WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

PUBLISHED MONTHLY
VOLUME XXII, No. 9

SEPTEMBER • 1947

35 CENTS A COPY
$4.00 PER YEAR

IN THIS ISSUE

Dug through solid rock, the Aspen Creek Siphon is under construction by the Horner and Switzer construction companies. The siphon is the first east slope unit of the Colorado-Big Thompson project, and will receive water from the east portal of Alva B. Adams tunnel through the continental divide.

Photo by Zellers.

STOP RUST

This Sure, Simple Way

TEXACO *Rustproof Compound*, applied to exposed metal surfaces, effectively prevents rust. More than that — if rust has already started, *Texaco Rustproof Compound* penetrates it, loosens it for easy removal, and prevents any further rusting.

You simply brush *Texaco Rustproof Compound* on the metal you want protected. It forms a waterproof film, soft and self-healing against accidental scratches or breaks. It does not harden or chip off.

Texaco Rustproof Compound goes on easily and quickly and is easy to remove when your machines go back into service. It is one of the most economical methods of preventing rust.

Stop rust for sure this winter. Get *Texaco Rustproof Compound* and helpful suggestions for its use from the nearest of the more than 2500 Texaco distributing plants in the 48 States. Or write The Texas Company, 135 East 42nd Street, New York 17, New York.

EFFECTIVE PROTECTION FOR METAL EVERYWHERE — Use *Texaco Rustproof Compound* to protect your construction machinery. Gas holders, water works, sewage disposal plants, bridges — wherever metal is exposed to weather or corrosive chemicals and fumes — *Texaco Rustproof Compound* gives protection at low cost. Texaco's 36-page book "Rust Prevention" tells the whole story, offers many money-saving suggestions. Write for your copy today.

TEXACO

TEXACO Rustproofing Products

Tune in . . . TEXACO STAR THEATRE presents the TONY MARTIN SHOW every Sunday night. See newspaper for time and station.

if there is a NORTHWEST in the picture

it's on the toughest part of the job!

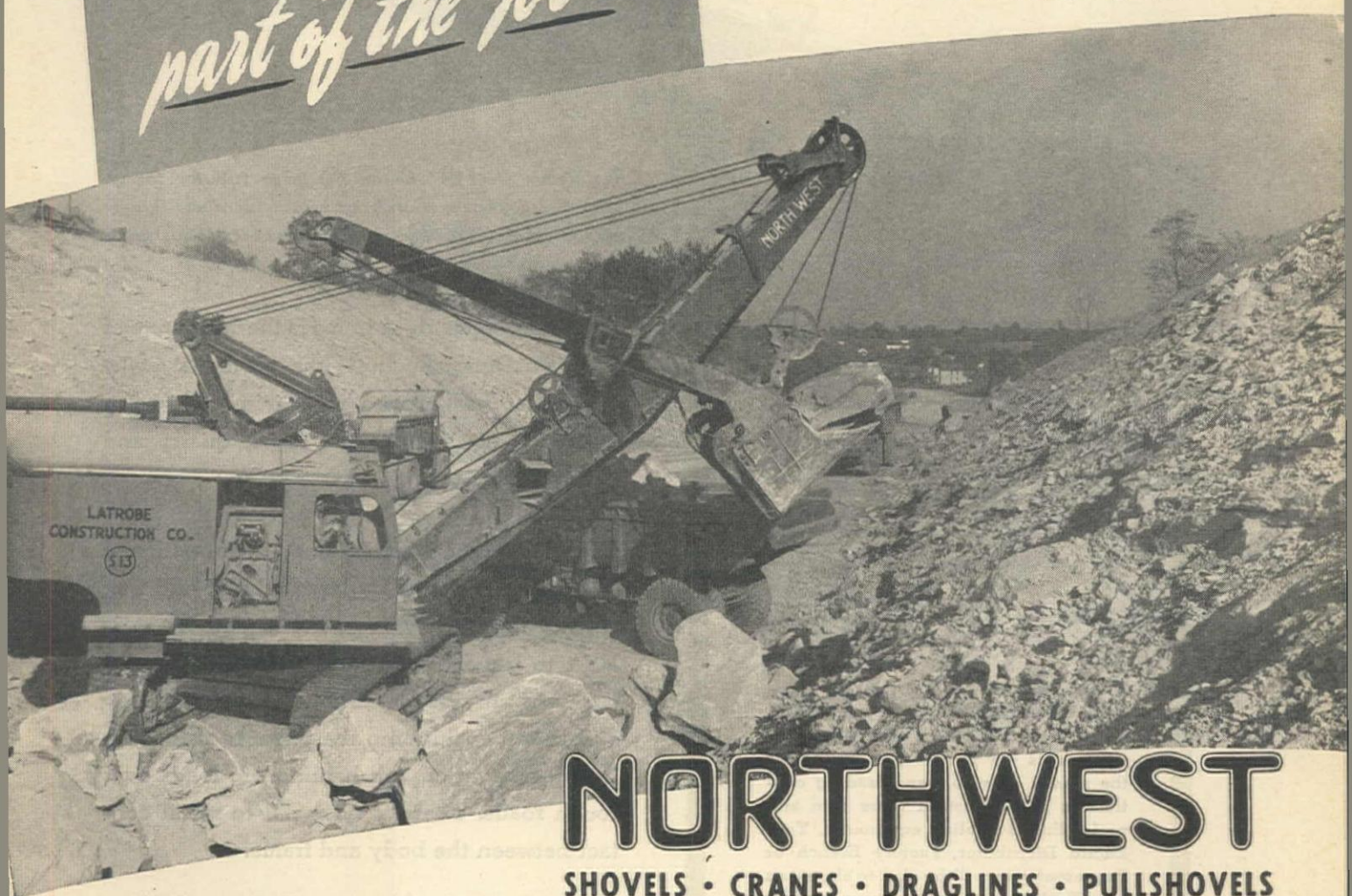
TAKE any job you want to and if there is a Northwest on it you can bet it's on the rock end of the digging.

The Northwest Shovel is built for the toughest job a shovel has to do. It's big—powerful with a welded boom that has been proved under punishment.

Dipper sticks are tied together at the upper end with a cap casting that assures their working as a unit. The Dual Independent Crowd utilizes force that other shovels waste. The "Feather-Touch" Clutch Control gives the *feel of the load* and makes handling the big ones easy, and the Cushion Clutch eliminates the effects of shock overload to parts under power when the dipper hits immovable rock.

Here is a combination you won't find in any other shovel. Follow the Northwest Crowd and have a real Rock Shovel.

NORTHWEST ENGINEERING CO.
135 South LaSalle St., Chicago 3, Ill.



NORTHWEST

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

ocal NORTHWEST sales agents

DENVER, COLORADO
The Mine & Smelter Supply Co.

BUTTE, MONTANA
Hall-Perry Machinery Co.

SALT LAKE CITY, UTAH
Arnold Machinery Co., Inc.

CHEYENNE, WYOMING
Wilson Equipment & Supply Co.

PHOENIX, ARIZONA
State Tractor & Equipment Co.

PORTLAND, OREGON
Baizer Machinery Co.

NORTHWEST SALES OFFICES:

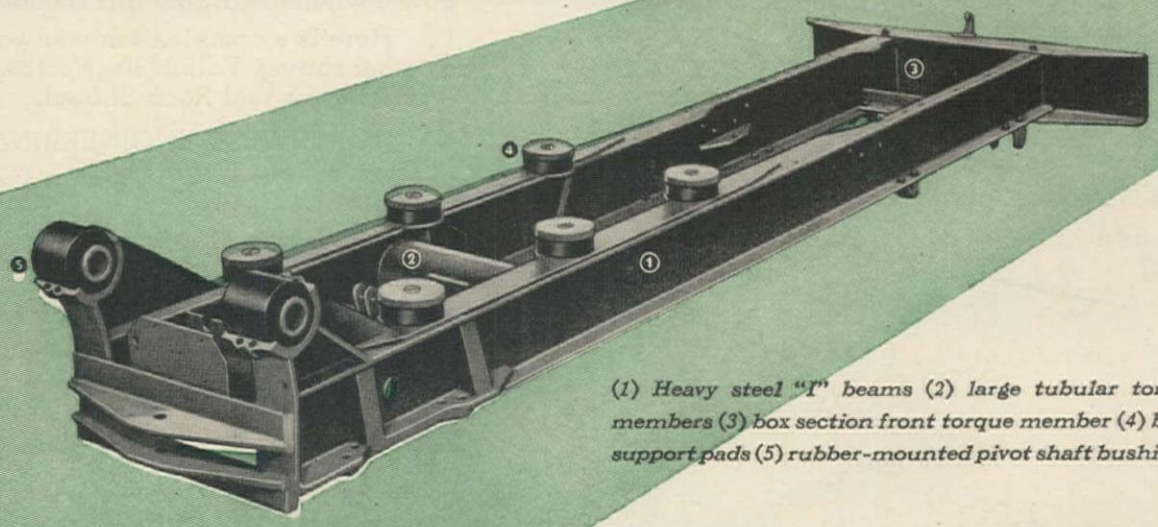
LOS ANGELES, CALIFORNIA
3707 Santa Fe Avenue

SAN FRANCISCO, CALIFORNIA
255 Tenth Street

SEATTLE, WASHINGTON
1234 Sixth Ave., South

Backbone for Big Loads

EUCLID Frame has Tremendous Strength



(1) Heavy steel "I" beams (2) large tubular torque members (3) box section front torque member (4) body support pads (5) rubber-mounted pivot shaft bushings.

Every part of the Rear-Dump Euclid is designed and built for heavy duty service and long life in off-the-highway work. This job proved performance is the reason why so many leading contractors and industrial users own and prefer Euclid hauling equipment. Your Euclid Distributor, Factory Branch or Representative will be glad to show you how Euclids can increase your production and cut your hauling costs.

● This massive, rigid frame is the backbone of the Rear-Dump Euclid — the off-the-highway truck that has proved its staying power on hundreds of the toughest mine, quarry and construction jobs.

Constructed of wide-flanged, deep-sectioned "I" beams stiffened by large tubular and box section torque members, the Euclid frame is built to last for the life of the truck. Rubber cushions provide for motion between the body and frame, cushioning the impacts of loading heavy excavation and hauling big loads over rough roads. There is no metal to metal contact between the body and frame.

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, Montana; Lively Equipment Co., Albuquerque, New Mexico; Construction 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; P. L. Crooks & Co., Portland 10, Oregon. REPRESENTATIVE: M. H. Johnson, W. 2411 Crown Avenue, Spokane, Washington.

Editor
J. M. SERVER, JR.

Associate Editors
D. F. Stevens
2611 Franklin Ave., Seattle 2, Wash.
Telephone MInor 0910
Arnold Kruckman
1120 Vermont Ave., NW.,
Washington 5, D. C.
Telephone DIstrict 8822

News Editors
K. M. Blamey
B. V. Bealer

Staff Correspondents
A. E. Niederhoff
L. L. Lee
C. J. Gorman
R. E. Carter, Jr.

Published monthly by
KING PUBLICATIONS
503 Market Street
San Francisco 5, California
Phone YUKON 6-1537

Arthur F. King . . . . . President
Donald F. Forster . Exec. V.-Pres.
L. P. Vrettos . . . . . Treasurer
L. B. King . . . . . Secretary
Ralph P. Dillon . Circulation Mgr.
R. C. Williams . Production Mgr.

Please address all communications to the San Francisco office

Advertising Offices

NEW YORK OFFICE
Ralph E. Dorland, District Manager
2225 Coles Ave., Scotch Plains, N. J.
Telephone Fanwood 2-8112

CHICAGO OFFICE
A. C. Petersen, District Manager
5833 S. Spaulding Ave., Chicago 29
Telephone PROspect 1685

SAN FRANCISCO OFFICE
Harry W. Bucknell, District Manager
503 Market St., San Francisco 5, Calif.
Telephone YUkon 6-1537

LOS ANGELES OFFICE
J. E. Badgley, District Manager
3853 Wilshire Blvd., Los Angeles 5
Telephone FItzroy 9462

ABC

Subscription Rates

The annual subscription rate is $4 in the United States and foreign countries where extra postage is not required. To Canada and to foreign countries where extra postage is necessary the annual rate is $5. Single copies, 35 cents.

