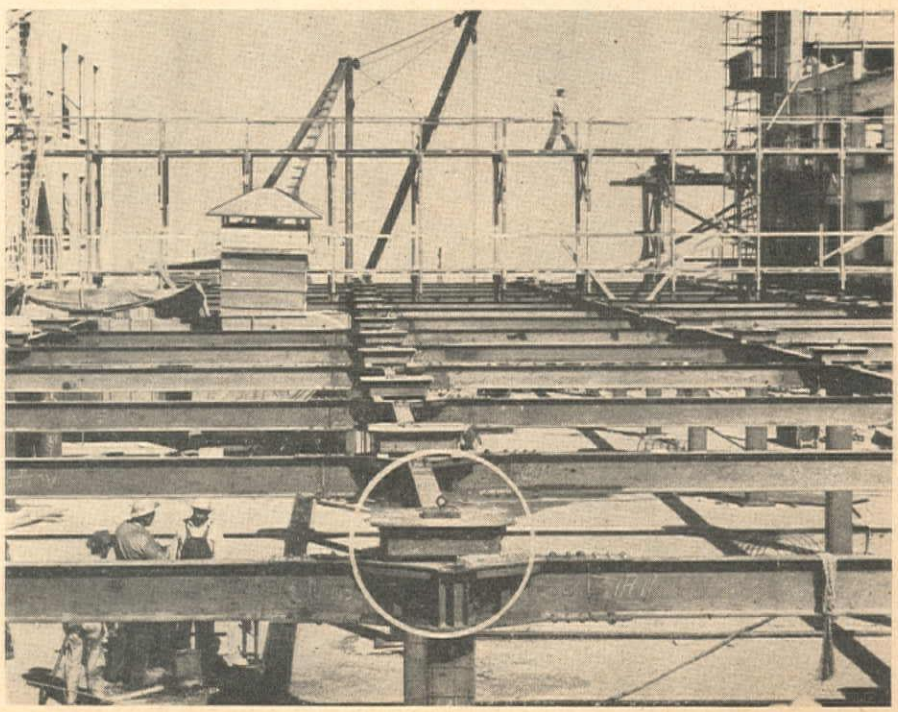
The roller-bearing assemblies—65 of them, each 21 in. square—placed between the 1929 building and its new floors will carry the vertical load, and at the same time absorb any horizontal stress. Each of the new floors will also be tied rigidly to the adjoining 1940 building.

The specially designed bearings weigh 600 lb. apiece and each bearing is required to carry a load of 250,000 lb. Acting together, they permit the addition to move six inches in any direction. The bearings consist of three steel plates with two interposed sets of steel rollers placed at right angles to each other. If a diagonal shock is encountered, both sets of rollers operate. Thus, the structure may move anywhere within a circle 12 in. in diameter.

Because of the tremendous weight they carry, the rollers and the steel plates upon which they move are made of the toughest alloy steel, ground and polished to mirror-like smoothness, and precise in measurement to within millionths of an inch. Each "nest" of rollers is hermetically sealed so no foreign matter can penetrate, and filled with a lubricant which has been found by test to show no deterioration in a period of 27 years. The bearing assemblies come to the job held by bolted clamps to prevent movement until erection is completed, after which the clamps are removed to permit them to function.

The anti-earthquake roller bearings are a product of The Torrington Co., South Bend, Ind. Myers Bros., of Los Angeles, Calif. have the $800,000 contract for the Sears, Roebuck addition, which when completed will be the first structure ever to be "floated" on roller bearings.

ENCIRCLED BELOW is the new anti-earthquake roller bearing, one of the 65 sets which provide a rolling foundation for three-story building addition in Los Angeles.



PORTAL EXCAVATION BEGINS ON 2-MI. COLUMBIA BASIN TUNNEL

A POWER SHOVEL, owned by T. E. Connolly, Inc., San Francisco contracting firm, excavates loose rock for the south portal of the Bacon Tunnel, Columbia Basin Project, which will irrigate 1,250,000 ac. in eastern Washington. The tunnel will carry the main irrigation canal through a hill of basalt. It will be 23 ft. in diameter and approximately two miles long. It is located a few miles south of Coulee City at the northern tip of the section of land designated to be the Columbia Basin Project Area. Connolly's contract is for $3,494,420.

California Construction Contracts Reach $750,000,000 Record Peak

CONSTRUCTION CONTRACTS in California for the first eight months of this year reached a record-breaking peak, estimated at $750,000,000. This was announced by A. Earl Washburn, Director of the State Reconstruction and Reemployment Commission, in releasing a report compiled by the commission's technical staff under the direction of V. B. Stanbery.

The report shows that the value of contracts awarded through August, 1946, as recorded by *Western Construction News* and other sources, totaled $665,000,000 and that other unreported construction work added approximately $85,000,000 more. These figures compare with the U. S. Census report for the entire year of 1939, in which the total value of construction contracts in California was $417,000,000.

"Because of the large rise in construction costs, the dollar volume of contract awards in 1946 does not represent the same physical volume of building it would have before the war," the report states. "However, despite reduced buying power of the construction dollar, the volume of work placed under contract in California during the first eight months of 1946 was undoubtedly greater than for a comparable period in any previous year."

In breaking down the reported awards, January 1—August 31, into types of construction, the report gives the following summary:

Public Construction	Amount	%
Public Housing	$ 22,815,000	3.4
Other Public Buildings	18,708,000	2.8
Other Public Works	159,003,000	24.0
Total Public	200,526,000	30.2
Private Construction		
Residential	235,729,000	35.5
Industrial	90,693,000	13.6
Commercial and Other	137,736,000	20.7
Total Private	464,158,000	69.8
Total Public and Private	$664,684,000	100.0

With a combined figure of $225,000,000, Los Angeles County and the nine San Francisco Bay Area Counties had 95 per cent of the State total of private residential building awards. Likewise, most of the private non-residential contracts were concentrated in these two areas.

The report points out that, at an assumed average cost of $7,000 per dwelling unit, the reported private residential contract awards represented about 34,000 new homes for Californians. This, however, does not include a considerable number of private home building awards for which contract amounts were not stated.

The report shows California has gained many new factories. A total of 408 contracts were awarded for new factories or industrial plant expansions, 356 of which were in nine California counties. Los Angeles County led with 273 and Alameda was second with 35.

The breakdown of the reported contract totals into areas shows:

Southern California Area	$384,589,000
San Francisco Bay Area	200,920,000
San Joaquin Valley	52,614,000
Sacramento Valley	17,153,000
Other Areas	9,408,000

Los Angeles, with $312,661,000 was the leading county, San Francisco was second with $60,349,000, and San Mateo third with $41,930,493.

The report states that employment in construction in the State has been increasing steadily during 1946 and is now at a peacetime peak of about 185,000 workers. Because of higher postwar construction costs and the longer time required to complete work, the employment rise has not been as great in comparison with prewar levels as the dollar volume of contracts would indicate.

Seven Earth-fill Dams Recommended by Army

THE CONSTRUCTION of seven dams instead of two originally planned has been recommended by the Army engineers for a portion of the Willamette Valley Flood Control System in Oregon. Too much fertile land would have been flooded and the town of Sweet Home would have been inundated by the two reservoirs now suggested for redesign.

The new recommendations for the construction of four earth-filled dams on tributaries of the McKenzie River and three on tributaries of the South Santiam River were made known by Col. O. E. Walsh, Portland district engineer, when he announced that public meetings would be held to allow local interests to present their views.

The four earth and gravel dams that will replace the proposed Quartz Creek dam on the McKenzie River will cost an estimated $27,000,000, as compared with the Quartz dam estimate of $23,137,000, or $19,800,000 without power.

The three dams on the South Santiam tributaries will cost approximately $17,700,000, whereas the Sweet Home dam on the South Santiam River would have cost about $7,644,000. These three dams will also be constructed of earth and gravel.

Navy Approves $4,300,000 Housing Project in Oregon

APPROVAL OF A proposed $4,300,000 housing project south of Tongue Point near Astoria, Ore., has been made by the Navy, and work on the project is expected to begin as soon as surveys of the site have been completed and plans prepared. The project will include 375 units to house officers and enlisted personnel attached to inactive units of the 19th Fleet. John Stoniunis, resident officer in charge of the project, will supervise construction.

WASHINGTON NEWS

. . . for the Construction West

By ARNOLD KRUCKMAN

WASHINGTON, D. C.—Upwards of $145,000,000 worth of projects scheduled in the 1946-1947 fiscal year program of the Bureau of Reclamation, for which Congress provided cash, have again been put to work by permission of the President and the approval of the Bureau of the Budget and Stabilization Director Steelman. This fiscal year's appropriation—July 1, 1946 to June 30, 1947—totaled something under $145,000,000; but there were other funds, chiefly unexpended balances, which over-all made available $210,000,000, the largest sum the Bureau of Reclamation ever has had for a single year. The Bureau still is presumably unable to use $65,000,000. It is generally assumed, here, however, that this "frozen" fund also will very rapidly be liquid in the Bureau's bank account. There is little doubt both the Administration and the new Congress will be eager to set public works humming.

Late in October the President formally gave permission to release $85,000,000 frozen Reclamation funds. It was found, however, the limitation might seriously interfere with a number of necessary undertakings. The situation was reviewed by the Director of the Budget and the Reconversion Director, and they reached the conclusion that $60,000,000 should be added to the unfrozen funds. The announcement was swiftly forthcoming the following projects will go ahead:

Region 1: Boise - Anderson Ranch, Boise-Payette, and Minidoka, in Idaho; Columbia Basin and Yakima-Roza, in Washington; Deschutes and Owyhee, in Oregon; and Hungry Horse, Montana.

Region 2: Central Valley, California; Klamath, in Oregon and California.

Region 3: Coachella Branch of the All-American Canal, California; Gila, Arizona; Parker Dam Power, California-Arizona; Davis Dam and Boulder Canyon, Arizona-Nevada.

Region 4: Ogden River, Provo River, and Scofield, all in Utah.

Region 5: Balmorhea, Texas; Rio Grande, Texas - New Mexico; Tucumcari, New Mexico; Lugert-Altus, Oklahoma.

Region 6: Fallon Unit of Buffalo Rapids, Dotson Unit of Milk River, Missoula Valley, Intake, Fort Peck Power, and Sun River, all in Montana; Rapid Valley and Angostura, South Dakota; Riverton, Shoshone, and Boysen, all in Wyoming; Missouri Basin Transmission Lines, North Dakota.

Region 7: Colorado - Big Thompson, Colorado; Kendrick and Kortes, Wyoming; and Mirage Flats, Nebraska.

Flood control

The cutback in flood control and rivers and harbors projects also was considered by the White House. It was finally announced that the deep cut out of the flood control budget for 1946-47 expenditure by the Corps of Engineers would be modified by $35,000,000. The cutback ordered in August by the President brought all waterway project cash allocation down from $500,000,000 to $185,000,000. Flood control was provided with $95,000,000, and rivers and harbors with $90,000,000. The modification late in October supplies flood control with $35,000,000 more, bringing the current cash available to $130,000,000.

No more money has yet been provided for rivers and harbors. Nor is it quite clear just where the $90,000,000 left in the Treasury will be spent. It is definitely known, however, that McNary Dam, the work on Foster Creek Dam, and other projects Congress directed should be started, are still held up. There is no reliable word that more funds may be released for rivers and harbors projects in the near future.

Apparently the ancient pork barrel stigma may seriously interfere with the proper development of unimpeachable rivers and harbors projects. It is probable the people of the Pacific Northwest, and in other areas of the West, will be compelled to insist upon the development of their legitimate projects by going direct and forcefully to the new Congress. It is generally understood the flood control funds will be released more rapidly and more plentifully, after Nov. 5, with the blessing of the White House. Incidentally, it is interesting to learn that the White House gives the color of justification for the release of the reclamation and flood control funds by the suggestion that the action does not take more money out of the Treasury because meat decontrol has saved the nation $300,000,000 in subsidies.

Executive interference

They say here that both Senators and Congressmen will make much unpleasant fuss over the White House interference with the laws directing that specific expenditures be made for various public works. The resolution adopted in New Orleans in September by fifteen members of Congress, demanding that waterway funds be restored for use by the agencies carrying out the will of Congress, specifically charges the President's action is "untimely, detrimental to the nation, fraught with potential danger to life and property, and **represents an unconstitutional and illegal power by the Chief Executive.**" The committee emphasized that if the President failed to rescind the cutback order they would demand the next Congress shall "enact such legislation as will effectively annul the curtailment order and effectively prohibit a repetition of the same or similar executive orders and any encroachment by the Executive Department upon the appropriation functions and power of the Legislative Branch of the Government."

It is startling that these biting and fighting words, in a period of a chaotic political situation with no certainty of pending election results, mainly should come from members of Congress outstanding in the President's own party. The signers of the resolution were Senators Overton, La.; McClellan, Ark.; Stewart, Tenn.; Bilbo, Miss.; and Congressmen Larcade, La.; Beall, Md.; Boykin, Ala.; Fisher, Tex.; McDonough, Calif.; Geelan, Conn.; Adams, Ky.; Simpson, Ill.; Robertson, N. Dak.; Pittenger, Minn. It is still more arresting to learn that virtually the same group, with the added influence of such members as Lea, of California, Whittington of Mississippi, and Harris of Georgia, went to the White House about Oct. 1, and flatly told the President he had exceeded his authority, even under the War Powers Act; had directly cut across the legislative will of Congress; and acted in conflict with the laws in such manner that it might require new legislation to make the appropriations and other Acts valid.

Telling 'em off!

The same group went from the Executive Offices to the offices of the Budget Director and the Reconversion Director. Here the Congressmen took the buttons off their foils and told the Budget and Reconversion Directors they were fooling with equations about which they knew practically nothing, that they were rank amateurs in the game, and that they were making trouble for the country and for themselves. The Congressmen made clear they knew the cutbacks came directly from the initiative of these Directors, still unused to the machinery of Government. Judge Whittington, the waterways expert of Congress, head of the Flood Control Committee, warned Steelman not to interfere with the work of the Corps of Engineers, and served notice Congress would discipline any employee of the Government who attempted to divert money from the purposes for which it had been appropriated.

The Congressmen later told their friends they thought the President had absorbed some of the qualities of the Missouri mule, and that his stubbornness, more than anything else, balked the effort to induce him to back down. There seems to be no doubt that this collision between the Hill and the White House may develop into a distressing and humiliating experience for the President.

If they can find the way there is no doubt some of the members of Congress would like to act in such manner as to impress upon the Government agencies that the orders of Congress come before the orders of the Executive. This would be almost unprecedented in administering wood-shed discipline to a President, and would create an almost insolubly embarrassing situation for the administrators of the Government agencies who receive orders from both the President and Congress. If the dignity of the office of President, and the authority of the Congress were not seriously in-

volved, the whole incident would simply be absurd and childish.

What about Mike Straus?

Gossip—and it is solely gossip—still insists that Mike Straus will be eased out of the Reclamation Commissioner's job as soon as it can be done without undue implications. Apparently the hefty Mike is not expected to remain in Interior, but, according to present chatter, may be taken care of by Mr. Truman, elsewhere. The most reliable prognosticators in Interior appear to have some reason for the opinion that the next Commissioner also may be chosen outside of the ranks of the engineering profession. They tell you that engineers do not ordinarily make good administrators.

Lineweaver would, under those circumstances, seem the likely successor, if the choice is made in the Bureau. But Lineweaver is said to be definitely opposed to being made the goat. Gossip also says that Barrow Lyons, head of Reclamation's information organization, may not come back from his prolonged vacation because he personally wishes to go elsewhere. But all this is gossip. The chief virtue to Washington, D. C. gossip is that it usually stems from something with a basis.

The moratorium on reclamation projects has made necessary considerable adjustment in plans for the Missouri Valley developments, and these adjustments again will have to be revised before a clear and definite program can be announced under the circumstances of the expansions which are possible as the result of the latest upward modifications. Meanwhile, the water resources review by the Geological Survey reveals the "over-all water supply picture in the West has improved, runoff increasing from a general average of 110% to 130%." The Arizona drought was substantially relieved by marked increases in flow in the Gila and Salt Rivers. Streams in New Mexico continued low and the flow in the Colorado again receded more than seasonably, from 98 to 77 per cent of normal.

Double XX by Krug

Interior Secretary J. A. Krug is assumed by people in the Capital to have made his surprising speech in Seattle, endorsing the candidacy of Sen. Hugh Mitchell and the Columbia Valley Authority program, upon orders from the White House. The White House, in turn, is supposed to have paid some political debts through Krug to its leftish friends in the State of Washington. Krug's unequivocal endorsement of the CVA was startling here because when he eagerly qualified for his job before the Senatorial Committee he most emphatically disclaimed "any leaning to the view that the big water power development in the Northwest should become the framework of a regional authority of the Federal Government."

In his speech he said about the CVA bill "the idea of that bill is sound, the principles are right, the objective is not only desirable, but—in my opinion—essential to the rapid development of this region. I wish to endorse the idea, principles, and objective." Obviously, the political integrity of J. A. Krug is now considered questionable. He is expected either to justify his statement by asserting he has always held local or regional circumstances must determine the politico-administrative form of a big water power development, or by amplifying his speech **after** Nov. 5 with the explanation that he meant any Authority must come under the control of the Department of Interior. The latter would be consistent with the policy set up and steadfastly maintained by Ickes.

At Seattle Krug said: "It is clear to me that a strong regional autonomous organization should be created to execute certain specified Federal functions in **this** area." His subordinates in Interior, who have been politically reared in the faith of Ickes, do not think he could justify an autonomous regional Authority in the Columbia Valley and attempt to exempt others under the umbrella of Interior.

The impression of slipperiness in the Seattle performance is enhanced by the way in which Krug physically approached the Seattle climax. Although it was well known among the faithful in the Capital that he would be in Seattle on Oct. 16, and, that he would speak, his trip was announced in the most circumspect fashion by his own press agents. The itinerary did not logically lead to Seattle, and Seattle was not mentioned on the schedules given out both in Washington and in the West. The tour criss-crossed around New Mexico, Nevada, Arizona, and California, and brought his party into Seattle with a minimum of brass and drums. In Washington no one wished to say much about it before it was under way. For this reason another trip, presumably to climax at Berkeley and San Francisco early in November, has aroused much speculation in the Capital. The Seattle incident makes understandable why in places such as Washington politicians tortuously read meanings into apparently innocent circumstances and why such subtleties bewilder and distress the bystander.

Miscellaneous

Plans have been completed for public works in the States of the West slope which, with Federal funds, will cost $1,916,000; similar projects, for which plans are not yet complete, will cost $100,255,000; Western states have made plans for similar works without Federal funds which will cost $130,654,000; State works for which plans are not complete will cost $877,203,000. The Federal Works Agency also reports that State and Federal Public Roads funds will be spent, on plans already completed, to a total of $147,477,000, in the 11 Western States, and in Hawaii and Alaska; it is estimated on plans yet incomplete the expenditure will be $387,057,000. It is calculated the money will be spent, approximately, for land, 3.5%; construction, 83.8%; equipment, 5.9%; plan preparation, 3.0%; miscellaneous, 3.8%. Over-all, it is estimated highways, roads and streets will take 5.6%; bridges, viaducts and grade separations, 1.0%; airports, terminals, and landing strips, 0.8%; sewer, water and sanitation facilities, 45.5%; schools, 29.6%; hospitals and health facilities, 3.5%; other public buildings, 8.6%; parks, 3.8%; all other public facilities, 1.6%.

Thomas H. McDonald, Commissioner of Public Roads, announced recently his Administration has established in the Philippines a new division office to administer the rehabilitation activities. The program calls for $100,000,000 expenditures, jointly contributed by the United States and the Philippines. Approximately $20,000,000 will be spent in 1946-47. The job includes integration with port and harbor work, air transport, the fishing industry, school and hospital reconstruction, public health facilities, and similar work. Francis C. Turner is in charge of the Manila office.

The Philippine War Damage Commission, which will liquidate claims for $1,000,000,000, also has been established in the Islands. The funds chiefly will be spent for rehabilitation. The staff, headed by Chairman Frank A. Waring and Commissioner Francisco A. Delgado, numbers 250 persons, Americans and Filipinos.

Cement companies may continue to sell at delivered prices under a multiple basing point method, according to a rule of the U. S. Circuit Court of Appeals in Chicago, wiping out a Federal Trade Commission order. The case will naturally go to the Supreme Court. The decision is a severe spanking for the FTC.

All construction in the Philippines coming under Army Engineers was awarded to Johnson, Drake and Piper Company, Oakland, Utah Construction Co., Ogden, and Grove Shepherd Wilson and Kruge, Inc., St. Louis. The amount involved exceeds $30,000,000.

Southern Idaho to Get Three New Power Plants

THREE NEW hydroelectric generating plants are planned for immediate construction on the Snake and Malad Rivers as part of the largest development program in Idaho Power Co.'s history, B. C. Russell, general superintendent, announced recently.

The generating facilities at river sites now in use will be completed with the installation of the three new hydroelectric plants.

Expenditure of approximately $11,950,000 is called for under the plans to provide additional generating capacity of 73,550 kw.

The rebuilding of the dam and power plant at the lower Salmon site of the Snake River near Hagerman, Ida., is the largest of the three projects. The new installation will have an installed capacity of 60,000 kw. This replaces the plant and dam constructed in 1910 which has a 7,200 kw. capacity.

The new lower Malad plant will generate 13,500 kw., and the Upper Malad, 7,250 kw.

Morrison-Knudsen Co., Inc., of Boise has received a contract for the construction which is expected to last until the latter part of 1948.

A. T. C. Opens Top of the World Flight to Tokyo

A NEW MILITARY airline to Tokyo over the "top of the world," saving more than 18 hours of flying time each way, has been opened by the Army Air Forces Air Transport Command.

The new line follows a one-stop route from Seattle, Wash., to Tokyo, via Adak, in the Aleutian Islands. A daily round-trip is being flown.

Over this new "Great Circle" route, skirting the Arctic, the flight to Tokyo can be made in 26 hours flying time. Present trans-Pacific route to Japan, via Hawaii and other Pacific islands, requires 44 hours.

From Hamilton Field, Calif., to Hawaii and on to Tokyo via Johnson Island, Kwajalein and Guam, is a 7,955-mi trip. From Seattle to Tokyo, via Adak, is only 4,722 mi. The 3,233-mi. reduction results in large savings in gasoline consumption and maintenance costs, and increases operating efficiency.

Cold Bay, Alaska, and Amchitka Island, in the Aleutians, have been designated as alternate bases, to forestall bad weather difficulties and, if necessary, to serve as refueling points.

Procurement of trained personnel to operate weather stations and communications and maintenance centers along the new route is a problem now facing the Air Transport Command's Pacific Division, which will operate the route.

The new flight carries primarily cargo and mail, but, as it develops and facilities are improved, passengers will be carried in increasing numbers.

PUDDLED EARTH TO FORM LINING OF PASCO CANALS

THE PASCO UNIT will be the first section to be placed under water in the Columbia Basin irrigation development in eastern Washington. All earth used in compacted canal embankments must first be soaked with water. W. B. Rogers, concrete and pipe foreman for J. A. Terteling & Sons, Boise contractors, is shown here making an experimental mix of water and soil to determine most impervious combination.

Motor Vehicle Registrations Rise In Spite of Limits on Production

DESPITE LIMITED production of new cars, the number of privately-owned motor vehicles registered during the current year will be substantially greater than 1945 registrations, according to estimates made by the Public Roads Administration, based on reports from State authorities.

Truck registrations will reach an estimated total of 5,423,000, an increase of 588,000 or 12.2 per cent over 1945 registrations, and approximately 563,000 more than the number registered in 1941, the prewar peak year for motor vehicle registrations.

Automobile registrations are expected to increase from 25,691,434 in 1945 to an estimated 27,088,000 in 1946, a rise of 5.4 per cent, but will be about 2,436,000 or 8.3 per cent fewer than the 29,524,101 cars registered in 1941.

California, with an estimated total of 2,955,000 privately-owned vehicles to be registered in 1946, and New York, with an estimated total of 2,560,000, will lead the States in motor vehicle registrations. Thirteen States will have increases over 1941 registrations.

Registrations totals for automobiles and trucks in the Western States follow:

State	*Registrations*			*Percentage Change 1941 to 1946*
	1946 Estimate	*1945*	*1941*	
Arizona	160,000	142,463	144,066	+11.1
California	2,955,000	2,848,629	2,957,959	—0.1
Colorado	377,000	341,586	364,368	+3.5
Idaho	163,000	150,364	170,892	—4.6
Kansas	648,000	599,981	612,243	+5.8
Montana	164,000	156,331	198,382	—17.3
Nebraska	416,000	405,148	422,736	—1.6
Nevada	48,000	45,791	48,004	0.0
New Mexico	128,000	116,861	127,933	+0.1
North Dakota	187,000	180,730	192,765	—3.0
Oklahoma	535,000	502,437	589,025	—9.2
Oregon	439,000	413,171	428,751	+2.4
South Dakota	185,000	178,323	202,734	—8.7
Texas	1,715,000	1,581,463	1,810,099	—5.3
Utah	165,000	153,648	149,862	+10.1
Washington	630,000	612,193	615,371	+2.4
Wyoming	88,000	82,029	91,319	—3.6

A. G. C. Representatives Hold Regional Meeting In Seattle

REPRESENTATIVES from six Pacific Northwest chapters of the Associated General Contractors held a regional meeting in Seattle, Oct. 5, to discuss labor, materials, and contract problems. Representatives were present from the Portland, Spokane, Idaho, Montana, and Tacoma chapters with the Mountain Pacific Chapter serving as hosts. Following considerable discussion on the subject, a resolution was passed recommending against undertaking of negotiations for an inclusive labor agreement with the building trades unions to apply throughout the Northwest. In the evening following the meeting the Mountain Pacific Chapter held a dinner dance at the Rainier Country Club in honor of the visiting members from other chapters and their wives.

Vancouver Water Works Project Now Under Way

MARKING a further step in the development of a gigantic water works project, work is now under way in the laying of a water main from the Upper Seymour Intake to the Second Narrows at Vancouver, B. C.

The project is being carried out for the Greater Vancouver Water District Board at a cost of approximately $3,750,000. Next unit in the development will be the erection of a large dam at the upper canyon of the Capilano River. It is not anticipated that this project will get under way for two or three years.

The new steel water main is designed to last more than 60 years and will replace water mains which have an estimated life of 20 years. The 60-in. water mains are now carrying between 30 and 35 million gallons of water to the city daily. The steel main will boost that

amount by another 10 to 12 m.g.d. When the total Seymour water development project is completed the river will yield around 80 m.g.d.

The new main extends for 11 mi. from the intake to the Second Narrows and the route has been planned to eliminate danger of flood or washout along the pipe line road. So far only a mile of the new pipe line has been laid at the upper end of the route as the steel strike in the east has held up delivery. The project was started in the fall of 1945, and it was hoped then it would be completed by next summer.

OBITUARIES . . .

P. M. Erlich, 54, contractor of Seattle, was killed in an automobile accident near Mt. Rainier National Park in Washington on Oct. 15. He was on his way to a construction project within the park when the accident occurred.

* * *

Joel M. Lowman, retired chief engineer of the Seattle city water department, died at his home on Bainbridge Island in Puget Sound on Oct. 14, at the age of 67. He had been with the Seattle water department from 1921 until his retirement a year ago, and had been chief engineer since 1932. Prior to joining the water department he had worked for the Seattle city engineer and for the Snohomish county engineer.

* * *

John McLaren, 86, pioneer Northwest contractor, died in Seattle Oct. 2. Among the early Seattle construction projects on which he was engaged were the Yesler Way cable car line and the Rainier Valley street car line. He was a native of Nova Scotia, Canada, but had resided in the vicinity of Seattle for 70 years.

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John J. Moser, past president of Intermountain Branch, Associated General Contractors, Salt Lake City, Utah, died there on September 28. Moser constructed many buildings throughout the state of Utah. He was A.G.C. president in 1935.

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Robert Vincent Derrah, former Salt Lake City, Utah, architect and engineer, died recently in Los Angeles, Calif. Many Southern California buildings had been designed by him. He was 51 at the time of his death.

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Paul C. Dukes died October 7 at the age of 27, after a long illness. He was well known in the city of Denver, Colo., where he was born. During the war he was a junior engineer at the Denver modification center.

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Lewis Telle Cannon, 74, Salt Lake City, Utah, architect, died suddenly at his office on October 10th. Many downtown buildings, as well as buildings on the Utah University campus had been designed under his supervision.

Frederick A. Hills, construction superintendent for the Anaconda Copper Mining Co., died in Butte, Mont., Oct. 6. He supervised construction of the chrome developments at Ben Bow and Mouat near Columbus in south central Montana, and the magnesium plant at Boulder City, Nev., during the war period.

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Charles W. Duncan, 82, one-time county engineer of Grant County, Washington, died in Ephrata, Wash., Oct. 9. A pioneer resident of the county, he took an active part in construction of the original highway between Vantage Ferry and Moses Lake.

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Eli Chouinard, 81, retired building contractor of Everett and Seattle, Wash., died in Seattle Oct. 11. Among the structures which he built were the high school, and the Catholic and Episcopal churches of Everett.

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Arthur W. Larson, 65, building contractor of Seattle, died in that city Oct. 10. He was a member of the Seattle chapter of the Associated General Contractors and the Seattle Master Builders.

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Martin Jacobson, 91, retired building contractor of LaConner in Skagit County, Washington, died there Oct. 8. His construction activity had been largely in Seattle, where he had lived until nine years ago.

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Charles B. LaJune, 52, building and excavating contractor of Seattle, was killed in that city on Oct. 15, when he was trapped in the cave-in of a 15-ft. sewer excavation.

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Charles H. Bigler, 71, died recently in Denver, Colo., after a prolonged illness. He operated as a general contractor in Denver since 1900.

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Walter C. Hallock, 57, engineer with the Thirteenth Naval District, died in Seattle Oct. 1. He was a graduate of the University of Colorado.

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Walter Harvey, 78 years old, of Seattle, Wash., died September 25. He was a retired building contractor, and a resident of Seattle for nearly forty years.

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Edwin M. Bushnell, former assistant city engineer of Los Angeles, Calif., died recently. He was 81 years of age and had been a resident of Los Angeles for 51 years.

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Niels Storgaard, retired contractor-builder of Los Angeles, Calif., died September 20 at the age of 65.

* * *

John E. Schafer, construction engineer of Los Angeles, Calif., died there recently at the age of 54.

Coulee Dam Gains Three 108,000-kw. Generators

MARKING the fifth anniversary of operation by the world's largest generators at the Grand Coulee Dam, the Bureau of Reclamation announced on Oct. 14 that power output had reached 20 billion kilowatt-hours.

Five years ago this month, the first of the massive 108,000-kw. generators in the West Powerhouse at the dam "went on the line." This unit was joined during the war by five companion generators and two 75,000-kw. units, designed originally for the Bureau's Shasta Dam. The Bureau is now completing transfer of the Shasta generators to Shasta Dam and is preparing to rush the installation of three more 108,000-kw. generators in the West Powerhouse.

Upon completion of the three new units, the West Powerhouse will have an installed rated capacity of 992,000 kw., compared with 818,000 in the war years when the powerhouse, in one month, set a world's record of 621,119,000 kw. hr.

Some turbine parts for "L-7," first of the new units, are expected to arrive at the dam in December. This unit is scheduled to begin operating in November, 1947. Its companions, "L-8" and "L-9," are marked for operation in February, 1948, and April, 1948, respectively. Each of the giants, with turbines, will weigh 3,500,000 lb. Fifty railroad cars will be needed to transport the parts for one unit.

Spokesmen for the Bonneville Power Administration, which markets power from the Grand Coulee and Bonneville dams, have stressed the need for additional generators to meet constantly increasing demands for power, particularly because of the rapid conversion of aluminum plants to peacetime production, and the greater use of electricity by other industries and by homes and farms.

Goudey Submits Plan for West Basin Water Supply

WEST BASIN which comprises communities bounded by Ballona Creek, the Inglewood earthquake fault and Long Beach, Los Angeles county, Calif., may soon have to purify sewage effluent, in order to have an adequate future water supply for the growing communities in the area, a recent survey made by R. F. Goudey, sanitary engineer of the Department of Water and Power, Los Angeles, reveals.

Goudey's plan calls for an eight-stage purification process, including pumping, pre-aeration, sedimentation, aeration, re-aeration, chlorination, high-pressure pumping, pressure filtration and filtration through diatomaceous earth.

He claims it would be much cheaper and more likely to produce an adequate future water supply for the community than joining the Metropolitan Water District of Southern California.

Jointly with Goudey's report, a survey of existing water supplies in the region

was presented by Harold Conkling, former deputy state engineer, who made the water survey for the West Basin Water Association. He found that "Water is being pumped out twice as fast as nature can replenish it, and sea water is encroaching on even these depleted reserves."

These reports, together with a third survey to be made by J. F. Poland, U. S. Department of Interior geologist, into the region's water plight from the long-range viewpoint, will be considered by the association which includes the communities of El Segundo, Manhattan Beach, Hermosa Beach, Redondo Beach, Gardena, plus 15 commercial users and local water companies.

News Items From the Pacific Northwest

BIDS FOR RECONSTRUCTION of the Tacoma Narrows bridge will not be called until the spring of 1947. The Washington State Toll Bridge Authority had announced last summer that bids for construction of the redesigned structure would be called this fall, but the shortages of materials and the uncertainty of the labor supply have now postponed the opening of bids for at least seven months.

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CONSTRUCTION of a four-lane toll highway across the State of Washington from the Puget Sound area to Spokane has been advocated by Gov. Mon C. Wallgren of Washington. The suggested highway would connect the shipping and industrial area of the state with the agricultural area, utilizing a tunnel through the Cascade Mountains in the vicinity of the present Snoqualmie Pass.

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STARTING OF construction of 750 to 800 homes at an estimated cost of $5,000,000 has been scheduled for Dec. 1, by Babbitt & Mercer, Inc., engineers and contractors of Portland. The large housing project is to be located in the Bangor section of North Bend in Coos County, Oregon, in the southwestern part of the state. Houses will be constructed in groups of 25 with all lumber precut at a mill to be erected on the site.

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SITE FOR A $1,750,000 bridge across the Columbia River at Wenatchee, Wash., has been selected, and design of the 1,203-ft. structure will be completed in about a year by the bridge department of the Washington State Highway Department. The bridge will be a steel arch cantilever span 54 ft. wide with the main span 512 ft. long. It will be 110 ft. above low water of the river.

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CEDAR CREEK DAM, a 70-yr. old structure on the Lewis River in Washington, has been removed in an effort to build up the salmon and trout runs on the river by the Washington State Department of Fisheries. The dam was built in 1876 to supply power for a grist mill.

NEW BOOKS...

BUILDING INSULATION, by Paul D. Close, illustrated by A. E. Burke. Published by the American Technical Society, Drexel Ave. at 58th St., Chicago 37, Ill., 360 pages, 8½x5½.

Perhaps no other phase of building construction involves so many controversial problems as insulation. The prospective home owner, with no previous knowledge of or experience with insulating materials used in conjunction with building construction, will invariably want to know what is considered to be the best insulation, or the best type, how much to use, where to apply it, what the saving in fuel will be, and many other facts.

The author has prepared this book as a reference volume for those interested in the subject of heat and sound insulation for buildings. The book contains information regarding the various types of insulation now in use.

The book clearly discusses and illustrates such subjects as the theory of thermal insulation, the fundamentals of heat transfer, heat-loss coefficients of insulating and building materials, compound wall and roof structures, economic phases of insulation, evaluation of the results obtained with various types and thicknesses of insulation, prevention of condensation within walls, pipe and duct insulation, and three important phases of the sound-insulation problem.

* * *

THE ENGINEER AT LAW—A Resume of Modern Engineering Jurisprudence by Conde B. McCullough and John R. McCullough. Published by The Iowa State College Press, Ames, Iowa, in two volumes. Vol. I, 447 pages, 6x9, price $3.00. Vol. II, 442 pages, 6x9, price $3.00. Price of both volumes $6.00.

Rather more comprehensive than the run-of-the mill engineering law works, these two volumes cover a wide variety of subjects from a brief history of the origin and evolution of American law to administrative law. As in any standard engineering law text, a great deal of space is devoted to equity, contracts, and specifications. These subjects together with chapters on courts, real property, and torts (private wrongs) constitute the first volume. The second volume covers the subjects of employment relations; trial work; patents, copyrights and trademarks; corporations, public utilities and carriers; administrative law; sales; negotiable instruments; and pleading and procedure. For use as a text in engineering law the first volume alone would suffice for a short course, but for a comprehensive study and for reference purposes the use of both volumes would be advisable. The material is quite readable because of the authors' obvious interest and long experience in the subject, and because of the absence of long and tedious references to past court decisions which the reader seldom has time or interest to investigate further. The authors are the late assistant chief engineer of the Oregon Highway Department, who was well known as a bridge designer and economist, lawyer and author, and his son, attorney for the transportation division of the Oregon Public Utilities Commission. Among the objects of the book as listed by the authors are "to indicate to the engineer the necessity for so planning and prosecuting his work as to satisfy the technical requirements of the law as well as its equitable demands," and "to convince the engineer of the folly and futility of attempting to do his own legal work."

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LUMINOUS TUBE LIGHTING, by H. A. Miller. Published by the Chemical Publishing Co., Inc., 243 King St., Brooklyn 31, N. Y. 140 pages, 8½x5½. Price $3.50.

Information contained in this clearly-written, practical book explains the underlying principles of the luminous tube, discusses and illustrates the materials and equipment involved, and describes each of the discharge tube light sources. It lists data on design and manufacturing which are certain to satisfy demands beyond the field of luminous tube lighting.

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MANUAL OF DESIGN FOR ARC WELDED STEEL STRUCTURES—By LaMotte Grover. Published by Air Reduction Sales Co., Dept. MD, 60 East 42d St., New York 17, N. Y. 6x9, 281 pages, price $2.00.

Compiled from the experiences of the publisher and the results of research reported by the Welding Research Council as well as other sources, this manual is intended to bring together the most authoritative data and information on the subject of welded steel design in a form comparable to the portion of steel handbooks which supply information for riveted joints. Part I, covering fundamentals of design, discusses welded joints, advantages, characteristics, specifications, typical design, estimating, and inspection. Part II consists of a series of tables for use in connection with a system of standardized welded details which is outlined in the book. Part III is devoted to reference and information data including definitions, symbols, welded joint forms, electrodes, and estimating of electrode requirements.

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SCIENTIFIC INSTRUMENTS—By Herbert J. Cooper. Published by The Chemical Publishing Co., Inc., 26 Court St., Brooklyn 2, N. Y. 5½x8½, 305 pages, price $6.00.

Intended to acquaint those who need or want to have a working knowledge of a wide variety of measuring instruments without going into design details, this book includes a well detailed section on lenses and optical instruments of all types. Since the author is English, the descriptions are particularly adapted to English makes. Sections are devoted to optical instruments, measuring instruments, navigational and surveying instruments, liquid testing, and miscellaneous types.

PERSONALLY SPEAKING

Commander Jack Senior has been appointed Pacific Northwest district supervisor for the U. S. Coast and Geodetic Survey to succeed **Captain Alfred M. Sobieralski,** who retired from active service on Nov. 1. Cmdr. Senior has served 31 years with the C&GS which included a year's service in Alaska on the survey ship Explorer, and another year in Puget Sound. He will make his headquarters in Seattle. Capt. Sobieralski has served 38 years with the C&GS, entering the service in 1908 as a hydrographic engineer. He has served 18 years in Alaskan waters, and he has had other tours of duty on the Pacific Coast, Atlantic Coast, in Hawaii and in the Philippines. He has been stationed in Seattle for the past six years and will continue to make his home there.

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William S. Wagner, formerly chief of the control division of the Seattle district, U. S. Engineer Dept., has been transferred to the headquarters of the Western Ocean division of the U. S. Engineer Dept., at Sausalito, Calif. Wagner had been on the staff of the Seattle district since 1941, coming at that time from the Wyoming State Highway Department at Cheyenne. He will serve in the same capacity in his new appointment, the Western Ocean division controlling military construction and supply in the Honolulu, Okinawa, and Manila districts.

* * *

James R. Griffith, author of the monthly Construction Design Chart appearing in *Western Construction News*, has resigned as structural engineer with James Carey & Associates, Seattle, to accept the position of consulting engineer with the Birch-Johnson-Lytle organization which holds a large building contract for structures to be erected at various locations in Alaska under the direction of the Corps of Engineers. Griffith is presently engaged in building up the engineering organization which will operate in the organization's Seattle headquarters.

* * *

Named at the meeting of the Compact Commission for Division of Colorado River Waters recently held at Santa Fe, New Mex., was a permanent engineering advisory committee comprised of: chairman, **J. R. Ritter,** Bureau of Reclamation, **C. L. Patterson, R. J. Tipton,** all of Denver; **R. Gail Baker,** Phoenix, Ariz.; **John H. Bliss,** Santa Fe, New Mex.; **F. W. Cottrell,** Salt Lake City, Utah; and **H. T. Person,** Cheyenne, Wyo. It will be the duty of this committee to engage in engineering studies, compiling data on the river, including stream flow and other details, for submission to the compact committee.

* * *

Col. Ralph A. Tudor was recently awarded the Legion of Merit medal for his wartime service, during which he supervised the army's military construction and postwar planning program in Oregon, Idaho and southern Oregon. The award was presented in San Francisco by **Col. Edwin H. Marks,** South Pacific Division engineer. Colonel Tudor is presently chief engineer for Morrison-Knudsen Co.'s China consulting group, with offices at San Francisco and Shanghai.

G. F. Fountain, assistant city engineer of Vancouver, B. C., was elected chairman of the Public Works and Municipal Engineers Association at their fourth annual convention at Kelowna, recently. **A. S. G. Musgrave,** municipal engineer of Oak Bay was elected secretary-treasurer. Committee members elected were: **Evan Jones,** district engineer, public works department, New Westminster; **Neil McCallum,** provincial surfacing engineer, provincial works department, Vancouver; **Don McGugan,** civil engineer, New Westminster; **Russell Potter,** city engineer, New Westminster, and **E. Q. Richardson,** municipal engineer, West Vancouver.

* * *

E. R. "Mike" Foley is resident engineer, representing the Bridge Department of the California Division of Highways on the Alameda Creek bridge and overhead between Niles and Sunol. Foley has been with the State since 1932, with the exception of four years of war duty with the Seabees, where he had the rank of lieutenant-commander. On his present assignment he is assisted by **J. M. Gayner** on bridge construction and **L. G. Marshall** on grading and paving work.

* * *

Clarence C. Davis, civil engineer with the operations division of the U. S. Engineer Dept., Portland district, has been recalled to duty with the U. S. Army, reporting at Fort Belvoir, Va., last month. Davis served as lieutenant colonel in the Corps of Engineers, seeing duty in the Mediterranean and European theaters during World War II. Since his return to the Portland district he had been engaged on the planning work in connection with Detroit and Meridian dams of the Willamette Valley project.

* * *

James H. Park, Compton, Calif., was re-elected president of the Pacific Coast Building Officials' Conference at the 24th annual meeting of the organization at Victoria, B. C., recently. Other officers re-elected were, first vice-president, **Harold O. Rasmussen,** Santa Ana, Calif., and second vice-president, **Frank H. Rogers,** Medford, Ore. **Hal Colling** of Pasadena, Calif., was appointed managing-secretary, and **Ray C. Eberhard** of Los Angeles, attorney. Over two hundred delegates attended the convention.

* * *

George B. Archibald, special assistant and consultant to the district engineer at Fort Norfolk, Canada, was recently awarded the medal and commendation for exceptional civilian service for the "adequacy of design and the direction of field supervision for the entire Canol project."

* * *

W. H. Rochester, assistant chief engineer for the Santa Fe Railway Coast Lines at Los Angeles, Calif., has been appointed chief engineer of the Gulf Lines, with headquarters at Galveston, Texas. Simultaneously, appointment of **H. E. Wilson** as district engineer of the Los Angeles, Valley and Terminal divisions, with headquarters at Los Angeles, Calif., was announced. His recent post was that of division engineer at La Junta, Colo.

Frank M. Lewis has been promoted to the position of resident engineer at Bonneville dam, a section of the Portland district, U. S. Engineer Dept. Lewis has been a member of the engineering staff at Bonneville since 1935 when he was appointed engineer in charge of electrical construction and inspection at the dam, which was then under construction.

* * *

In the expanded program in the office engineering operations of the Metropolitan Water District of Southern California the following men hold key positions: **William H. Eppinger,** engineering aide in the Operation and Maintenance Division; also **Joy H. Dunlap,** engineering aide; **Walter R. Kalpinski,** draftsman; **Max W. Millman,** draftsman; **Carl C. Pascal,** assistant engineer; **Norman N. Stafford,** draftsman; **Marvin E. Stephens,** draftsman; and **Jim W. Westphal,** engineering aide.

* * *

John Roberts, formerly assistant city controller for Tacoma, Wash., has been appointed public works commissioner for the city, succeeding **A. R. Bergesen,** who resigned recently to accept a position with a Tacoma contracting firm. **C. E. Henriot,** formerly with the Washington State Highway Department, has been appointed superintendent of streets for Tacoma.

* * *

E. B. Debler, director of Region 7 of the Bureau of Reclamation at Denver, Colo., recently sailed for Hawaii to investigate irrigation possibilities in the Islands. He will be assisted by **James C. Douglass,** Bureau engineer from Salt Lake City, Utah. **Avery A. Batson,** assistant regional director, will be in charge of Region 7 office in Debler's absence.

* * *

R. H. Corey, consulting engineer of Portland, has received a contract for architectural-engineering services for the preparation of designs for the $3,980,000 housing project to be constructed by the Navy near Tongue Point, Ore. Preconstruction work is already under way at the site by Lease & Leighland and Kuney Johnson Co., contractors of Portland.

* * *

Elmer N. Humphrey, formerly a member of the agricultural engineering faculty at the University of Idaho, Moscow, has been appointed deputy state reclamation engineer of Idaho to serve under **Mark Kulp,** state reclamation engineer. Humphrey recently returned from Germany, where he had been on duty with a military government unit of the U. S. Army.

* * *

Albert W. Newcomer, Bureau of Reclamation engineer at the Denver, Colo., office, has been assigned to aid the Venezuelan government in planning a long-range agricultural resources development program. He will investigate sites for reservoirs and other irrigation construction, and recommend reclamation procedures.

* * *

George S. Hinckley, city engineer of Redlands, Calif. for 38 years, retired September 1. Among the many improvements

during his tenure of office, was the acquisition and development of the city water system. He was a recognized hydraulic engineering expert whose services were widely sought.

* * *

Oliver Olson, formerly associated with numerous large construction jobs in the Northwest, and **Bjarne C. Olsen,** on the faculty of the School of Architecture at the University of Washington, have opened an office at 905 Second Avenue Bldg., in Seattle, Wash., for the practice of architecture in connection with commercial, industrial and residential problems.

* * *

At the annual meeting of the Canada-to-Mexico Highway Assn. held at Grand Junction, Colo. during October, the following officers were elected: **L. L. Newton,** Lander, Wyo., re-elected president; **H. C. Chernin,** Nogales, Ariz., first vice-president; **E. L. Dreser,** Craig, Colo., second vice-president; and **H. L. Buck,** secretary-treasurer. At the meeting, the association recommended standardized markings in the five states through which the road runs.

* * *

Eugene H. Merrill of Salt Lake City, Utah, was recently appointed chief of communications branch, Internal Affairs and Communications Division of the U. S. Military Government of Germany, and will reside in Berlin. He is a graduate engineer, and formerly chief of the telephone branch, War Production Board.

* * *

Doyle F. Boen was recently appointed acting city engineer of Corona, Calif., for a period of six months, substituting for **A. H. Hanapel** who is away from the office due to ill health. Boen was at one time chief engineer on a project in Owens Valley.

* * *

J. A. Stasek, until recently employed as office engineer on the San Diego Aqueduct Project in California, has moved to Milwaukee, Wisc., where he is engaged as engineer in flood control design for the U. S. Soil Conservation Service.

* * *

W. S. Angst and **W. C. Manville,** who have maintained a plant for the servicing of heavy truck and tire equipment for a number of years in National City, Calif., have established a large plant in San Diego, maintaining the old location as a branch.

* * *

Frank J. Bennett, until recently in an engineering capacity with the Division of Hydrology of the Bureau of Reclamation at Sacramento, Calif., is now at Kortes Dam, part of the Kendrick Project near Casper, Wyo., where he is inspector for the Bureau.

* * *

Arthur R. Watson has joined the staff of Donald R. Warren Co., San Francisco, Calif., as a structural designer and draftsman. He was formerly of the U. S. Bureau of Reclamation at Quincy, Plumas Co., Calif.

* * *

Robert B. Cochrane, formerly resident engineer at Bonneville dam, has been placed in charge of the hydraulic section of the engineering division of the Portland district, U. S. Engineer Dept.

William M. Williams, former planning director of the State Highway Department at Denver, Colo., was recently appointed director of the State Planning Commission, replacing **Al Rockett,** who had held the position by provisional appointment for the past several months.

* * *

J. H. Bjork has received a promotion in grade to engineer-construction and has moved from the Davis Dam project, Kingman, Ariz., to the Coachella Branch of the All American Canal in California, in the employ of the Bureau of Reclamation.

* * *

E. B. Stanton, maintenance of way engineer for the Spokane, Portland & Seattle Ry. Co., Portland, Ore., has been promoted to the post of assistant general manager and maintenance engineer of the rail system.

* * *

R. H. Hammond has been appointed city engineer and head of the newly formed department of Public Works, including engineer, street and building divisions, at Hawthorne, Calif. He succeeds **John E. Bonadiman,** resigned.

* * *

Harold Fong, who during the war served with the 302 Engineers on Okinawa, is now a junior engineer with the U.S.E.D. in Sacramento, Calif. Also with the U. S. Engineers in Sacramento is **Paul C. Ricks.** Ricks spent nearly six years on defense projects in Panama Canal Zone.

Ralph O. Lund, after having served for five years as cost accountant with Rumsey & Co., general contractors of Seattle, has returned to the architectural field, having recently joined the staff of **John Maloney,** architect of Seattle.

* * *

Hugh T. Wilson is working on the Homer-Kenai section of the Homer-Anchorage Highway for the Alaska Road Commission. He has the title of chief of party and makes his headquarters at Anchorage.

* * *

Weller Probasco of Salem, Ore., has been appointed to the position of city engineer for Newburg, Ore. His duties will include supervision of the water, street and sanitary departments for the town.

* * *

Gorham B. Knowles, formerly of the Los Angeles, Calif., office of the engineering and construction firm of Sanderson & Porter, has recently been transferred to the San Francisco office.

* * *

A. L. Hutchison has moved from Pullman, Wash., and will reside at New Haven, Conn., while attending Yale University following the receipt of a fellowship to study traffic engineering.

* * *

J. A. Bradley was appointed flood control engineer of Orange County, Calif., effective October 1st.

SUPERVISING THE JOBS

D. L. Cheney, who was bituminous engineer for the Montana State Highway Department prior to the war, and associated with S. Birch & Sons Construction Co., Great Falls, Mont., during the construction of many large war time projects, has been appointed general manager for the joint venture Alaskan army housing project recently awarded to S. Birch & Sons, Al Johnson Construction Co., St. Paul, Minn., and C. F. Lytle Construction Co., Sioux City, Ia., which will be operated under the name of Birch-Johnson-Lytle with headquarters in Seattle. **E. B. Skeels** will be project manager, maintaining his headquarters at Anchorage, and **Dale Lince** will be assistant project manager with headquarters at Fairbanks. **H. P. Bosworth** will be general superintendent in charge of the work at Anchorage, and **R. M. Hoover** will be general superintendent in charge of the work at Fairbanks. Most of the work on the contract this year has been confined to construction of the contractor's camp and plant. Major work on the project proper will get under way next year.

* * *

Ed Raimer is superintendent for Guy F. Atkinson Co., contractor on the outfall sewer job at El Segundo, Calif., for the city of Los Angeles, Calif. Resident engineer is **M. D. McManus;** assistant project manager, **Philip N. Fletcher;** material superintendent, **J. E. Myers;** office manager, **L. A. Cook;** paymaster, **Fred W. Bales;** purchasing agent, **H. H. Brainerd.** Foreman carpenter is **Asa Grumpton,** and mechanic is **C. L. Montgomery.** Working under piledriver superintendent **Carroll Glenn** are **J. H. Mabery, Ray Brigance, Sailor Lewis** and **H. F. Conroy.** This is a $3,500,000 contract.

* * *

R. H. Mitchell is the general manager and **A. E. Quinton** assistant general manager of the Sparling Diving School located at Berth 179 in Wilmington, Calif. The school is run by **Joe Sparling** who says it is the only such school approved for ex G.I.'s The training takes place in a large tank and observation of the work performed is made through a compression chamber, together with a 490-ton ship in the harbor. Besides the training of divers, the school also has a department for the testing of a man's ability before undertaking a diving job.

* * *

L. Ralph Peltier, formerly building adviser for the American Red Cross, is now building inspector on various buildings in Los Angeles and Beverly Hills, Calif. One of them is the I. Magnin building being erected by the Los Angeles firm of Wm. A. Simpson Construction Co., at Wilshire and Bedford Dr., in Beverly Hills. Other key men on the job are: project manager, **Carl Marquardt;** general superintendent, **Mel Evinson;** carpenter foremen, **Don**

Hitchcock, Charles Wadstein, Ed Eilers and **Homer Bowder**; labor foremen, **J. Mulkey, J. Garcia, M. Hutchinson, W. Simpson** and **J. Duncan.** This construction is about a $2,000,000 contract.

* * *

R. A. "Andy" Metcalf, for many years a contractor in the Southwest, and during World War II a major in the Corps of Engineers, serving in the India, Burma and China areas, has re-established himself at 5753A South Alameda St., Los Angeles, Calif., operating as a heavy construction contractor under the name of Metcalf Construction Co.

* * *

Charles O. Bodenhamer is superintendent for R. G. Clifford, South San Francisco, and **Grant Chapman** holds a similar position for Louis Biasotti & Son, Stockton, Calif., joint contractors for construction of the Alameda Creek bridge and overhead being erected by the California Division of Highways between Niles and Sunol. **Jack Corbett** is also on the job as grading foreman. This combination of contractors was low bidder to the State at $427,966.

* * *

Fred Ciatti is superintendent and **John E. Sawyer** his assistant, for Welding Service Sales, Inc., San Francisco, Calif., subcontractor for Carl B. Warren Co., for welding approximately 5 mi. of 7-in. steel pipe for the Salt Lake Aqueduct, part of the Provo River Project in Utah, under construction by the Bureau of Reclamation.

* * *

Hal Grammer, assisted by **Vernon Harmon** as foreman, is superintending the construction of school buildings in Phoenix, Ariz. This contract was recently awarded to R. E. Bruce Construction Co. of Phoenix at a cost of $380,000.

* * *

H. B. Adair has gone into business for himself as a heavy duty contractor, with headquarters in Santa Monica, Calif. Until two years ago he was in partnership with his brother in El Monte, Calif., under the name of Harvey B. Adair Co.

* * *

Frank C. Sheldon is construction manager and co-owner of the Urban Development Co. in Hawthorne, Calif., engaged in industrial, housing and light commercial construction.

* * *

I. F. "Ike" Lindsay, well known superintendent, is now with E. W. Elliott Construction Co., San Francisco, Calif., on the Anaheim Street project of the freeway to Terminal Island at Wilmington, Calif. **Frank Arentz** is assistant superintendent, **Ernest Peterson** carpenter foreman, and **W. B. "Bud" Munson** is civil engineer on the project.

* * *

Adolf Haidlen is superintendent for Morrison-Knudsen Co., Inc., San Francisco, Calif., on construction of dam and related structures at the Pit River No. 1 power plant at Fall River Mills, Shasta

JACK STONE, veteran superintendent of tunnel construction for T. E. Connolly, Inc., San Francisco, who was awarded the $3,494,420 contract for 2 mi. Columbia Basin Irrigation tunnel.

Co., Calif. **John Chrisman** has the assistant superintendent spot, and **Ray Slavin** is office manager. This is a $500,000 contract.

* * *

Francis T. Hayden is now with Wm. E. Mohler Co., general contractors of Indianapolis, Ind. He is civil engineer and assistant to the general construction superintendent on housing reconversion for veterans. Among his previous connections was an assignment with E. I. du Pont de Nemours at Pasco, Wash.

* * *

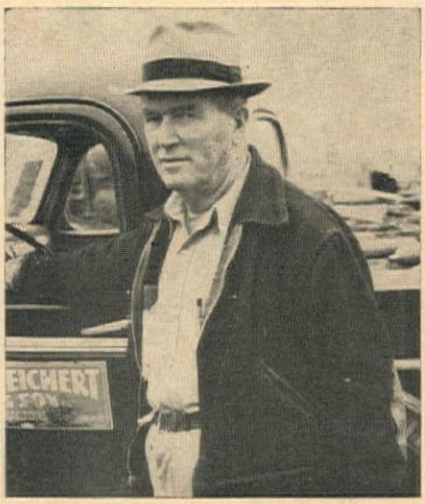
Charles J. Heppner, for many years in a key capacity for Harvey A. Nichols Co., Los Angeles, Calif., is now supervising construction on the company's contract for the expansion of the Bekins Warehouse & Storage Co. plant at Wilmington, Calif. **Thomas K. Thompson** is sub-foreman on the project.

* * *

Philip G. Dunn is working as superintendent on the $210,151 highway contract for construction of 2.4 mi., Nevada City-Downieville road, Tahoe National Forest, in Yuba Co., Calif. This contract was recently awarded to A. Teichert & Son, Inc., Sacramento, Calif. Also employed on this job are: **Davis R. Hanny,** tractor excavation foreman; **Belvin R. Willis,** shovel excavation foreman; and **Roy P. Peterson,** labor foreman.

* * *

I. F. "IKE" LINDSAY



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F. L. Claussen, superintendent for the Concrete Conduit Co. of Colton, Calif., is supervising the company's contract for construction of a sewage pumping plant and treatment plant at Big Bear Lake, San Bernardino Co., Calif., a $499,722 project. Project engineer is **H. A. Weigand.**

* * *

J. L. "Slim" Hinote is in charge of the night shift at the Rector Dam job near Napa, Calif., where three shifts are now in operation. **Dick Zimmerman** is foreman on the fill and **Meril Laughlin** foreman on the grizzlies. H. Earl Parker is the contractor at Rector Dam.

* * *

J. H. Beale is superintendent for W. C. Thompson, San Francisco, Calif., contractor who has the $407,305 highway job in the vicinity of Mosquito Ridge, Tahoe National Forest, Calif. **Ray Walters** is the equipment superintendent.

* * *

Charles McInroe is supervising the 7.9 mi. surfacing and crushed rock stockpile job in the North Plains section of Sunset Highway in Washington Co., Ore., for the Rogers Construction Co., Tillamook, Ore. This is a $359,982 contract.

* * *

C. S. LeNoir, assisted by **A. M. Wimberley,** is supervising the construction of a natural gas pipeline between Santa Fe Springs and Blythe, Calif. H. C. Price Co., Bartelesville, Okla., was recently awarded the contract at $3,750,000.

* * *

Justin Barber is superintending the Yuma-Gila Bend highway work in Arizona for the Western Contracting Co., which was awarded the contract at $540,632. **M. E. Burke** is accountant for the construction firm.

* * *

Al Meehleis is superintendent for Anthony C. Meehleis, steel reinforcing contractor of Los Angeles, Calif., on various contracts in the Long Beach, Calif., area.

* * *

James W. Harding, formerly at Estes Park, Colo., on the Ramshorn and Prospect tunnels for Lowdermilk Bros., is now assistant superintendent on the Watuga power tunnel for the TVA.

* * *

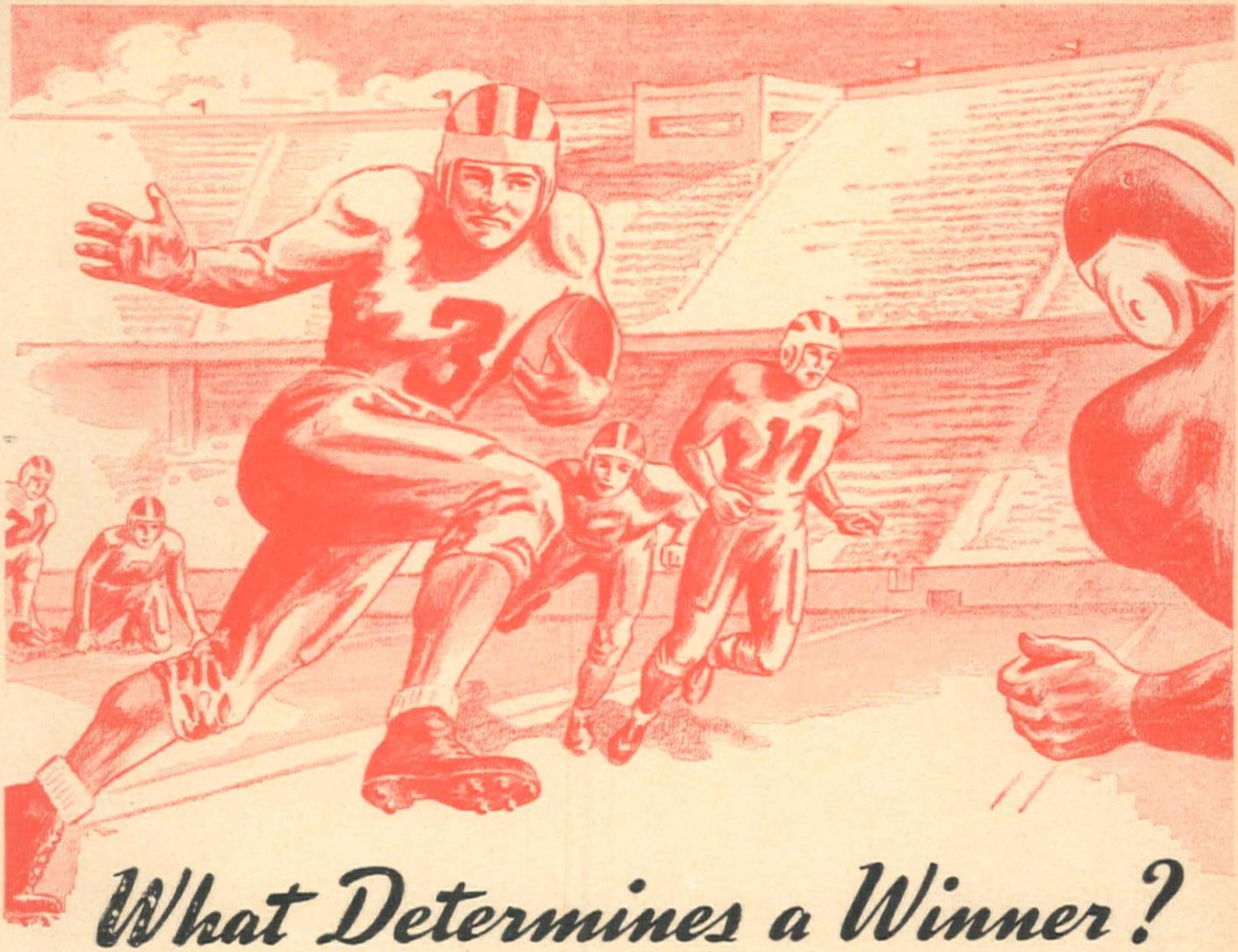
Jack Humphrey, superintendent for Cowen Construction Co., Shawnee, Okla., is in charge of this company's $147,300 contract for the erection of a high school building in Enid, Okla.

* * *

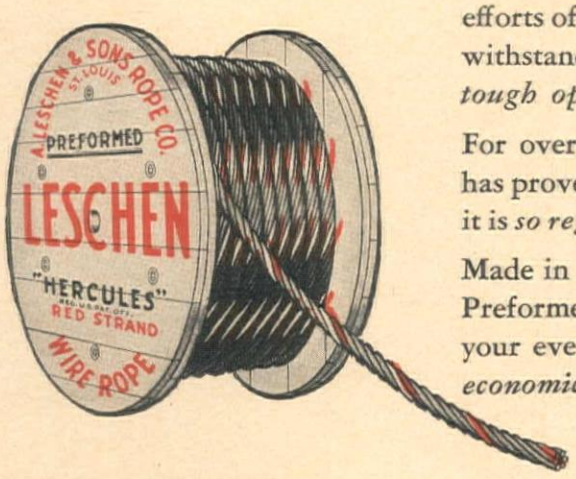
Sebastian Miretti of Hawthorne, Calif., has been assigned to Yokohama, Japan, as crane and shovel instructor for the U. S. Engineers.

* * *

Joseph Schloderer is foreman for J. A. Powers, Los Angeles, Calif., on the new Textile Bldg. under construction in that city.



What Determines a Winner?



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UNIT BID SUMMARY

Dam . . .