Entered as Second Class Matter at the Post Office in San Francisco, California under the Act of March 3, 1879.

WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED WESTERN HIGHWAYS BUILDER

Volume 22 SEPTEMBER • 1947 Number 9

TABLE OF CONTENTS

Covering the Western Half of the National Construction Field

TOURNADOZER

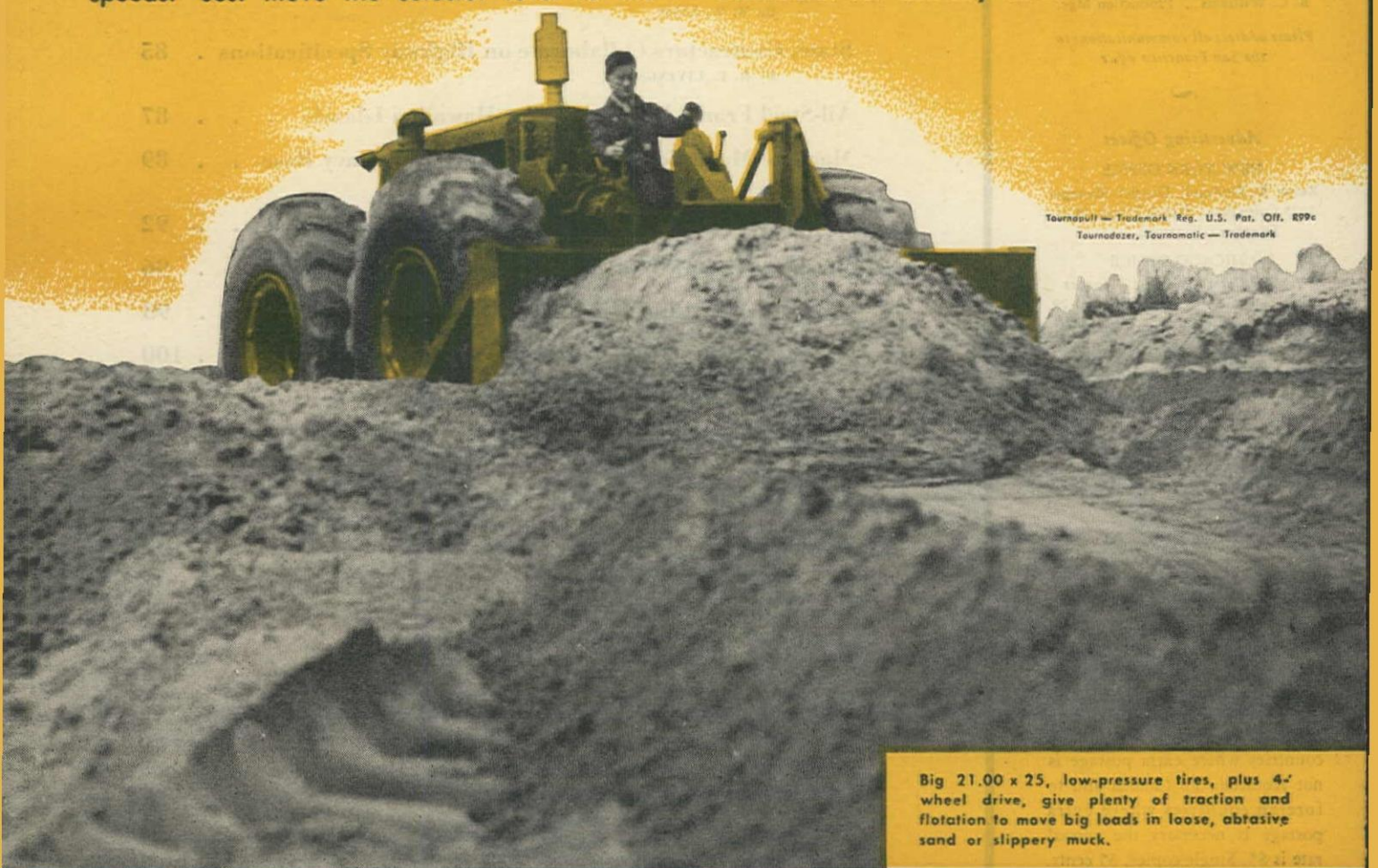
New high-speed, rubber-tired tool to increase dozer production

THE NEW rubber-tired Tournadozer gives you the high-rolling speed you have always wanted on your dozer work.

You get 15 m.p.h. top speed . . . and you get it in BOTH FORWARD and REVERSE.

Equally important is the constant-mesh Tournamatic transmission which gives you instantaneous selection of 4 forward and 4 reverse speeds. Just move the selector lever to the speed you want and air-actuated clutches give it to you right now. This means an extremely fast, maneuverable unit . . . quick to get in there and get going without any loss of momentum . . . and you get high-speed reverse that cuts "deadhead" time to a fraction of that required by track-type tractors.

180 h.p. C Tournadozers are now in production . . . other sizes soon. See your Le Tourneau Distributor for delivery dates . . . order NOW.



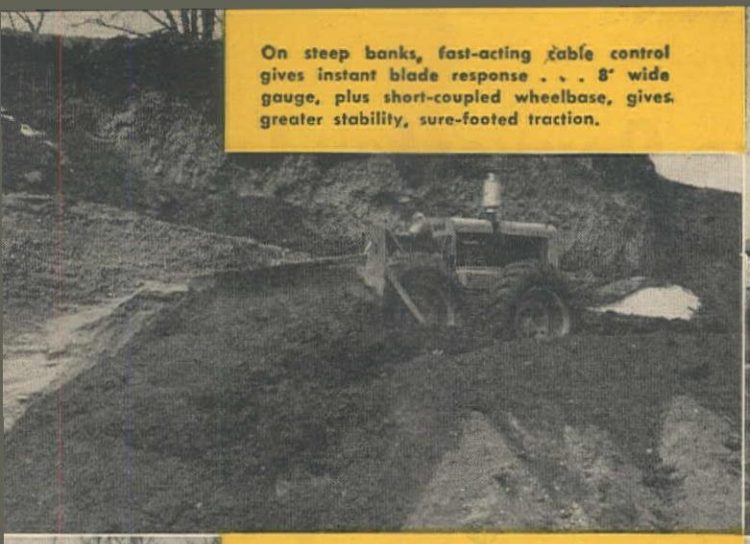
Tournapull — Trademark Reg. U.S. Pat. Off. 899c
Tournadozer, Tournamatic — Trademark

Big 21.00 x 25, low-pressure tires, plus 4-wheel drive, give plenty of traction and flotation to move big loads in loose, abtasive sand or slippery muck.

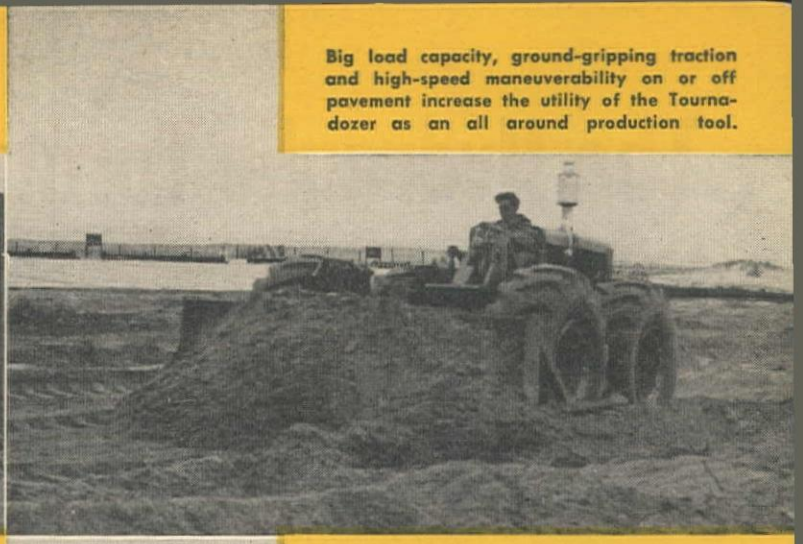
LE TOURNEAU EQUIPMENT

See your Le Tourneau Distributor NOW for complete information

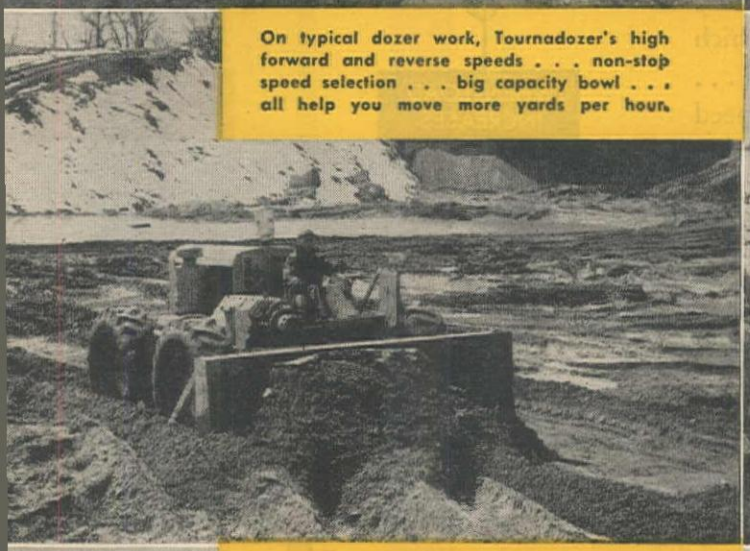
On steep banks, fast-acting cable control gives instant blade response . . . 8' wide gauge, plus short-coupled wheelbase, gives greater stability, sure-footed traction.



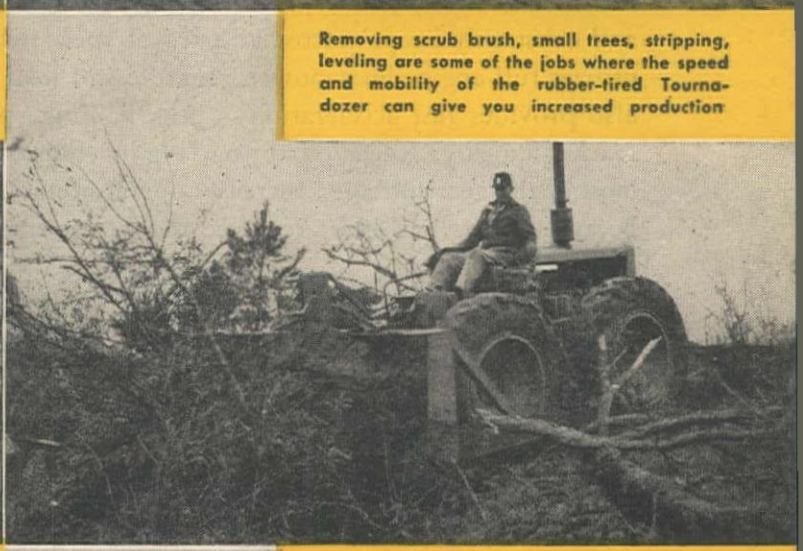
Big load capacity, ground-gripping traction and high-speed maneuverability on or off pavement increase the utility of the Tournadozer as an all around production tool.