Washington—Grant County—Bureau of Reclam.—Earthfill

C. F. Lytle Co., Green Construction Co. and Amos Construction Co., operating as a joint venture submitted the low bid of $9,359,011 to the Bureau of Reclamation, Coulee Dam, Wash., for construction of Potholes Dam near Moses Lake, a unit in the Columbia Basin Irrigation Project. The dam is composed of about 19,000 ft. of continuous embankment varying in height up to approximately 200 ft., across several depressions in Crab Creek basin. The dike will be a rolled embankment with outer sections of sluiced gravel fill. The outlet works will consist of a 700-ft. tunnel 7½ ft. in diameter, and an uncontrolled spillway 500 ft. wide excavated between sections of the dam. Unit bids were as follows:

(1) Lytle-Green-Amos $9,359,011
(2) Bressi-Bevanda Constructors, A. Teichert & Co., W. E. Kier Construction Co. and Guy F. Atkinson Co. 9,584,677
(3) Morrison-Knudsen Co., Inc., Peter Kiewit Sons Co., Utah Construction Co., S. Birch & Sons, Winston Bros. and C. & F. Trucking Co..... $10,448,000
(4) J. A. Terteling Sons, Inc..... 11,168,479

	(1)	(2)	(3)	(4)
Lump sum, diversion of river and unwatering found	$40,000	$178,000	$225,661	$77,700
600,000 cu. yd. excav. strip borrow pits	.32	.22	.25	.36
380,000 cu. yd. excav., common, spillway	.50	.45	.50	.53
480,000 cu. yd. excav., rock, spillway	1.32	1.75	1.70	1.50
1,400 cu. yd. excav., common, outlet works	.88	1.40	2.50	2.35
5,000 cu. yd. excav., rock outlet works	2.65	3.20	2.50	3.90
2,600 cu. yd. excav., tunnel and shaft	16.90	42.00	35.00	37.00
10,000 lb. steel tunnel liner plates	.25	.25	.30	.23
535,000 cu. yd. excav., common, dam found.	.66	.50	1.00	.80
60,000 cu. yd. excav., rock, dam found.	2.65	3.00	3.25	3.90
48,000 cu. yd. excav., all classes for grout caps	16.90	19.00	20.00	19.00
2,000 cu. yd. excav., common, roadway	.47	2.00	2.50	.38
2,300 cu. yd. excav., rock, roadway	1.70	2.00	2.50	1.95
1,150,000 cu. yd. excav., com., borrow pit No. 1 and transp. to dam	.448	.44	.40	.52
3,500,000 cu. yd. excav., com., borrow pit No. 2 and transp. to dam	.504	.49	.60	.59
4,900,000 cu. yd. excav., com., borrow pit No. 3 and transp. to dam	.591	.45	.60	.64
5,000,000 cu. yd. earthfill in embankment	.176	.28	.21	.25
3,600,000 cu. yd. sluiced gravel fill	.147	.20	.16	.215
50,000 cu. yd. tamping earthfill	2.28	3.00	2.50	3.00
180,000 cu. yd. rock surf., downstream slope	.50	.38	.40	.50
400,000 cu. yd. riprap, upstream slope	.50	.32	.30	.50
10,000 cu. yd. road surf.	2.95	2.75	3.30	2.20
250 lin. ft. drilling weepholes	2.20	2.20	1.50	1.20
1,000 lin. ft. core drilling 5½-in. holes less than 30 ft. deep	18.75	11.50	12.00	23.00
15,000 lin. ft. drill groutholes, 0 to 35 ft.	1.55	3.00	2.25	1.55
10,000 lin. ft. drill groutholes, 35 to 60 ft.	3.15	3.00	2.25	3.00
2,500 lin. ft. drill groutholes, 60 to 100 ft.	4.00	3.00	2.25	3.90
15,000 lin. ft. drill groutholes, percussion drill	1.25	1.25	1.00	1.15
22,000 lb. place grout pipe	.25	.30	.42	.75
40,000 cu. ft. pressure grouting	1.90	2.00	2.00	2.80
7,500 cu. ft. pressure grouting with packers	2.50	2.50	2.15	3.10
30,000 bbl. cement	5.45	4.00	5.00	5.75
4,800 cu. yd. conc. in grout caps	12.75	15.00	14.00	19.50
900 cu. yd. conc. in tunnel lining	48.90	60.00	48.00	43.00
75 cu. yd. conc. in trashrack	60.00	54.00	62.00	77.00
260 cu. yd. conc. in gate chamber	59.40	60.00	70.00	77.00
100 cu. yd. conc. in tunnel outlet	47.20	70.00	50.00	54.00
60 cu. yd. conc. in gate plug	29.50	40.00	45.00	54.00
750 cu. yd. conc. in spillway	17.50	22.00	17.00	62.00
2,400 cu. yd. conc. in walls	39.50	54.00	35.00	40.00
250,000 lb. place reinf. bars	.05	.05	.06	.047
90 lin. ft. place metal sealing strips	1.70	1.50	2.00	1.50
Lump sum, valve house	280.00	600.00	$1,000	$1,554
1,600 lb. install hollow jet valve	.28	.12	.15	.75
45,000 lb. install high pressure gate	.055	.07	.08	.38
1,000 lb. install gate control piping	.42	.60	.30	.75
24,000 lb. install outlet pipe	.06	.07	.30	.30
11,000 lb. install trashrack metal	.04	.12	.10	.40
9,200 lb. install miscel. metalwork	.12	.45	.37	.60

Nebraska—Chase County—Bureau of Reclam.—Earthfill

Wunderlich Contracting Corp., Jefferson City, Mo., with a bid of $4,109,927, was low to the Bureau of Reclamation, Denver, Colo., for construction of Enders Dam, key unit of the Frenchman Cambridge Project in Nebraska, and was awarded the contract. The dam is an earthfill structure approximately 2,570 ft. long at the crest, with a maximum height of 100 ft. above the bed of Frenchman Creek. Both upstream and downstream faces are protected with 3 ft. layers of rock riprap. The spillway will be an open channel, with a concrete gate structure, concrete channel and stilling basin. Flood discharges will be controlled by six 5 x 30-ft. radial gates. In addition to the main dam a dike will be constructed approximately 6,420 ft. long and with a maximum height of 26 ft. In addition it will be necessary to relocate about 4 mi. of state highway No. 61. The following unit bids were submitted:

(1) Wunderlich Contracting Corp..... $4,109,927
(2) Massman Construction Co. 4,409,088
(3) Western Contracting Corp..... 4,740,579
(4) Bowen & McLaughlin; C. F. Lytle Co.; Amis Construction Co. and S. J. Groves & Sons Co..... 4,834,074
(5) Morrison-Knudsen Co., Inc. and Condon-Cunningham Co. $4,969,023
(6) Peter Kiewit Sons Co. 4,992,000
(7) J. A. Terteling & Sons, Inc..... 5,178,755

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lump sum, divers'n of river & unwatering	$20,000	$220,187	$96,500	$180,000	$50,000	$238,332	$100,000
100,000 cu. yd. excav., strip borrow pits	.50	.25	.16	.265	.19	.27	.24
30,000 cu. yd. excav., strip rk. deposits	.50	.25	.90	.35	.815	.30	.30
200,000 cu. yd. excav., all classes, found.	.50	.83	.40	.35	.45	.61	1.00
100,000 cu. yd. excav., all cl., outlet wks.	1.25	.74	1.40	.95	2.77	.73	1.00
900,000 cu. yd. excav., all cl., spillway	.70	.39	.60	.95	.60	.63	.60
600,000 lb. driving steel sheet piling	.02	.039	.03	.03	.024	.03	.04
10 M. gal. water for found., less than 10 M. gal.	$3,150	$2,000	790.00	$2,500	$2,700	$2,300	$3,500
30 M. gal. water for found., 10-40 M. gal.	200.00	300.00	700.00	250.00	$1,200	500.00	300.00
30 M. gal. water for found., over 40 M. gal.	200.00	300.00	700.00	250.00	$1,200	500.00	200.00
1,500,000 cu. yd. excav. com. bor. & trans.	.40	.24	.36	.265	.29	.35	.32
40,000 cu. yd. excav. all cl., roadway	.50	.45	.20	.56	.32	.25	.34
150,000 sta. cu. yd. roadway overhaul	.01	.01	.01	.004	.024	.01	.02
1,650,000 cu. yd. earthfill in dam	.08	.24	.10	.24	.385	.20	.15

(Continued on next page)

HAWKINS & ARMSTRONG USE LORAIN MOTO-CRANE TO DRIVE PILING FOR SKAGIT RIVER BRIDGE

JOB FACTS

This rubber-tire Lorain Moto-Crane, owned by Hawkins & Armstrong, general contractors of Seattle, Washington, is being used with 4400 lb. drop hammer to drive wooden piling up to 60 ft. long on reconstruction of the approaches to a bridge across the Skagit River at Sedro Woolley, Washington.

Thew-Lorain gives you equipment designed — and proven — to furnish greater digging power, increased lifting capacities and faster material handling. Your nearby Thew-Lorain distributor can advise you on the proper Lorain equipment you need for construction and digging profits. There's a complete line to choose from — in capacities — in various booms — and in crawler or rubber-tire mountings. And he can back up his recommendation because he knows conditions in your territory — and he knows Lorain service and maintenance from tread shoe to tag line. His trained, experienced, always-on-the-job personnel will keep your machines in top shape for top results.

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CRANES • SHOVELS • DRAGLINES • CLAMSHELLS • MOTO-CRANES

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LE ROI-RIX MACHINERY CO., Los Angeles 11
CATE EQUIPMENT CO., Salt Lake City 4
LIBERTY TRUCKS & PARTS CO., Denver 1
COAST EQUIPMENT COMPANY, San Francisco 1
A. H. COX & CO., Seattle 4, Washington
BUNTING TRACTOR CO., INC., Boise, Twin Falls, Gooding, Fairfield, and Burley, Idaho; LaGrande, Oregon
CONNELLY MACHINERY COMPANY, Billings and Great Falls, Montana
SANFORD TRACTOR & EQUIPMENT CO., Reno, Nevada
THE MOUNTAIN TRACTOR CO., Missoula, Montana
THE TRACTOR & EQUIPMENT CO., Sidney, Montana
P. L. CROOKS & CO., Portland 10, Oregon
LEE REDMAN COMPANY, 2020 West Grant St., Phoenix, Arizona
WORTHAM MACHINERY CO., Cheyenne, Wyoming
Branches: Sheridan, Greybull, Casper, and Rock Springs

12,000	cu. yd. tamping earthfill	2.00	2.67	2.00	1.90	3.00	4.00	3.00
45,000	cu. yd. backfill	.50	.89	.85	.285	.36	.77	.50
100,000	ton riprap, upstream slope	1.40	3.40	5.10	3.00	3.00	3.30	3.00
13,000	cu. yd. grav. blanket, upstr. sl.	1.50	7.00	9.00	5.90	3.25	6.50	4.00
85,000	cu. yd. rockfill, downstr. slope	.15	.50	.50	.24	.415	.10	.50
20,000	ton dumped riprap	1.70	3.90	5.00	3.00	3.00	3.30	3.00
2,000	cu. yd. grad. sand under spillwy.	1.00	5.71	6.00	6.85	2.10	6.60	5.00
4,000	cu. yd. sand & grav. und. spillwy.	1.25	5.71	6.50	5.40	2.10	2.35	5.00
4,000	cu. yd. grad. grav. und. spillwy.	2.00	8.92	10.00	7.90	3.25	6.70	5.00
50	cu. yd. graded grav., spillwy. dr.	3.00	8.92	12.00	8.95	3.50	7.00	5.00
50	cu. yd. sand & grav., spillwy. dr.	3.00	8.92	12.00	6.60	3.50	5.00	5.00
2,720	lin. ft. 4-in. sewer pipe drain, uncem. joints	2.00	.55	2.10	.36	1.20	1.70	2.00
1,050	lin. ft. 6-in. sewer pipe drain, uncem. joints	3.00	1.20	2.20	.83	1.20	1.70	2.50
7,500	lin. ft. 8-in. sewer pipe drain, uncem. joints	4.00	1.27	2.50	.57	1.50	2.35	2.75
1,500	lin. ft. 12-in. sewer pipe drain, uncem. joints	4.00	2.18	3.20	1.22	1.80	2.55	3.00
200	lin. ft. 4-in. sewer pipe drain, cem. joints	2.00	.62	1.60	.80	1.20	.80	2.00
200	lin. ft. 8-in. sewer pipe drain, cem. joints	3.00	.85	1.80	1.08	1.50	1.20	2.75
450	lin. ft. 12-in. sewer pipe drain, cem. joints	4.00	1.08	2.20	1.28	1.80	1.40	3.00
250	lin. ft. 24-in. corr. metal pipe	2.00	1.50	2.90	4.30	3.50	2.30	1.00
260	lin. ft. 48-in. corr. metal pipe	8.00	2.00	5.50	7.15	4.50	3.20	2.00
86,000	bbl. cement	4.00	4.91	2.95	3.50	4.15	3.50	4.00
500	cu. yd. conc. in outlet works	45.00	52.90	70.00	53.00	56.00	45.00	70.00
2,200	cu. yd. conc .in outlet conduit	35.00	26.30	39.00	35.00	53.00	32.00	40.00
1,400	cu. yd. conc. in gate sub-struct	24.00	20.40	37.00	24.50	38.00	22.00	35.00
375	cu. yd. conc. in gt., super-struct.	70.00	82.00	90.00	94.00	90.00	85.00	80.00
700	cu. yd. conc. in stilling basin	30.00	41.15	40.00	32.50	46.00	40.00	38.00
14,000	cu. yd. conc. in spillway gate	25.00	27.60	28.80	32.30	40.00	43.00	45.00
19,000	cu. yd. conc. in spillway floor	21.00	17.60	21.60	16.90	21.50	19.00	30.00
14,000	cu. yd. conc. in spillway chan	30.00	28.75	36.30	31.30	46.00	32.00	45.00
50	cu. yd. conc. in culv. headwalls	45.00	50.00	75.00	81.50	60.00	114.00	50.00
70	cu. yd. conc. in paved gutter	30.00	17.80	45.00	31.50	60.00	74.00	50.00
4,600,000	lb. place reinf. bars	.04	.031	.03	.043	.035	.04	.04
3,800	lin. ft. place metal sealing strips	1.00	.71	1.00	.86	.85	1.10	1.00
90	lin. ft. place rubber waterstops	2.50	3.50	1.50	1.43	1.40	1.20	1.00
2,900	sq. ft. place joint filler	.75	.45	.40	.215	.35	.65	1.00
1,800	sq. yd. dampproofing concrete	.40	.71	.75	1.17	.60	.55	.75
Lumpsum,	valve house	$4,250	$1,720	$2,000	715.00	600.00	720.00	$1,000
18,000	lin. ft. highway guardrails	.68	.50	.17	1.28	.70	1.15	1.00
80,000	lb. install hollow-jet valves	.04	.045	.10	.095	.05	.055	.08
150,000	lb. install highpressure gate	.05	.053	.07	.115	.05	.055	.10
8,000	lb. install control apparatus	.30	.18	.60	.43	.45	.23	.30
1,900,000	lb. install radial gates	.04	.045	.03	.063	.044	.05	.04
50,000	lb. install radial gate hoists	.07	.093	.06	.071	.05	.065	.10
44,000	lb. install crane	.07	.044	.20	.185	.04	.05	.06
28,000	lb. install track rails	.07	.024	.08	.115	.05	.03	.10
140,000	lb. install outlet pipe	.06	.023	.06	.057	.06	.05	.20
2,500	lb. install ventilating system	.85	.18	.15	.57	.32	.18	.25
2,200	lb. install pipe, etc., less than 6 in.	.25	.27	.30	.215	.27	.34	.15
1,800	lb. install pipe, etc., over 6 in.	.34	.27	.30	.215	.21	.17	.15
38,000	lb. install trashrack metal work	.05	.021	.05	.17	.055	.055	.08
12,000	lb. install miscl. metalwork	.20	.18	.35	.29	.24	.13	.15
4,500	lb. install ice prevention system	.50	.57	.45	.43	.24	.34	.20
50,000	lb. install stop-log slots	.04	.024	.08	.115	.18	.065	.10
44,000	lb. install pipe hand-rail	.20	.18	.40	.215	.14	.19	.20
3,400	lin. ft. install elect. conduit less than 1¼ in.	1.00	.90	1.10	.86	.85	.65	1.00
2,600	lin. ft. install elect. conduit over 1½ in.	1.25	.90	1.40	.715	.85	1.00	1.00
2,150	lb. install elect. conductors	.80	.90	1.05	.57	.54	.30	1.00
3,500	lb. install elect. apparatus	1.00	1.78	1.40	.86	.30	.33	1.00

Bridge and Grade Separation . . .

California—Stanislaus County—State—Substructure

Bent Construction Co., Los Angeles, was the lowest bidder at $152,904 to the Division of Highways, Sacramento, on placing the substructure for a bridge to be built across the Stanislaus River about 8 mi. northwest of Modesto. Unit bids follow:

(1) Bent Construction Co. $152,904
(2) Macco Construction Co. 163,615
(3) A. Soda & Son $232,521

		(1)	(2)	(3)
Lump sum,	clearing and grubbing	$1,650	$6,000	$3,000
1,400	cu. yd. structure excavation	26.00	10.00	50.00
190	cu. yd. Class "A" P.C.C. (footing blocks)	35.00	40.00	35.00
600	cu. yd. Class "A" P.C.C. (structure)	52.50	75.00	70.00
8,900	lb. structural steel	.40	.50	.40
7,070	lin. ft. furnishing concrete piling	3.40	4.50	5.00
150	ea. driving concrete piles	125.00	165.00	160.00
3,810	lin. ft. furnishing steel piling	2.60	2.00	4.00
108	ea. driving steel piles	105.00	55.00	140.00
15	ea. steel pile splices	20.00	20.00	100.00
300	cu. yd. riprap	12.00	16.00	14.00
44,000	lb. furn. bar reinf. steel	.05	.08	.06
44,000	lb. placing bar reinf. steel	.04	.03	.03
Lump sum,	engineer's office	$1,250	$6,500	$7,940

California—Sonoma County—State—Conc. and Steel

Kiss Crane Co., San Pablo, Calif., submitted the low bid of $127,700 to the California Division of Highways, Sacramento, for construction of a steel and concrete bridge across the Russian River at Hacienda between Guerneville and Forestville. Bids were received as follows:

(1) Kiss Crane Co. $127,700
(2) Carl N. Swenson $153,968

		(1)	(2)
Lump sum,	removing existing bridge	$11,000	$5,000
220	cu. yd. structure excavation	10.00	7.00
1,030	cu. yd. Class "A" P.C.C.	45.00	63.00
618	lin. ft. concrete railing	5.00	8.00
Lump sum,	altering existing truss span	$16,000	$14,382
90,000	lb. structural steel	.11	.24

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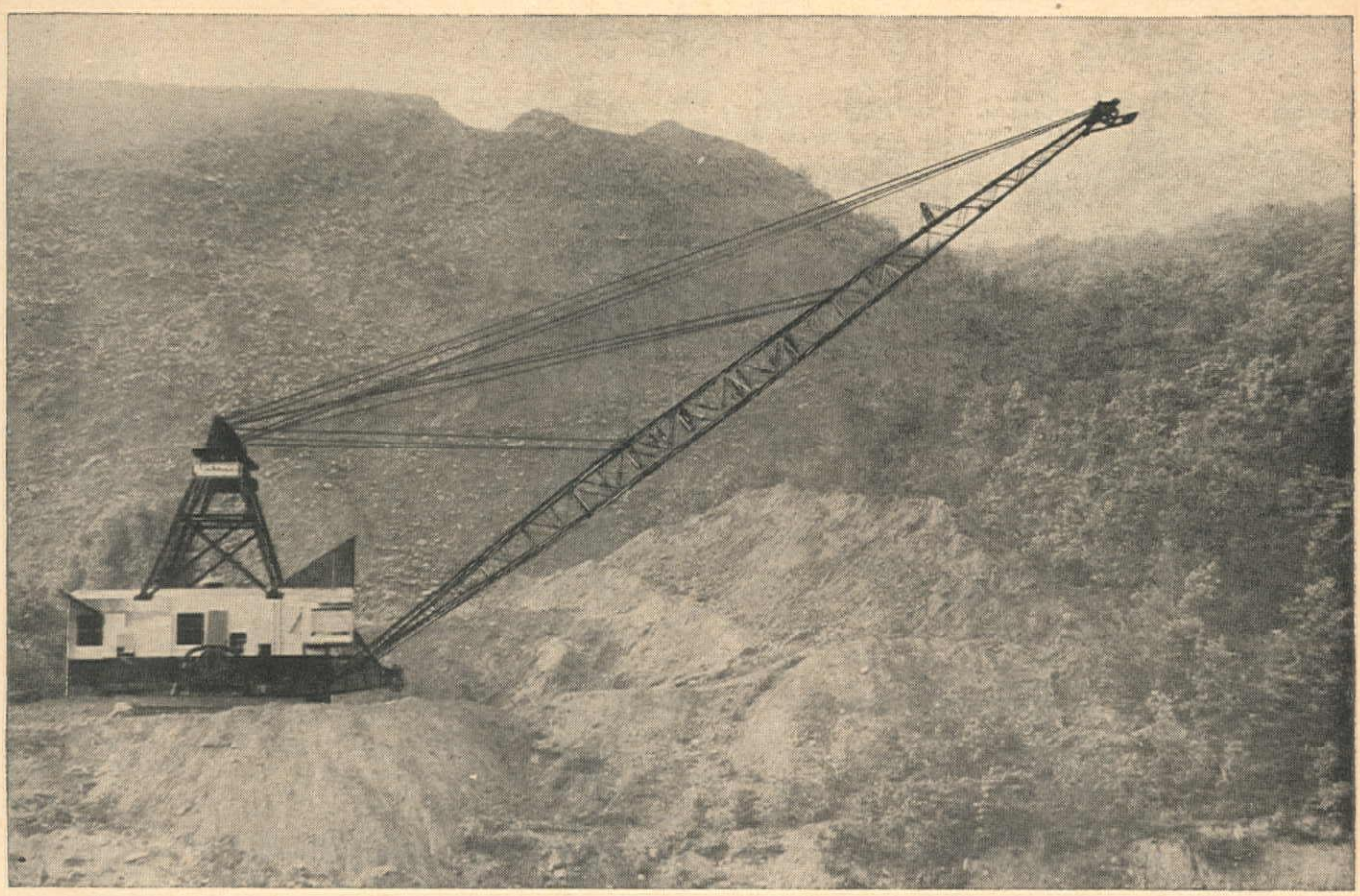

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Size, alone, doesn't matter! C. I. T. finances purchases of almost every type of construction equipment . . . and whether the amount involved be large or small, the funds can be obtained quickly and AT LOW COST.

Contractors acquire new and used equipment by making only moderate initial investments. Working funds are left free for tax payments, supplies, pay rolls and other expenses. Terms are arranged which permit equipment to help pay for itself out of earning capacity.

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AFFILIATED WITH COMMERCIAL INVESTMENT TRUST INCORPORATED

5,500 lb. misc. iron and steel	.20	.60
1,600 lin. ft. furnishing concrete piling	3.00	2.35
49 ea. driving concrete piles	130.00	110.00
Lump sum, cleaning and painting truss span	$7,000	$6,140
154 lin. ft. pipe handrail	3.00	6.00
220,000 lb. furn. bar reinf. steel	.04	.06
220,000 lb. placing bar reinf. steel	.015	.02
406 lin. ft. steel railing	5.00	8.00
Lump sum, misc. items of work	$5,298	$1,250

New Mexico—Taos County—State—Concrete & Steel Bridge

Lowdermilk Bros., Denver, Colo., with a bid of $649,338 submitted the lowest proposal to the State Highway Dept., Santa Fe, on construction of a concrete and steel bridge 103.25 ft. long, three multiple concrete box culverts over 20 ft. clear span and other minor grade structures, also grading and rolling 7.9 mi. of state highway route No. 3 between Questa and Taos. Three hundred weather working days are allowed for completion. The following unit bids were submitted:

(1) Lowdermilk Bros. $649,338
(2) Brown Bros. 680,896
(3) W. T. Bookout Construction Co. 791,164
(4) Allison & Haney $874,715
(5) Skousen Construction Co. 874,766

	(1)	(2)	(3)	(4)	(5)
80 ac. clearing and grubbing	200.00	60.00	100.00	200.00	150.00
Lump sum, removal of old structures	750.00	500.00	$1,500	800.00	250.00
828,400 cu. yd. excavation, unclassified	.245	.36	.31	.30	.44
1,745 cu. yd. excavation for structures	2.50	2.00	5.00	2.00	3.00
3,030 cu. yd. excavation for pipe culverts	1.50	2.00	4.00	2.00	3.00
1,397,300 sta. yd. overhaul	.01	.02	.02	.02	.025
409,800 ¼ mi. yd. haul	.05	.06	.08	.08	.08
3,135 hr. mechanical tamping	4.00	3.50	6.00	7.00	4.00
414 sta. finishing earth graded roads	10.00	5.00	4.00	15.00	25.00
15,500 hr. rolling—sheepsfoot roller	3.00	2.00	5.00	6.00	2.00
27,900 M. gal. watering	2.00	1.00	2.00	3.00	3.00
3,573 cu. yd. Class "AE" concrete	30.00	30.00	38.00	35.00	34.00
501,284 lb. reinforcing steel	.08	.08	.08	.09	.075
9,040 lb. structural steel	.14	.15	.30	.18	.30
18 cu. yd. mortar rubble masonry	50.00	30.00	20.00	20.00	40.00
2,304 lin. ft. std. reinf. conc. pipe, 24-in.	5.50	5.00	5.00	7.00	5.70
200 lin. ft. 4000-D reinf. conc. pipe, 24-in.	6.00	5.50	5.50	8.00	6.25
240 lin. ft. extra str. reinf. conc. pipe, 24-in.	6.00	5.50	5.50	9.00	6.25
632 lin. ft. std. reinf. conc. pipe, 30-in.	7.50	6.50	7.00	11.00	7.50
644 lin. ft. 4000-D reinf. conc. pipe, 30-in.	8.00	7.00	7.50	11.00	8.00
544 lin. ft. extra str. reinf. conc. pipe, 30-in.	8.50	7.00	7.50	11.00	8.00
424 lin. ft. std. reinf. conc. pipe, 36-in.	10.00	8.60	9.00	13.00	9.60
312 lin. ft. extra str. reinf. conc. pipe, 36-in.	11.00	9.00	9.50	15.00	10.30
364 lin. ft. std. reinf. conc. pipe, 42-in.	13.00	10.00	12.50	16.00	13.00
120 lin. ft. std. reinf. conc. pipe, 48-in.	15.50	13.00	15.50	20.00	15.50
196 lin. ft. 4000-D reinf. conc. pipe, 48-in.	17.50	14.50	16.00	20.00	16.50
252 lin. ft. extra str. reinf. conc. pipe, 54-in.	20.00	17.00	20.00	25.00	20.00
108 lin. ft. std. reinf. conc. pipe, 60-in.	22.50	19.00	20.00	27.00	21.00
4,100 lin. ft. perf. corr. galv. culv. pipe, 8-in.	3.50	2.00	1.85	2.00	2.35
656 cu. yd. medium derrick stone riprap	6.00	5.00	9.50	35.00	5.00
2 ea. cattle guards, 12-ft. roadway	750.00	700.00	750.00	900.00	900.00
1 ea. cattle guard, 24-ft. roadway	$1,250	$1,200	$1,250	$1,400	$1,300
2 ea. reinf. conc. monument and marker	50.00	50.00	50.00	60.00	50.00
84,100 lin. ft. galvanized barbed wire fence	.13	.13	.15	.15	.15
23 ea. gates (Texas type)	7.00	5.00	10.00	10.00	10.00
252 ea. bracing	4.50	2.00	5.00	5.00	2.00
75 ea. right of way and station markers	7.50	4.00	7.00	5.00	4.00
1.2 mi. obliterating old road	300.00	500.00	500.00	500.00	500.00
19,500 lin. ft. contour ditches	.15	.10	.12	.20	.10
320 cu. yd. rock and wire check dams	9.00	10.00	16.00	8.00	20.00
122 lin. ft. 18-in. O. D. steel pipe	10.00	5.00	7.00	5.00	12.50
BRIDGE ITEMS					
178 cu. yd. excavation for structures	7.50	5.00	6.00	2.00	10.00
104.86 cu. yd. Class "AE-AR" concrete substructure	40.00	30.00	45.00	30.00	40.00
93.32 cu. yd. Class "AE-AR" concrete	45.00	40.00	45.00	35.00	50.00
0.112 M.B.M. untreated timber substructures	500.00	200.00	250.00	500.00	300.00
87,500 lb. erecting structural steel	.055	.03	.03	.20	.04
1,384 lin ft. steel rail piling	5.00	3.00	5.00	7.00	5.00

Sewerage . . .

Lower California—City—Drainage Canal

Home Builders of San Diego, Inc., San Diego, Calif., submitted the low bid of $174,000 to the city of Ensenada for construction of a drainage canal 4,800 ft. long and 157.5 ft. wide at the bottom, an access road, a reinforced concrete bridge and two rock jetties. All bids were rejected however, because no Mexican bond was submitted. Unit bids were as follows:

(1) Home Builders of San Diego, Inc. $174,000
(2) Constructorio Pacifico 253,987
(3) Haddock-Engineers, Ltd. 237,000
(4) Hazard-Trepte $288,485
(5) J. P. Brown 359,700

	(1)	(2)	(3)	(4)	(5)
1: 2: 4 concrete, per cu. yd.	35.00	51.00	65.00	69.00	75.00
Rock per ton	8.75	8.60	4.00	4.00	9.00
Small rock in place per ton	4.25	5.70	6.00	6.25	5.00
Overhaul per cu. yd.	.06	.02	.005	.01	.135
1½ in. ditch rock per cu. yd.	4.25	3.15	3.00	3.00	4.00
Remove old bridge, lump sum		$1,000	$5,500	$1,000	$2,500

California—Los Angeles County—State—Storm Drain

Charles T. Brown Co., San Fernando, with a bid of $182,544 was low to the Division of Highways, Sacramento, for construction of storm drains and sanitary sewers appurtenant to the 4 level grade separation structure to be constructed later on Hollywood Parkway between Diamond St. and Sunset Blvd. in the city of Los Angeles. Unit bids were as follows:

(1) Charles T. Brown Co. $182,544
(2) Mike Radich & Co. 228,102
(3) Artukovich Bros. $324,089
(4) J. E. Haddock, Ltd. 389,307

	(1)	(2)	(3)	(4)
600 cu. yd. removing concrete	6.00	8.00	5.60	18.00
25,000 cu. yd. structure excavation	2.60	2.75	4.90	9.75
Lump sum, dev. water supply and furn. watering equip.	$1,500	$1,600	150.00	$1,000
400 M. gals. applying water	2.30	2.50	1.50	2.00
880 T. asphalt concrete	6.50	6.50	10.00	7.00

(Continued on next page)

COMPRESSOR CYLINDERS
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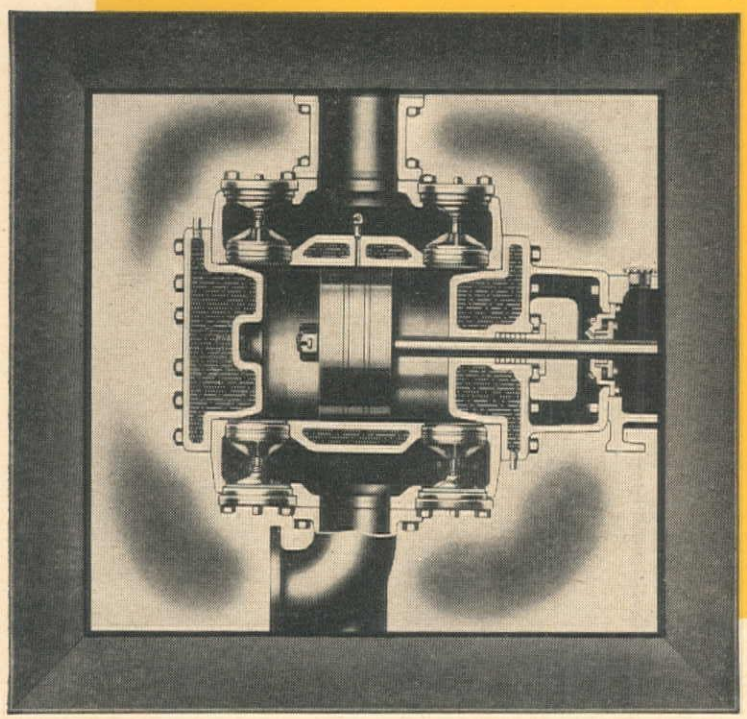

1. **Low carbon-forming tendency to keep passages clear.**
2. **Extreme oxidation stability to prevent valve sticking.**
3. **Low-temperature fluidity to prevent "dry starting."**
4. **Low foaming tendency to reduce pick-up by air.**
5. **Good demulsibility to resist washing by moisture.**
6. **Low volatility to reduce carry-over to air line.**

HOW SHELL PREPARES COMPRESSA OILS

Carbon-Forming is greatly reduced by special care in testing and selecting crudes, and by Shell's solvent extraction process. Not only is a minimum of carbon formed, but that minimum is soft, fluffy... valves stay clean and free.

Gum Forming is evidence that an oil oxidizes easily. Shell's solvent-extraction process removes all unstable compounds, with the result that valves and ports remain free of gum and lacquer.

Fluidity at low temperatures is important to protect cylinder parts in starting and before operating temperatures are reached. Both in crude selection and in refining, this property is closely watched in Compressa Oil processing.

Foaming and Emulsifying tendencies indicate that an oil is not thoroughly free of the soap-like compounds which are created by certain refining steps. Shell takes special pains to purify Compressa Oils with a clay filtering step in the final stage of refining.

Volatility rating should not only be low, but it is important that it be achieved through selection of fractions from a narrow "band" in the distillation scale. Compressa Oils measure up fully in this respect.

* * *

The Shell Lubrication Engineer will gladly give you specific advice on the lubrication of any type of compressor. For informative literature about compressed air equipment lubrication, write to Shell Oil Company, Incorporated, 100 Bush St., San Francisco 6, Calif.

SHELL COMPRESSA OILS

SHELL

22	cu. yd. Class "B" P.C.C. (pavement)	18.00	20.00	22.50	30.00
330	cu. yd. Class "C" P.C.C. (pipe reinf.)	14.00	19.00	16.50	27.50
480	cu. yd. Class "A" P.C.C. (structures)	55.00	70.00	64.00	100.00
32,000	lb. bar reinf. steel	.09	.10	.12	.10
3,700	lb. misc. iron and steel	.25	.30	.23	.50
12	lin. ft. 18-in. R.C.P. (std. str.)	4.85	5.00	6.00	4.50
8	lin. ft. 21-in. R.C.P. (std. str.)	5.65	7.00	7.50	6.00
16	lin. ft. 42-in. R.C.P. (2000 D)	16.00	17.00	25.00	13.00
610	lin. ft. 60-in. R.C.P. (1250 D)	17.00	22.00	38.00	15.50
700	lin. ft. 60-in. R.C.P. (1500 D)	18.00	26.50	40.00	16.00
250	lin. ft. 69-in. R.C.P. (1500 D)	23.00	37.00	50.00	21.00
570	lin. ft. 72-in. R.C.P. (1500 D)	28.00	41.00	55.00	22.00
540	lin. ft. 78-in. R.C.P. (1500 D)	30.00	44.00	60.00	28.50
20	lin. ft. 12-in. plain concrete pipe	3.50	2.00	4.50	4.00
104	lin. ft. 15-in. plain concrete pipe	4.00	3.00	5.00	4.25
110	lin. ft. 6-in. vitrified clay pipe (std. str.)	2.75	3.00	5.00	2.50
580	lin. ft. 8-in. vitrified clay pipe (extra str.)	3.00	5.00	7.50	2.75
660	lin. ft. 15-in. vitrified clay pipe (extra str.)	4.25	7.00	15.00	4.75
44	lin. ft. 8-in. cast iron pipe	5.00	8.00	9.00	3.50
30	lin. ft. pipe shaft manholes	15.00	16.00	25.00	25.00
82	lin. ft. Type "B" manholes	25.00	30.00	20.00	25.00
36	lin. ft. Type "F" junction chamber	27.50	30.00	20.00	26.00
3	ea. remodeling manholes	100.00	100.00	150.00	150.00

Arizona—Yuma County—City—Vitrified Clay

R. A. Wattson Co., North Hollywood, Calif., submitted the low bid of $297,346 to the city of Yuma for installaion of vitrified clay pipe sewer lines in sewer district No. 9, an assessment project known locally as the New Mesa District. Unit bids were as follows:

(1) R. A. Wattson Co. $297,346
(2) J. H. Welsh & Son $399,649

		(1)	(2)
6,127	lin. ft. 18-in. cit. clay sewer pipe	12.00	10.30
3,307	lin. ft. 15-in. vit. clay sewer pipe	10.00	9.24
2,091	lin. ft. 12-in. vit. clay sewer pipe	5.00	8.06
4,168	lin. ft. 10-in. vit. clay sewer pipe	4.00	5.05
27,620	lin. ft. 8-in. vit. clay sewer pipe	3.50	4.72
1,180	lin. ft. 6-in. vit. clay sewer pipe	2.00	3.48
16,487	lin. ft. 6-in. vit. clay house connections	1.50	5.44
114	ea. standard manholes	300.00	337.45
8	ea. drop manholes	350.00	387.45
191	lin. ft. replac. exist. 12-in. lines with 18-in. vit. clay sewer pipe	15.00	12.31

California—San Bernardino County—County—Treatment Plant

Concrete Conduit Co., Colton, with a bid of $499,722 was low before the San Bernardino Board of Supervisors for construction of a sewage treatment plant, a pumping plant and various sewer lines in the Big Bear Lake Sanitation District and was awarded the contract. Unit bids submitted were as follows:

(1) Concrete Conduit Co. $499,722
(2) J. L. Kruly Co. 513,895
(3) R. A. Wattson Co. $584,724

		(1)	(2)	(3)
2,333	lin. ft. 21-in. cast reinfo. conc. pipe	9.25	10.50	19.21
5,722	lin. ft. 18-in. cast reinfo. conc. pipe	8.20	9.50	17.50
3,003	lin. ft. 15-in. cast reinfo. conc. pipe	6.60	8.40	14.00
160	lin. ft. 12-in. cast reinfo. conc. pipe	5.50	8.25	10.70
49,932	lin. ft. 8-in. cement conc. pipe	3.35	4.90	4.71
55	lin. ft. 6-in. cement conc. pipe	3.30	3.75	4.50
420	lin. ft. 9-in. cast pressure-lined conc. pipe	4.90	7.50	7.00
246	ea. manholes	245.00	242.50	250.00
110	lin. ft. reinfo. conc. encasement, 8-in. pipe	7.75	4.00	2.75
120	lin. ft. reinfo. conc. encasement, 15-in. pipe	10.30	6.00	4.50
1,058	sq. ft. conc. backfill, 18-in. pipe	8.65	7.00	4.00
Lump sum, pumping plant		$25,500	$15,650	$18,100
Lump sum, treatment plant		$144,000	$76,600	$73,000

Irrigation . . .

Washington—Grant County—Bureau of Reclam.—Aggregates

H. F. Green & Co., Spokane, submitted the lowest bid of $373,612 to the Bureau of Reclamation, Coulee Dam, for preparation of concrete aggregates at the Adrian deposit, these materials to be used on the various concrete structures in the Columbia Basin Project. The deposit itself is owned by the Government. Unit bids were as follows:

(A) H. F. Green & Co. $373,612
(B) Sather & Sons and Curtis Gravel Co. 438,000
(C) Millay & McBride Co. 463,050
(D) C. & F. Trucking Co. 538,200
(E) J. A. Terteling & Sons, Inc. 547,500
(F) Utah Construction Co. and Winston Bros. Co. 552,900
(G) M. E. Nelson Construction Co. $557,350
(H) E. B. Bishop 570,750
(I) Colonial Construction Co. 598,900
(J) F. R. Hewett Co. 628,500
(K) Max J. Kuney Co. 645,750
(L) J. G. Shotwell 669,750
(M) Miles Co. and Woodworth & Co. Inc. 735,150

		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
120,000	cu. yd. excav. strip. deposit	.12	.24	.10	.13	.30	.19	.25	.30	.27	.20
170,000	cu. yd. prep. and stkpl. sand	.7725	.88	.97	1.20	1.10	1.14	1.28	1.15	1.25	1.30
75,000	cu. yd. prep. and stkpl. aggreg. 3/16 to ⅜ in.	.7725	.88	.97	1.08	1.10	1.14	1.05	1.15	1.20	1.30
88,000	cu. yd. prep. and stkpl. aggreg. ⅜ to ¾ in.	.7725	.88	.97	1.08	1.10	1.14	1.05	1.15	1.20	1.30
132,000	cu. yd. prep. and stkpl. aggreg. ¾ to 1½ in.	.7725	.88	.97	1.08	1.10	1.14	1.05	1.15	1.20	1.30

Oregon—Jefferson County—Bur. of Reclam.—Earthwk. and Struct.

Adler Construction Co., Seattle, Wash., submitted the low bid of $602,833 to the Bureau of Reclamation, Bend, Ore., for construction of 11.7 mi. of unlined canal and appurtenant structures including thirteen chute, inclined drop, or check drop structures of concrete with a total length of 4,407 ft. Canal sections vary from 40 to 20-ft. bottom widths. Bids were received as follows:

(1) Adler Construction Co. $602,833
(2) Morrison-Knudsen Co., Inc. 602,855
(3) J. A. Terteling & Sons, Inc. 673,319
(4) W. C. Thompson $715,889
(5) Natt McDougall Co. 883,393

(Continued on next page)

		(1)	(2)	(3)	(4)	(5)
460,000	cu. yd. excav. com., for canal	.36	.24	.30	.46	.48
50,000	cu. yd. excav. rock, for canal	1.00	1.75	2.22	1.55	2.75
45,000	cu. yd. excav. for core banks	.25	.30	.30	.65	.24
10,000	sta. yd. overhaul	.05	.05	.04	.05	.04
40,000	cu. yd. compact emb.	.30	.20	.30	.24	.50
51,000	cu. yd. excav., com., for struct.	1.00	.90	.50	.95	1.50
3,400	cu. yd. excav., rock, for struct.	3.00	3.50	4.20	4.00	8.00
27,000	cu. yd. backfill	.30	.50	.25	.45	.40
11,000	cu. yd. compact. backfill	.70	2.00	3.00	1.10	1.35
4,900	sq. yd. dry-rock paving	3.00	3.50	3.50	3.90	4.80
3,000	cu. yd. riprap	4.00	3.00	2.50	5.05	3.00
5,060	cu. yd. concrete in structures	41.00	41.00	48.36	44.00	55.00
594,000	lb. place reinf. bars	.05	.05	.04	.045	.05
400	sq. ft. place elastic jt. filler	1.00	1.00	1.00	.66	1.00
20	lin. ft. place rubber water stops	1.00	1.00	1.00	.95	1.00
1,850	lb. place metal water stops	.20	.50	.58	.44	.30
192,000	ft.B.M. erect timber in struct.	75.00	100.00	90.00	50.00	75.00
1,200	lin. ft. constr. underdrains with uncem. jt.	1.50	.75	1.00	1.20	1.45
150	lin. ft. lay sewer pipe with cem. jt.	1.00	1.00	1.00	1.00	1.00
490	lin. ft. lay 18-in. dia. conc. pipe	1.25	2.00	.92	1.60	1.50
60	lin. ft. lay 24-in. dia. conc. pipe	2.00	2.00	1.20	2.10	2.05
90	lin. ft. lay 30-in. dia. conc. pipe	2.50	4.00	1.80	2.90	3.00
150	lin. ft. lay 36-in. dia. conc. pipe	3.00	4.00	2.80	3.90	4.30
9,500	lb. install gates and hoist	.20	.10	.25	.20	.25
8,700	lb. install misc. metalwork	.25	.20	.25	.18	.30

Highway and Street . . .

South Dakota—Pennington County—Federal—Grade.

Northwestern Engineering Co., Rapid City, S. Dak., submitted the low bid of $215,200 to the Public Roads Administration, Denver, Colo., for construction of 2.8 mi. of the Deadwood-Custer-Hot Springs route. The roadway will be 28 ft. in width and will be finished with a graded earth surface. Bids submitted were as follows:

(1) Northwestern Engineering Co. $215,200
(2) Peter Kiewit Sons Co. 231,282
(3) Western Contracting Corp. $292,432
(4) Inland Construction Co. 311,159

		(1)	(2)	(3)	(4)
20	ac. clearing and grubbing	400.00	300.00	350.00	340.00
5,000	cu. yd. stripping and storing topsoil	.55	.35	.30	.42
188,000	cu. yd. unclassified excavation	.80	.885	1.17	1.23
910	cu. yd. unclass. excav. for structures	2.50	2.50	3.20	3.00
16,000	cu. yd. unclass. excav. for borrow	.655	.50	.72	.60
700,000	sta. yd. overhaul (1000-ft. free haul)	.015	.015	.01	.02
8,000	cu. yd. mi. spec. overhaul of borrow (1000-ft. free haul)	.18	.20	.10	.20
6,200	cu. yd. replacing topsoil	.35	.65	.65	.95
220	unit obliteration of old roadways	7.50	9.00	1.50	10.20
2.82	mi. finishing earth graded roads	500.00	$1,500	800.00	653.00
191	cu. yd. concrete Class A	42.00	31.00	41.00	43.50
22,000	lb. reinforcing steel	.09	.08	.10	.115
50	cu. yd. cement rubble masonry	30.00	40.00	80.00	49.00
40	lin. ft. 18-in. std. str. reinf. conc. culv. pipe	3.53	3.50	4.60	4.75
30	lin. ft. 24-in. std. str. reinf. conc. culv. pipe	4.00	5.00	6.50	6.10
1,094	lin. ft. 24-in. C.G.S.M. culvert pipe	3.60	4.00	5.60	5.60
626	lin. ft. 30-in. C.G.S.M. culvert pipe (14 gauge)	4.90	6.00	7.80	7.50
140	lin. ft. 30-in. C.G.S.M. culvert pipe (12 gauge)	6.00	7.00	8.80	8.80
164	lin. ft. 48-in. C.G.S.M. culvert pipe	10.00	11.00	15.20	14.00
50	sq. yd. grouted rubble gutter	10.00	7.00	80.00	12.30
13,200	lin. ft. barbed wire fence	.18	.25	.15	.34

Utah—Iron County—State—Surf.

Floyd S. Whiting, Salt Lake City, was the low bidder at $158,503 before the State Road Commission, Salt Lake City, for construction of a 2-in. roadmix bituminous surfaced road between New Castle and Modena, a total of 13.5 mi. The roadway is to be 24 and 28 ft. wide and the surfacing on the respective sections 20 and 24 ft. wide. The following bids were submitted:

(A) Floyd S. Whiting $158,503
(B) A. O. Thorn & Sons 159,903
(C) W. W. Clyde & Co. 160,251
(D) Reynolds Construction Co. 164,522
(E) Grant Construction Co. 164,571
(F) Palfreyman Construction Co. 173,808
(G) Hunsaker Sand & Gravel Co. $175,248
(H) R. M. Jensen 176,716
(I) Gibbons & Reed Co. 188,022
(J) Brown Construction Co. 189,821
(K) Wheelwright Construction Co. 191,740
(L) Engineer's estimate 166,158

(1) 217,000 gal. bituminous material, Type SC-3.
(2) 49,300 gal. bituminous material, Type RC-4.
(3) 2,500 ton cover material.
(4) 12.273 mi. scarifying and mix'g (24 ft. wide).
(5) 1.182 mi. scarifying and mix'g (20 ft. wide).
(6) 71,200 ton cr. rock or cr. gravel surf. crse.
(7) 9,000 ton gravel or cr. rock base crse.
(8) 174,000 cu. yd. unclassified excavation.
(9) 100,000 sta. yd. overhaul, Class "A".
(10) 1,000 yd. mi. overhaul, Class "B".
(11) 104 ac. clearing and grubbing.
(12) 500 cu. yd. channel excavation.
(13) 3,141 M. gal. watering.
(14) 2,590 hr. rolling.
(15) 450 cu. yd. excavation for structures.
(16) 700 lin. ft. 18-in. C.G.M. pipe.
(17) 402 lin. ft. 24-in. C.G.M. pipe.
(18) 352 lin. ft. 30-in. C.G.M. pipe.
(19) 92 lin. ft. 36-in. C.G.M. pipe.
(20) 520 lin. ft. 48-in. C.G.M. pipe.
(21) 300 lin. ft. 60-in. C.G.M. pipe.
(22) 30 cu. yd. loose riprap.
(23) 314 ea. right of way markers.
(24) 2 ea. F.A.P. markers.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(L)
(1)	.10	.09	.09	.09	.095	.10	.12	.10	.10	.10
(2)	.12	.105	.12	.12	.12	.11	.14	.11	.12	.11
(3)	2.00	2.50	3.50	2.00	2.00	2.50	3.00	3.00	4.25	3.00
(4)	600.00	600.00	600.00	800.00	700.00	640.00	700.00	650.00	475.00	600.00
(5)	600.00	600.00	500.00	800.00	650.00	640.00	650.00	650.00	460.00	600.00
(6)	.60	.65	.66	.70	.68	.70	.65	.75	.75	.65
(7)	.60	.60	.63	.60	.60	.70	.65	.65	.80	.60
(8)	.20	.18	.18	.20	.19	.19	.19	.145	.20	.20
(9)	.015	.01	.015	.01	.015	.01	.015	.015	.015	.02
(10)	.20	.20	.15	.20	.20	.15	.15	.15	.15	.20
(11)	20.00	15.00	15.00	10.00	40.00	15.00	30.00	100.00	15.00	20.00
(12)	.50	.50	.50	1.00	.50	.50	1.00	.90	.40	.30
(13)	2.00	2.50	2.00	1.00	1.50	4.00	2.25	2.50	4.20	2.00
(14)	4.00	3.75	3.50	4.00	4.00	4.00	3.50	4.50	5.00	4.00
(15)	1.00	1.50	1.00	2.00	2.00	.50	1.50	1.50	1.25	1.00
(16)	2.10	2.60	2.00	2.20	2.15	2.25	2.90	2.60	2.40	2.30
(17)	3.00	3.80	3.20	3.50	3.30	3.50	3.90	3.60	3.75	3.50
(18)	4.00	4.90	4.00	4.25	4.30	4.50	5.00	4.50	4.90	4.30
(19)	6.00	6.80	6.40	6.50	6.65	6.80	6.80	7.00	8.00	7.00
(20)	8.00	9.00	8.60	9.00	8.50	10.40	10.00	9.00	11.50	9.25

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(21)	12.00	16.00	14.30	15.00	13.00	16.50	18.00	14.00	17.00	15.00
(22)	3.00	5.00	4.00	10.00	5.00	5.00	10.00	7.00	3.80	5.00
(23)	4.00	4.00	4.00	5.00	4.00	2.50	4.00	5.00	3.25	2.50
(24)	15.00	20.00	20.00	20.00	20.00	15.00	20.00	15.00	15.00	20.00

California—San Joaquin County—State—Grade & Pave

Fredrickson & Watson Construction Co., Oakland, Calif., submitted the low bid of $811,181 to the California Division of Highways, Sacramento, for 8.2 mi. of grading and Portland cement concrete paving between the Calaveras River and Lodi on U. S. Highway 99. Three reinforced concrete bridges are to be constructed. Bids were received as follows:

(A) Fredrickson & Watson Construction Co. $811,181
(B) N. M. Ball Sons & H. W. Ruby 853,361
(C) Bressi & Bevanda Constructors, Inc. 870,495
(D) A. Teichert & Son, Inc. $873,602
(E) Clyde W. Wood, Inc. 879,487
(F) Marshall S. Hanrahan 883,343
(G) Fredrickson Brothers $1,051,202

(1) 250 cu. yd. rem. conc.
(2) 433 sta. clear and grub
(3) 44,000 cu. yd. roadway excav.
(4) 9,200 cu. yd. struct. excav.
(5) 1,820 cu. yd. ditch and channel excav.
(6) 200,000 sq. yd. compact. orig. gr.
(7) 111,500 cu. yd. imported borrow
(8) 124,000 cu. yd. imported subgrade matl.
(9) 6,000 sta. yd. overhaul
(10) lump sum dev. wtr. sup. & furn. wat. equip.
(11) 15,500 M. gal. applying water
(12) 433 sta. finishing roadway
(13) 110,200 sq. yd. mix and compact (cem. tr. subgr.)
(14) 3, 280 bbl. Port. cem. (cem. tr. subgr.)
(15) 12,100 ton untr. rock base
(16) 120 ton liq. asph SC-2 (prime ct. & pen. tr.)
(17) 40 cu. yd. sand (prime ct.)
(18) 100 ton asph. emuls. (pt. bdr., cur. seal, arm. ct. and seal ct.)
(19) 1,400 ton screenings (arm. ct. & seal ct.)
(20) 1,900 ton min. aggr. (P.M.S.)
(21) 100 ton paving asph. (P.M.S.)
(22) 400 lin. ft. raised bars
(23) 24,145 cu. yd. P.C.C. (pave. 8-in.)
(24) 385 cu. yd. P.C.C. (pave. 4-in.)
(25) 18,000 ea. tiebolt assemb.
(26) 1,950 cu. yd. Class "A" P.C.C. (struct.)
(27) 50 cu. yd. broken conc. riprap
(28) 22 cu. yd. P.C.C. (curbs)
(29) 100 ea. monuments
(30) 1,103 lin. ft. timb. bridge railing
(31) 510 lin. ft. remov. timber railing
(32) 25 lin. ft. rem. and reset timber railing
(33) 225 ea. culv. markets and guide posts
(34) 0.1 mi. property fence, Type "A"
(35) 0.25 mi. property fence, Type "B"
(36) 0.15 mi. property fence, Type "C"
(37) 4 ea. drive gates
(38) 0.3 mi. rem. and reconstr. exist. prop. fence
(39) 10 lin. ft. 12-in. C.M.P. (16 ga.)
(40) 864 lin. ft. 18-in. C.M.P. (16 ga.)
(41) 122 lin. ft. 24-in. C.M.P. (14 ga.)
(42) 78 lin. ft. 30-in. C.M.P. (14 ga.)
(43) 86 lin. ft. 24-in. C.M.P. siphon (14 ga.)
(44) 120 lin. ft. 30-in. C.M.P. siphon (14 ga.)
(45) 132 lin. ft. 48-in. C.M.P. siphon (12 ga.)
(46) 1,280 lin. ft. 21½x13½-in. corr. metal arch pipe (16 ga.)
(47) 496 lin. ft. 30x17-in. corr. metal arch pipe (14 ga.)
(48) 126 lin. ft. 37x21-in. corr. metal arch pipe (14 ga.)
(49) 70 lin. ft. 120-in. field assemb. plate culv. (710-18)
(50) 5 ea. 24-in. field joints for siphons
(51) 7 ea. 30-in. field joints for siphons
(52) 8 ea. 48-in. field joints for siphons
(53) 3,850 lin. ft. salv. exist. pipe culv.
(54) 3,125 lin. ft. relay salv. C.M.P.
(55) 21 ea. rem. and reset headwalls
(56) 1 ea. drain. gate
(57) 1 ea. frame and cover for deep inlet
(58) 198,000 lb. furn. reinf. steel (pave.)
(59) 198,000 lb. place reinf. steel (pave.)
(60) 271,500 lb. furn. reinf. steel (struct.)
(61) 271,500 lb. placing bar reinf. steel (struct.)
(62) 2,245 lb. misc. iron and steel
(63) Lump sum, misc. items of work

	(A)	(B)	(C)	(D)	(E)	(F)	(G)
(1)	4.50	4.00	7.00	4.00	4.00	10.00	7.00
(2)	23.00	18.00	37.50	44.00	25.00	50.00	70.00
(3)	.30	.33	.37	.32	.38	.35	.36
(4)	2.00	2.00	2.10	2.20	1.75	2.00	2.75
(5)	.70	.70	1.00	.65	.75	.75	1.25
(6)	.028	.03	.05	.03	.04	.06	.05
(7)	.90	1.05	.75	.80	.92	1.20	1.60
(8)	1.08	1.30	.90	1.00	1.37	1.20	1.70
(9)	.02	.01	.015	.02	.03	.05	.02
(10)	$4,775	$2,000	$3,500	$2,000	$10,000	$5,000	$3,800
(11)	1.30	1.64	1.45	1.85	.90	1.50	1.50
(12)	10.00	7.00	23.00	11.00	20.00	8.00	15.00
(13)	.20	.24	.29	.34	.15	.20	.36
(14)	2.75	2.80	2.80	3.00	2.50	2.30	2.60
(15)	2.25	2.25	2.30	2.50	1.75	2.20	2.40
(16)	24.00	20.00	23.00	25.00	18.00	20.00	21.60
(17)	8.00	4.00	5.25	5.00	2.40	6.00	4.80
(18)	24.00	40.00	39.00	50.00	22.00	25.00	25.00
(19)	4.50	5.00	4.85	5.00	2.75	5.00	5.00
(20)	5.00	4.50	5.20	4.30	4.75	4.00	4.90
(21)	17.00	16.00	18.50	20.00	18.00	20.00	21.00
(22)	1.15	1.00	1.30	1.00	1.00	2.00	1.20
(23)	10.40	10.45	12.25	11.85	11.60	10.50	11.00
(24)	10.80	11.50	12.65	15.00	12.00	12.00	12.00
(25)	.53	.58	.70	.55	.60	.50	.60
(26)	45.00	40.00	45.00	44.00	48.00	40.00	43.90
(27)	12.50	10.00	11.50	6.00	3.00	20.00	13.00
(28)	30.00	38.75	29.00	37.00	22.00	40.00	45.00
(29)	4.00	4.50	5.50	4.50	4.00	5.00	5.50
(30)	4.25	2.50	5.25	4.00	3.00	3.50	6.60
(31)	1.15	.50	1.70	1.50	1.00	2.50	1.50
(32)	5.00	1.50	4.00	4.00	3.00	4.00	3.50
(33)	3.00	3.00	4.50	4.00	3.00	3.00	5.00
(34)	$1,200	900.00	$1,150	900.00	750.00	800.00	950.00
(35)	$1,200	$1,200	$1,275	$1,100	$1,000	$1,000	$1,050
(36)	$1,600	$1,500	$1,400	$1,300	$1,000	$1,200	$1,200
(37)	60.00	50.00	60.00	60.00	50.00	50.00	40.00
(38)	$1,200	750.00	800.00	800.00	750.00	600.00	800.00
(39)	1.70	1.35	2.00	1.90	2.00	3.00	1.56
(40)	2.30	2.10	2.40	2.50	2.90	2.50	2.28
(41)	3.50	3.15	4.00	3.90	3.80	3.35	3.42
(42)	4.47	4.20	4.75	4.80	5.25	4.00	4.38
(43)	4.75	4.55	5.00	5.10	5.75	5.50	5.00
(44)	6.00	5.70	6.25	6.30	6.75	6.25	7.50
(45)	11.25	10.90	11.00	17.70	12.50	11.50	12.65
(46)	2.50	2.40	2.50	2.80	2.90	3.10	2.95
(47)	3.75	3.50	3.60	4.20	4.50	4.10	4.80
(48)	4.75	4.40	4.60	5.40	5.50	5.25	5.90
(49)	37.00	30.00	30.00	45.00	30.00	45.00	33.00
(50)	24.00	17.00	25.00	18.00	15.00	25.00	24.00
(51)	25.00	20.60	35.00	21.00	20.00	25.00	31.20
(52)	26.00	31.50	45.00	32.00	35.00	30.00	45.00
(53)	.90	.80	1.15	1.00	1.00	1.25	1.00
(54)	.90	.80	1.15	1.00	1.00	1.25	1.00
(55)	28.00	40.00	70.00	25.00	50.00	35.00	24.00
(56)	63.00	70.00	60.00	80.00	75.00	75.00	66.00
(57)	75.00	70.00	90.00	100.00	75.00	60.00	90.00
(58)	.05	.04	.06	.05	.04	.035	.046
(59)	.01	.03	.02	.025	.03	.035	.024
(60)	.051	.05	.06	.05	.04	.035	.058
(61)	.015	.024	.02	.03	.03	.045	.024
(62)	.45	.25	.50	.35	.25	.30	.46
(63)	$2,600	$2,800	$5,000	$2,000	$2,000	$2,500	$2,000

CONSTRUCTION SUMMARY

The following pages contain the most complete available tabulation of construction contracts awarded in the eleven western states during the past month. Except for certain instances, contracts amounting to less than $10,000 are not listed. Space is not available to list more than a small proportion of the proposed projects. For your convenience, all items are prepared in an identical manner to provide the following information: County of job location (capital letters); name and address of contractor (bold face); bid price; brief description of work; awarding agency; and approximate date of award. More detailed information on many of these projects is often available, and will gladly be furnished upon your request to the Editor, WESTERN CONSTRUCTION NEWS, 503 Market Street, San Francisco.

CONTRACTS AWARDED

Large Western Projects . . .

Morrison-Knudsen Co., Inc., of Boise, Ida., have received an $11,950,000 contract for the reconstruction of the dam and installation of hydroelectric generating plant on the Snake River, and to install 2 more power plants, one on Upper Malad River and the second on the Lower Malad River, Idaho. The Idaho Power Co., of Boise let the contract.

Lease & Leigland and **Kuney Johnson Co.** of Astoria, Ore., were given a $4,300,000 contract by the Bureau of Yards and Docks, Washington, D. C., for the construction of 375-unit naval housing project on a 290-acre site east of Astoria.

Stone & Webster Engineering Corp., Bakersfield, Calif., have a $10,000,000 contract for the construction of a steam operated electric generating plant and substation installations near Bakersfield. The construction is for the Pacific Gas & Electric Co. of San Francisco.

C. F. Lytle, Sioux City, Ia., **Green Construction Co.**, Des Moines, Ia., and **Amis Construction Co.**, Oklahoma City, Okla., were awarded the contract by the Bureau of Reclamation, Denver, Colo., at $9,359,011 for construction of the Potholes Dam to be situated on Crab Creek, about 15 mi. west of Warden, Grant Co., Wash.

Macco Construction Co., Oakland, Calif., and **Morrison-Knudsen**, San Francisco, Calif., on bid of $2,993,138 received the contract from the Division of Highways at Sacramento for construction of 5.1 miles of the new Bayshore Freeway, betw. Colma Creek in South San Francisco and Broadway Ave., Burlingame, Calif.

J. Paul Campbell, Los Angeles, has a $5,500,000 contract for the construction of 900 prefabricated-type construction dwellings on a tract in the Van Nuys district of Los Angeles, Calif. Kaiser Community Homes awarded the contract.

H. B. Zachery Co., San Antonio, Tex., has received a $1,500,000 contract for the construction of an 850-car parking lot under Travis Park in San Antonio. The City Council awarded the contract.

Peter Kiewit Sons Co., Arcadia, Calif., has been awarded by the Division of Highways, Sacramento, Calif., a contract for $1,543,233 to grade and pave 4.5 miles, betw. Latigo Canyon and Malibu Creek in Los Angeles Co., Calif.

McNutt Brothers, Eugene, Ore., have been awarded the $877,031 contract by the State Highway Commission, Salem, for the construction of 6 timber bridges in Douglas and Josephine Counties, Ore.

Howard Hasting, Inc., Hollywood, Calif., holds a $2,000,000 contract for the constr. of a 2-story and basement milk processing plant, 2-story office bldg. and other bldgs. on a 16-acre site near Culver City, Calif. The award was made by the Carnation Milk Co. of Oconomowoc, Wis.

J. W. Bateson of Dallas, Tex., was awarded by the Midland Office Bldg., Inc., a $1,088,227 contract for the construction of an 8-story office building in Midland, Tex.

Mead & Mount Construction Co. of Denver, Colo., were awarded a $835,000 contract by the Public Buildings Administration, Washington, D. C., to remodel six buildings to be used by federal agencies in Denver, Colo.

Guy F. Atkinson Co., South San Francisco, was awarded an $874,215 contract by the Division of Highways at Sacramento for the construction of two bridges, foundations of a third bridge and to reline a portion of the State Hwy. Rt. 1 in Mendocino County, Calif.

R. J. Daum Construction Co. of Inglewood, Calif., received from the Southern California Telephone Co., Los Angeles, a $1,100,000 contract for the construction of a 2-story telephone bldg. in Hawthorne, Calif.

Gunner Corp., and **J. E. Haddock, Ltd.,** both of Pasadena, Calif., received a joint award of $778,949 to grade, apply base and surface 6.5 miles of roadway between Fowler and Calma overpass in Fresno Co., Calif. The Division of Highways, Sacramento, made the award.

Lowdermilk Bros., Denver, Colo., have a $649,337 contract for 7.8 miles of highway work on the Questa-Taos road, New Mexico, by the State Highway Department at Santa Fe.

Lawrence McConville of Los Angeles, Calif., received a $864,980 award for the construction of 104 frame and stucco dwellings in the Venice district of Los Angeles from Truxton Building Corp., of the same city.

J. G. Bartholomew, Dallas, Tex., has been awarded a $556,464 contract for additions and improvements to the water purification plant No. 2, clear water basin No. 2 and the extension to the filter house, Dallas. The Dallas City Council awarded the contract.

A. Teichert & Son, Sacramento, Calif., will grade, place base and surface 6.7 miles of highway slightly north of Crazy Horse Summit in Monterey and San Benito Cos., Calif. The $723,658 award was made by the Division of Highways at Sacramento.

Grant Construction Co., Springville, Utah, has received a $427,223 contract from the Bureau of Highways, Boise, Idaho, for 7.6 miles of highway improvement on U. S. Highway No. 30, in Bannock County, Idaho.

Highway and Street . . .