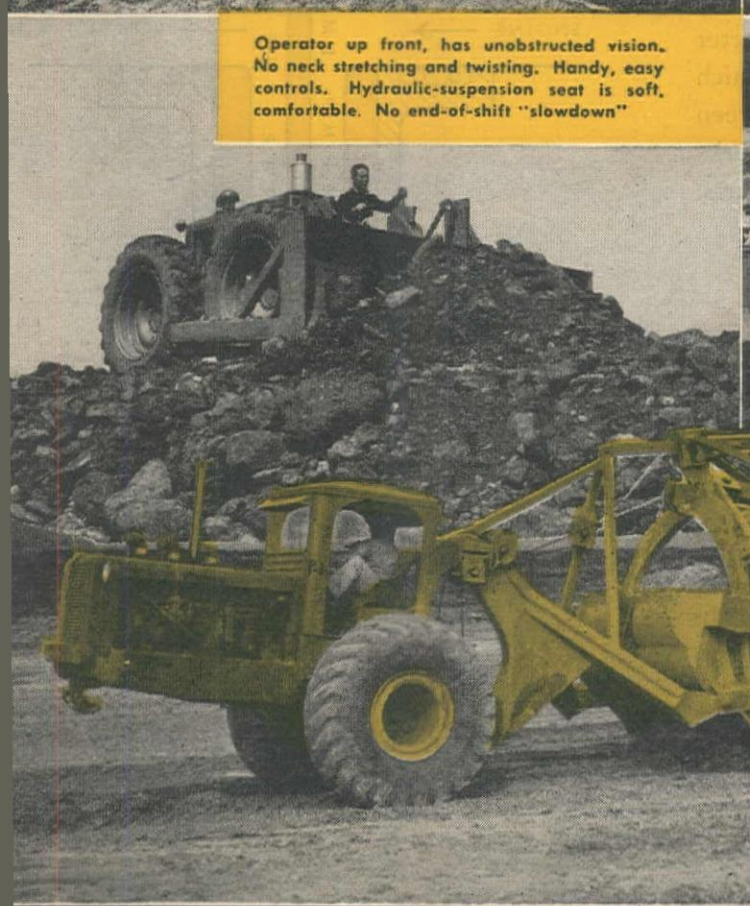
On typical dozer work, Tournadozer's high forward and reverse speeds . . . non-stop speed selection . . . big capacity bowl . . . all help you move more yards per hour.



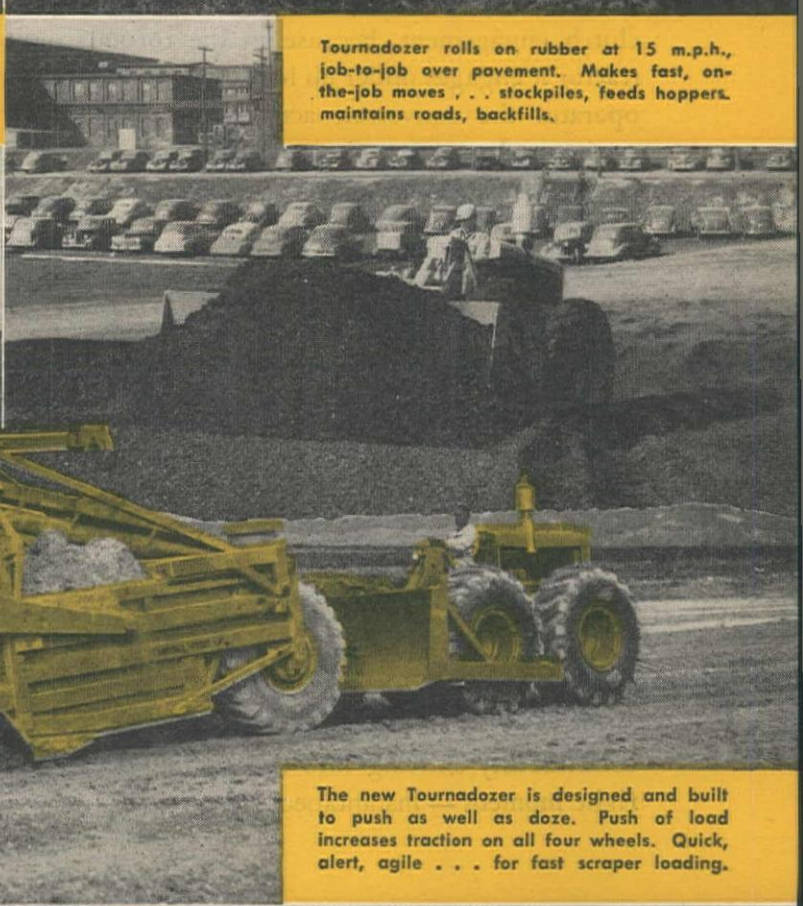
Removing scrub brush, small trees, stripping, leveling are some of the jobs where the speed and mobility of the rubber-tired Tournadozer can give you increased production



Operator up front, has unobstructed vision. No neck stretching and twisting. Handy, easy controls. Hydraulic-suspension seat is soft, comfortable. No end-of-shift "slowdown"



Tournadozer rolls on rubber at 15 m.p.h., job-to-job over pavement. Makes fast, on-the-job moves . . . stockpiles, feeds hoppers, maintains roads, backfills.



The new Tournadozer is designed and built to push as well as doze. Push of load increases traction on all four wheels. Quick, alert, agile . . . for fast scraper loading.

LETOURNEAU

PEORIA, ILLINOIS

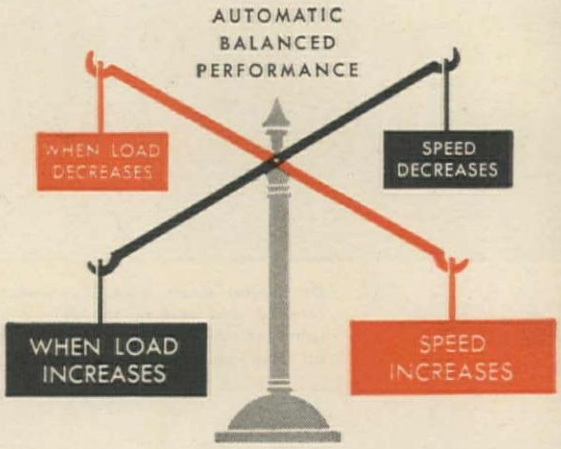
HIGH-SPEED RUBBER-TIRED

TOURNADOZERS

The Hydraulic Torque-Converter Tractor

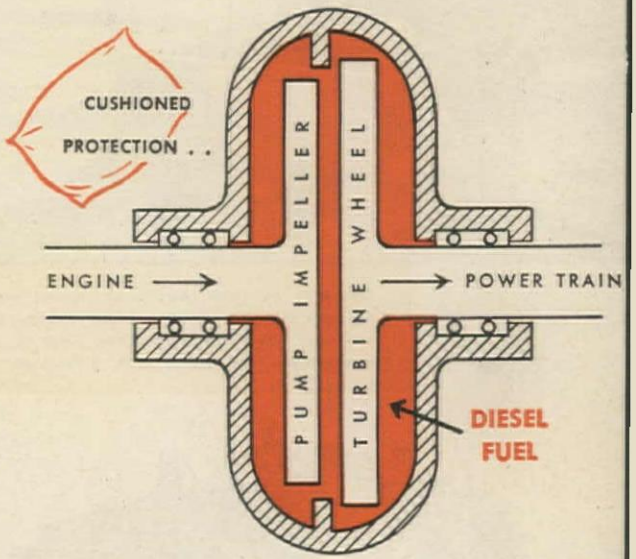
PRODUCES MORE

The hydraulic torque converter tractor gets more done because it works at higher *average* speeds — achieved in numerous ways. Torque converter automatically and constantly keeps tractor at a travel speed which utilizes full engine horsepower, regardless of load . . . also provides fast acceleration — peak hauling speed reached quickly. Keeps tractor moving by eliminating most of the gear-shifting. Increases operator efficiency because there's less effort required to operate tractor.



CUTS UPKEEP COST

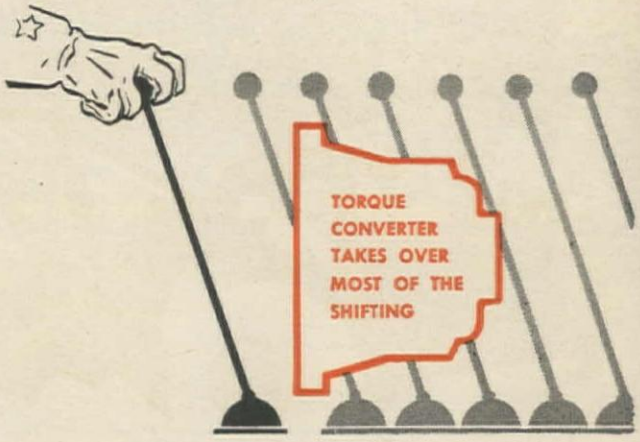
Longer life, less breakage and wear are assured for tractor and auxiliary equipment because operation is continuously smooth. There is no shock from master clutch engagement, because in the torque converter tractor it engages under no load. The diesel fuel, which operates the converter, acts as a cushion between engine and tractor train — no sudden twists or jerks can be transferred between driving and driven parts.



MAKES IT EASIER FOR OPERATOR

No restarting — engine can't be stalled. No constant shifting — torque converter automatically selects the maximum speed ranges at which load can be moved. No jolts and shock to tire operator — power flow is smooth and even.

To approach the accomplishment of a torque converter . . . a fluid coupling would be required, plus a transmission with an unlimited number of gear ratios, and an operator with the impossible task of continuously shifting into the right gear at just the right moment — instantaneously.



ALLIS-CHALMERS

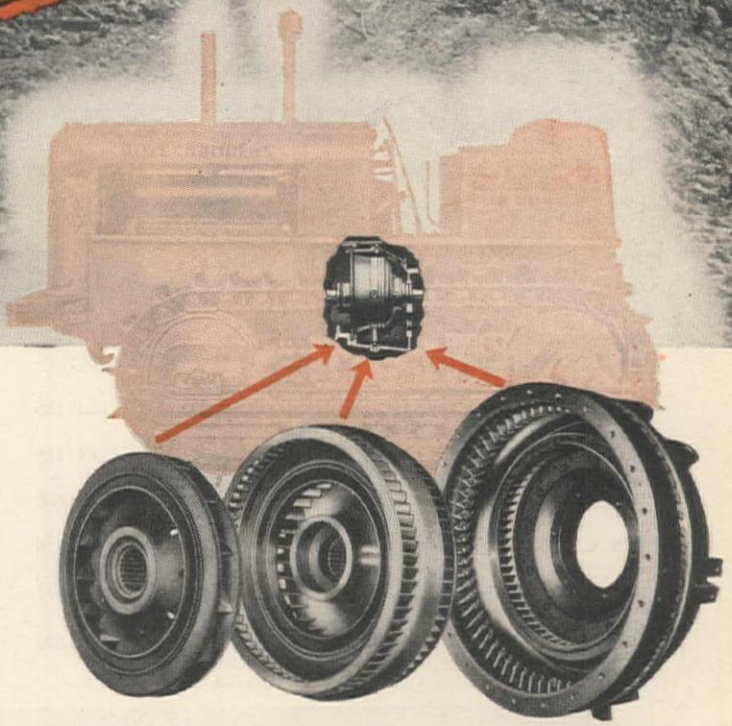
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

Takes Work Away From Operator

YET GETS MORE WORK DONE!

WHAT THE TORQUE CONVERTER IS

The Twin Disc torque converter in Allis-Chalmers tractors is a remarkably simple mechanism. It consists of only two wheels — impeller and turbine — rotating independently of each other in an oil-filled housing. The impeller is directly connected to the engine, and the turbine to the power train.



IMPELLER TURBINE HOUSING

Originator of the Torque-Converter Tractor

COLD FACTS ABOUT THE

ONE book of facts can be worth more than a library of books based on conjecture.

Such a book* of facts has recently been published by the American Water Works Association. It records the findings of a study of "Survival and Retirement Experience With Water Works Facilities" in 25 cities.

With the permission of the A.W.W.A., we have reprinted, in brochure form, the facts as they apply to cast iron pipe. This brochure is available on request. Write to the Cast Iron Pipe Research Association, Peoples Gas Bldg., Chicago 3, Illinois, and ask for a copy of "Survival and Retirement Experience With Cast Iron Water Mains."

A feature of this brochure is a chart showing the percentage of cast iron water mains that have survived out of all such mains laid by these 25 cities from the first, some as early as 1817. For example, in sizes 6-inch and over, *more than 90 per cent of all the cast iron pipe that has ever been laid in these cities is still in service.*

Tabulations showing in detail the survival and retirement experience with cast iron water mains, in various sizes, are given for each city; also experience with cement-lined cast iron pipe in the 16 cities that have installed it.

*Available from American Water Works Association, 500 Fifth Ave., New York.