Arizona

COCONINO CO.—**Diggs Contracting Co.,** Box 701, Phoenix—$36,592 for 15.7 mi. hwy. constr. on Flagstaff-Clints Well project, Coconino National Forest—by Public Roads Administration, Phoenix. 10-14

COCONINO CO.—**J. E. Skousen,** 243 W. 1 Ave., Mesa—$36,504 for 1.5 mi. improvement of Railroad Ave., betw. Sitgraves and Verde Sts., Flagstaff—by State Highway Department, Phoenix. 10-18

MARICOPA CO. — **Arizona Sand & Rock Co.,** Box 1522, Phoenix—$20,954 to improve certain sections of 14th St. and Hubbell St., Phoenix—by City Council, Phoenix. 10-14

MARICOPA CO. — **Arizona Sand & Rock Co.,** Box 1522, Phoenix—$16,305 to improve 13th St. and Evergreen St. from the S. line of Oak St. to S. line of Sheridan St., Phoenix—by City Council, Phoenix. 10-14

MARICOPA CO.—**Bartol & Shearer,** 1350 S. 7th St., Phoenix —$24,233 to improve Cornell St., Phoenix—by East Thomas Road Tracts Improvement District, Phoenix. 10-14

MARICOPA CO. — **Phoenix-Tempe Stone Co.,** Box 1670, Phoenix—$89,352 for 4.5 mi. grade, drain and surf. of W. Van Buren St., Phoenix—by State Highway Department, Phoenix. 10-16

MARICOPA CO.—**Tiffany Construction Co.,** Box 846, Phoenix —$27,987 to improve streets in Franklin-Palomas Section, Phoenix—by Franklin-Palomas Improvement District, Phoenix. 10-14

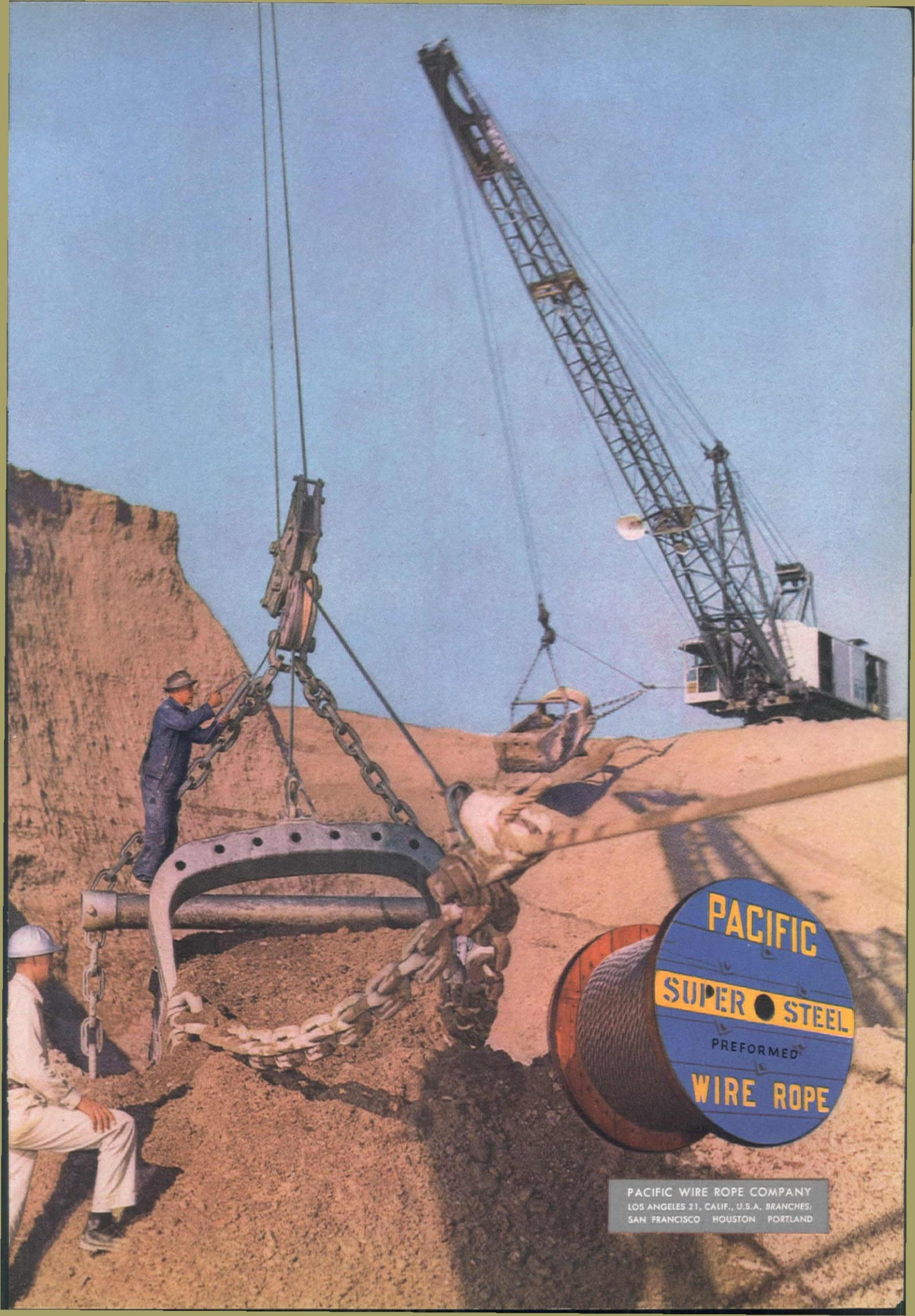
YAVAPAI CO.—**W. J. Henson,** Prescott—$96,992 to grade, drain and surf. NW. of city limits and one intersection of Prescott—by State Highway Department, Phoenix. 10-16

California

ALAMEDA CO.—**Heafey-Moore Co.,** 344 High St., Oakland—$15,865 to resurf., repair portions of existing pave., base and seal coat, Maitland Dr. from E. city limits to Bay Farm Island Bridge, Alameda—by City Council, Alameda. 10-17

BUTTE CO.—**Tyson & Watters Co.,** 1201 10th Ave., Sacramento—$32,999 to grade and pave Third Agricultural District, Chico—by State Division of Architecture, Sacramento. 10-14

CONTRA COSTA CO.—**Lee J. Immel,** Box 65, Station A,



Berkeley—$17,150 to widen and pave .3 mi. between Fourth and First Sts., Rodeo—by Division of Highways, Sacramento. 10-18

FRESNO CO.—**Gunner Corp.,** 272 Annandale Rd., Pasadena and **J. E. Haddock, Ltd.,** 3538 E. Foothill Blvd., Pasadena—$778,949 for 6.5 mi. grade, base and surf. betw. Fowler and Calma overpass—by Division of Highways, Sacramento. 10-14

HUMBOLDT CO.—**Mercer Fraser Co.,** 2nd and Commercial Sts., Eureka—$185,557 for 8 mi. grade and plant mix surf., betw. Arcata and Ryans slough bridge—by Division of Highways, Sacramento. 10-14

KERN CO.—**George E. France,** 1509 College Ave., Visalia—$165,504 for 5.1 mi. grade and surf. betw. Rt. 4 and five mi. N.—by Division of Highways, Sacramento. 10-18

LOS ANGELES CO.—**A. A. Bainter,** 1767 Lime Ave., Long Beach—$142,687 to grade at university campus, Arroyo Area, Los Angeles—by Board of Regents of University of California, Los Angeles. 10-1

LOS ANGELES CO.—**Griffith Co.,** 1060 S. Broadway, Los Angeles—$23,700 to furnish and apply 5,500 tons plant mix surf. on various sts. in Long Beach—by City Council, Long Beach. 10-25

LOS ANGELES CO.—**Griffith Co.,** 1060 S. Broadway, Los Angeles—$22,372 for 1.5 mi. plant mix surf. betw. Sproul St. and Anaheim-Telegraph Rd.—by Division of Highways, Sacramento. 10-11

LOS ANGELES CO.—**Peter Kiewit Sons Co.,** 345 Kieways Ave., Arcadia—$1,543,233 for 4.5 mi. grade. and pave. with portland cement conc., betw. Latigo Canyon and Malibu Creek—by Division of Highways, Sacramento. 10-16

LOS ANGELES CO.—**Matich Bros.,** Box 390, Colton—$70,700 for .7 mi. grade, widen and surf., betw. Rt. 77 and Pomona—by Division of Highways, Sacramento. 10-22

LOS ANGELES CO.—**M. S. Mecham & Sons.,** 10861 Drury Lane, Lynwood—$10,331 to improve Hedda St., betw. Downey and Hayter Aves., near Bellflower—by County Board of Supervisors, Los Angeles. 10-14

LOS ANGELES CO.—**Harold L. Miller,** 914 Humphreys Ave., Los Angeles—$13,045 to improve Odessa Ave., betw. Hart and Kittridge Sts., Los Angeles—by Board of Public Works, Los Angeles. 10-14

LOS ANGELES CO.—**George Savala,** 1105 S. Alameda St., Compton—$12,060 to improve Crenshaw Blvd., betw. Hardy and Manchester Blvds., Inglewood—by City Council, Inglewood. 10-14

LOS ANGELES CO.—**Sully-Miller Contracting Co.,** 1500 W. 7th St., Long Beach—$37,856 to improve Carson St., betw. California and Orange Aves., Long Beach—by City Council, Long Beach. 10-14

MENDOCINO CO.—**A. R. McEwen,** Box 1017, Sacramento and **C. M. Syar,** Box 1431, Vallejo—$136,870 for .8 mi. grade and surf., betw. Northwestern Pacific R. R. grade crossing and Northwestern Pacific R. R. underpass—by Division of Highways, Sacramento. 10-16

MONTEREY AND SAN BENITO COS.—**A. Teichert & Son,** Box 1133, Sacramento—$723,658 for 6.7 mi. of grade., crusher run base and plant mix surf. slightly N. of Crazy Horse Summit and Chittenden Rd.—by Division of Highways, Sacramento. 10-17

ORANGE CO.—**Cox Brothers Construction Co.,** Box 36, Stanton—$23,305 to widen Edinger St. from Main to Flower Sts., Santa Ana—by City Council, Santa Ana. 10-14

PLACER CO.—**Leo G. Lynch,** Box 92, Danville—$328,238 for 4.8 mi. hwy. constr. Mosquito Ridge project, Tahoe National Forest—by Public Roads Administration, San Francisco. 10-14

PLACER CO.—**W. C. Thompson,** 2801 Third St., San Francisco—$407,305 for constr. of 7 mi. Mosquito Ridge project, Tahoe National Forest—by Public Roads Administration, San Francisco. 10-14

SAN BERNARDINO CO.—**George Herz & Co.,** Box 191, San Bernardino—$39,323 for .4 mi. widen and surf. 8.6 mi. N. San Bernardino—by Division of Highways, Sacramento. 10-14

SAN MATEO CO.—**Charles L. Harney,** 625 Market St., San Francisco—$10,790 to improve W. side of Hillside Blvd., from Bismark St. to few feet S. of Mission St., Daly City—by City Council, Daly City. 10-16

SAN MATEO CO.—**Macco Construction Co.,** Ferry and Freight Sts., Oakland, and **Morrison-Knudsen,** 111 Sutter St., San Francisco—$2,993,138 for 5.1 mi. grade. and pave with asphalt conc. on crusher run base, Bayshore Freeway from Colma Creek in South San Francisco to Broadway Ave., Burlingame—by Division of Highways, Sacramento. 10-10

SOLANO CO.—**E. E. Lowell,** Box 148, Vallejo—$52,446 to grade, pave, install sewers, storm drain, box culvert and curbs and gutters in portions of Reo Alley, Alameda and Monterey Sts., Vallejo—by City Council, Vallejo. 10-11

YUBA CO.—**A. Teichert & Son, Inc.,** Box 1113, Sacramento—$210,151 for constr. of 2.4 mi. of Nevada City-Downieville rd., Tahoe National Forest—by Public Roads Administration, San Francisco. 10-14

Idaho

BANNOCK CO.—**H. A. Gardner,** 685 Northwest Main St., Blackfoot—$79,336 for 5.1 mi. drain. structs. and surf. of McCammon-Robin road—by Bureau of Highways, Boise. 10-15

BANNOCK CO.—**Grant Construction Co.,** Springville, Utah—$427,223 for 7.6 mi. drain. structs., base and surf. on U. S. Hwy. 30, betw. McCammon and Lava Hot Springs—by Bureau of Highways, Boise. 10-21

BONNER CO.—**Morrison-Knudsen Co., Inc.,** Box 450, Boise—$163,114 for 6 mi. grade, pave Priest River Hwy.—by Public Roads Administration, Portland, Ore. 10-24

BONNER CO.—**Sather & Son,** Box 197, Spokane, Wash.—$155,810 for 4 mi. of hwy. constr. on W. side of Priest Lake, N. of Norman—by Bureau of Highways, Boise. 10-9

IDAHO CO.—**S. Rilyea & Sons,** New Plymouth—$237,350 for 14 mi. grade on Glenwood-Eldorado timber access rd., E. of Kooskia—by Public Roads Administration, Portland, Ore. 10-14

IDAHO CO.—**Shoshone Co.,** Twin Falls—$41,260 for 3.5 mi. roadbed constr., drain structs. and surf. of Senn-Dover road—by Bureau of Highways, Boise. 10-15

KOOTENAI CO.—**Carborn Bros.,** Box 5025, Sta. C, Spokane, Wash.—$43,603 for 5 mi. drain. structs. and surf. of Hayden Junction-West rd.—by Department of Public Works, Boise. 10-5

LEMHI CO.—**Nic Burggraf,** Box 397, Idaho Falls—$375,481 for 12.6 mi. grade. and surf.—by Bureau of Highways, Boise. 10-21

SHOSHONE CO.—**Colonial Construction Co.,** Box 1452, Spokane, Wash.—$135,980 for constr. of 3 mi. of timber access rd., extending from Prichard N. along Coeur d'Alene river—by Bureau of Highways, Boise. 10-9

Montana

MISSOULA CO.—**S. Birch & Sons Construction Co.,** Ford Bldg., Great Falls—$188,788 for 9.3 mi. grade, Lewis and Clark Hwy., Lolo National Forest—by Public Roads Administration, Missoula. 10-26

New Mexico

BERNALILLO CO.—**J. H. Ryan,** Box 513, Albuquerque—$118,117 for 2.5 mi. rolling, leveling, pave, Albuquerque—by State Highway Department, Santa Fe. 10-18

TAOS CO.—**Lowdermilk Bros.,** Denver, Colo.—$649,337 for 7.8 mi. clear and grub., tamping, watering, etc., Questa-Taos rd.—by State Highway Department, Santa Fe. 10-15

Oklahoma

BLAINE CO.—**Grady Owens,** 816 Classen St., Norman—$26,353 for 6.1 mi. grade and drain starting 11 mi. NW. of Watonga and extending to Southard—by State Highway Commission, Oklahoma City. 10-15

BLAINE CO.—**Grady Owens,** 816 Classen St., Norman—$10,055 for 5.9 mi. grade and drain, five mi. W. of Watonga and extending NW.—by State Highway Commission, Oklahoma City. 10-15

Oregon

DESCHUTES CO.—**T. W. Thomas,** Portland—$123,321 for 10 mi. regrade, surf. and oiling Cline Falls-Tumalo section of Cline Secondary Hwy.—by State Highway Commission, Salem. 10-14

DESCHUTES CO.—**T. W. Thomas,** Portland—$64,217 for 3.8 mi. regrade, surf., and oiling Tumalo-Deschutes section of Tumalo-Deschutes Secondary Hwy.—by State Highway Commission, Salem. 10-14

DOUGLAS CO.—**R. A. Heintz Construction Co.,** 8101 NE. Union St., Portland—$299,478 for 7.1 mi. grade and surf. of Johns-Glendale Junction section of Pacific Hwy.—by State Highway Commission, Salem. 10-1

MALHEUR CO.—**K. F. Jacobsen Co.,** Portland—$122,796 for 6.6 mi. regrade, surf. and oiling, also furnishing 2,000 cu. yds. crushed material base in stockpiles on Hope-Derry Ranch section of Vale-West Secondary Hwy.—by State Highway Commission, Salem. 10-14

WASCO AND SHERMAN COS.—**O. C. Yocum,** 902 SE. 11th St., McMinnville—$189,402 to grade and surf. Deschutes River-Sherars Summit section and Deschutes River section of Sherars Bridge Secondary Hwy.—by State Highway Commission, Salem. 10-1

WASHINGTON CO.—**Harr & Horten,** Portland—$18,997 for .2 mi. hwy. widening Main St. and College Way on Wilson River-Nehalem Hwy., Forest Grove—by State Highway Commission, Salem. 10-14

WASHINGTON CO.—**Rogers Construction Co.,** Rt. 15, Box 526, Portland—$359,982 for 7.9 mi. bitum. macadam surf. and furnishing crushed rock in stockpiles, North Plains section of Sunset Hwy.—by State Highway Commission, Salem. 10-1

Texas

ARCHER CO. — **Shawver Construction Co.,** 3402 McFarlin, Dallas—$46,871 for 6.8 mi. grade, base and surf. on Hwy. FM 374, from Megargel NE. — by State Highway Department, Austin. 10-10

BLANCO CO.—**Holland Page,** Box 1181, Austin—$43,409 for 5.4 mi. grade., structs., base preserv. on Hwy. 165, from US. Hwy. 281 to Middle Creek rd.—by State Highway Department, Austin. 9-23

BOSQUE CO.—**Brown & Root, Inc.,** Box 1139, Austin—$312,055 for 6.3 mi. grade., structs., base and surf. on Hwy. 22, from 11 mi. E. of Meridian to Whitney Dam—by State Highway Department, Austin. 10-23

BOWIE CO.—**Harrison Engineering & Construction Corp.,** Kansas City, Mo.—$169,665 for 11.8 mi. widening conc. pave. from New Boston to 3.3 mi. W. and from S. city limits of Texarkana to 1 mi. N. of Sulphur River—by State Highway Department, Austin. 10-10

CHILDRESS CO.—**Wallace & Bowden,** 5513½ Grand Ave., Dallas—$37,717 for 3.9 mi. grade., structs., base and surf. from Childress NE. toward Center—by State Highway Department, Austin. 9-23

COLLIN CO.—**Austin Road Co.,** Box 1590, Dallas—$91,962 for .5 mi. grade, struct. and conc. pave in McKinney—by State Highway Department, Austin. 10-14

COMANCHE CO.—**Fred Bell,** Abilene—$55,989 for 6.8 mi. flexible base and asphalt surf. treat. from 4 mi. E. of Gustine to Hamilton Co. line—by State Highway Department, Austin. 10-10

DALLAS CO.—**Austin Road Co.,** Box 1590, Dallas—$176,127 for street improvements on Parry and Lindsley Aves., betw. Peak St. and Tennison Memorial Dr., Dallas—by City Council, Dallas. 10-28

DALLAS CO.—**Texas Bitulithic Co.,** 1111 Commerce St., Dallas —$178,399 to resurf. Cedar Springs, Lemon, Oak Lawn and other streets in Dallas—by City Council, Dallas. 10-3

DALLAS CO.—**Uvalde Construction Co.,** 2400 Uvalde St., Dallas—$22,283 to pave McVey from Beckley to Toluga, Corning from Beckley to Toluga and Toluga from McVey and Corning, Dallas—by City Council, Dallas. 10-3

ELLIS CO.—**Brown & Root,** Box 1139, Austin—$265,580 for 20.6 mi. asphalt underseal and conc. pave., from Waxahachie to Hill Co. line—by State Highway Department, Austin. 10-10

ELLIS CO.—**John T. Leslie,** Bailey—$197,551 for 7.8 mi. grade, structs. base course and surf. on Elwing Rd., from Lufkin E.—by State Highway Department, Austin. 10-25

HAMILTON CO.—**Brazos Construction Co.,** Majestic Bldg., Fort Worth—$163,266 for 19.8 mi. grade., drain struct., base and seal coat slightly W. of Hamilton to rd. junction 20, on Hwy. 218 —by State Highway Department, Austin. 9-26

HARDEMAN CO.—**John T. Leslie,** Bailey—$123,085 for 14.4 mi. grade, base and base preservative on Hwy. FM. 104, betw. Lazare to Quanah—by State Highway Department, Austin. 10-10

HARDEMAN CO.—**R. W. McKinney,** Box 190, Nacogdoches —$44,594 for 14.4 mi. drain. structs. on Hwy. FM. 104, betw. Lazare and Quanah—by State Highway Department, Austin. 10-10

HILL CO.—**J. W. Perry,** Insurance Bldg., San Antonio—$191,925 for 4.9 mi. grade, structs., base and double asphalt surf. on Hwy. 22, from proposed Whitney Dam to Whitney—by State Highway Department, Austin. 10-23

HUNT CO.—**Texas Bitulithic Co.,** 1111 Commerical St., Dallas —$104,239 for 11.1 mi. hot mix asphalt conc. pave. on U.S. Hwy. 67, from Collin Co. line NE.—by State Highway Department, Austin. 10-10

HUTCHINSON CO.—**Bell & Braden,** Herring Hotel Bldg., Amarillo—$39,498 for 5.8 mi. grade, structs., flexible base and asphalt surf. treat. on Hwy. FM. 279, from junction of St. Hwy. 117 to 5.8 mi. E.—by State Highway Department, Austin. 10-10

JEFF DAVIS CO.—**Harry L. Campbell,** 2435 Winton Terr., Fort Worth—$230,577 for 20 mi. grade, structs., base and surf., from Barrell Springs to junction with State Hwy. 17—by State Highway Department, Austin. 10-14

LAMPASAS CO.—**A. L. Bucy,** Brownwood—$61,814 for 7.9 mi. grade., drain. struct., base and surf. treat. from W. Co. line of Lampasas to Ogles Rd.—by State Highway Department, Austin. 10-10

LIMESTONE CO.—**F. M. Reeves & Son,** Box 972, Austin—$201,259 for 12.1 mi. grade., structs., base and surf. treat. on Hwy. No. 164, betw. Groesbeck and Personville—by State Highway Department, Austin. 10-10

LIPSCOMB CO.—**Bell & Braden,** Herring Hotel Bldg., Amarillo—$136,131 for 10 mi. grade., base and asphalt surf., from Hwy. 117 to Lipscomb—by State Highway Department, Austin. 10-10

MAVERICK CO.—**Collins Construction Co.,** Box 1192, Austin —$124,673 for 17 mi. grade and structs. from 12 mi. NE of Eagle Pass to Zavala Co. line—by State Highway Department, Austin.

MENARD CO.—**Collins Construction Co.,** Box 1192, Austin—$125,446 for 14.4 mi. grade, struct., base and surf. treat., from Schleicher Co. line to 6.5 mi. W. of Menard—by State Highway Department, Austin. 10-10

SOMERVELL CO.—**Houston Clinton & Midwest Trucking Co.,** 2824 Colonial Ave., Waco—$49,434 for 6.6 mi. grade, drain. structs. and surf. near Rainbow and from Glenn Rose to Lanham—by State Highway Department, Austin. 10-1

TARRANT CO.—**Texas Bitulithic Co.,** 1111 Commerce, Dallas —$255,796 for 2.4 mi. grade, widen structs., and conc. pave. from Sylvania Ave. to connect with U.S. Hwy. 377—by State Highway Department, Austin. 10-14

TARRANT CO.—**Texas Bitulithic Co.,** 1111 Commerce St., Dallas—$82,425 to resurf. N. Main St., betw. Bluff St. and Marine Creek Bridge, Fort Worth—by City Council, Fort Worth. 10-10

TRAVIS CO.—**Dean Skinner,** Box 972, Austin—$214,627 for 14.4 mi. grade. and structs. on Hwy. FM. 93, betw. Blanco-Travis Co. line and Bee Caves—by State Highway Department, Austin. 10-10

WHEELER CO.—**Ernest Loyd,** Box 1120, Fort Worth—$52,646 for 15.8 mi. grade., struct. from U. S. Hwy. 83 at Twitty, through Kelton to Hwy. 152—by State Highway Department, Austin. 9-26

WINKLER CO.—**Thomas & Ratliff,** Rogers—$181,696 for 12.1 mi. grade., drain., base and surf. E. and W. of Kermit—by State Highway Department, Austin. 9-28

Utah

RICH CO.—**Parsons & Fife,** Salt Lake City—$105,235 for 17 mi. gravel surf. from Ideal Beach to Laketown—by State Road Commission, Salt Lake City. 10-26

SALT LAKE CO.—**W. W. Clyde & Co.,** Springville—$189,194 to grade Mountain Dell-Henefer Hwy., betw. Mountain Dell and Big Mountain Summit—by State Road Commission, Salt Lake City. 10-28

Washington

ASOTIN CO.—**C. E. O'Neal Co., Inc.,** 209 Elliott, Ellensburg—$295,096 for 4.4 mi. clear, grub., grade and surf. of P. State Hwy. 3, Grand Ronde River to Ore. state line—by Department of Highways, Olympia. 10-28

GRAYS HARBOR CO.—**Grays Harbor Construction Co.,** 609 H, Hoquiam—$24,797 to redeck approaches to Chehalis River

bridge, P. State Hwy. 9, near Montesano—by Department of Highways, Olympia. 10-28

JEFFERSON CO.—**Peter Kiewit Sons Co.,** 1403 W. 45th St., Seattle—$188,112 for 19.9 mi. clear and grub., base and surf. of Primary State Hwy. 9, Queets River to Hoh River—by Department of Highways, Olympia. 10-1

KING AND SNOHOMISH COS.—**J. P. Surace & Co.,** Seattle —$23,087 for .2 mi. clear, grub., grade and pave S. State Hwy. 2-B, near Lake Ballinger — by Department of Highways, Olympia. 10-28

STEVENS CO.—**F. R. Hewett Company,** 420 West 22nd Ave., Spokane—$15,722 for .3 mi. hwy. constr. on State Hwy. 22, Gerome Slide—by Department of Highways, Olympia. 10-1

PIERCE CO.—**Consolidated Construction Co.,** 3102 N. 28th, Tacoma—$64,209 for 4.1 mi. structs., base and surf. West Side Dairy Rd. and North Levee Rd.—by Department of Highways, Olympia. 10-1

Wyoming

NATRONA CO.—**Roush Construction Co.,** Scottsbluff—$25,599 for .3 mi. grade, drain, surf. and seal coat of Casper-Alcova Rd.—by State Highway Department, Cheyenne. 10-14

SWEETWATER CO.—**H. W. Read,** 706 W. 19th St., Cheyenne —$85,301, conditional contract, for 8.7 mi. grade, drain, etc. of Green River-Linwood Rd.—by State Highway Department, Cheyenne. 10-14

TETON CO.—**Teton Construction Co.,** Box 197, Cheyenne—$25,961 for 4.7 mi. grade, drain, surf. and road mix oil treatment of Jackson-South Park Rd.—by State Highway Department, Cheyenne. 10-14

Canada

BRITISH COLUMBIA — **General Construction Co., Ltd.,** Vancouver—$107,050 for completion of 2.8 mile link in Lougheed Hwy., connecting with Pacific Hwy. and southern trans-provincial hwy., Vancouver—by Provincial Department of Public Works, Vancouver. 10-4

Bridge & Grade Separation...

California

KERN CO.—**Griffith Co.,** 1060 S. Broadway, Los Angeles—$515,503 for 6.7 mi. grade and pave and constr. of reinf. conc. bridge across Poso Creek overflow, betw. Cawelo and Famoso underpass—by Division of Highways, Sacramento. 10-22

MENDOCINO CO.—**Guy F. Atkinson Co.,** Orange & Railroad Aves., South San Francisco—$874,215 for constr. of Mitchell and Hare Creek bridges, foundations of Noya River bridge and reline portion of State Hwy. Rt. 1—by Division of Highways, Sacramento. 10-28

ORANGE CO.—**Johnson-Western Co.,** 2100 Wilmington-San Pedro Rd., San Pedro—$31,660 to repair bridge across N. arm of Newport Bay—by Division of Highways, Sacramento. 9-27

SACRAMENTO CO.—**M. A. Jenkins,** 3560 Broadway, Sacramento—$74,295 for constr. of reinf. conc. bridge across Bear slough, 4.5 mi. W. of Galt—by Division of Highways, Sacramento. 10-14

SACRAMENTO CO.—**Bati Rocca,** 2124 Sunset Ave., Stockton —$34,074 to constr. reinf. conc. slab bridge across Laguna Creek, .8 mi. N. of Elk Grove—by Division of Highways, Sacramento. 10-17

TRINITY CO.—**S. C. Giles & Co.,** Elks Bldg., Stockton—$53,372 for constr. of bridges over Carr Creek and Hayfork River—by Public Roads Administration, San Francisco. 10-16

Idaho

IDAHO CO.—**Clifton & Applegate Co.,** Box 1473, Spokane, Wash.—$230,042 for constr. of 90.7 ft. steel and timber bridge and constr. of drain. structs. on 5.3 mi. of Lewis and Clark Hwy.,

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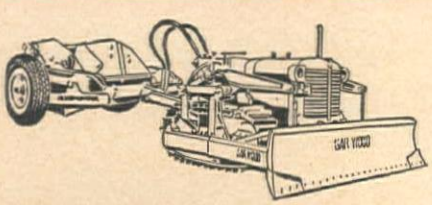

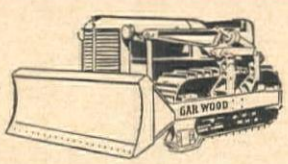

ARIZONA: Allison Steel Mfg. Co., 19th Ave. and So. Pac. Tracks, Phoenix; CALIFORNIA: Gar Wood Industries, Inc., 1210 Mateo St., Los Angeles 21; Gar Wood Industries, Inc., 17th and Folsom Sts., San Francisco 10; COLORADO: Liberty Trucks & Parts Co., 690 Lincoln St., Denver 1; IDAHO: Olson Mfg. Company, 4000 Warm Springs, Boise; General Machinery Co., E. 3500 Block, Riverside Ave., Spokane 1, Wash.; MONTANA: Reymer Machine Co., Inc., 115 N. 25th St., Billings; Granite Alaska Garage, 45 W. Granite St., Butte; NEW MEXICO: Oden Equip. Co., 312-24 N. 4th St., Albuquerque; Lone Star Equip. Co., 1500 Texas St., El Paso, Texas; OREGON: Fruehauf Trailer & Equip. Co., 1138 S. E. 10th St., Portland 14; UTAH: Lundberg Equip. Co., 257 N. Main St., Logan; Cate Equip. Co., 49 East 9th South, Salt Lake City 4; WASHINGTON: Fruehauf Trailer & Equip. Co., 300-4 Michigan St., Seattle 8; WYOMING: Wilson Equip. & Supply Co., 902 W. 22nd St., Cheyenne.

from Powell Ranger Station W.—by Department of Public Works, Boise. 10-5

Oregon

DOUGLAS AND JOSEPHINE COS.—**McNutt Bros.,** 351½ E. Broadway, Eugene—$877,031 for constr. of 6 timber bridges and approaches on Glendale Junction-Wolf Creek section of Pacific Hwy.—by State Highway Commission, Salem. 10-1

Texas

BRAZOS AND GRIMES COS.—**Austin Bridge Co.,** Box 1590, Dallas—$236,698 for constr. of bridge and approaches near Navasota on Hwy. 90—by State Highway Department, Austin. 10-1

CAMERON CO.—**Dodds & Wede-Gartner Construction Co.,** San Benito—$288,974 to grade, drain. structs., pave and bridge N. of Harlingen—by State Highway Department, Austin. 9-28

DALLAS CO.—**Austin Bridge Co.,** Box 1590, Dallas—$250,716 for constr. of overpass and grade and structs., Hall St., Dallas—by State Highway Department, Austin. 10-1

GRAY CO.—**Amarillo Bridge Co.,** Amarillo—$36,190 to repair 3 bridges on N. fork of Red River, McClellan and Red Mud Creeks—by State Highway Department, Austin. 10-23

TARRANT CO.—**J. M. Purvis,** 2304 Medford Court, West, Fort Worth—$20,627 to repair Balknap Overpass, Fort Worth—by State Highway Department, Austin. 10-10

WILLIAMSON CO.—**Wallace & Bowden,** 5513½ Grand Ave., Dallas—$98,606 to constr. bridges and culverts betw. Bartlett and Granger—by State Highway Department, Austin. 9-25

Airport . . .

California

LOS ANGELES CO.—**Peter Kiewit Sons Co.,** 345 Kieways Ave., Arcadia—$496,879 for additional terminal facilities, including addition to passenger loading apron, aircraft parking aprons, grading and paving, two passenger subways, etc., Los Angeles Airport, Los Angeles—by Board of Public Works, Los Angeles. 10-8

Texas

BEXAR CO.—**Townsco Construction Co.,** Oklahoma City, Okla.—$31,691 to repair runways, taxiways, aprons and ramps, Brooks Field—by Army Air Corps, Brooks Field. 10-28

Water Supply . . .

California

CONTRA COSTA CO.—**Stolte, Inc.,** 8451 San Leandro St., Oakland—$180,785 to install 59-in. dia. steel pipelines, valves, piers, culverts and appurtenant work, Second Mokelumne Aqueduct, near Walnut Creek—by East Bay Municipal Utility District, Oakland. 10-18

LOS ANGELES CO.—**Edward Greene,** 3001 Coolidge Ave., Burbank—$71,365 to furnish and lay water transmission main to connect reservoir with city water distribution system, Burbank—by City Council, Burbank. 10-4

SACRAMENTO CO.—**Tom L. Gogo,** 10024 S. Figueroa St., Los Angeles—$291,500 to furnish and install asbestos-wrapped steel water pipelines in various sections of Sacramento—by City Council, Sacramento. 10-22

SAN MATEO CO.—**Underground Construction Co.,** 75th Ave. and San Leandro Blvd., Oakland—$15,013 to install water mains in various sections of Redwood City—by City Council, Redwood City. 10-2

Texas

CHILDRESS CO.—**O. J. Parrott,** Box 9247, Dallas—$28,933 for waterworks improvements in Childress—by City Council, Childress. 10-17

DALLAS CO.—**J. G. Bartholomew,** Construction Bldg., Dallas—$556,464 for additions and improvements to water purification plant No. 2, clear water basin No. 2 and extension to filter house, Dallas—by City Council, Dallas.

DALLAS CO.—**W. G. Cullum & Co.,** Great National Life Bldg., Dallas—$26,127 to install water mains in Irving—by City Council, Irving. 10-10

DALLAS CO.—**E. E. Farrow Construction Co.,** 1518 Kings Highway, Dallas—$13,228 to install water mains in various parts of Dallas—by City Council, Dallas. 9-30

Washington

ADAMS CO. — **Pittsburgh - Des Moines Steel Co.,** 1015 Tuttle St., Des Moines, Iowa—$35,374 for constr. of 1,000,000 gal. water tank, Ritzville — by City Council, Ritzville. 10-18

KING CO.—**Argentieri & Colarossi,** 1819 Weller St., Seattle—$300,000 for water system improvements, modern chlorination, storage, hydrants, etc., Bellevue — by County Water District No. 68, Bellevue. 10-11

KING CO.—**Valley Construction Co.,** 7708 Rainier Ave., Seattle—$5,965 to install water mains in W. Willow St., Seattle—by City Board of Public Works, Seattle. 10-18

SNOHOMISH CO.—**Superior Construction Co.,** 4610 37th Ave., S.W., Seattle—$73,586 for constr. of steel reservoir, cement-asbestos pipe line, etc., Everett—by County Public Utility District No. 1, Everett. 10-11

Sewerage . . .

Arizona

YUMA CO.—**Alton B. Carter,** Yuma—$72,431 to install sewer lines in First St. district, Yuma—by City Council, Yuma. 10-25

California

ALAMEDA CO. — **Erickson, Phillips & Weisberg,** 3341 Telegraph Ave., Oakland—$156,529 for constr. of drainage conduit, incidental sewer and appurtenant work betw. E St. at 87th Ave. and SW terminus of 84th Ave., Oakland—by City Council, Oakland. 10-14

ALAMEDA CO.—**Oakland Sewer Construction Co.,** 9915 Walnut St., Oakland—$87,094 to install sewer lines in El Portal Annex, Hayward—by Oro Loma Sanitary District, Hayward. 10-14

ALAMEDA CO.—**Oakland Sewer Construction Co.,** 9915 Walnut St., Oakland—$15,330 for storm drain from present district drain to Halcyon Dr. on Hesperian Blvd., Hayward—by Oro Loma Sanitary District, Hayward. 10-14

ALAMEDA CO.—**Paris Bros.,** 2415 Oregon St., Berkeley—$14,978 to constr. storm sewer extension, University Ave., Berkeley—by City Council, Berkeley. 10-23

ALAMEDA CO.—**Edwin J. Tobin,** 1000 Carleton St., Berkeley—$19,984 to install sewers on Mountain Blvd., betw. Sausal Creek and La Puerta—by City Council, Oakland. 10-14

ALAMEDA CO.—**Edwin J. Tobin,** 1000 Carleton St., Berkeley—$7,273 to install storm sewer on Third St., betw. Jones and

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, etc., required by the Acts of Congress of August 24, 1912, and March 3, 1933, of Western Construction News, published monthly at San Francisco, California, for October 1, 1946.

State of California, County of San Francisco, ss. Before me, a Notary Public in and for the State and county aforesaid, personally appeared D. F. Forster, who, having been duly sworn according to law, deposes and says that he is the Business Manager of the Western Construction News and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher—Arthur F. King, 503 Market St., San Francisco, Cal.

Editor—John M. Server, Jr., 503 Market St., San Francisco, Cal.

Managing Editor—D. F. Stevens, 503 Market St., San Francisco, Cal.

Business Manager—D. F. Forster, 503 Market St., San Francisco, Cal.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

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3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is: (This information is required from daily publications only.)

Donald F. Forster, Exec. V. P.
Business Manager

Sworn to and subscribed before me this 13th day of September, 1946.

(Seal) ELEANOR J. SMITH,
Notary Public

(My commission expires Jan. 3d, 1947.)

Camelia Sts., Berkeley—by City Council, Berkeley. 10-1

LOS ANGELES CO.—**Bosko Construction Co.,** 3726 Lee St., Los Angeles—$38,756 for constr. of sanitary sewer in Harcross Dr., Los Angeles—by County Board of Supervisors, Los Angeles. 10-18

LOS ANGELES CO.—**Charles T. Brown Co.,** 1955 6th St., San Fernando—$182,543 for constr. of storm drain and sanitary sewer, near Hollywood Parkway, betw. Diamond St. and Sunset Blvd., Los Angeles—by Department of Public Works, Sacramento. 10-29

LOS ANGELES CO.—**J. P. Evans** 356 S. Spring St., Los Angeles—$16,604 for constr. of sanitary sewers in Stockwell, Benwell, Carson Drives and Imperial Hwy., Lynwood—by City Council, Lynwood. 10-14

LOS ANGELES CO. — **Edward Green,** 3001 Coolidge Ave., Los Angeles—$27,665 for constr. of Dockweiler St. and Muirfield Rd. storm drain, Los Angeles—by Board of Public Works, Los Angeles. 10-25

LOS ANGELES CO. — **O'Shaughnessy Construction Co.,** 2400 Piru St., Compton—$9,471 to install sanitary sewers in Rendalia and other sts., Los Angeles — by County Board of Supervisors, Los Angeles. 10-14

LOS ANGELES CO. — **J. E. Popovich,** 1444 W. 218th St., Torrance—$13,374 for constr. of sanitary sewers in Caldwell Ave., Compton—by City Council, Compton. 10-14

ORANGE CO.—**Cox Bros. Construction Co.,** Box 36, Stanton—$7,403 for constr. of storm drain in Bristol St., betw. 15th and 17th, Santa Ana—by City Council, Santa Ana. 10-14

SAN BERNARDINO CO. — **Concrete Conduit Co.,** 899 La Cedena Ave., Colton—$499,722 for constr. of sewage treatment plant, pumping plant and sewer lines, Big Bear Lake Sanitation District—by County Board of Supervisors, San Bernardino. 10-9

SAN DIEGO CO.—**V. R. Dennis Construction Co.,** Box F, Hillcrest Station, San Diego—$10,442 for sanitary sewers in 60th St., College Ave. and 62nd St., San Diego—by City Council, San Diego. 10-4

SAN JOAQUIN CO.—**Fred J. Early, Jr.,** 369 Pine St., San Francisco—$145,765 for constr. of intercepting sewer, manholes, connections and sewage treatment plant, Stockton — by County Board of Supervisors, Stockton. 10-23

SAN JOAQUIN CO.—**McGuire & Hester,** 796 66th Ave., Oakland—$67,153 to install sanitary intercepting and lateral sewers and appurtenances in Tracy — by City Council, Tracy. 10-14

SAN JOAQUIN CO. — **Stockton Construction Co.,** 40 W. Clay St., Stockton—$29,976 for constr. of sewage pumping plant, Stockton—by City Council, Stockton. 10-10

STANISLAUS CO.—**Manuel Smith,** 1440 Broadway, Oakland—$77,411 for collection sewers, domestic sewage disposal facilities and industrial sewage facilities at Hughson—by City Sanitary District, Hughson. 10-8

Oregon

LINN CO.—**Leonard & Slate, Ltd.,** 7805 S.W. 40th Ave., Portland — $6,657 for constr. of 3 lateral sewers in Albany—by City Council, Albany. 10-1

UMATILLA CO.—**W. C. Smith, Inc.,** Board of Trade Bldg., Portland—$179,446 to install city system sanitary sewers and house sewer connections, Milton—by City Council, Milton. 10-11

UMATILLA CO. — **W. C. Smith, Inc.,** Board of Trade Bldg., Portland—$100,880 for constr. of sewage treat. plant at Milton—by City Council, Milton. 10-18

Texas

CALDWELL CO. — **Wahrmund-Logan Co.,** 422 Hays St., San Antonio—$7,961 to extend sanitary sewer system in Luling—by City Council, Luling. 10-3

CAMERON CO.—**Trueheart & Caldwell,** American Hospital & Lige Bldg., San Antonio—$121,857 to install storm sewers, Harlingen—by City Council, Harlingen. 10-10

DALLAS CO.—**W. B. Garner & Co.,** 7417 Erath, Houston—$25,513 for sewage treatment plant and sanitary sewer line, Lancaster—by City Council, Lancaster. 10-14

Washington

KING CO.—**Valley Construction Co.,** 7708 Rainier Ave., Seattle—$18,610 to install sewers in 28th Ave., S., Seattle—by City Board of Public Works, Seattle. 10-18

PEND OREILLE CO.—**Rushlight Automatic Sprinkler Co.,** 55 NE. Farragut St., Portland, Ore.—$169,033 for constr. of trunk sewer, treatment plant, lateral and sub-trunk sewers at Newport—by City Council, Newport. 9-27

Waterway . . .

California

HUMBOLDT CO. — **Mercer-Fraser Co.,** 2nd and Commercial Sts., Eureka—$39,392 for const. of pile and heavy stone riprap bank protection, Dyerville—by Division of Highways, Sacramento. 10-22

MENDOCINO CO. — **Johnson Western Co.,** Box 416, Alameda—$60,315 for 53,100 cu. yds. of dredging of Noyo River, Noyo—by U. S. Engineer Office, San Francisco. 9-30

ORANGE CO. — **Johnson-Western Co.,** 2100 Wilmington-San Pedro Rd., San Pedro—$26,425 for constr. and improvement of Coyote Creek channel in the City of La Habra—by County Board of Supervisors, Santa Ana. 9-27

SACRAMENTO CO. — **H. Earl Parker,** 12th and F Sts., Marysville—$161,500 to enlarge E. levee of Sacramento River from Meridian Bridge to Tisdale Weir, Sacramento—by U.S. Engineer Office, Sacramento. 10-16

SACRAMENTO CO. — **H. Earl Parker,** 12th and F Sts., Marysville—$157,664 for constr. of levee setbacks and enlargements, at three locations along the Sacramento River—by U.S. Engineer Office, Sacramento. 10-14

SACRAMENTO CO. — **H. Earl Parker,** 12th and F Sts., Marysville—$20,950 to remove existing retard, place cobbles and new retards Yuba River betw. Rubke Bend and Dantonis—by U.S. Engineer Office, Sacramento. 10-14

TEHAMA CO.—**L. G. Schalz,** Rt. 1, Box 22, Chico—$10,050 for fishway reconstruction at Clough Dam, Mill Creek—by State Division of Architecture, Sacramento. 10-1

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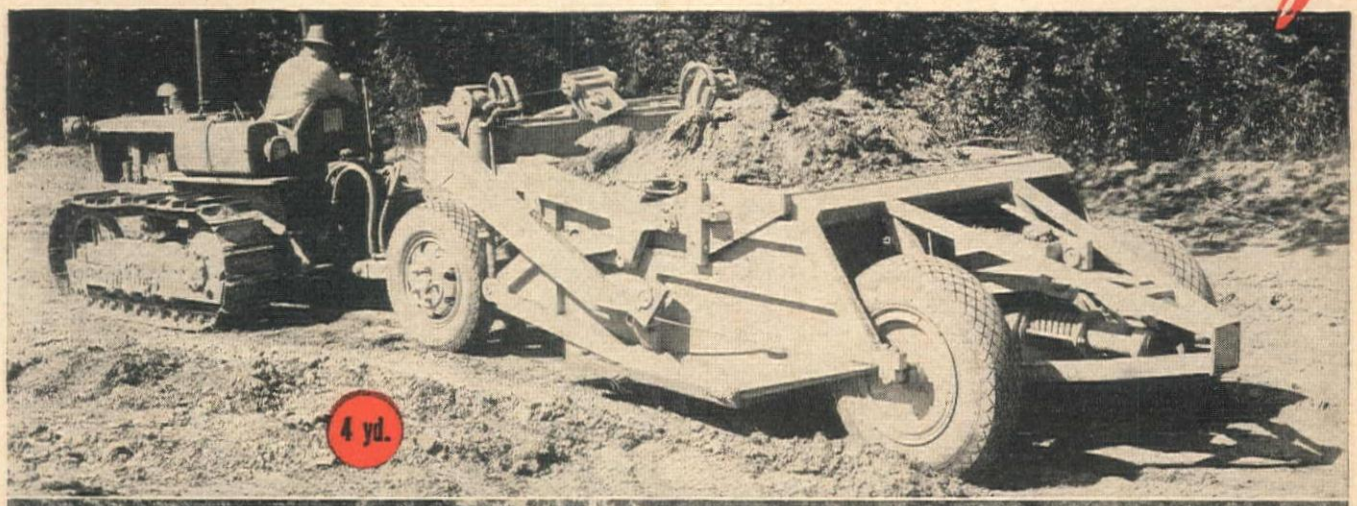

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C-42	69	59	55	52	50	46	44	32	1.75 Min.	3.75

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Albuquerque, New Mexico

LIBERTY TRUCKS & PARTS CO.
690 Lincoln Street
Denver, Colorado

Oregon

KLAMATH CO.—**George Stacey,** Klamath Falls—$24,500 for 175,000 cu. yds. of excavation work on North Canal, Klamath Falls—by City Drainage District, Klamath Falls. 10-19

Canada

BRITISH COLUMBIA — **B. C. Bridge and Dredging Company, Ltd.,** 544 Howe St., Vancouver—$119,000 to improve Fraser River elevator docks and constr. new retaining wall, New Westminster—by City Council, New Westminster. 10-19

Dam . . .

Washington

GRANT CO.—**C. F. Lytle,** Box 206, Sioux City, Ia., **Green Construction Co.,** Des Moines, Ia., and **Amis Construction Co.,** Oklahoma City, Okla. — $9,359,011 for constr. of Potholes Dam, Columbia Basin project, approx. 15 mi. W. of Warden—by Bureau of Reclamation, Denver, Colo. 10-4

Irrigation . . .

California

ALAMEDA CO. — **Erickson, Phillips & Weisberg,** 3341 Telegraph Ave., Oakland —$156,529 for constr. of Elmhurst drain, conduit and appurtenances, E. St. at 87th Ave. and SW. 84th Ave., Oakland—by City Council, Oakland. 10-18

STANISLAUS CO.—**E. W. Smith,** 912 3rd St., Modesto — $20,085 conc. lining for North Bacon branch of lateral No. 6, Modesto—by Modesto Irrigation District, Modesto. 10-11

STANISLAUS CO.—**E. W. Smith,** 912 3rd St., Modesto—$10,598 conc. lining for Colt branch of lateral No. 5, Modesto—by Modesto Irrigation District, Modesto. 10-11

STANISLAUS CO.—**Lloyd W. Terrell,** 221 9th Ave., Turlock—$20,676 to install conc. pipe, Randolph Branch of Baker Shiloh Ditch, Modesto—by Modesto Irrigation District, Modesto. 10-21

Oklahoma

JACKSON CO. — **Stamey Construction Co.,** 10 W. 21st St., Hutchinson, Kans.—$337,147 for constr. of earthwork and structs. at Altus Canal project—by Bureau of Reclamation, Washington, D. C. 10-18

JACKSON CO. — **Stebbins Construction Co.,** Tulsa — $319,719 for earthwork and structs., Ozark Canal, Altus project, near Altus—by Bureau of Reclamation, Altus. 10-29

Power . . .

California

KERN CO.—**Stone & Webster Engineering Corp.,** Box 264, Bakersfield—$10,000,000 for constr. of 100,000-hp. steam operated elect. generating plant and substation installations, 5 mi. NW. of Bakersfield—by Pacific Gas & Electric Co., San Francisco. 10-29

LOS ANGELES CO.—**Blaw-Knox Co.,** Pittsburgh, Penna.—$400,000 to supply and install all piping in high-pressure, steam turbine electrical power plant, Los Angeles —by City Council, Los Angeles. 10-20

SAN FRANCISCO CO.—**MacCabe Electric Co.,** 355 Fell St., San Francisco—$10,557 for constr. of light and power service to main yard, Golden Gate Park, San Francisco—by County Board of Park Commissioners, San Francisco. 10-1

Idaho

GEM CO.—**S. H. Reither,** Aitkin, Minn.—$53,193 for constr. of 17 mi. long, 69-kilovolt transmission line, Black Canyon "C" line canal pumping plant, Payette Division, Boise Project—by Bureau of Reclamation, Denver, Colo. 10-29

GOODING CO.—**Morrison-Knudsen Co., Inc.,** Box 450, Boise—$11,950,000 for constr. of 3 hydro-electric generating plants on Upper and Lower Malad River and on the Snake River and for the rebuilding of dam on Snake River near Hagerman—by Idaho Power Co., Boise. 10-17

Texas

DEAF SMITH CO.—**Walco Engineering & Construction Co.,** 2408 East 4th Pl., Tulsa, Okla.—$254,504 for 234 mi. of rural electric line, Hereford — by Deaf Smith County Electric Cooperative, Hereford. 10-14

Building . . .

Arizona

MARICOPA CO.—**R. E. Bruce Construc-**

tion Co., Rt. 1, Box 76, Phoenix—$380,000 for constr. of school bldgs., 15th Ave., Phoenix—by Board of Trustees of School District No. 1, Phoenix. 9-27

MARICOPA CO.—**J. R. Porter Construction Co.**, 3407 N. 7th St., Phoenix—$75,000 for constr. of one-story, masonry office anl warehouse bldg. at Fourth Ave. and Madison St., Phoenix—by A. R. Staley Sales Co., Phoenix. 10-4

MARICOPA CO.—**Stewart Construction Co.**, 802 N. Central, Phoenix—$135,196 for constr. of lunchroom and home economics bldgs. at Longview and Grandview Schools, Osborn School District No. 8—by County Board of Supervisors, Phoenix. 10-16

MARICOPA CO.—**Del E. Webb Construction Co.**, Box 4066, Phoenix—$200,000 for constr. of market center at 15th Ave. and Thomas Rd., Phoenix—by John S. Kerr, Phoenix. 10-21

California

ALAMEDA CO.—**Dinwiddie Construction Co., Inc.**, 620 Market St., San Francisco—$590,000 for constr. of foundations and steel frame 15-story bldg., 1545 Franklin St., Oakland—by Pacific Telephone & Telegraph Co., San Francisco. 10-8

ALAMEDA CO.—**M. & K. Corp.**, Financial Center Bldg., San Francisco—$600,000 for constr. of reinf. conc., steel frame additions to tomato products plant, 98th Ave. and San Leandro Blvd., Oakland—by Butler Packing Co. Oakland. 10-22

FRESNO CO.—**L. H. Hansen & Sons**, 313 Palm Ave., Fresno—$68,000 for constr. of office bldg. at 2346 Inyo St., Fresno—by C. G. Connors, Fresno. 10-28

FRESNO CO.—**Larsen-Ratto Construction Co.**, 1901 Hedges St., Fresno—$40,711 to remodel steel frame and conc. milk processing plant, Fresno—by Golden State Co., Ltd., San Francisco. 10-9

FRESNO CO.—**Markwart Company**, Box 2071, Sacramento—$50,000 for reconstr. of fire damaged bldg. at McCall and California Aves., Fresno—by Peters & Garabedian Packing Co., Fresno. 10-2

FRESNO CO.—**Robert E. McKee**, 4700 San Fernando Rd., W. Los Angeles—$150,000 for constr. of reinf. conc. addition to machine shop bldg. at Big Creek Power Plant No. 3, near Huntington Lake—by Southern California Edison Co., Los Angeles. 9-27

GLENN CO.—**B & R Construction Co.**, 268 Market St., San Francisco—$81,347 for constr. of reinf. conc. addition to school bldg. at Marin and Chapman Sts., Orland—by School District, Orland. 10-2

KERN CO.—**Ashby & Opperman**, Box 127, Bakersfield—$159,099 for constr. of frame and stucco school bldg., Bakersfield—by Lakeside Union Elementary School District, Bakersfield. 10-16

KERN CO.—**Guy E. Hall**, Box 1723, Bakersfield—$267,187 for constr. of wood frame and stucco exterior school bldg., Truxton Ave. and A St., Bakersfield—by Board of Education, Bakersfield. 10-16

KERN CO.—**Guy E. Hall**, Box 1723, Bakersfield—$62,294 for constr. of 4 classrooms at elementary school, Bakersfield—by Edison Elementary School District, Bakersfield. 10-14

LOS ANGELES CO.—**Austin Co.**, 777 E. Washington Blvd., Los Angeles—$295,000 for constr. of steel frame and reinf. conc. studio and factory bldg., Alden Dr., betw. Robertson Blvd. and Hamel Rd., Los An-

geles—by Columbia Recording Corp., Los Angeles. 10-9

LOS ANGELES CO.—**James I. Barnes Construction Co.,** 1119 Montana Ave., Santa Monica—$353,200 for constr. of one- and two-story, frame and stucco, steel reinf. bldg., Zoe St. and Miles Ave., Huntington Park—by City Council, Huntington Park. 10-11

LOS ANGELES CO.—**C. & M. Homes,** 7825 S. Western Ave., Los Angeles—$654,180 for constr. of 87 six-room, frame and stucco dwelling units, Venice—by self. 10-4

LOS ANGELES CO.—**J. Paul Campbell,** 5555 W. Manchester Ave., Los Angeles—$5,500,000 total cost for constr. of 900 two- and three-bedroom, prefab. type constr. dwellings on tract betw. Vanowen, Whitsett Sts., Coldwater Canyon and Victory Blvd., Van Nuys—by Kaiser Community Homes, Los Angeles. 10-14

LOS ANGELES CO.—**R. E. Campbell,** 316 E. Weber Ave., Compton—$500,000 for constr. of 8-story, 100-room, reinf. conc. hotel bldg. addition, Broadway and Linden Aves., Long Beach—by self. 10-4

LOS ANGELES CO.—**J. L. Dandy & Co.,** 4316 Lankershim Blvd., N. Hollywood—$93,600 for constr. of 20 frame constr., 4-room dwellings on Berg, Amboy and other Sts., Van Nuys—by self. 10-4

LOS ANGELES CO.—**R. J. Daum Construction Co.,** 6803 West Blvd., Inglewood—$1,100,000 for constr. of reinf. conc. 2-story telephone bldg., Hawthorne — by Southern California Telephone Co., Los Angeles. 10-28

LOS ANGELES CO.—**R. J. Daum Construction Co.,** 6803 West Blvd., Inglewood—$430,000 for constr. of administration bldg. and 3 steel frame bldgs. at 4910 E. Anaheim-Telegraph Rd., E. Los Angeles—by Southern Counties Gas Co., Los Angeles. 10-14

LOS ANGELES CO. — **Davies, Keusder and Brown,** 4915 Exposition Blvd., Los Angeles—$97,700 for constr. of 2-story, reinf. conc. and brick mill bldg. and one-story press bldg. at 2626 E. 25th St., Los Angeles—by Peterson Manufacturing Co., Los Angeles. 10-4

LOS ANGELES CO.—**The Eisen-Hart Co.,** 416 N. La Brea Ave., Los Angeles—will constr. 192 four-, five- and six-room frame and stucco dwelling units off Londley and Van Owen Sts., Van Nuys—by Rancho Chimineas, Van Nuys. 9-27

LOS ANGELES CO.—**Escherich Bros.,** 234 W. 37th Pl., Los Angeles—$125,000 for constr. of 2-story, frame and stucco Sunday school bldg., E. Virginia Rd., S. of Huntington Dr., San Marino—by San Marino Community Church, San Marino. 10-17

LOS ANGELES CO.—**Finecraft, Inc.,** 736 N. Highland Ave., Los Angeles—$274,900 for constr. of 72, frame and stucco, 5-room dwellings, Van Nuys district, Los Angeles. —by Green Ivy Homes, Los Angeles. 10-28

LOS ANGELES CO.—**George A. Fuller Co.,** 1329 E. St., NW., Washington, D. C. $200,000 for constr. of film exchange bldg., Los Angeles—by Joseph M. Berne, Cleveland, Ohio. 10-28

LOS ANGELES CO.—**Griffith, Walker & Lee,** 4124 N. Marber Ave., Lakewood—will build 300 five- and six-room, frame and stucco dwellings on 125-acre tract in Lakewood—by self. 9-27

LOS ANGELES CO.—**Howard Hasting, Inc.,** 1135 N. Las Palmas Ave., Hollywood $2,000,000 for constr. of 2-story and basement, reinf. conc. and steel frame milk processing plant bldg., 2-story office bldg., garage bldg. and retail ice cream bldg. on 16-acre site S. of Exposition Blvd., near Culver City — by Carnation Milk Co., Oconomowoc, Wis. 10-18

LOS ANGELES CO.—**G. G. Larfield,** 4310 Sutton Pl., Sherman Oaks, Van Nuys—$175,000 for constr. of 7 frame and stucco, 20-room apartment bldgs., 2600, 3600, 3700 7th Ave., blocks, Los Angeles—by self. 10-30

LOS ANGELES CO.—**Lawrence McConville,** 6205 S. Harvard Blvd., Los Angeles—$864,980 to constr. 104, one-story, 6-room, frame and stucco dwellings, Venice District—by Truxton Building Corp., Los Angeles. 10-17

LOS ANGELES CO.—**Oltmans Construction Co., Inc.,** 810 E. 18th St., Los Angeles—$78,000 for constr. of chapel and Sunday school unit, cor. Overhill and Northridge Drives, View Heights District, Los Angeles—by Park Hills Collegiate Church, Los Angeles. 10-14

LOS ANGELES CO.—**Rayden Construction Co.,** 453 S. Spring St., Los Angeles—$394,400 for constr. of 58 frame and stucco, 6-room dwellings, Huntington Land Development Tract, Redondo Beach — by Huntington Land Development Co., Redondo Beach. 10-25

LOS ANGELES CO.—**Security Construction Co.,** 7801 Glenoaks Blvd., Burbank—

$150,000 for constr. of ten 4-unit, frame and stucco apartment bldg., N. Maple, N. Kenwood, Cordova and S. Avon Sts., Burbank —by Keswick Corp., Burbank. 10-14

LOS ANGELES CO.—**Warner S. Stokes,** 2316 Burbank Blvd., Burbank—$334,560 for constr. of 48 frame and stucco, 6-room dwellings on Strathern St., Radford and Hinds Aves., Van Nuys—by R. A. Eaton, Burbank. 10-4

LOS ANGELES CO.—**Del E. Webb Construction Co.,** 5101 San Fernando Rd., W. Los Angeles—$340,000 for constr. of reinf. conc. warehouse bldg. at Slauson and Eastern Aves., Los Angeles—by Kraft Foods Co., Chicago, Ill. 9-27

LOS ANGELES CO. — **Raymond and Stanley Woodward,** 618 W. Buckthorn Ave., Inglewood—$120,000 to remodel 2-story, mattress factory bldg. at 5300 S. San Pedro St., Los Angeles—by A. Moody & Co., Los Angeles. 10-14

MARIN CO.—**Mattock Construction Co.,** 212 Clara St., San Francisco—$42,000 for constr. of one-story and mezzanine, conc. block garage and shop bldg., 4th St., betw. Irwin St. and Grand Ave., San Rafael—by Alfred Hall and Richard Weil, Hillsborough. 10-21

NEVADA CO.—**George Latin, Tahoe Mill & Moulding Co.,** Hills Flat, Grass Valley—$50,000 for constr. of one-story, basalt blocks, frozen food processing and lockers near Nevada Co. Farm Market in Glenbrook Park section, Grass Valley—by A. G. Montin, Napa, and Joseph Long and Albert Bergman. 10-30

RIVERSIDE CO.—**George B. Thatcher Co.,** 4074 Laurel Canyon Blvd., N. Hollywood—$52,195 for erection of 55 dwelling units at Hemet—by Federal Public Housing Authority, San Francisco. 10-14

SAN BERNARDINO CO. — **Roy E. Dowd & Son,** 174 S. Sierra Ave., Fontana—$68,372 for constr. of 2 steel and conc. additions to poultry plant on Ceres St., Fontana—by Swift & Co., Fontana. 9-27

SAN FRANCISCO CO.—**S. J. Amoroso Construction Co.,** 2100 Oakdale Ave., San Francisco — $40,200 for constr. of addt. classrooms at school sites 1, 2 and 3, Ridge Point war dwellings, San Francisco—by Department of Public Works, San Francisco. 10-24

SAN FRANCISCO CO.—**Dinwiddie Construction Co., Inc.,** Crocker Bldg., San Francisco—$1,500,000 for constr. of 8-story addition to O'Connor Moffatt Co. bldg., O'Farrell near Stockton St., San Francisco —by R. H. Macy & Co., Inc., New York City, N. Y. 10-1

SAN FRANCISCO CO.—**George A. Fuller Co.,** 1329 E. St., NW., Washington, D. C.—$125,000 for constr. of film exchange bldg., San Francisco—by Joseph M. Berne, Cleveland, Ohio. 10-28

SAN FRANCISCO CO.—**Carl J. Fung & Co.,** 777 Broadway, San Francisco—$45,000 for constr. of 4-story, Class C constr. medical bldg., Clay and Stockton Sts., San Francisco—owner withheld. 10-10

SAN FRANCISCO CO.—**J. H. Netherton,** 237 7th St., San Francisco—$100,000 for constr. of 4 frame and stucco apartment bldgs., 46th Ave. and Fulton St., San Francisco—by B. Dudley, San Francisco. 10-28

SAN JOAQUIN CO.—**Basalt Rock Co.,** 8th and River Sts., Napa — $175,000 for constr. of basalite block and steel factory bldg. on Tracy Rd., 3 mi. S. of Stockton—by self. 10-4

SAN LUIS OBISPO CO.—**Paul Spencer Construction Co.,** 832 W. 5th St., Los Angeles—$129,156 to place and repair 188 standard trailers and utility trailers on campus of California Polytechnic Institute, San Luis Obispo—by Federal Public Housing Authority, San Francisco. 10-14

SAN MATEO CO.—**MacDonald, Young & Nelson,** 127 Montgomery St., San Francisco—$250,000 for constr. of steel frame, brick facing telephone exchange bldg., 1480 Burlingame Ave., Burlingame—by Pacific Telephone & Telegraph Co., San Francisco. 10-23

SAN MATEO CO.—**Soule Steel Co.,** 1750 Army St., San Francisco — $60,000 for constr. of one-story steel frame, aluminum siding factory bldg., 1105 Old County Rd., San Carlos—by Lenkurt Electric Co., San Francisco. 10-15

SAN MATEO CO.—**Stolte, Inc.,** 8451 San Leandro St., Oakland—$70,000 for constr. of one-story, steel frame and conc. block sales and service bldg., Burlingame—by Lawrence V. Metcalf, San Francisco. 10-10

SANTA CLARA CO.—**Basalt Rock Co.,** 8th and River Sts., Napa — $100,000 for constr. of steel and conc. mfg. plant, Bayshore Hwy. across from Moffett Field, Sunnyvale—by self. 10-2

SANTA CLARA CO.—**Daley Bros.,** 426 Bryant St., San Francisco — $75,000 for constr. of one-story, reinf. conc. and steel sales and service bldg., El Camino Real, opp. Mountain View grammar school, Mountain View—by Mark Tuban, Mountain View. 10-8

STANISLAUS CO.—**Hodges Construction Co.,** 2125 Blake St., Berkeley—$42,000 for constr. of masonry and reinf. conc. veterinary hospital, Turlock—by Drs. Collinson and Bohlender, Turlock. 10-22

Colorado

DENVER CO. — **Mead & Mount Construction Co.,** Denver National Bank Bldg., Denver—$835,000 to remodel six bldgs. for use by federal agencies, Denver—by Public Buildings Administration, Washington, D. C. 10-22

DENVER CO. — **Mead & Mount Construction Co.,** Denver National Bank Bldg., Denver—$424,000 for constr. of superstructure and site improvements at hospital, 1050 Clermont St., Denver—by Rose Memorial Hospital Association, Denver. 10-8

Montana

DEER LODGE CO. — **Cahill-Mooney Construction Co.,** Box 398, Butte—$326,720 for constr. of men's dormitory bldg., State Hospital for the Insane, Warm Springs—by State Board of Examiners, Helena. 10-17

GALLATIN CO. — **Carson Construction Co.,** Helena—$250,000 to dismantle 386-man Hudson house-type dormitory in Vancouver, Wash., and reconstruct it on Montana State college campus, Bozeman—by Veterans' Housing Authority, Washington, D. C. 10-4

Nevada

CLARK CO.—**C. B. Bagnall,** 1505 Border Ave., Torrance, Calif.—$311,000 for constr. of city jail and police station bldg. at Las Vegas—by City Council, Las Vegas. 10-14

Oklahoma

GARFIELD CO. — **Cowen Construction Co.,** 214 N. Broadway, Shawnee—$147,300 to constr. high school bldg. in Enid—by School Board, Enid. 9-28

Oregon

BENTON CO.—**W. C. Smith, Inc.,** Board of Trade Bldg., Portland—$274,574 for constr. of one-story, T-shaped grade school bldg. at Corvallis—by Consolidated School District No. 9, Corvallis. 10-1

CLATSOP CO.—**Lease & Leigland** and **Kuney Johnson Co.,** Box 359, Astoria—$4,300,000 for constr. of 375-unit naval housing project, 290-acre site, E. Astoria—by Bureau of Yards and Docks, Washington, D. C. 10-28

MULTNOMAH CO.—**George A. Fuller Co.,** 1329 E. St., NW., Washington, D. C.—$75,000 for constr. of film exchange bldg., Portland—by Joseph M. Berne, Cleveland, Ohio. 10-28

MULTNOMAH CO. — **Realty Building Co.,** Henry Bldg., Portland—$100,000 for constr. of 2 brick veneer apartment bldgs., NE. Pacific St. and 82nd St., Portland—by self. 10-28

MULTNOMAH CO. — **O. R. Wayman,** Lewis Bldg., Portland—$100,000 for constr. of garment manufacturing plant, 915 N.E. Davis, Portland—by Pacific Garment Co., Portland. 10-12

UMATILLA CO. — **Collier-Harris Construction Co.,** 117 SW. 20th St., Pendleton—$250,000 for constr. of 42 dwellings in Milton—by self. 10-30

Texas

BEXAR CO.—**Becher & Becher,** 341 N. Comal, San Antonio—$61,331 for constr. of addition to Johnson School, S. Laredo St., San Antonio—by Board of Education, San Antonio. 10-23

BEXAR CO.—**Joe Joeris,** 219 Ave. A, San Antonio — $217,500 for constr. of high school bldg., San Antonio—by Pastor, St. Gerard's Parish, San Antonio. 10-18

BEXAR CO.—**Vincent & Anthony Falbo,** 515 N. San Saba St., San Antonio—$72,137 to remodel Highland Park School No. 26, 2011 S. New Braunfels Ave., San Antonio—by School District No. 26, San Antonio. 10-8

DALLAS CO.—**Henry C. Beck,** Tower Petroleum Bldg., Dallas—$72,000 for constr. of 9 units of 4 apartments each, Dallas—by City Housing Association, Dallas. 10-28

DALLAS CO.—**Hal C. Dyer,** Dallas Gas Bldg., Dallas—$40,000 to remodel present bldg. at 2701 Logan St., Dallas—by Lone Star Gas Co., Dallas. 10-7

DALLAS CO.—**W. Carl King,** 3310 Swiss Ave., Dallas—$50,000 to constr. bus station and filling station at 1815 N. Akard and 1600 Munger, Dallas—by A. Harris & Co., Dallas. 9-25

DALLAS CO.—**J. N. Meek,** 2509 Steevers St., Dallas—$115,000 for constr. of one-story, masonry warehouse bldg. at 6519 Cedar Springs, Dallas—by Hutting Sash & Door Co., Dallas. 9-25