CAST IRON PIPE

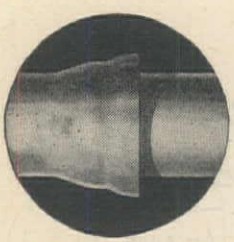
LIFE OF WATER MAINS

The 25 cities were carefully selected to comprise a representative cross-section of conditions; the study was concerned solely with discovering and reporting the facts.

For your convenience and quick reference, we have reprinted such facts as apply to cast iron pipe only—facts which leave no room for conjecture if what you want is water mains with assured long life and efficient life.

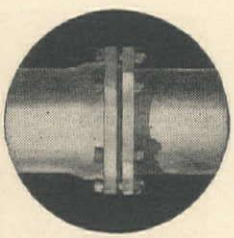
> *"Cast iron pipe not only offers a century or more of efficient life as a structure—it offers a century or more of efficient life as a carrier. In the limited areas with tuberculating waters, cement-lined cast iron pipe is tuberculation-proof and insures high carrying capacity for the life of the pipe. In the greatly predominating areas without tuberculating waters, the carrying capacity of unlined cast iron pipe remains practically unimpaired for the life of the pipe."*

Joints for Cast Iron Pipe



Bell-and-Spigot Joint: the standard joint for water and sewerage service.

A variety of joints are available, of which the two most widely used are illustrated. Special purpose joints, such as the Ball-and-Socket, or Flexible Joint for underwater use, and the Flanged Joint for above-ground use, are also available.



Mechanical Joint: bottle-tight and flexible, now with interchangeable parts.

"SILENT SERVICE is not enough"—A.W.W.A.

The American Water Works Association is recommending to its members, for local action, a sound, well-planned program of Public Relations publicity and advertising. It is based on the premise that good water service, like good health, is too often taken for granted, in which case favorable public opinion is dormant.

To co-operate with this program and help to arouse national recognition of the efficient service rendered by America's water supply systems, the Cast Iron Pipe Research Association is presenting little known facts about public water supply to the *six million* readers of "Time" and "Nation's Business" throughout 1947.

For example, the following human-interest cartoon and excerpts from a current advertisement

"extra!—*read all about it*"

All this excitement about water? Well, if you lived in one of the 5700 towns* that need a water supply system, or any town that needs improvement to its water supply system, you'd understand. An abundant supply of potable water makes life easier, safeguards health and property, attracts industry, rarely increases taxes. The cost of installing or improving a municipal water supply system is usually financed by a bond issue to be liquidated out of revenue from a low delivered cost to the consumer—a cost that averages less than a dime for a ton of safe and palatable water.

Because of the efficient and economical operation of America's water supply systems, water works construction or improvement bonds are rated among the most stable of investments, and have a ready market at a low rate of interest.

*U. S. Public Health Survey, released July 6, 1947

Cast Iron Pipe Research Association, Thos. F. Wolfe, Engineer, Peoples Gas Bldg., Chicago 3, Illinois.

SERVES FOR CENTURIES

KOEHRING

Digs and hauls more rock

• Rugged rock boom of the Koehring 605 (1½ yd. shovel) is fully protected against strains of rock handling. Heavy coil spring shock absorbers, one on each side of the boom foot, absorb twists of fast rock loading, eliminate the strains that injure unprotected booms.

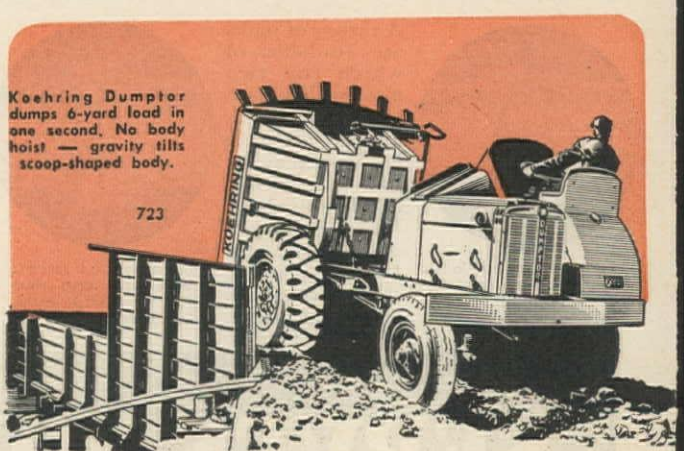
605 Increases output because 605 Power Clutches (on main drums) cannot be thrown in too fast. All the machinery of the 605 is protected against sudden overloads. Light lever pull, with complete feel of the load, keeps operator alert throughout the shift, steps up production on tough rock jobs.

Dumptor speeds haul: Koehring 6 yd. Dumptor is ideally suited for work with rock shovels. Same high speeds forward or reverse eliminate slow turns in tight spots. Heavy-duty construction keeps maintenance cost low. One-second gravity dump saves production time every trip.

• • •

See your Koehring distributor today for full information on Koehring 605 plus Koehring Dumptor.

Columbia Equipment Co., ***Portland, Boise***
Harron, Rickard & McCone Co. of Southern California, ***Los Angeles***
Kimball Equipment Co., ***Salt Lake City***
McKelvy Machinery Co., ***Denver***
Moore Equipment Co., ***Stockton***
Neil B. McGinnis Co., ***Phoenix***
Pacific Hoist & Derrick Co., ***Seattle***
The Harry Cornelius Co., ***Albuquerque***
Western Machinery Co., ***Spokane***



KOEHRING **HEAVY-DUTY**

KWIK-MIX

NEW 11-S END OR SIDE DISCHARGE

Fast charging, rapid discharge, thorough mixing and lasting strength are the outstanding features of the 11-S Kwik-Mix Dandie concrete mixer. Dandie mixing action folds as it mixes. Heavy duty all-welded frame resists twisting. Tilted flow-line discharge chute empties drum in approximately 7 seconds. Selective skip shaker does not shake until skip is partially emptied and ready for shaking.

Columbia Equipment Company ..... *Portland, Boise*
Harron, Rickard & McCone Co. of So. Calif. ..... *Los Angeles*
Kimball Equipment Company ..... *Salt Lake City*
McKelvy Machinery Company ..... *Denver*
Moore Equipment Company ..... *Stockton*
Neil B. McGinnis Company ..... *Phoenix*
Pacific Hoist & Derrick Company ..... *Seattle*
The Harry Cornelius Company ..... *Albuquerque*
Western Machinery Company ..... *Spokane*

DANDIE MIXER

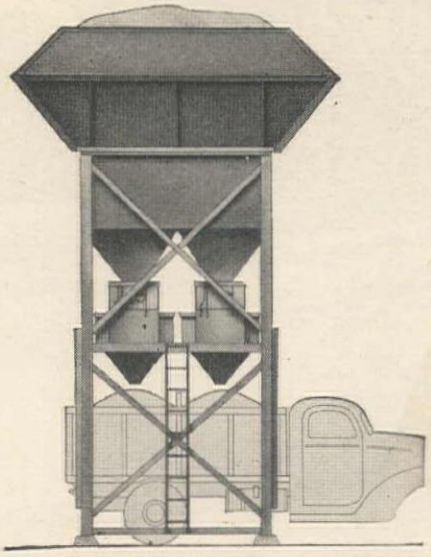
JOHNSON

LOADS 2-BATCH TRUCKS ON 1 STOP

Johnson Dual Aggregate Batch Plant discharges two full batches simultaneously, in the same time it takes other plants to deliver one batch. 2-Batch trucks loaded in one stop. Extra stops eliminated. Often, fewer trucks are needed. Always, less danger of time lost at the paver. 100 yard capacity; 3 compartments; 2 multiple material batchers. Fully portable.

Cramer Machinery Company ..... *Portland*
Edward R. Bacon Company ..... *San Francisco*
Harron, Rickard & McCone Co. of So. Calif. ..... *Los Angeles*
McKelvy Machinery Company ..... *Denver*
Neil B. McGinnis Company ..... *Phoenix*
Pacific Hoist & Derrick Company ..... *Seattle*
The Harry Cornelius Company ..... *Albuquerque*
Western Machinery Company ..... *Spokane*
Western Machinery Company ..... *Salt Lake City*

1-STOP BATCH PLANT



PARSONS

CLEAN BUCKETS GET BIG BITES

On the Parsons 250 Trenchliner, each bucket that bites into the trench is clean, empty, ready to take a big, full load. Spring-mounted bucket scraper cleans out sticky material as each bucket is dumped. Even gumbo clay can't stick to cut down trenching efficiency. Lightweight, high strength buckets, forged bucket teeth, heat-treated chain links, self-locking connecting pins.

Columbia Equipment Company ..... *Portland, Boise*
Harron, Rickard & McCone Co. of So. Calif. ..... *Los Angeles*
Kimball Equipment Company ..... *Salt Lake City*
McKelvy Machinery Company ..... *Denver*
Moore Equipment Company ..... *Stockton*
Neil B. McGinnis Company ..... *Phoenix*
Pacific Hoist & Derrick Company ..... *Seattle*
The Harry Cornelius Company ..... *Albuquerque*
Western Machinery Company ..... *Spokane*

TRENCHLINER

Reg. U. S. Pat. Off.

UTILITY

1 A "Caterpillar" Diesel No. 12 Motor Grader shapes ditches on a county road in Crawford County, Mich. The big tires give excellent control in sandy soil.

2 Tullahoma, Tenn., a "Caterpillar" Diesel No. 12 Motor Grader blades cold mix rock asphalt on what is claimed the widest road in the world.

3 Near Sebeka, Minn., this Wadena County "Caterpillar" Diesel No. 12 is maintaining a stretch of sandy road.

UNLIMITED

No machines on earth have greater year-round utility in the road-building field than "Caterpillar" Diesel Motor Graders. They were the first machines designed specifically to do the job, and they have increased their margin of leadership for 15 years.

These pictures, chosen from thousands, show the variety of jobs they do superlatively well:

1. **Build and rebuild roads from bank to bank.**
2. **Spread all types of surface materials, including oil mix.**
3. **Maintain every kind of highway that requires maintenance.**
4. **Keep roads clear of snow and ice through the winter months.**

Many owners are frank in their praise of "Caterpillar" Diesel Motor Graders and the dependable work-power they deliver. Here is a statement from Road Supervisor R. H. Parker, of Sevier County, Utah:

"It's the best grader for our work. Its handling ease and low operating cost mean a lot to us. We wouldn't have anything else. It's 'Caterpillar' all the way with us."

And Contractor Ellis Fesler, of Santa Maria, California, says:

"Ease of operation and 'Caterpillar' dependability make our No. 12 Grader an excellent blade for oil-field road work. It enables us to produce first-class roads with a minimum of effort."

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

The New No. 12 and No. 112 Motor Graders

See the new No. 12 and No. 112 Motor Graders, with one-third more horsepower, strengthened design and many mechanical refinements. Their greater work capacity and faster working speeds will mean higher earnings and savings on all types of road jobs.

4 Clearing drifts of frozen snow up to 6 feet deep is one of the many efficient jobs done by this No. 12 in Marshall County, Ill.

CATERPILLAR DIESEL

REG. U. S. PAT. OFF.

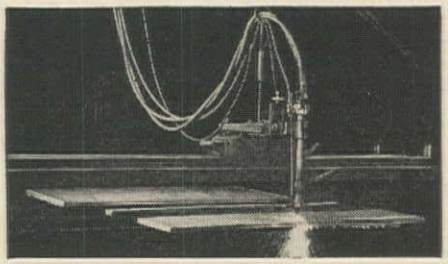
ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT

"Tailored steel" becomes a regular steel warehouse commodity when an OXWELD shape-cutting machine is used.

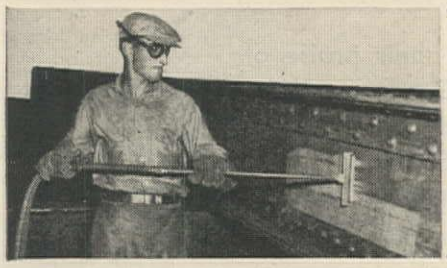
LINDE process service cuts production corners

You may be taking advantage of all of the more apparent economies of LINDE methods. Yet, through the broad and comprehensive experience of the LINDE service organization, important additional savings may be made.

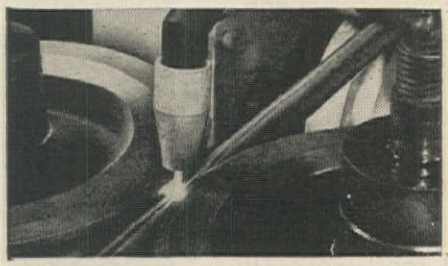
LINDE Process Service is available to all LINDE customers through any LINDE office.



Stainless steel plate, difficult to oxygen-cut by usual methods, can be quickly cut to size and shape by powder-cutting.



Scrubbing steel with a brush of flame removes scale, rust, and surface moisture prior to painting. This is flame-priming, a LINDE development.



HELIARC welding makes strong, clean welds in stainless steel tubing because the weld zone is protected from oxidation by a protecting envelope of argon or helium gas.

The design of a simple jig for centering cold rounds—or the design of a completely mechanized flame-conditioning installation — are examples of LINDE Process Service.

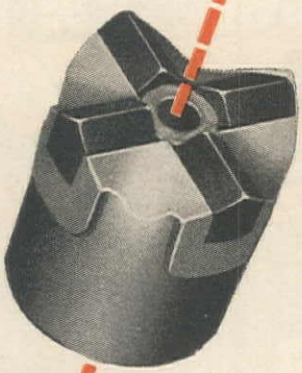
Linde

THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation

They're Ready

REVOLUTIONARY CARSET JACKBITS



CARSET JACKBIT after drilling 307 FEET in Barre Granite with a DA-35 Drifter at 90 psi

You have been hearing about the new Ingersoll-Rand CARSET bit with *CARBOLOY* cutting edges. Here it is—an alloy steel bit with cutting edges of tungsten carbide, the hardest metallic substance made by man. Although developed with heavy drifters and high air pressures, the Carset Jackbit is in keeping with, and ideally suited to, the modern trend toward smaller machines and smaller holes. The amazing performance of this new *ultra-hard tipped* bit is due in part to its use with the recently announced "Jackstud" bit connector. Reports from mines and tests in our development work indicate the Carset bit to be one of the greatest advances in rock drilling history. We are confident that the Carset Jackbit opens the door to a new era in rock drilling. Performance and specific advances read like a driller's dream.

FOR INSTANCE, YOU CAN—

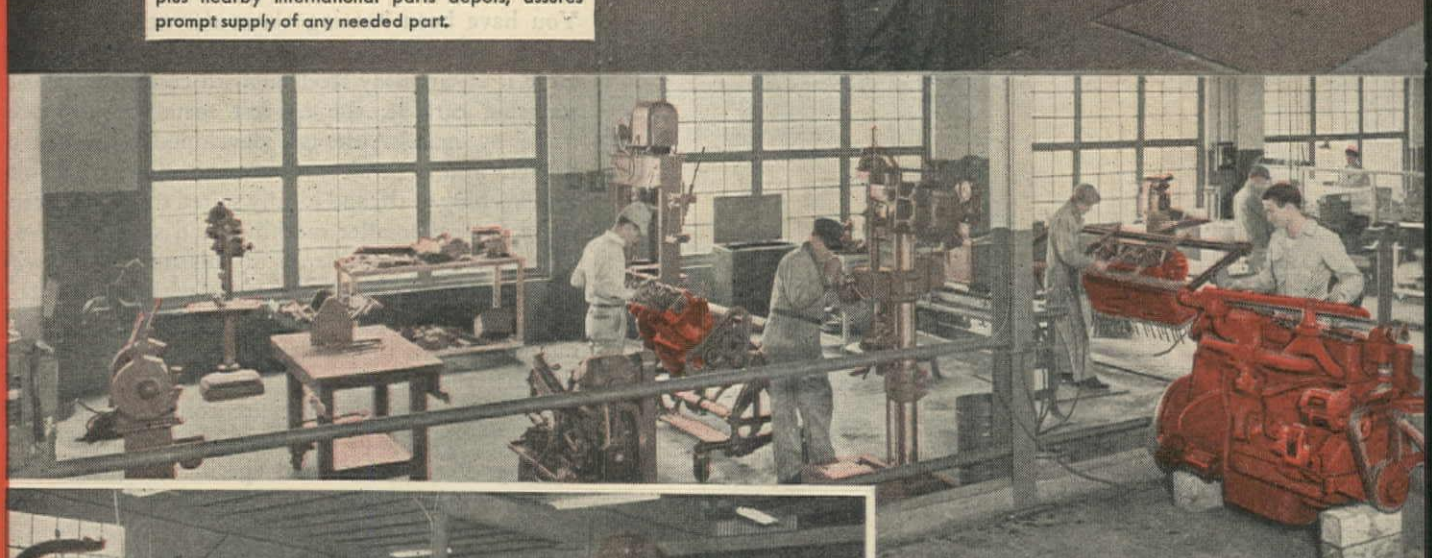
Drill continuously with one size bit
Use steels as long as the setup will permit
Increase drilling speeds 20% and higher
Almost eliminate the changing of bits
Drill small, uniform diameter holes
Materially reduce explosive costs
Drill the hardest rock
Reduce or even eliminate bit reconditioning
Use lighter drills
Drill more holes with the same amount of air
Finish more rounds per month

Order some Carset Jackbits and Stud Jackrods now and determine the economics of their use in your own operation.

Ingersoll-Rand

36-15 11 BROADWAY, NEW YORK 4, N. Y.

International distributors maintain complete stocks of parts under a perpetual inventory control. This, plus nearby International parts depots, assures prompt supply of any needed part.



Factory-trained mechanics, using modern fixtures and tools, make sure of factory-level servicing, repairing and rebuilding of International engines. The engine department of a distributor's shop is shown above.

Shears, drills, lathes, punch presses and other powered tools are used in many distributors' shops for equipment repair or construction.

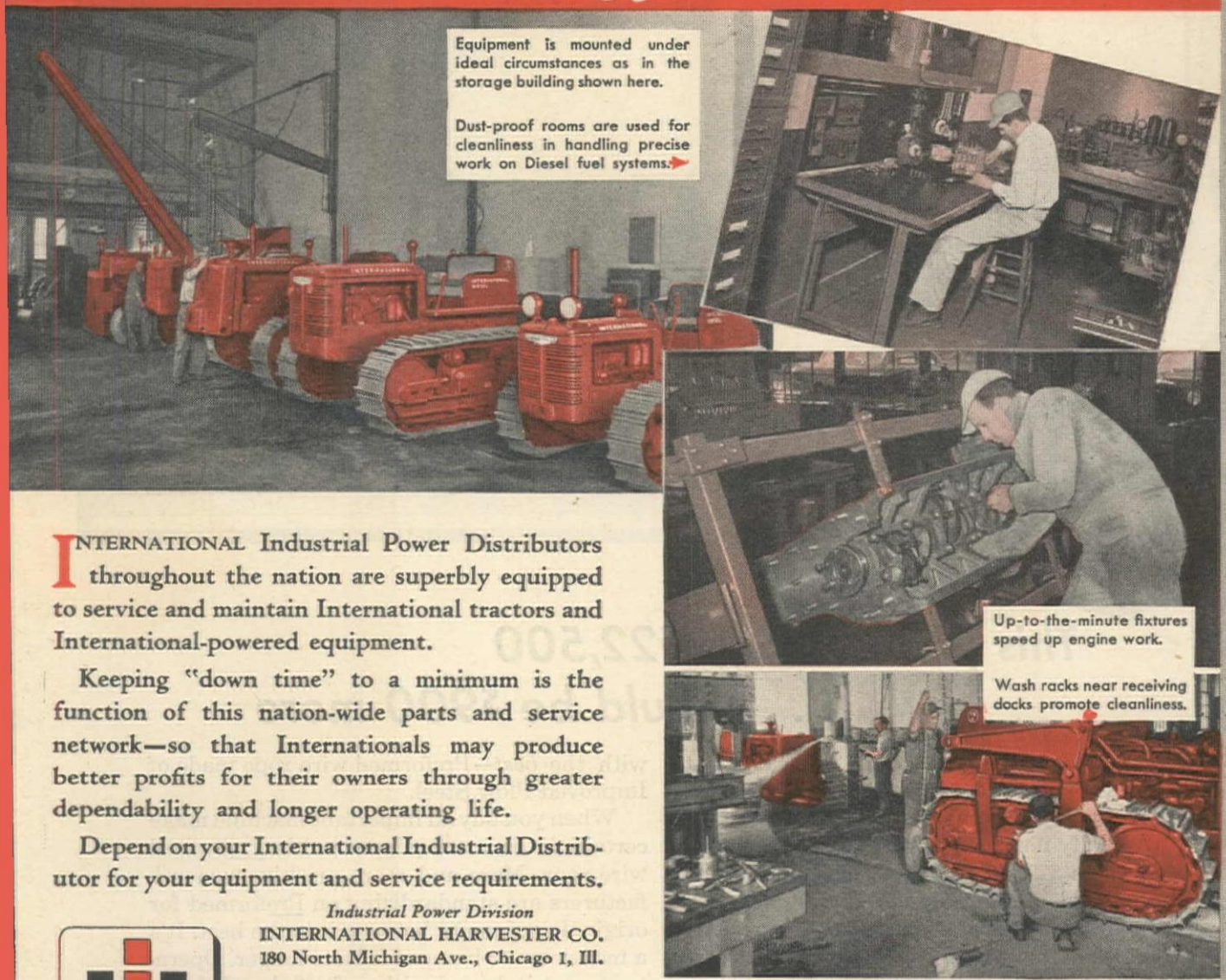
CRAWLER TRACTORS
POWER UNITS
DIESEL ENGINES
WHEEL TRACTORS

INTERNATIONAL

Unexcelled

NATION-WIDE SERVICE
and Parts Facilities

Keep INTERNATIONAL Power *at Peak Efficiency*



Equipment is mounted under ideal circumstances as in the storage building shown here.

Dust-proof rooms are used for cleanliness in handling precise work on Diesel fuel systems.

Up-to-the-minute fixtures speed up engine work.

Wash racks near receiving docks promote cleanliness.

INTERNATIONAL Industrial Power Distributors throughout the nation are superbly equipped to service and maintain International tractors and International-powered equipment.

Keeping "down time" to a minimum is the function of this nation-wide parts and service network—so that Internationals may produce better profits for their owners through greater dependability and longer operating life.

Depend on your International Industrial Distributor for your equipment and service requirements.

Industrial Power Division
INTERNATIONAL HARVESTER CO.
180 North Michigan Ave., Chicago 1, Ill.

INTERNATIONAL HARVESTER

Industrial Power

This picture costs $22,500 . . . should be $900 more

You may never have to handle pulpwood, but this is a splendid example of where false economy might prove costly.

Actually it's the pulpwood handling crane that costs $22,500—not its picture. But this mechanical giant couldn't lift a matchstick without the wire rope sinews that control its operation . . . Ordinary wire rope would cost about $750. For about $900 you could rig with the *best*—Preformed wire rope made of Improved Plow Steel.

When you buy an important machine make certain it comes equipped with Preformed wire rope. More and more machinery manufacturers are standardizing on Preformed for original equipment because it is the best. It's a money-saver because it lasts longer. Operators want it, because it's safer to handle.