DALLAS CO.—**A. J. Rife Construction Co.,** Dallas—$60,000 for constr. of masonry addition to warehouse bldg., Dallas—by E. H. Perry, Dallas. 10-21

ECTOR CO.—**T. C. Bateson Construction Co.,** Irwin-Keasler Bldg., Dallas—$340,140 for constr. of school bldgs. and additions, Odessa—by County Independent School District, Odessa. 10-17

EL PASO CO.—**Robert E. McKee,** 1917 Texas St., El Paso—$427,500 for constr. of stone and reinf. conc. dormitory and dining

hall bldgs., college grounds, El Paso—by Board of Supervisors, College of Mines and Metallurgy, El Paso. 10-4

EL PASO CO.—**J. E. Morgan & Sons,** Box 712, El Paso—$257,914 for constr. of South Side Elementary School bldg., El Paso—by Board of Education, El Paso. 10-14

EL PASO CO.—**J. E. Morgan & Sons,** Box 712, El Paso—$55,000 for constr. of one-story and basement bldg. at 810 E. San Antonio St., El Paso—by Frymuth Ice Cream Co., El Paso. 9-25

HAYS CO.—**Gordon Fulcher,** 2411 Scenic Dr., San Marcos—$300,000 for constr. of 4-story hotel bldg. at San Marcos — by Hugh Williamson & Carl C. Mays, Jr., Dallas. 9-28

MIDLAND CO.—**J. W. Bateson,** Irwin-Keasler Bldg., Dallas—$1,088,227 for constr. of 8-story office bldg., Midland—by Midland Office Bldg., Inc., Midland. 10-25

TARRANT CO.—**W. I. Browning Construction Co.,** Fort Worth—$40,000 for constr. of 8 one-story dwellings in 1700 and 1800 Robinwood blocks, Fort Worth—by self. 10-15

TARRANT CO. — **Cunningham & Shaw,** 2004 Ave. K, Fort Worth — $40,000 for constr. of 8 one-story dwellings, Sunshine Hills Addition, Fort Worth—by McDonald & Son, Fort Worth. 10-8

TARRANT CO.—**McCann Construction Co.,** Box 2079, Fort Worth—$300,000 for constr. of 130 prefabricated dwelling units, Fort Worth—by Federal Public Housing Authority, Fort Worth. 10-8

TARRANT CO.—**Elmer Wooldridge,** 200 Houston, Fort Worth—$400,000 for constr. of one-story, reinf. conc. warehouse bldg., Fort Worth—by self. 10-7

TRAVIS CO.—**R. H. Folmar,** 205 Riverside Dr., Austin—$130,000 for constr. of milk bottling plant at 608-10 East First St., Austin—by Superior Dairies, Austin. 9-28

WICHITA CO.—**Ramey & Mathis,** Paramount Bldg., Amarillo—$210,000 to convert 40 bldgs. into apartments, Sheppard Field — by Federal Housing Authority, Fort Worth. 10-16

Washington

COWLITZ CO.—**Robert Kellogg,** Rt. 1, Kelso—$60,000 for constr. of 2-story, reinf. conc. detention home annex to courthouse bldg. Kelso—by City Council, Kelso. 10-4

KING CO.—**George A. Fuller Co.,** 1329 E. St., NW., Washington, D. C.—$75,000 for constr. of film exchange bldg., Seattle—by Joseph M. Berne, Cleveland, Ohio. 10-28

KITTITAS CO.—**McLean Construction Co.,** 4600 Leary Way, Seattle—$110,142 to move 2 dormitory bldgs., from Baxter Gen. Hospital, Spokane and re-erect on college campus Ellensburg—by Board of Trustees, Central Washington College of Education, Ellensburg. 10-30

SNOHOMISH CO.—**Elias Moe,** c/o Wm. Arild Johnson & Associates, First National Bank Bldg., Everett—$100,000 for constr. of conc. frame dairy bldg., Everett—by Arown Guernsey Farm, Everett. 10-30

Canada

BRITISH COLUMBIA—**Allan & Viner Construction Company, Ltd.,** 602 West Hastings Street, Vancouver—$53,530 for constr. of mill type and stucco poultry and egg storage and processing plant near Canadian National depot on Terminal Ave., Vancouver—by Wm. Scott & Company, Vancouver. 10-11

BRITISH COLUMBIA—**Commonwealth Construction Company, Ltd.,** 670 Taylor St., Vancouver—$60,000 for constr. of dairy plant at Dewdney Ave. and Victoria St., Trail—by Palm Dairies Ltd., Trail. 10-11

BRITISH COLUMBIA—**Dawson, Wade & Company, Ltd.,** 775 Clark Drive, Vancouver—$400,000 for constr. of new apartment blocks containing 116 suites betw. Sixth and Eighth Aves. on McBride Blvd., New Westminster — by Housing Enterprises of Canada, Ltd., Vancouver. 10-5

BRITISH COLUMBIA—**Sam Kirkpatrick,** Vancouver—$80,000 for constr. of new apartment block at Cardero and Burnaby Sts., Vancouver—by T. Campbell, Vancouver. 10-11

BRITISH COLUMBIA—**E. H. Shockley,** 342 West Pender St., Vancouver—$450,000 for constr. of 104 single housing units at Victoria—by Housing Enterprises of Canada, Ltd., Vancouver. 10-5

Miscellaneous . . .

California

ALAMEDA CO.—**M. Williams & Son,** 1630 Webster St., Oakland — $65,000 to paint hangars at airport, Oakland—by Port of Oakland, Oakland. 10-14

LOS ANGELES CO.—**Johnson Western Co.,** 2100 Wilmington, San Pedro—$85,100 for constr. of retaining wall, university campus, Los Angeles—by Board of Regents of University of California, Los Angeles. 10-1

LOS ANGELES CO.—**Newbery Electric Corp.,** 1038 Venice Blvd., Los Angeles—$200,000 to re-wire department store and constr. conc. vault in sub-basement at 401 S. Broadway, Los Angeles—by Broadway Department Store, Inc., Los Angeles. 10-4

MONTEREY CO. — **Monterey County Plumbing Co.,** 8275 San Leandro St., Oakland—$55,900 for constr. of underground sewer and water lines, Soledad—by Division of Architecture, Sacramento. 10-28

SACRAMENTO CO.—**A. Teichert & Son,** Box 1133, Sacramento—$81,225 to pave sts., constr. curbs and gutters, sidewalks, etc., Colma Terrace Units 2, 3 and 4, Sacramento —by City Council, Sacramento. 10-18

SAN DIEGO CO.—**American Pipe & Construction Co.,** 2910 Kurtz, San Diego—$49,650 to fabricate and deliver trenchside 7,000 ft. of 16-in. and 3,400 ft. of 18-in. steel cylinder pipe for P-1 and Maryland Heights supply line, La Mesa—by La Mesa, Lemon Grove and Spring Valley Irrigation District, La Mesa. 10-4

SAN LUIS OBISPO CO. — **Tyson & Waters,** 201 10th Ave., Sacramento—$56,537 for underground drainage, chain link fence, etc., Polytechnic College, San Luis Obispo—by Division of Architecture, Sacramento. 10-28

SAN MATEO CO.—**Edward Keeble & F. H. Brown,** Box 669, San Mateo—$349,956 to grade, pave, constr. curbs, gutters, sidewalks, storm drains, box culverts and sewers, Sunnybrae No. 3, San Mateo—by City Council, San Mateo. 10-23

SAN MATEO CO.—**Edward Keeble & F. H. Brown,** Box 669, San Mateo—$155,233 to grade, pave, constr. curbs and gutters, install sewers, storm drains, etc., San Mateo Knolls No. 3 and Laurelwood, San Mateo —by City Council, San Mateo. 10-23

SANTA CLARA CO.—**A. J. Raisch Paving Co.,** 900 W. San Carlos St., San Jose—$128,143 to grade and pave and to install sanitary and storm sewers on 51-acre subdivision, Homestead Rd., Saratoga Ave. and Gould St., Santa Clara—by George Dunlap, Oakland, and Daniel Nelson, Fresno. 10-16

SANTA CRUZ CO.—**Pacific Pipe Line Construction Co.,** 2128 San Pablo Ave., El Cerrito—$250,000 to install 10 in. gas transmission line near Aptos—by Coast Counties Gas & Electric Co., Santa Cruz. 10-8

STANISLAUS CO. — **Calaveras Cement Co.,** 315 Montgomery St., San Francisco—$440,000 to furnish 200,000 bbls. of Portland cement f.o.b. Kentucky House, 2 mi. SW. of Westley—by Bureau of Reclamation, Denver, Colo. 10-2

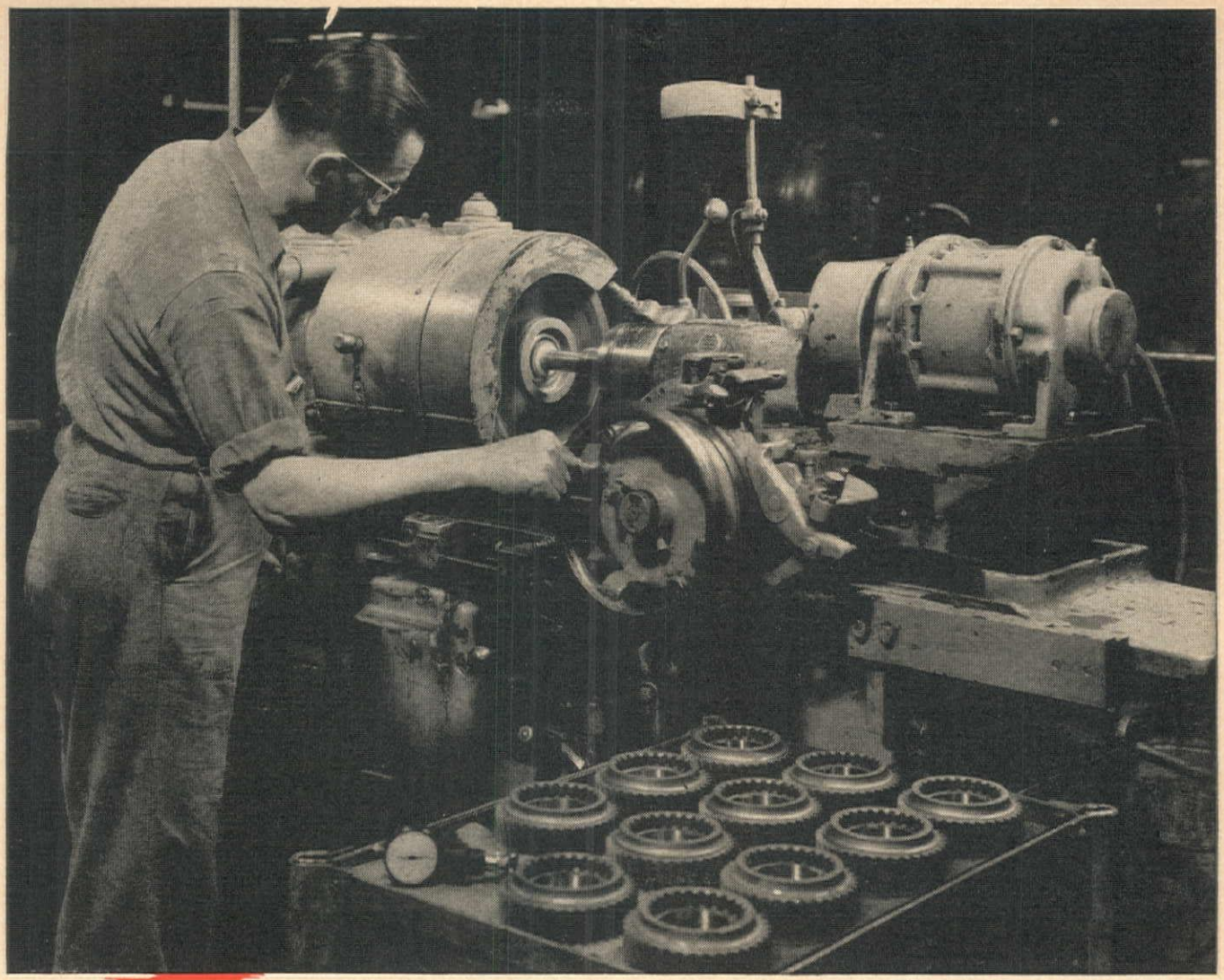
Montana

LEWIS AND CLARK CO.—**Thompson Pipe & Steel Co.,** Denver, Colo.—$107,978 to furnish 27,500 ft. of 24-in. steel water main for Woolston district, Helena—by City Council, Helena. 10-17

Texas

BEXAR CO.—**H. B. Zachery Co.,** Transite Tower, San Antonio—$1,500,000 for constr. of 850-car parking lot under Travis Park, San Antonio—by City Council, San Antonio. 10-17

MOORE CO.—**Sherman Machine & Iron Works,** 26 E. Main St., Oklahoma City, Okla., $118,660 for waterworks, sewer system and sewage disposal plant in Sunray—



Grinding inside diameter of transmission gears in the Oliver "Cletrac" plant.

Inside Information!

For extra smooth operation, *inside* diameters of all transmission gears on Oliver "Cletrac" crawler tractors are ground to close tolerances on precision grinding machines . . . added insurance that gears will run true and will shift smoothly and easily.

Through the use of modern production methods and equipment, Oliver "Cletrac" is able to build in *extra* quality like this . . . at no extra cost to the user. Only the finest quality materials—only the highest type workmanship and precision machinery, are used to produce every tractor part.

Maintenance of this standard enables your Oliver "Cletrac" dealer to offer you the finest in crawler tractors—for your every need.

CLETRAC

a product of

THE OLIVER CORPORATION Cletrac

The OLIVER Corporation

State of Arizona: Choguill Tractor Co., Phoenix. ***State of California:*** Gustafson Tractor Co., Eureka; Mechanical Farm Equipment Dist., Inc., San Jose; Comber & Mindach, Modesto; Tractor Service Company, Inc., 820 Broadway, Chico; Tractor & Equipment Co., San Leandro; Flood Equipment Co., Sacramento; W. J. Yandle, Santa Rosa; Hamsher Tractor Co., Stockton. ***State of Washington:*** Inland Truck & Diesel Company, Spokane; Pacific Hoist & Derrick Co., Seattle; Melcher-Ray Machinery Co., 202 East Alder Street, Walla Walla; Coleman-Jones Equipment Co., Chehalis; Central Tractor and Equipment Co., Wenatchee. ***State of Oregon:*** Loggers & Contractors Machinery Co., Portland and Eugene. ***State of Idaho:*** Idaho Cletrac Sales Co., Lewiston; The Sawtooth Company, Boise. ***Western Montana:*** Western Construction Equipment Company, Billings and Missoula. ***State of Nevada:*** B & M Tractor & Equipment Corp., 1420 S. Virginia St., Reno. ***British Columbia:*** Pacific Tractor & Equipment, Ltd., 505 Railway Street, Vancouver.

by City Council, Sunray. 9-30

PECOS AND WINKLER COS.—**Smith Contracting Co.**, Fort Worth—have contract for the constr. of 98 mi. of 10¾-in. OD pipeline from Yates Pool to Hendrick Pool—by Pasotex Pipeline Co., El Paso. 10-25

Washington

GRANT CO. — **Morrison-Knudsen, Inc.**, Hoge Bldg., Seattle—$235,583 for constr. of sewage treat. plant, 2 sewage lift stations, sewer lines and water system and reservoir, Soap Lake—by City Council, Soap Lake. 10-1

Foreign

LOWER CALIFORNIA—**Home Builders Co.**, 1764 Kettner Blvd., San Diego, Calif.—$174,000 for constr. of 4,000 ft. drain. canal, reinf. conc. bridge, 2 access rds., rock bank protection, etc., Ensenada—by City Council, Ensenada. 10-18

PROPOSED PROJECTS

Irrigation . . .

California

RIVERSIDE AND IMPERIAL COS.—Earthwork, canal lining and structs., Station 6267 plus 10 to Station 6517 plus 00, Coachella Canal, Boulder Canyon project, will be re-advertised in the near future. All bids opened on July 8, 1946 were rejected by the Bureau of Reclamation at Coachella, Calif.

Power . . .

Arizona

YAVAPI CO.—Verde Electric Cooperative, Inc., Cottonwood, received a $260,000 loan for the constr. of 180 mi. of line to serve 258 consumers—by Rural Electrification Administration, Washington, D. C.

Colorado

LINCOLN CO.—Mountain View Electric Association, Inc., Limon, received a $421,000 loan for the constr. of 301 miles of line to serve 371 consumers—by Rural Electrification Administration, Washington, D. C. 10-23

OTERO CO.—Southeast Colorado Power Association, La Junta—$262,000 for constr. of 215 mi. of line to serve 173 rural consumers—by Rural Electrification Administration, Washington, D. C. 10-18

New Mexico

ROOSEVELT CO. — Roosevelt County Electric Cooperative, Inc., Portales, received a $520,000 loan for construction of electric line—by Rural Electrification Administration, Washington, D. C. 10-23

Oregon

BENTON CO.—Benton-Lincoln Electric Cooperative, Inc., Corvallis, received approval of a $505,000 loan for system improvements and for 217 mi. of line to serve 531 rural consumers—by Rural Electrification Administration, Washington, D. C.

CLACKAMAS CO. — Northeast Clackamas County Electric Cooperative, Inc., received a loan in the amount of $290,000 for 36 mi. of line to serve 489 consumers and for system improvements—Rural Electrification Administration, Washington, D. C.

Texas

HUNT CO.—Farmers Electric Cooperative, Inc., Greenville, was given a loan of $215,000 for the constr. of 104 miles of line and for system improvements—by Rural Electrification Administration, Washington, D. C. 10-17

KAUFMAN CO.—Kaufman County Electric Cooperative, Kaufman, has received an REA loan of $440,000 for 338 miles of rural electric lines.

LYNN CO.—Lyntegar Electric Cooperative, Tahoka, received funds in the amount of $415,000 for constr. of 169 miles of rural electric lines—by Rural Electrification Administration, Washington, D. C. 10-17

Wyoming

BIG HORN AND OTHER COS.—Big Horn Rural Electric Company, Basin, received $237,000 for 165 mi. of line to serve 273 rural consumers and for system improvements—by Rural Electrification Administration, Washington, D. C.

CROOK AND WESTON COS. — Tri-County Electric Association, Inc., Sundance received an $855,000 loan for the constr. of 488 miles of line to serve 823 consumers, including acquisition and rehabilitation of municipally-owned power facilities serving 323 consumers in Sundance and Upton—by Rural Electrification Administration, Washington, D. C. 10-23

TRADE WINDS

News of Men Who Sell to the Construction West

CALIFORNIA

Stockholders of THE PARAFFINE COMPANIES, INC., at the annual meeting in San Francisco, Calif., re-elected all of the corporation's directors and officers. Officers re-elected are: **R. S. Shainwald,** Chairman of the Board; **W. H. Lowe,** President; **R. H. Shainwald,** Executive Vice-President; and **C. C. Gibson,** Vice-President and Treasurer. Appointment of **I. J. Bush** as Southern District Manager, Building Materials Division was announced, and **Clay Lilleston** has been promoted to the post of Assistant District Manager.

☆ ☆ ☆

The new western sales manager of the Lumite Division of the CHICOPEE MANUFACTURING CORP. is **Charles A. Jeanson, III,** who is a veteran of the Iwo Jima and Okinawa campaigns. Jeanson will assume his new post immediately in San Francisco, Calif. and will direct sales of Lumite insect screen, decorative fabrics and industrial fabrics in California, Washington, Oregon, Idaho, Utah, Arizona and Nevada.

☆ ☆ ☆

COMPETING IN a safety contest conducted by the FRUEHAUF TRAILER CO. among its 60 factory branches, the Los Angeles branch won first honors. It compiled a record of 110,911 work hours with no time loss due to accidents. The picture shows, left, A. H. KIRKSEY, branch manager, receiving from W. J. RICKHARDT, right, vice-president, Fruehauf of California, a plaque commemorating the achievement.

Frank Hubert, Jr., formerly with BETHLEHEM STEEL CO.'s Houston, Texas, and Los Angeles offices, has been appointed Traffic Manager, Bethlehem Pacific Coast Steel Corp. He succeeds **George J. Sussman,** who has retired after 28 years of service with the company. **E. N. Ferretta** is the new Assistant Traffic Manager.

☆ ☆ ☆

Eugene Somoff has taken over the newly created post of technical service engineer for the AMERICAN STANDARDS ASSOCIATION. Somoff, an electrical engineer with wide experience in Russia, Belgium, Great Britain, and the U. S., will collect and supply technical information concerning American standards and those of other countries. During the war Somoff served as a Russian translator for the U. S. Army. He was administrative assistant in the Translation Unit of the Air Service Command, Fairfield, O., and subsequently of the Long Range Research Unit, Weather Information Branch, A. A. F., Pasadena, Calif.

☆ ☆ ☆

EDWARD R. BACON CO. has added three men to its sales staff. **Ray Dundas** comes to Erbco with a background as service engineer with Independent Pneumatic Tool Co. During the war he was resident engineer with the U. S. Engineering Corp. **Gordon Harris** was formerly with Capitol Tractor & Equipment Co. as sales and sales promotion man. **A. W. Burrows** was for many years with Allis-Chalmers Co., Industrial Equipment Division, as salesman and District Sales Manager.

☆ ☆ ☆

PAKCO CO., Los Angeles, has been made a distributor of the STERLING ENGINE CO., Buffalo, N. Y. Owners of Pakco are **P. A. Palmer** and **E. S. Know,** both formerly in the armed services.

☆ ☆ ☆

The new Sacramento, Calif., plant of the SUTTON-MORF TRACTOR CO. will have its gala formal opening November 30. The firm is a distributor for International Harvester tractors and engines, McCormick-Deering farm equipment, and numerous lines of contractor's, miner's, and logger's equipment. International Harvester Co. officials rate the new plant as one of the most completely up-to-date units in the company's entire world-wide dealer system.

FREDERICK A. PURDY, above, has been appointed manager of the new Los Angeles plant of JOSEPH T. RYERSON AND SON, INC., warehouse steel distributors, according to an official announcement by the company. Associated with Purdy is THEODORE L. KISHBAUGH, who has been named assistant plant manager. Kishbaugh comes from Earle M. Jorgenson Co. Warehouse operations at this new plant began in October.

☆ ☆ ☆

E. L. King has taken over as western district manager for both the Transmission and Drop Forge Divisions of the FULLER MFG. CO., Kalamazoo, Mich. King will be in charge of the Fuller factory branch which is to be located in the bay area of San Francisco. E. E. Richter and Son formerly represented Fuller on the West Coast.

☆ ☆ ☆

PACIFIC NORTHWEST

Work on atomic energy which the GENERAL ELECTRIC CO. is undertaking for the government has been designated the "General Electric Nucleonics Project." The project includes nuclear research and development at Schenectady, at the HANFORD ENGINEER WORKS near Richland, Wash., and at other locations. The company's activities on the project will be under the general direction of **Harry A. Winne,** vice-president in charge of engineering policy. The project will be administered by a three-man "Nucleonics Committee" consisting of Mr. Winne, **Dr. Zay**

Jeffries, G-E vice-president and general manager of the Chemical Department, and **Dr. C. G. Suits,** vice-president and director of the Research Laboratory. **W. H. Milton, Jr.,** was recently named administrator of the Hanford Engineer Works and **D. H. Lauder** was appointed works manager.

☆ ☆ ☆

ENGINEERING ASSOCIATES, 71 Columbia St., Seattle, has developed a stock truss system to supply details, calculations, cutting lists, and layout diagrams for the use of steel fabricators to produce 635 different roof trusses. Designs cover the roof truss alone and the application of the data is the function of architects and engineers. SEIDELHUBER IRON & BRONZE WORKS, 1421 Dearborn St., Seattle, has been granted the rights to use of the system in the Seattle territory.

☆ ☆ ☆

The AMERICAN LUMBER AND TREATING CO. has opened a Pacific Northwest laboratory at its Wauna, Ore., plant. This new research unit will be in charge of **William A. McFarland,** chemical research engineer, who previously directed process control for the company's 10 plants from the central technical laboratory in Chicago.

☆ ☆ ☆

CONTRACTORS RENTAL SERVICE CO., with offices and warehouse facilities at 153 Michigan St., Seattle, last month began functioning as a rental service for all types of construction and logging equipment. **W. E. McDonald** is president and general manager. Among the types of equipment which the new firm has available are motor graders, rollers, shovels and cranes, draglines, truck cranes, and D8 Caterpillar tractors equipped with clearing blades and Hyster winches.

☆ ☆ ☆

James M. Borror has been appointed Northwest district representative of The GALION IRON WORKS & MFG. CO., covering the states of Washington, Oregon, Idaho, Montana and Wyoming. Mr. Borror is a licensed civil engineer and surveyor. He had 4½ years practical experience before entering the Army where he served 51 months in the Engineers Corps, rising to rank of Captain.

☆ ☆ ☆

POOLE-KRIEGER IMPLEMENT CO., a newly formed organization, has purchased the DESCHUTES TRACTOR & IMPLEMENT CO., at Redmond, Ore., having taken over the business as of Sept. 16.

☆ ☆ ☆

FERGUSON TRUCK & EQUIPMENT CO., LTD., distributors for Kenworth Trucks in Vancouver, B. C., opened its newly constructed $150,000 building in September. It is of concrete and steel construction throughout, with one entire side devoted to show windows. A service floor of 15,000 sq. ft. is included. **W. J. Ferguson** is president of the company and **J. D. Keating** is secretary-treasurer. They entertained at an open house the day before the official opening of the new plant.

☆ ☆ ☆

A. E. Anderson, manager of the Seattle office of the DuPONT COMPANY, Explosives Department, for the past six years, retired on Sept. 1 and was succeeded by **R. F. Cramer,** who has been assistant manager since 1938. The new assistant manager is **S. M. Strohecker, Jr.** Anderson had been with the company since 1907.

☆ ☆ ☆

INTERMOUNTAIN

WESTERN STATES WELDING AND PRESS CO., Albuquerque, New Mex., has been appointed exclusive distributor for LaPLANT-CHOATE MFG. CO. equipment. The new distributor's territory includes the state of New Mexico and several counties in West Texas. Company now represents some 15 manufacturers of construction equipment and road machinery. Selection of WESTERN STATES WELDING AND PRESS CO. as headquarters for LaPlant-Choate products is in line with the company's policy of establishing its own independent organization of specialized distributors throughout the world.

☆ ☆ ☆

L. T. McGuire has been appointed manager of the Salt Lake City branch of WESTERN MACHINERY CO. He has had many years experience in sales and service of heavy machinery in the contracting, mining and industrial fields. **H. J. Mayer,** who has been in charge of the Salt

Lake City branch, will return to the company's San Francisco headquarters. The company distributes products of WESTERN-KNAPP ENGINEERING CO., JAEGER MACHINE CO., AUSTIN-WESTERN CO., UNION WIRE ROPE CO., C. S. JOHNSON CO., INDEPENDENT PNEUMATIC TOOL CO., and other well known manufacturers.

☆ ☆ ☆

H. B. Lilley, development engineer on alloy mechanical tubing for TIMKEN ROLLER BEARING CO., has been appointed district manager for Timken's steel and tube division at Houston, Tex. His territory will include Texas, Louisiana, Arkansas, Oklahoma and Kansas.

☆ ☆ ☆

PATTERSON SALES CO., El Paso, Texas, has been appointed distributor for Arizona, New Mexico, Mexico and Central America by LOGAN ENGINEERING CO., Chicago, Ill., to handle the Aridifier, a device to remove moisture, oil and dirt from compressed air in order to prevent spoilage of sprayed work and gumming of air tools.

☆ ☆ ☆

AMONG THE MANUFACTURERS

R. W. Lea, vice-president of finance since 1939 and executive vice-president since January, 1946, succeeds **Lewis H. Brown** as President of JOHNS-MANVILLE CORP. Brown becomes chairman of the board and chief executive officer of the company. Other elections include that of **Alvin Brown** as vice-president of finance and a member of the board of directors, and **John P. Syme** as vice-president and assistant to the chairman of the board. Six new operating divisions have been set up. Heading them are: **J. A. O'Brien,** Industrial Products Division; **Harold R. Berlin,** Building Products Division; **A. S. Elsenbast,** Celite Division; and **E. C. Brockett,** Canadian Products Division. **E. S. Crosby** continues as general manager of the International Division. **A. R. Fisher,** who is vice-president of production, will act as general manager of the Asbestos Fibre Division.

☆ ☆ ☆

Seven supervisory changes including promotions of field and home office personnel of the MINNEAPOLIS-HONEYWELL REGULATOR CO. have been announced by **C. B. Sweatt,** executive vice-president. **James S. Locke,** who has been Chicago regional sales manager of the company's Air Conditioning Controls Division, has been named sales manager of the division and transferred his headquarters to Minneapolis October 1; **George D. Guler,** who has been sales manager of the Air Conditioning Controls Division, has been transferred to Atlanta, where he will serve as regional manager in that territory. He succeeds **Albert H. Koch** who has been made Philadelphia Branch Manager. **J. F. Cumminskey** will succeed Locke in Chicago. **L. C. Johnson** has been promoted to branch manager in Milwaukee, replacing **Harold Pride** who has resigned to accept a position with a Honeywell distributor. **J. C. Dorsey,** who has been acting branch manager in Philadelphia, has been placed in charge of manufacturers' business in Philadelphia and henceforth will supervise all such activity in the southern part of Honeywell's eastern sales zone. In Minneapolis, **T. S. Carley** has been promoted to sales manager of the wholesale division and, in addition, will continue as sales manager of Honeywell's stoker controls division.

Robert D. Evans has joined the sales development division of CATERPILLAR TRACTOR CO. as civil engineer consultant on earth-moving equipment and its applications. He comes to "Caterpillar" from R. G. LeTOURNEAU, INC., where he was chief field engineer.

☆ ☆ ☆

FORSS PNEUMATIC TOOL CO., Aurora, Ill., manufacturer of a general line of small, portable pneumatic tools, has been acquired by SKILSAW, INC., Chicago manufacturer of portable electric tools, for a cash consideration understood to be in excess of $100,000. Sales potential of the present Forss plant, consisting of some 40,000 square feet, is said to aggregate several million dollars a year. The Forss Pneumatic Tool Co. was founded in 1943 by **F. P. Forss** and his son, John. Both will remain with the Skilsaw organization and will be in charge of pneumatic tool manufacturing operations at the Aurora plant.

☆ ☆ ☆

C. M. Taylor has been elected executive vice-president of the LINCOLN ELECTRIC CO., Cleveland, Ohio, by the board of directors. He has been with the company since 1916, serving as foreman, assistant superintendent, superintendent, and vice-president in charge of sales. Taylor has been on the board of directors since 1927.

☆ ☆ ☆

C. E. Frudden, consulting engineer of the ALLIS-CHALMERS MFG. CO. tractor division, became the sole nominee for the 1947 national presidency of the

Society of Automotive Engineers at the society's eleventh annual tractor meeting recently concluded in Milwaukee, Wis. The nomination is tantamount to election. Frudden will be the first Wisconsin man and the first tractor man elected to the presidency of the 40-year-old society. He joined the Allis-Chalmers tractor organization in 1929, where he has been instrumental in effecting many of the remarkable advances apparent in the tractor field. Shortly before the war he was promoted from chief engineer of the West Allis tractor division to executive engineer of the entire Allis-Chalmers Tractor Division. Retiring president is **L. R. Buckendale** of the TIMKEN-DETROIT-AXLE CO.

☆ ☆ ☆

Ralph B. McKinney, 58, general manager of the paper makers chemical department and member of the board of directors of HERCULES POWDER CO., died Sept. 21, at the Delaware Hospital, Wilmington, Del., after two-weeks' illness. A native of Wilmington, he had been associated with Hercules since its organization in 1913 when he started as a member of the purchasing department. In 1943 he was appointed general manager of the paper makers chemical department, and was elected a member of the board of directors in 1945.

☆ ☆ ☆

B. P. Spann has been promoted from advertising manager to personnel and industrial relations director of the GARDNER-DENVER CO. Spann, who has been with the company since 1934 with the exception of 38 months as lieutenant commander in the Navy, will be in charge of all factory and office personnel for the company's Quincy, Ill., plant. **D. P. Tunnicliff** succeeds Spann. Tunnicliff was formerly a newspaper man. He served three years of active duty in the Navy.

☆ ☆ ☆

Effective November 1, **Arthur P. Shanklin** will be CARRIER CORP.'s vice-president and general sales manager. A vice-president of the corporation since 1941, he has been associated with the company since 1922. During that period he served in many sales and executive capacities. As vice-president and general sales manager he will be in charge of all of Carrier's domestic sales activities.

☆ ☆ ☆

Fayette Leister, veteran of a quarter-century of service as an anti-friction bearing engineer, has been elected by directors of THE FAFNIR BEARING CO., New Britain, Conn., to the office of vice-president in charge of engineering. Leister has been with Fafnir since 1921. Known widely in the ball and roller bearing field, he has been active in the development of some of the most important anti-friction bearing improvements of the past 25 years.

☆ ☆ ☆

Leonard W. Beck has been appointed acting general sales manager of the CUMMINS ENGINE CO., INC. Beck's new responsibilities will be the overall administration of the distribution division. **Byron A. Duling,** manager of the Cleveland region, has been assigned to work directly under Beck. **Corwin B. Briscoe** will be acting parts merchandising manager at the Columbus, Ind., plant. Other appointments are **Norman E. Palmer** as the Cummins representative in Washington, D. C., and **Fred W. Sparks** as manager of the Cleveland Region.