WRITE FOR FREE COPY OF HELPFUL BOOK ABOUT PREFORMED

Address: PREFORMED WIRE ROPE INFORMATION BUREAU • 520 N. MICHIGAN AVENUE • CHICAGO 11

Ask your own wire rope manufacturer or distributor

HANDLES EASIER

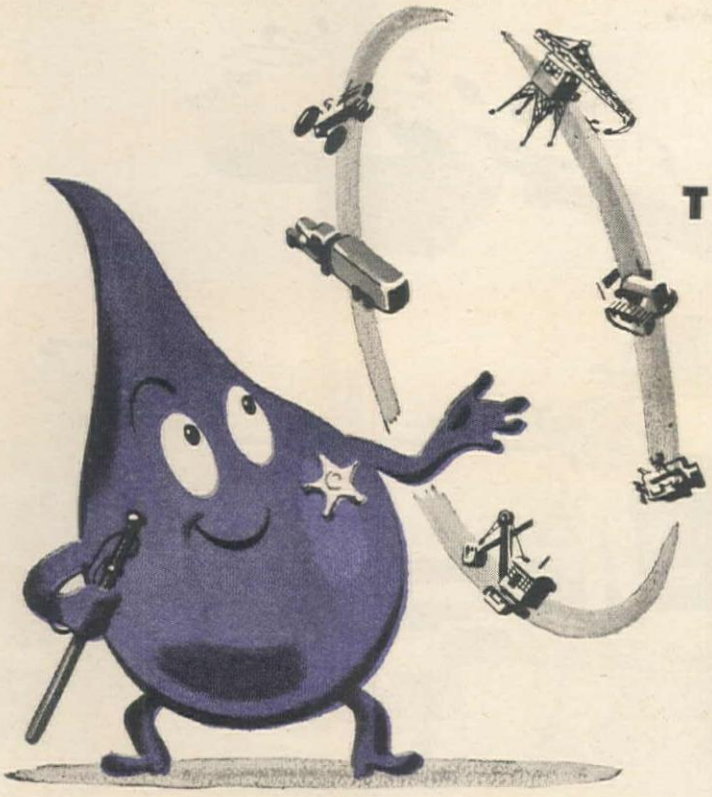
PREFORMED WIRE ROPE

LASTS LONGER

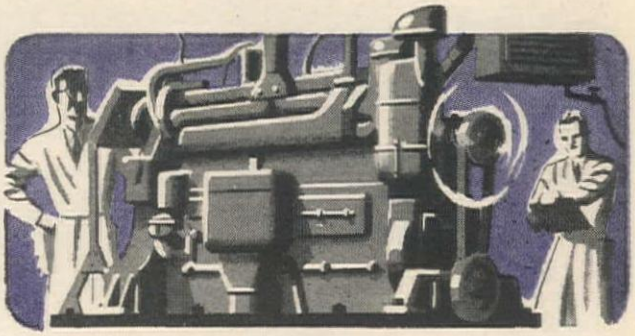
T5X

THE NEW PURPLE OIL

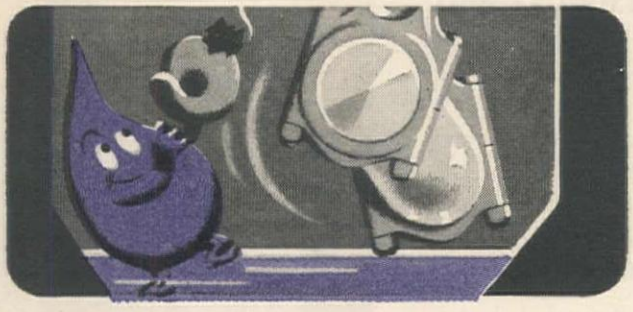
Better Protection for ANY Internal Combustion Engine!



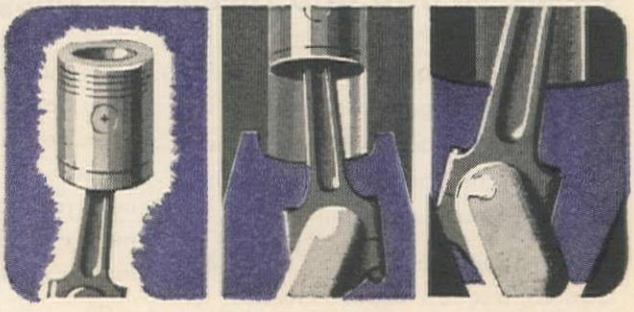
1. T5X—the sensational new purple oil—gives maximum protection and performance in *any* kind of internal combustion engine in *any* industrial operation! T5X is a fully compounded, detergent-type oil. Its distinctive color comes from an exclusive ingredient which helps give the oil its remarkable stability.



2. In the "L-4" Coordinating Research Council tests for gasoline engine lubricants, T5X lasted *double* the length of time required. It easily passed the grueling 500-hour continuous-run Diesel engine test—considered the most exacting test of all for Diesel lubricants!



3. T5X keeps engines clean! It contains a detergent compound that holds unburned fuel residues and other impurities suspended harmlessly in the oil, preventing sludge formation. Thus oil lines, pistons and ring grooves stay clean longer!



4. T5X reduces wear! It contains an inhibitor which minimizes oil oxidation, gives high stability against heat. Another additive protects against corrosion and rust. A third ingredient retards foaming even under the most adverse conditions.

This sensational *purple* oil is now available for immediate delivery. For additional information, phone your local Union Oil Representative, or wire Sales Dept., Union Oil Co., Los Angeles 14, California.

T5X—*"as distinctive in quality as it is in color"*

UNION OIL COMPANY
OF CALIFORNIA

Gradall's powerful telescoping boom loads big chunks of frozen earth into trucks in the first phase of the Maryland job. By fast, positive, hydraulic action, the boom can be extended to an operating range of 24 feet; swings full 360°.

GRADALL Versatility

speeds $8,000,000 Glenburnie Village Housing Project

OVER 1250 homes are to be built on the huge Glenburnie Village Project between Baltimore and Annapolis on the Governor Ritchie Highway, Maryland.

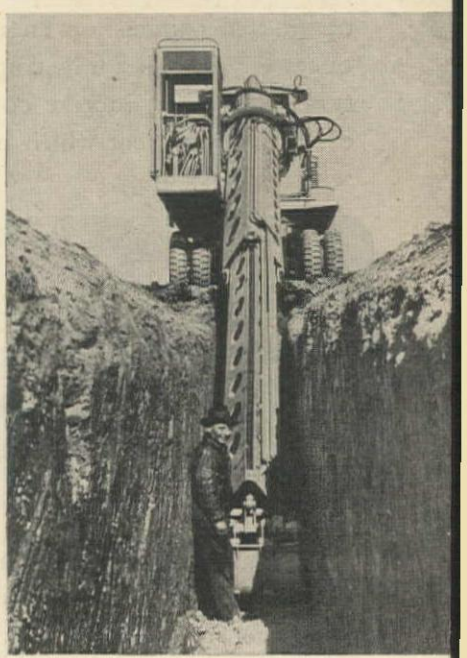
Byrne Communities, Inc., construction contractors, report Gradall as doing many jobs which formerly required several kinds of equipment.

General excavating, sloping, grading, digging trenches and storm sewers, back filling, and unloading pipe and other heavy material—all are taken in stride by Gradall.

Its mobility and speed in getting from one job to another, and its fast operation make it a great time and money saver for the contractor. Its neat, precise work also saves time and money by eliminating a great deal of manual clean-up labor.

The first Gradall showed such outstanding performance on the job that an additional unit was quickly purchased.

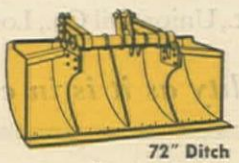
For more jobs at greater profits, it will pay you to investigate Gradall —the really new development in construction machinery.



A Gradall specialty—a ten-foot trench. Note clean, straight walls and chamfered corners.

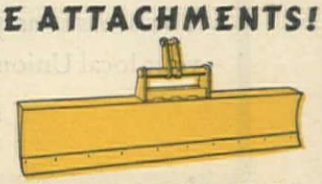
LESS THAN 15 MINUTES TO CHANGE ATTACHMENTS!

48" Cleanup Bucket; 72" Bucket for snow removal



72" Ditch Cleaning Bucket

47" Pavement Removing Bucket



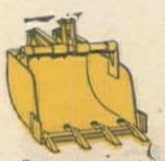
8'0" Blade—furnished with plain and serrated cutting edges

Mounted on truck chassis, two Gradalls are maneuvered quickly into position. The unique "Arm Action" reaches and pulls, turns and tilts the bucket to dig perfectly floored and sheer walled excavations.

Gradall dug the trench, laid pipe, and is shown back-filling.

SEND FOR BOOKLET

. . . illustrating Gradall's many uses. Gives dimensions, operating ranges and mechanical specifications.



32" Digging Bucket; 36" Digging Bucket

Pavement Ripper

GRADALL DIVISION
WARNER & SWASEY
Cleveland

Gradall Reg. U. S. Pat. Off.

SALES AND SERVICE:

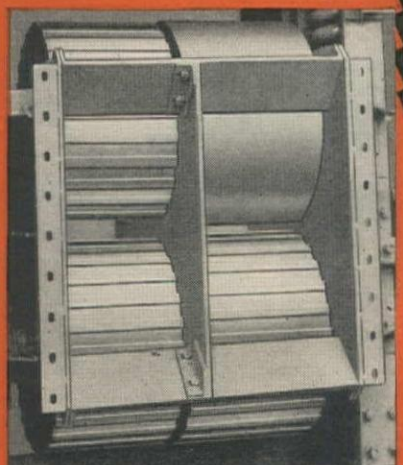
GOLDEN STATE EQUIPMENT CO.
4770 Valley Blvd.
Los Angeles 32, California

BAY EQUIPMENT CO.
3254 East Shore Highway
Richmond, California

INDUSTRIAL EQUIPMENT CO.
720 South 19th Ave., P. O. Box 2669
Phoenix, Arizona

NOW TWICE THE YARDAGE

UNIVERSAL'S NEW TWINDUAL* MASTER GRAVEL PLANT



Feed Opening View TWINDUAL Rolls

*TWINDUAL Rolls, the exclusive patented Universal development which gives two full stages of secondary reduction in one crusher. Its use provides amazing capacity with savings in weight. Permits 100% wider jaw crusher discharge opening, more than doubling its capacity and reducing jaw wear.
*PATENTED

Top capacity plus *ready portability,* you get both and *more* in the new **TWINDUAL*** MASTER... the first completely *new* post-war gravel plant. Three full stages of reduction with only two crushers. First stage—jaw crusher; second and third stages—**TWINDUAL*** Rolls. Size for size and weight for weight the **TWINDUAL*** MASTER has no equal for production where crushing must be done. Under identical pit conditions it has produced twice the yardage of larger conventional model plants. Its record smashing capacity, smooth operation with minimum vibration, and remarkably low power requirement is setting an entirely new standard for low cost production of finished aggregate.

CONTRACTORS EQUIPMENT CORP.
Portland, Oregon

INDUSTRIAL EQUIPMENT CO.
Los Angeles, Oakland and Reno

OLSON MANUFACTURING CO.
Boise, Idaho

J. K. WHEELER MACHINERY CO.
Salt Lake City, Utah

Complete details available in bulletin 682. Write for it.

UNIVERSAL ENGINEERING CORPORATION

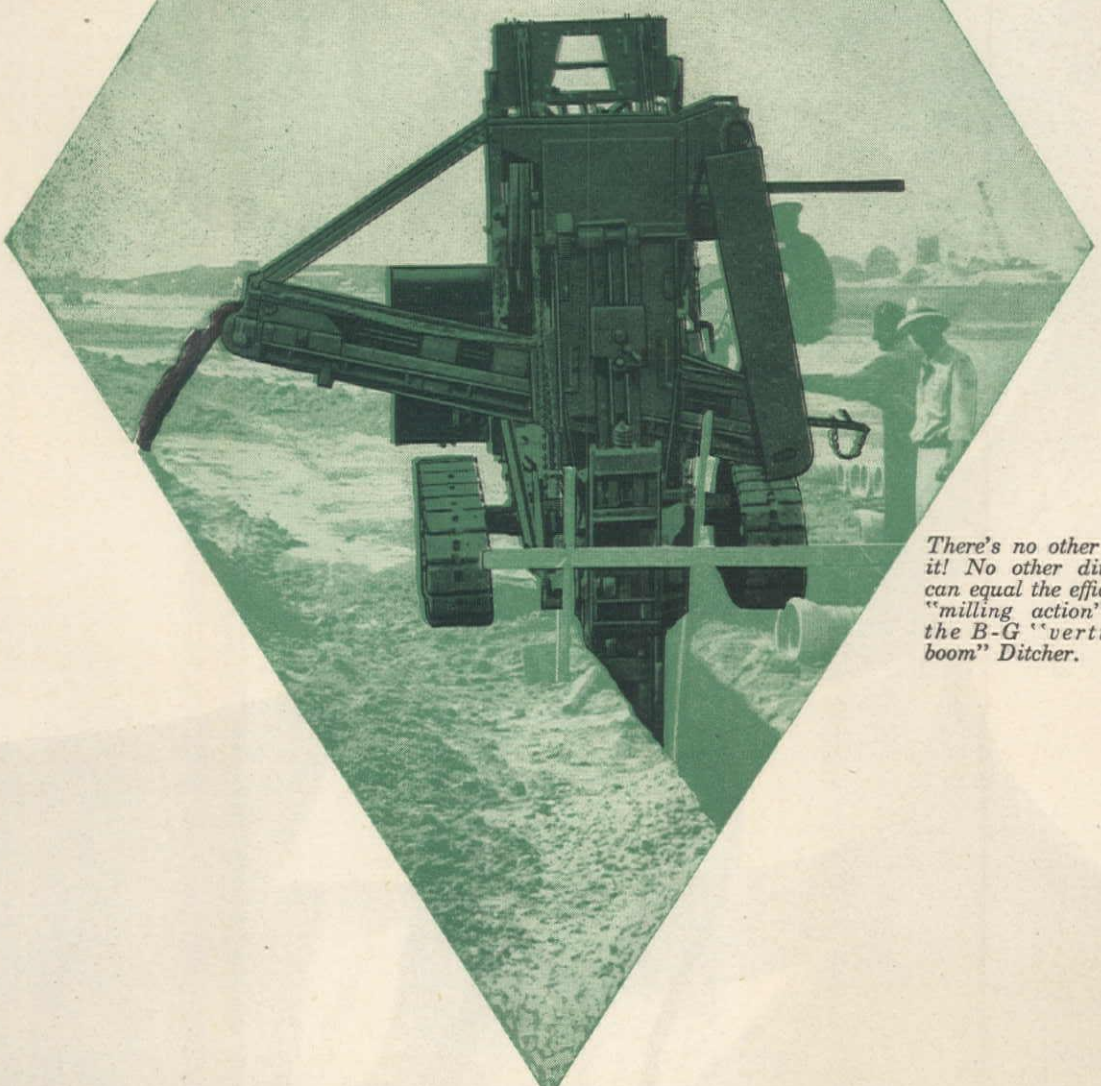
323 8TH STREET N. W. **CEDAR RAPIDS, IOWA**

Barber-Greene

The Ditcher that Conquered CORAL ROCK!

Tough abrasive coral rock wasn't considered a good spot for a mechanical ditcher until the B-G Vertical Boom Ditcher first showed how the job could be done. Since that time, miles of trench have been cut in coral rock by B-G Ditchers, from the Florida flat lands to the Pacific's war-won islands. Naturally, with that kind of ability it is the preferred, moderate width, medium depth ditcher for working in everything from cemented gravel to sticky gumbo.

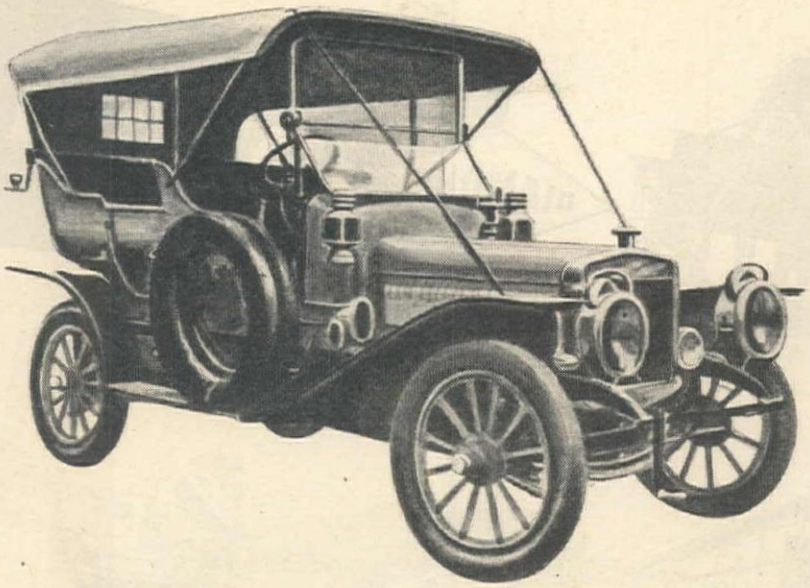
Like all B-G machines, it is engineered by experts to give long-time, cost-reducing service: the self-cleaning "kick-out" digging buckets on the vertical boom operate like a milling machine for sure cutting action: the automatic overload release gives positive protection, automatically resets itself: its short length, low over-all height and sure-footed crawlers give it maximum maneuverability. These are unique features that recommend this B-G Ditcher for tough going. Barber-Greene Company, Aurora, Illinois.



There's no other like it! No other ditcher can equal the efficient "milling action" of the B-G "vertical boom" Ditcher.

BARBER-GREENE COMPANY · AURORA, ILLINOIS

Constant Flow Equipment



THE AUTOMOBILE WAS A RICH MAN'S TOY

THE AUTOMOBILE WAS A RICH MAN'S TOY—but today nearly everyone drives a car.

An important reason for the rapid success and wide acceptance of the automobile is that it was designed and engineered for a single purpose . . . to provide better transportation.

The same reason accounts for the rapid success and wide acceptance of Transite Pressure Pipe. It, too, was designed and engineered for a single purpose . . . to carry water more efficiently.

J-M engineers combined asbestos and cement under great pressure, produced a material that did a better job. The new material was called Transite. Transite is rustproof, it cannot tuberculate, it resists even the most corrosive soils.

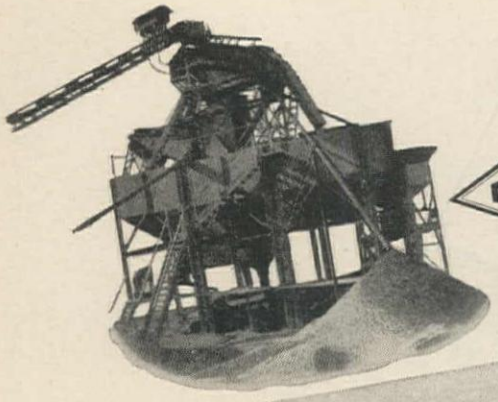
Then they designed a coupling made of Transite and named it the Simplex Coupling. Simple and effective, it consists only of a Transite sleeve and two rubber rings tightly compressed into position between sleeve and pipe. This construction guards against leakage and also provides flexibility at each joint. The flexibility helps to cushion the entire line against shock and soil stresses, permits a deflection up to 5 degrees at each joint.

Today you can have the engineering progress that goes into a streamlined car when you travel today's highways. Probably you'll want the advantages of modern engineering in the field of water transportation too.

Then remember this important fact. *Transite Pressure Pipe was engineered for the single purpose of transporting water more efficiently.*

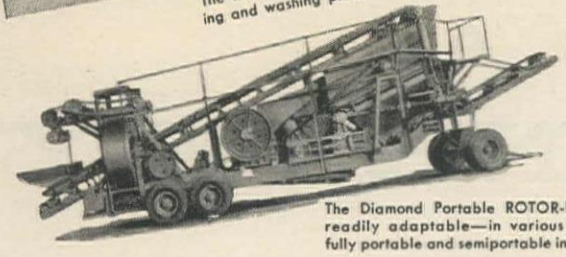
For all the facts about Transite, the *modern* water pipe, write Johns-Manville, Box 290, New York 16, New York.

JOHNS-MANVILLE JM PRODUCTS



DIAMOND **DYNAMICS** *in action*

The new Diamond-equipped, gravel crushing, screening and washing plant of King Brothers, Dayton, Ohio.



The Diamond Portable ROTOR-LIFT Plant, readily adaptable—in various sizes—to fully portable and semiportable installations.

• • • Producing crushed gravel economically at or near the site of a job is one of the tough problems construction engineers have to lick. That's where the *portability* of the Diamond Rotor-Lift gravel crushing and screening plant can save time and cut haulage costs. Here in a completely *portable* plant, is all equipment needed to process gravel from its raw state to the exact size needed for the job . . . and as close to the job site as possible! Learn how Diamond Dynamics can work for you. Call your Diamond dealer today!

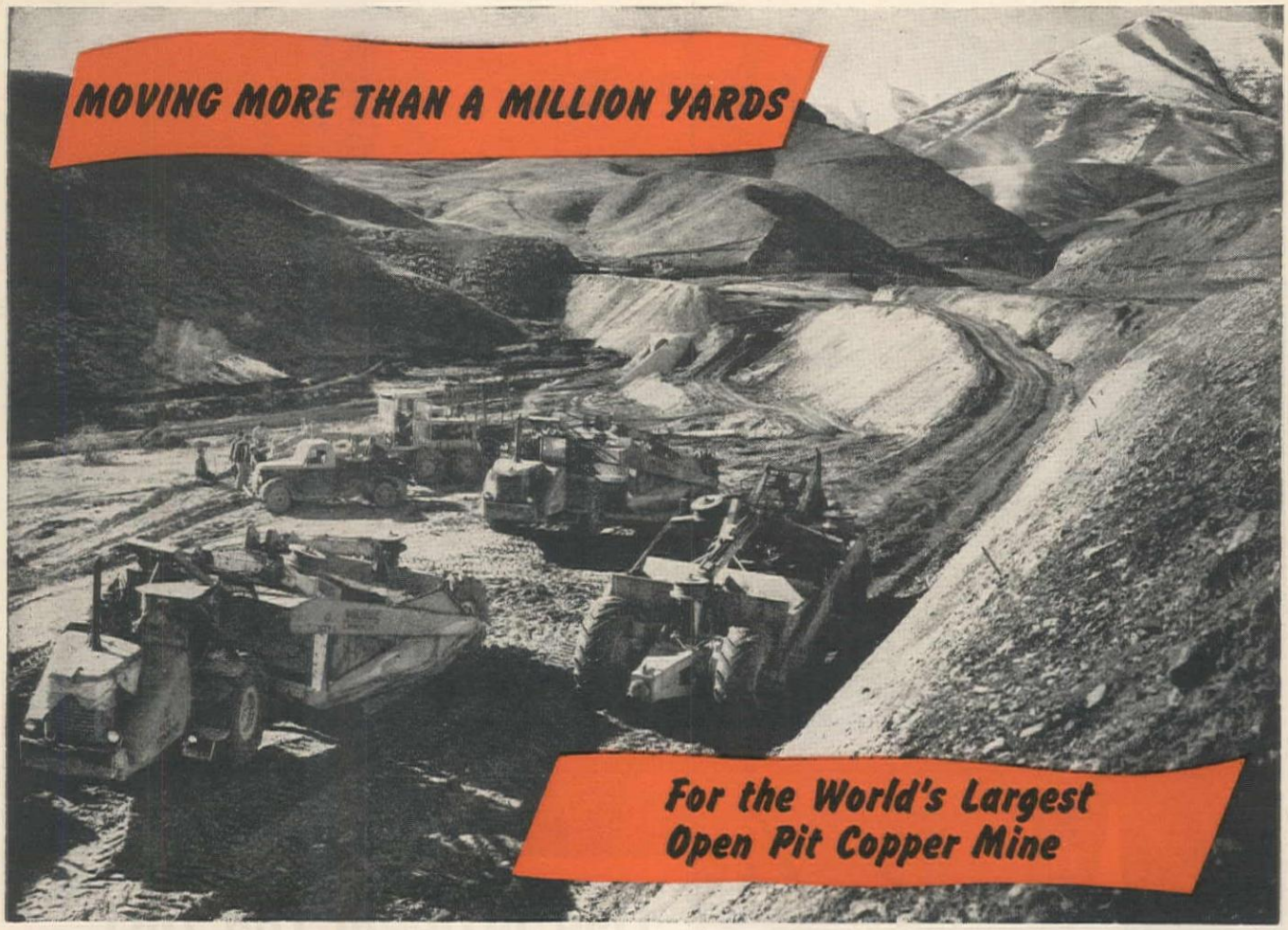
"THERE'S NOTHING TOUGHER THAN A DIAMOND"

DIAMOND

DIAMOND IRON WORKS, INC.
AND THE MAHR MANUFACTURING COMPANY DIVISION
MINNEAPOLIS 11, MINNESOTA

YOUR NEAREST DIAMOND DEALER FOR SALES AND SERVICE

Los Angeles . . . GARLINGHOUSE BROS.	*Denver* . CONSTRUCTORS EQUIPMENT CO.	*Boise* . . . . WESTERN EQUIPMENT CO.
Seattle . . . . . A. H. COX & CO.	*Salt Lake City* . FOULGER EQUIPMENT CO.	*Spokane* . . . WESTERN EQUIPMENT CO.
	San Francisco . . C. H. GRANT COMPANY	



UTAH CONSTRUCTION COMPANY JOB, BINGHAM TO GARFIELD, UTAH

—With a Fleet of Wooldridge Terra-Cobras

WOOLDRIDGE TERRA-COBRAS employ the same Bowl features as Wooldridge "Terra-Clipper" tractor-drawn Scrapers

Enlarging the railroad access road to the world's largest open pit copper mine near Bingham, Utah, a fleet of six Wooldridge high-speed heavy-duty Terra-Cobras teamed with six rugged Terra-Clipper scrapers to move more than a million yards of dirt, rock and gravel. Under hot and dusty as well as cold and muddy operating conditions, Terra-Cobras handled capacity loads at speeds up to 17 M.P.H. on round-trip hauls from 2000 to 12,000 feet. Ample power, high speed, positive traction, and effortless hydraulic two wheel steering control assure the Terra-Cobra's high production performance at lower costs per yard. For faster earthmoving on long and short hauls, investigate Wooldridge Terra-Cobras. Write today for full details.