Tyler S. Rogers of Toledo, Ohio, has been elected president of the PRODUCERS' COUNCIL, national organization of building product manufacturers. Rogers, who is assistant to the executive vice-president of the OWENS-CORNING FIBERGLAS CORP., was vice-president of the Council for the past year and had served for three years on the board of directors. In addition, he had been chairman of the organization's Technical Committee.

☆ ☆ ☆

A. Elton Holcomb, widely known in the power shovel and crane industry for more than 40 years, and former division sales manager for the KOEHRING CO., died in Indianapolis, Ind., October 5, at the age of 68. Holcomb was a past president of the Milwaukee chapter of the American Association of Engineers and a member of the American Association of Civil Engineers, the American Society of Mechanical Engineers, and the American Society of Military Engineers. Before joining Koehring, he had been with Bay City Industrial Works, Bucyrus-Erie, Clyde Iron Works, and F. C. Austin Co., and had been active as a private excavating contractor.

☆ ☆ ☆

THE AMERICAN STOVE CO. has a new director of manufacturing and engineering, **George P. Eichelsbach, Jr.** Eichelsbach began with the company's St. Louis plant in 1935 as an engineering draftsman and was advanced to chief engineer of the St. Louis division and later chief engineer of the entire company. As director of manufacturing and engineering he now has full responsibility for both in all five plants of the company. During the war he was civilian head of the committee which con-

trolled the nation's production of 40-millimeter shells. He was also a member of the "production advisory committee" in the St. Louis Ordnance District.

☆ ☆ ☆

THE KOMLONE-SANDERSON ENGINEERING CORP., Ridgewood, N. J., has been formed for the purpose of developing and marketing machinery and equipment for the treatment of sewage and industrial wastes. Partners in the concern are **Thomas R. Komline** and **Walter H. Sanderson,** both recently released from the Army. For eight years prior to the war, Komline was engaged in the development of the sludge drier and other equipment at the Plainfield, N. J. plant. Sanderson has been active in the heavy construction field for over 15 years. The corporation offers exceptional service as both an engineering and a construction organization.

☆ ☆ ☆

H. J. Hocker, former chief of production for Chicago, Ill., Engineer Procurement District, and recently returned after 26 months' duty with troops in the European theatre as regimental commander of engineer units, has been appointed general plant manager of the C. R. JAHN CO., Chicago, Ill., manufacturers of heavy-duty low-bed trailers. Mr. Hocker entered military service in 1942 as major, Corps of Engineers, and was separated from the Army in June, 1946, with the rank of colonel.

☆ ☆ ☆

Dr. John Johnston retired as director of the research laboratory of UNITED STATES STEEL CORP. OF DELAWARE on Nov. 1, and was succeeded by **Dr. J. B. Austin,** assistant director who had been associated with him since the laboratory was opened in 1928. There are 57 scientists in the laboratory today and their principal task is the study of suiting various steels to their most efficient uses.

☆ ☆ ☆

The GENERAL ELECTRIC CO. has purchased the plant of the Mahoning Valley Steel Co. of Niles, Ohio. The move was made necessary in order that General Electric might have readily available a steady supply of hot-rolled steel sheets, which under OPA pricing policies were very difficult to obtain. The company denies any intention of going into the steel industry on a competitive basis with other producers. **John P. Hosack,** vice-president and treasurer of Mahoning, has been named president and treasurer of the new G-E affiliate and other officers of the mill continue in their same capacities.

☆ ☆ ☆

INDEPENDENT PNEUMATIC TOOL CO., Chicago, has announced the appointment of **J. A. Hill,** formerly manager of its New York branch office, as manager of electric tool sales, and the opening of a new branch office in Cincinnati, Ohio. **W. C. Rush,** formerly connected with the St. Louis branch, was named manager of the new office.

☆ ☆ ☆

John L. Hallett has been named vice-president and chief engineer of KAISER-FRAZER CORP. and GRAHAM-PAIGE MOTORS CORP. Until recently he was plant manager of the Southern California Division of Kaiser-Frazer at Long Beach and during the war was for a time general superintendent of Kaiser's Oregon Shipbuilding Corp. and Vancouver Shipyards.

GORMAN-RUPP CO., pump manufacturers of Mansfield, Ohio, has announced the appointment of **Gilmore Hiett** as advertising and sales promotion manager. He was formerly advertising manager for refrigerators with WESTINGHOUSE ELECTRIC CORP. In his new position he will direct all the advertising activities in marketing Gorman-Rupp centrifugal pumps for the irrigation, oil field, farming, fire fighting, water supply and sanitation fields.

☆ ☆ ☆

Three major appointments have been made by the AMERICAN MANGANESE STEEL DIVISION of AMERICAN BRAKE SHOE CO., Chicago Heights, Ill. **A. R. Sittig** has been made manager of manganese steel sales, with offices at Chicago Heights; **E. L. Quinn** is assistant vice-president in charge of welding products, also with offices at Chicago Heights; and **E. J. Nist** has been made assistant vice-president, with offices in New York City.

☆ ☆ ☆

Robert C. Friedly has been appointed construction specialist for NELSON SALES CORP., Lorain, Ohio. His first assignment will be to establish complete application specifications for Nelson stud welding in construction. These applications currently include corrugated asbestos and sheet metal roofing and siding, sprinkler systems, wire conduits, piping and insulation. Nelson has just been discharged from the Army.

☆ ☆ ☆

G. V. Leece, vice-president of GARDNER-DENVER CO., has been appointed general sales manager. He has been with the company for twenty-four years, the last two of which were as vice-president in charge of the export division at New York City. Previous to that he was district manager at New York and Pacific Coast manager. In his new position he will be located at the Quincy, Ill., plant of the company.

☆ ☆ ☆

Thomas A. DeMarco, formerly with United Aircraft Products Corp., has been named executive assistant to **John J. Bergen,** chairman of the board of GAR WOOD INDUSTRIES, INC., with headquarters in New York. DeMarco's former associations include Chapman Valve Mfg. Co., Johns-Mansville Sales Corp., and service as a major in the office of the Assistant Chief of Air Staff, Washington, D. C.

NEW EQUIPMENT

***MORE COMPLETE** information on any of the new products or equipment briefly described on these pages may be had by sending your request to the Advertising Manager, Western Construction News, 503 Market Street, San Francisco 5, California.*

Self-Priming Centrifugal Pumps

Manufacturer: Worthington Pump & Machinery Corp., Harrison, N. J.

Equipment: Portable self-priming centrifugal pump.

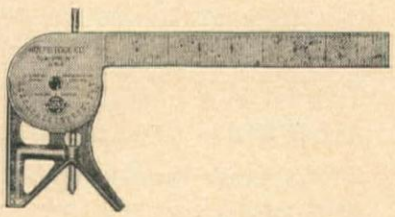
Features claimed: Fabricated of corrosion and abrasion resisting steel, pumps are rugged, light in weight and streamlined in appearance. All sizes except the smallest (1½ in.) are regularly equipped with pneumatic-tired wheels, towing handles and lifting bales. The 1½-in. pump is base-mounted with lifting handle, and is readily carried by one man. The 1½-in. to 4-in. pumps are available with standard air-cooled gasoline engines, while the 6-in. and 8-in. units are equipped with water-cooled engines, either gasoline or diesel. Engines are regularly equipped with all necessary accessories.

New Center-Finder Protractor

Manufacturer: Interstate Sales Co., New York City, N. Y.

Equipment: Center-finder protractor.

Features claimed: The "center-finder" enables layout men to mark 4 equidistant points on circumference of pipe of any size



at any degree at the same time. It serves as a 360° protractor, has a 0°-90°-0° scale together with a double-reading of ½ in. per ft. pitch scale, and all calibrations are etched on stainless steel. Specifications are as follows: frame—special heat-treated magnesium, width ⅝ in.; frame "V"—2¼" x 2¼", center punch of low alloy stainless steel; four-level dial of etched stainless steel; level container of formed yellow brass; protractor blades—1" wide with a measurement over frame of 9" at right angles, spring stainless steel, etched, with 1/16" calibration in depressed black and 1/12" calibrations in depressed red. Level vials—six, 5/16" x 1". Weight is approximately 10 oz.

Standard Speed Jack

Manufacturer: Templeton, Kenly & Co., Chicago, Ill.

Equipment: New simplex ball bearing bridge and industrial jack.

Features claimed: Simplex jack No. 2522, has a capacity of 25 tons and will lift a maximum height of 10¼ in., yet it weighs only 140 lb. It lifts high or low work to full rated capacity on corrugated top cap which is 22 in. above ground level or on 10 in. square toe lift which is only 4⅜ in. above ground level. It provides greater clearance above ground for easier operation because fully enclosed dirt-proof ratchet and elevating mechanism are at top of jack instead of in the base. Speedy, smooth, safe operation is assured by chrome-molybdenum steel thrust bearings, heat-treated seamless alloy steel elevating sleeve, alloy steel lifting screw, and forged alloy steel gears.

Automotive De-Scaler

Manufacturer: The Butler Engineering Co., New Orleans, La.

Equipment: The Butler Model ATI automotive de-scaler.

Features claimed: A spring-and-core unit to be fitted into the top hose connection or dropped into the top of the radiator, the new device uses electrolysis to remove old scale from internal combustion engines and to prevent formation of new scale. It is guaranteed for a minimum of one year or 25,000 mi. The spring is silver-plated, and the core is made of a special metal which decomposes as the result of the electrolytic action. The products of the decomposition attach themselves to the minerals in the water, precipitating them to the bottom of the radiator where they may be removed easily by draining or flushing. After one or more flushings to remove scale, rust, and mud, the water is claimed to remain crystal-clear. The de-scaler is also effective in preventing corrosion. It neither affects

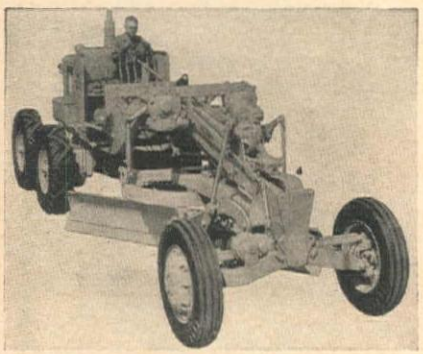
nor is affected by the action of anti-freezing solution. Installation is simple. The spring coil can be cut off at any point to fit the hose connection without affecting its operation. No other adjustment or wiring is necessary.

High Axle Motor Graders

Manufacturer: J. D. Adams Mfg. Co., Indianapolis, Ind.

Equipment: High arch axle on three new motor graders.

Features claimed: Materially improved steering is accomplished by the use of tapered roller bearings and an entirely new design in the front axle. The high arch gives greater axle clearance, providing approximately twice the capacity of conventional axles for straddling large windrows, and bulldozing of axles through material is eliminated. All three Adams motor graders are powered by International Diesel engines, available with cab controlled push-button starting, and have a range of 8 forward and 2 reverse speeds. The three models are known as No. 512 (extra-heavy duty), No. 414 (heavy duty), and No. 312 (medium duty).



The Three New Adams Motor Graders are of the same overall design.

Lightweight Ladders

Manufacturer: White Aircraft Corp., Palmer, Mass.

Equipment: Lightweight magnesium ladders.

Features claimed: Of all-welded construction, the 8 ft. magnesium ladder weighs only 5½ lb. as compared to 16 lb. in wood, while the weight of a 63-lb., 24-ft. extension ladder has been cut to 31 lb. All metal construction avoids splintering and deterioration due to weather exposure. Welding of the rungs into the side channels assures complete freedom from the loosened joints which make a ladder wobbly and unsafe.

Snow Removal Truck

Manufacturer: Four Wheel Drive Auto Co., Clintonville, Wis.

Equipment: Snow removal truck, FWD Model M10.

Features claimed: Improvements in design are the FWD Universal cab, which features a number of comfort and safety advantages, a sturdy streamline radiator grill, and improved heavy-duty axles. Engines with higher hp. rating will be installed in the M10. The standard engine is a gasoline 186 B.H.P. with customer's option on the installation of a 200 B.H.P. Diesel engine. The rated gross vehicle weight is 44,000 lb. Adapted to hauling heavy highway equipment, the M10 is a powerful prime mover as well as a capable snow removal unit for highways and airports.

Portable Apron Feeder

Manufacturer: Pioneer Engineering Works, Inc., Minneapolis, Minn.

Equipment: Portable apron feeder conveyor.

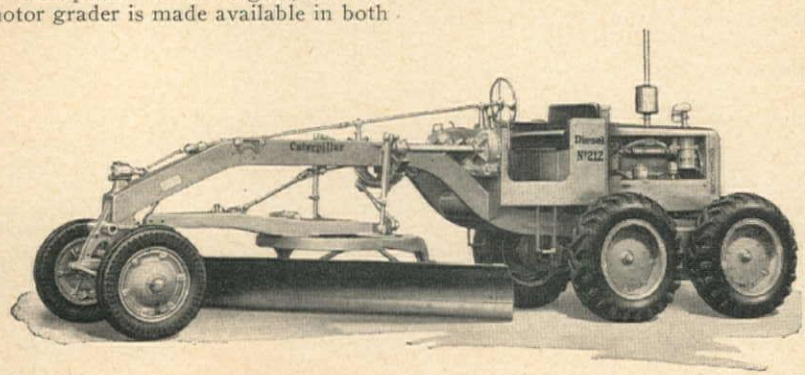
Features claimed: This feeder, mounted on its own chassis and wheels, with hopper attached, can be swung into place quickly for short-time set-ups. Its frame is built from rolled channels, truss-braced to prevent weaving and distortion under load. Feeder pans are ½-in. forged steel plate, with overlapping corrugations to give added strength against impact and load and to prevent slippage of material. Malleable castings are bolted to the ends of the pans and are interlocking to prevent spillage at the sides. The pans are carried by three steel chains riding on hardened rollers and three steel sprockets carry the chains at the head and tail ends. Return idlers support the pans under the feeder. Drive is from the crusher to the feeder head shaft through a clutch and built-in gear reduction. Principal gears are steel cut and main driving chains are roller type. The drive mechanism is covered to protect it from dirt and falling material. A hinged cover over the gears provides ready inspection at all times. The feeder, made in 36-in. width and measuring 30 ft. from center to center of head and tail shafts, is supported on a single axle equipped with dual pneumatic tires.

Motor Graders

Manufacturer: Caterpillar Tractor Co., Peoria, Ill.

Equipment: Diesel No. 212 motor graders.

Features claimed: Powered by a rear-mounted, 35-brake hp., four-cylinder, four-cycle "Caterpillar" Diesel engine, the No. 212 motor grader is made available in both tandem and single drives. Equipped with 10-ft. moldboard and leaning front wheels, it has the traction, strength and blade positions to do a complete range of blade work, and positive-acting, precision-made mechanical power controls provide fast, easy operation of all blade and scarifier movements.



Post Hole Drill

Manufacturer: Hugh B. Williams Machine Shop, Dallas, Texas.

Equipment: Williams post hole drill.

Features claimed: The Williams' drill is practically the only drill of its type which uses "power crowd." The full horsepower of the motor may be utilized in addition to the unit's weight to "crowd" the drill bit into the earth and so secure more positive and quicker results. The "rotary & throw-off" and "up & down" control handles are the only two controls used by the operator during actual drilling.

New Three-Ton Truck Line

Manufacturer: Chrysler Corp., Detroit, Mich.

Equipment: Two 3-ton heavy duty trucks.

Features claimed: Wheelbases range from 136 to 196 in. One has a gross vehicle weight rating of 20,000 lb. and the other 23,000 lb. As tractors both have a gross tractor-trailer rating of 37,000 lb. The engine used in the three-ton heavy duty line has 331.35 cu. in. piston displacement and a compression ratio of 6.5 to 1. It develops 128 hp. at 3000 rpm. and 270 lb.-ft. of torque at 1200 rpm.

Flexible Polishing Wheel

Manufacturer: Raybestos - Manhattan, Inc., Passaic, N. J.

Equipment: Flexible polishing wheel.

Features claimed: The new wheel is the most flexible of a series of soft neoprene bonded polishing wheels. It is bonded with a specially modified compound of neoprene impregnated with abrasive grain, and can be varied over a wide range of densities depending on its ultimate application. It is available in the finer abrasive grain sizes or with pumice, rottenstone or other mild abrasives. It is very effective in blocks and rubbing pads as well as in wheel form.

Hydraulic Construction Equipment

Manufacturer: Bendix Aviation Corp., North Hollywood, Calif.

Equipment: Hydraulic earth moving and construction equipment.

Features claimed: Advanced designs of high pressure hydraulic rams and cylinders, custom built to the individual job, are a feature of the new line. The Power Dome hydraulic pump, hand operated, which can

supply instant pressure to energize cylinders and rams to do any type of work, will produce 5,000 lb. per sq. in. pressure and requires only one pipe line to the work unit. Also recently developed by Bendix is an industrial hydraulic pressure accumulator which can store hydraulic energy by putting fluid under pressure, making it available for instant use.

Earth Boring Machine

Manufacturer: Jaques Power Saw Co., Denison, Texas.

Equipment: Jaques hydraulically controlled earth boring machine.

Features claimed: All plumbing is hydraulically controlled, enabling faster operation and transportation from hole to hole; faster drilling, as the hydraulic feed maintains a constant pressure on the bit, maintaining the maximum RPM's on the auger without the slipping of any clutch or gears; hydraulic pressure on bit transmits less shock to machine while digging in hard-to-drill soils; hydraulic fingertip control reduces operator fatigue to a minimum; one man easily operates this machine as all controls are conveniently located; peak operation maintained hour after hour, and holes can be drilled easily at any angle.

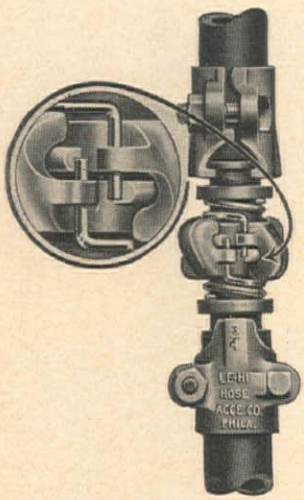
Holes up to and including 24 in. in diameter can be drilled to a depth of 8 to 9 ft. with standard machine. Total weight of this machine is 3400 lb. It is 4 ft. 3 in. in width and 10 ft. long.

Safety-Locking Hose Couplings

Manufacturer: Hose Accessories Co., Philadelphia, Pa.

Equipment: Universal type hose coupling.

Features claimed: Constructed entirely of bronze, these universal type hose couplings with a built-in safety locking feature possess rugged strength and resistance to rust or corrosion. No tools are required to



operate them, and they are not affected by dirt, mud, or rough treatment. LE-HI Series 150-B hose couplings are fully interchangeable with other universal type hose couplings made to accepted standards, and will securely and positively lock in engagement with such units.

Hydraulic Jack

Manufacturer: Airquipment Co., Burbank, Calif.

Equipment: 7½-ton hydraulic jack.

Features claimed: The jack ram provides a lifting range of from 21 in. to 35 in. under a 7½-ton load. A lifting step attached to jack ram lowers the lifting range from a minimum of 7½ in. to a maximum of 21 in. under a 5-ton load. An 8-in. by 13½-in. cast steel base provides safety in a compact area. Lift power is generated by a single action, manually-operated hydraulic pump. Jack caps are available to meet individual requirements.

Hydraulic Slide Rule

Manufacturer: C. H. Monett, Los Angeles, Calif.

Equipment: Open channel hydraulic slide rule.

Features claimed: Water depth, slope, width of channel, discharge quantity, coefficient of roughness as defined by the Manning or Kutter formulas, and velocity of flow, can be computed by use of an open channel hydraulic slide rule and correction factor curves. The slide rule is based on an adaptation of the Manning formula. The water depth factor has been substituted for the hydraulic radius. When the ratio of the width of the channel to the depth of water is larger than 50 there is no necessity for correction. Ratios under 50 are readily corrected by means of accompanying graphs or correction curves. These curves have been adjusted so that a direct multiplication or division of the factor by the slide rule result gives the desired answer.

Blue Brute Drifters

Manufacturer: Worthington Pump and Machinery Corp., Harrison, N. J.

Equipment: Drifters for mining, quarrying and general construction.

Features claimed: Manufactured in three sizes, 3", 3½", and 4" cylinder diameters, drifter may be mounted as a hand crank machine, Model WHC; an air motor driven unit with motor attached to guide shell, Model WPMS; or with the air motor attached to the back head of the drifter, Model WPM. The width of all cylinder ways is the same on all sizes and models. Each size drifter uses the same guide shell. They are equipped with standard four-pawl rifle bar rotation and the time tested and proven Worthington end-seating, positive-acting automatic valve whose efficiency is in no way affected by wear. Balanced valve and piston action reduces excessive vibration and whip.

New All-Position Electrode

Manufacturer: Wilson Welder and Metals Co., New York, N. Y.

Equipment: All-position electrode for general welding on poor fit-up.

Features claimed: The No. 107 electrode

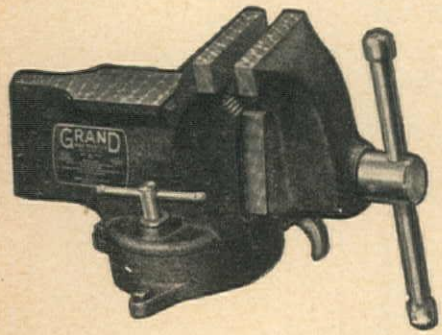
can be used with abnormally high welding current, has exceptionally high deposition rates, permits use of "dragging technique," has more forceful arc action, and offers high burn-off rate. Excellent appearance of weld deposit is immediately observed. Less skilled operators produce outstanding results because of its shallow, flexible arc. Rod conforms to the E-6012 classification of the A.W.S. specification A233-45T, and is marked in accordance with NEMA standards.

Quick Action Vise

Manufacturer: Grand Specialties Co., Chicago, Ill.

Equipment: Heavy duty high speed vise.

Features claimed: Known as the Vise Master, this tool is described as closing instantly with a push on the free jaw, (eliminating the time and motion required for running in with the screw handle) and opening automatically by a trigger release on its spring action. The vise is equipped with steel pipe jaws which are integral with the body to eliminate time required to adjust loose jaws to pipe. The unit revolves a full 360 deg. on its base with double swivel, friction type, lock-up which fastens from both sides and holds the desired position firmly. The vise is made of alloy steel, has a roomy anvil top and is rust proof. It weighs 23¾ lbs.



Rubber Base Metal Coating

Manufacturer: The Truscon Laboratories, Inc., Los Angeles, Calif.

Equipment: Paratex rubber base coating.

Features claimed: This rubber-base coating works as successfully on wood or concrete as it does on metal. On raw material it is necessary to clean surface thoroughly and apply only one coat of Truscon Patented Bar-Ox Formula "97," which not only inhibits rust but kills it as well, then two coats of ParaTex Rubber Base Coating. Extreme protection from wear and fumes, acids, moisture, weather and many other items which are generally harmful to metals results.

Blast Cleaning Device

Manufacturer: Vacu-Blast Co., Inc., Burlingame, Calif.

Equipment: Vacu-Blaster, new blast-cleaning device.

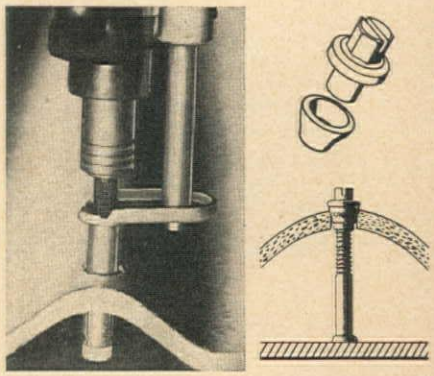
Features claimed: This new blast-cleaning device may be operated in much the same fashion as a simple household vacuum cleaner. No masks, goggles, or protective clothing are needed. Its vacuum return system permits no abrasives or other particles to escape into the open. Many types of abrasives may be used, depending upon the nature of the work to be done and the finish desired. Spent abrasive is reclaimed by the device and re-used as long as it remains effective.

Stud Welding Equipment

Manufacturer: Nelson Sales Corp., Lorain, Ohio.

Equipment: Process to secure roofing and siding.

Features claimed: Savings up to 50 per cent in the cost of securing corrugated asbestos roofing and siding to steel frames are indicated by this new process. Roofing or siding sheets are laid in position over the frame; holes are then drilled on predetermined centers over the purlins and threaded studs are automatically welded to the purlins through the holes. The average operator can complete 100 to 200 stud welds per hour. After the stud is welded in place zinc nuts equipped with soft lead



washers are run down over the stud with a speed wrench. Tightening expands the soft lead to form a water tight seal. The equipment operates from a DC welding generator.

Hardfacing Electrode

Manufacturer: Lincoln Electric Co., Cleveland, Ohio.

Equipment: Hardfacing AC electrode.

Features claimed: High carbon electrodes for building up worn steel parts by welding with low voltage AC transformers, these rods have a heavily extruded shielded-arc-type coating and produce flat, smooth beads. The deposits can be hot-forged. Two electrodes are available, known as "Hardweld 50 AC" and "Hardweld 100 AC." The first is available in 3/16 and ¼-in. rod, the other in ⅛, 5/32, 3/16 and ¼-in. Both will produce a dense, tough surface of moderate hardness to resist shock and abrasion.

LITERATURE FROM MANUFACTURERS...

Copies of the bulletins and catalogs mentioned in this column may be had by addressing a request to the *Western Construction News*, 503 Market Street, San Francisco 5, California.

REX MOTO-MIXERS — **Chain Belt Co.**, Milwaukee, Wis., has just released Bulletin No. 46-8 which illustrates and describes the 1947 line of Rex moto-mixers. Close-up photographs are used to illustrate many features—such as the new water nozzle and its position in the drum; the bolted on, replaceable mixing blades; the patented air vent in the charging hopper; the chain drum drive, etc. Diagrams show the paths of mixing action; the rotation of the drum; the complete water system, etc. Information is given on chute lengths, and the method of mounting. A complete set of specifications, photographs of each of the three drum sizes, and two pages of job pictures are included.

DUPONT COLOR CONDITIONING FOR INDUSTRY—**E. I. DuPont De Nemours and Co.**, Wilmington, Del., has made available a new 32-page booklet illustrating and describing years of research and practical experience with color to increase production, improve seeing conditions and create a better working environment. The booklet makes clear the fundamental principles on which color conditioning is based. The "Three-Dimensional Seeing" treatment of machines is depicted with photographs of actual installations. The Safety Color Code for Industry is also outlined. Color Conditioning is shown at work in plants of several well-known companies, and a coordinated functional program for an entire plant is illustrated in a double-page cutaway drawing.

DUFF-NORTON JACKS — **The Duff-Norton Mfg. Co.**, Pittsburgh, Pa., has issued a new 40-page catalog giving complete descriptions, data, and specifications for every jack in the Duff-Norton line. The catalog contains much new information as well as descriptions of improvements of their standard jacks and new additions to the line. Described and illustrated is each of the various types of ratchet jacks, screw jacks, air motor operated jacks, and hydraulic jacks. Details on the improved automatic lowering mechanism, the improved journal jacks, and a new 50-ton general purpose screw jack of the inverted type are included.

DIESEL ENGINE COOLING SYSTEMS—**Binks Mfg. Co.**, Chicago, Ill., has released a 20-page booklet which will help solve many of the problems encountered every day in diesel engine cooling. The booklet is illustrated with pictures, diagrams, and blueprints, and it shows clearly how water jacket scale, over-heating, costly breakdowns and insurance rates can be greatly reduced or entirely eliminated. It is a valuable addition to the reference library of anyone interested in stationary diesel engine efficiency and lower operating cost.

MULTIPLEX RADIAL ARM SAWS —**Red Star Products, Inc.**, Cleveland, Ohio, has published a new circular just off the press on Red Star Radial Arm Saws. This circular features a new and larger size saw and an advanced design of drill press.

BUCKEYE CLIPPER—**Buckeye Traction Ditcher Co.**, Findlay, O., has published an informative 36-page catalog on the convertible power shovel. The advanced features of this versatile unit are pictured and described in detail. The booklet is profusely illustrated with views of a wide diversity of applications of the shovel's convertibility. Complete specifications with explanatory drawings are included.

REX MORTAR AND PLASTER MIXER — **Chain Belt Co.**, Milwaukee, Wis., is distributing bulletin No. 46-11, a description of the 1947 Rex mortar and plaster mixer. The new bulletin contains

close-up illustrations of features of the mixer, job pictures, and a table of specifications.

DESIGN FOR ARC WELDED STRUCTURES — **Lincoln Electric Co.,** Cleveland, Ohio, has prepared a fifteen minute sound color film comparing man's first attempt to join structures with man's most modern method. It has been produced to assist architects, engineers, contractors and all people in the structural field to visualize the improvements in design and construction which are made possible by the use of arc welding. The film, produced by Herb Lamb Productions, is available in 16-mm. sound color prints from this company at no charge except for transportation.

ROTATING ELECTRICAL EQUIPMENT — **Electrical Specialty Co.,** Stamford, Conn., has issued the ESCO Catalog No. 46-1. This publication includes general descriptions of A.C., D.C., and Universal Motors for applications not met by standard motors; Dynamotors and Converters; Motor-Generator Sets; A.C. and D.C. Generators; Gas and Diesel Electric Generating Plants. General specifications cover the main construction points, uses, and the range of electrical and mechanical characteristics to which other units can be manufactured.

WELDING ELECTRODES — **Hollup Corp.,** Chicago, Ill., has just published a new and complete 64-page catalog of all Hollup electrodes and National oxy-acetylene gas welding rods. Included are complete descriptions, color identifications, specifications conformed to, physical properties, welding procedures, recommended ranges and sizes available, tables on the weldability of metals, appearance inspection of welds, electrode consumption estimating chart, and definitions of welding terms.

WHEN IT'S POWER YOU NEED— **Caterpillar Tractor Co.,** Peoria, Ill., has prepared this 16-page booklet which highlights operations of the manufacturer's products in all phases of the earthmoving field. Also available from Caterpillar, THE 1-2-3 OF ZONED EQUIPMENT, an illustrated publication which defines the basic zones recognized in modern problems of earthmoving and outlines the types of equipment suitable to each.

THE VAPORSPHERE—**The Chicago Bridge & Iron Co.,** Chicago, Ill., announces the publication of a new 20-page booklet, which describes the method of reducing evaporation losses from flat-bottom tanks storing volatile liquids by installing a vapor-saving system with facilities for the temporary storage of vapor. The vapor pressure, expansion of air-vapor mixture and the flow of vapor in the lines can be read directly from charts included in the booklet.

HEAVY DUTY GRADER—**The Galion Iron Works & Mfg. Co.,** Galion, Ohio, offers in the form of new literature Catalog No. 290 on the new Galion 102 Heavy Duty Motor Grader, Catalog No. 288 on the new Galion 402 Light-Duty Motor Grader, and Catalog No. 295 on the new Galion Portable Roller. The detailed information in these three booklets will be of much interest to contractors and other users.

PEERLESS VERTICAL CENTRIFUGAL PUMPS—**Food Machinery Corp.,** Los Angeles, Calif., has just issued a 6-page bulletin which describes the design, construction and application of three types of Peerless Vertical Centrifugal pumps. Comprehensive parts diagrams illustrate all three types.

AGRICULTURAL LAND LEVELING — **R. G. LeTourneau, Inc.,** Peoria, Ill., has prepared a new folder showing a new field entered by contractors—that of agricultural land leveling. Earthmoving economies are putting into production agricultural sites once too expensive to level. Profusely illustrated, the folder gives 10 reasons why contractors are finding Tournapulls adaptable to landleveling jobs. Form No. G-1077.

HD-14 TRACTOR CATALOG—**Allis-Chalmers Mfg. Co.,** Milwaukee, Wis., recently released a 32-page catalog on its powerful HD-14 Diesel "crawler" tractor. Photos of the tractor in action plus cutaway views of important parts are liberally distributed throughout the booklet. Special pages are devoted to allied equipment, auxiliary attachments and specifications.

SPECTI-GOGGLE — **Eastern Equipment Co.,** Willow Grove, Pa., has published a four-page pamphlet on its new line of Specti-Goggles. Also available is a unique price list which enables any buyer to determine the type and price of the goggle he requires.

CMC JETCRETE GUNS — **Construction Machinery Co.,** Waterloo, Iowa, has issued an attractive 16-page bulletin which features three newly improved CMC Jetcrete Gun models. The booklet shows typical on-the-job applications and tells how pneumatically applied concrete can now be used to build, protect, or repair with speed and economy.

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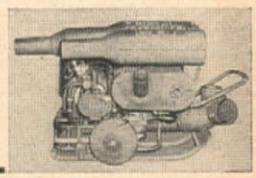

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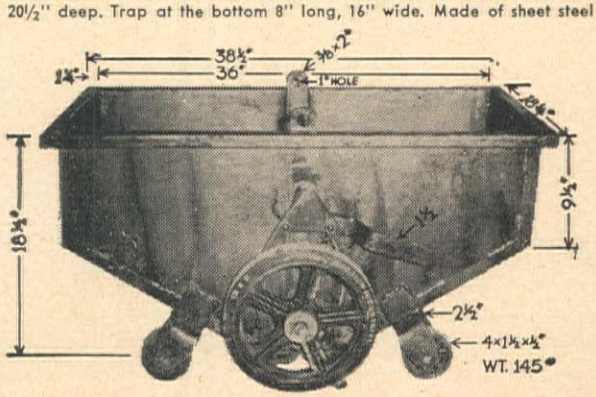

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