Measure Each Job in terms of WOOLDRIDGE EQUIPMENT:

- ★ High Speed EARTHMOVERS
- ★ Tractor-drawn SCRAPERS
- ★ BULLDOZERS
- ★ TRAILBUILDERS
- ★ RIPPERS
- ★ POWER CONTROLS

WOOLDRIDGE

TERRA COBRA

HIGH SPEED-SELF PROPELLED

EARTHMOVERS

WOOLDRIDGE MANUFACTURING CO.
SUNNYVALE, CALIFORNIA
NATIONWIDE SERVICE

One accident can cost your client more —

than the entire cost of scientific safety through modern Color Engineering

Safety *rules* are not enough! Safety must be *created*—accident prevention *practiced*. Color Engineering by Fuller corrects bad light and drab surroundings, points out danger areas—lifts employee morale, promotes good housekeeping, increases work efficiency, and cuts accident costs.

Our trained representative will give you details, help you specify color systems. No obligation.
W. P. Fuller & Co. San Francisco.
Branches and Dealers throughout the West.

FREE—24-page book, "Color Engineering by Fuller"—full color photos, diagrams, symbols.
Put it in your file.

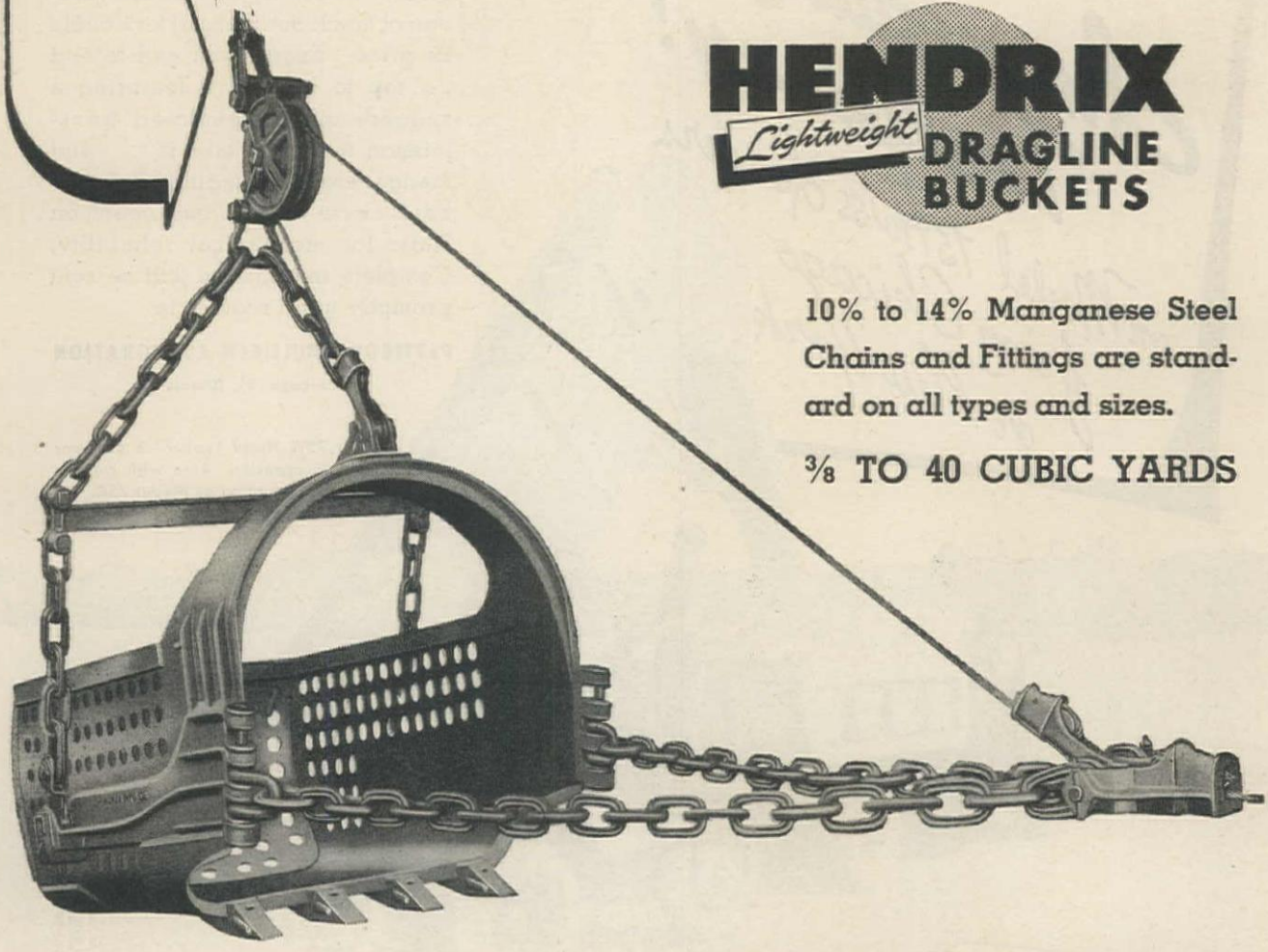
Fuller Floor Finishes *stand the gaff*

Customer tests prove superiority in open competition of Fuller floor preservatives—for institutions, for gymnasiums, arenas, schools, industrial plants, public buildings.

NEW — Red LZI Metal Primer

Composite LZI (lead, zinc, iron) saves *three* ways on structural steel—lower initial cost, lower application cost, longer rust inhibition. Make us prove it!

EVERYTHING THAT COULD BE ASKED FOR IN A 3/8 TO 40 CUBIC YARD BUCKET



HENDRIX Lightweight DRAGLINE BUCKETS

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

3/8 TO 40 CUBIC YARDS

3 TYPES DESIGNED FOR EVERY DIGGING CONDITION

LS..... A lighter weight bucket designed for levee and drainage work.

TS..... A medium weight bucket, classified as a general purpose bucket.

HS..... A heavy duty bucket for moving shale or any hard formation.

- ★ 20% to 40% lighter than other buckets, type for type.
- ★ All welded construction for greater strength and durability.
- ★ Manganese Steel Chains, Fittings, and Reversible Tooth Points.
- ★ Full Pay Load every trip, even in wet digging.
- ★ Perfect Balance; handles easier, fills faster, dumps cleaner.

WITH OR WITHOUT PERFORATIONS

WRITE FOR DESCRIPTIVE LITERATURE OR ASK YOUR DEALER

HENDRIX MANUFACTURING COMPANY
MANSFIELD INCORPORATED LOUISIANA

Get 25% MORE CRUSHING AREA

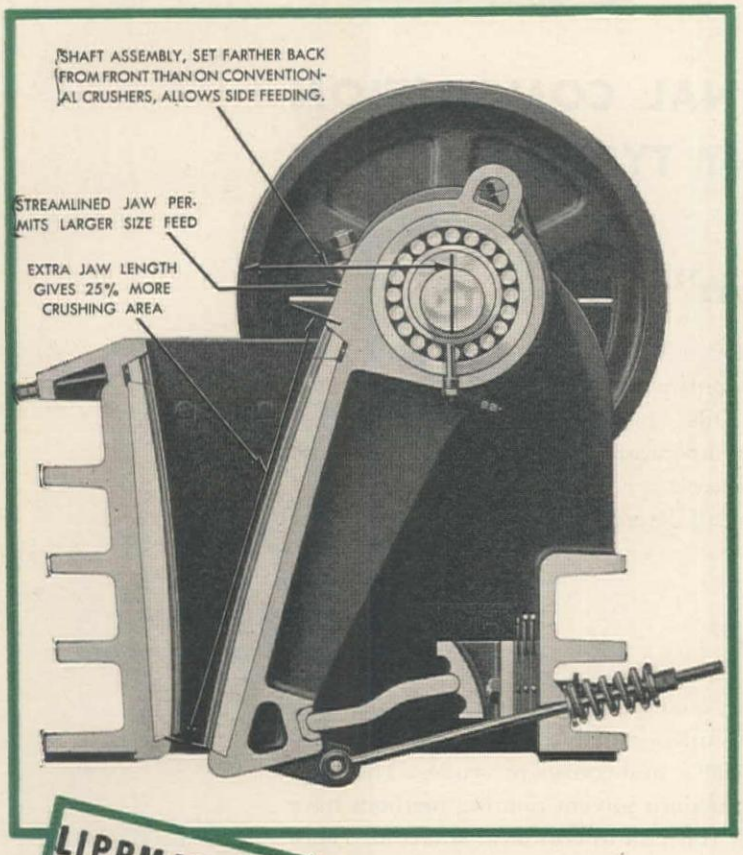
with LIPPMANN HEAVY DUTY ALLOY JAW CRUSHERS!

Check This Table. See for Yourself Why You Get More for Your Money . . . with the Lippmann Heavy Duty *Alloy* Steel Jaw Crusher!

COMPARISON OF JAW LENGTH (IN.)

Crusher Size	15 x 36	18 x 36	24 x 36
Other Crushers	34.5(1)	40.67(2)	54.67(3)
LIPPMANN Heavy-Duty	45	51	66
% Extra Area with LIPPMANN	30.4	25.4	20.7

(1) Average of 8, (2) average of 3, (3) average of 3. (Only comparable sizes listed in Powers' Roads & Streets Catalog.)



WHEN you buy the new, post-war Lippmann Heavy Duty Jaw Crusher, you get more crusher for your money, based on crushing area alone.

That extra 25% means wider range of product sizes available, finer settings, reduced need for additional processing. Coupled with force-down feed, it adds up to increased output for you. And that extra jaw length gives greater nip, prevents round rocks from "pinching" out, lessens possibility of large rocks' clogging crushing chamber with consequent costly shutdowns.

Remember, too, the Lippmann Heavy Duty Jaw Crusher is *designed* to take advantage of alloy steel's great structural strength. The *alloy* steel frame, jaw and bearing caps, plus forged *alloy* steel shaft, give you a rugged, high capacity crusher. *No Lippmann crusher, with proper maintenance, has ever had a shaft or bearing failure!*

These engineering extras in the Heavy Duty Jaw Crusher are typical of the added values you get with all Lippmann equipment. Whenever you need any of the products listed below, get in touch with the Lippmann distributor near you. Or write direct to Lippmann Engineering Works, 4603 West Mitchell Street, Milwaukee 14, Wisconsin.

LIPPMANN ENGINEERING PRODUCTS for PITS, MINES, QUARRIES

- Jaw and Roll Crushers
- Pulverizers
- Vibrating and Rotary Screens
- Loaders and Conveyors
- Scrubbers and Washers
- Hoppers and Bins
- Portable Washing Plants
- Self-Propelled Crushing Plants

Distributed by

BALZER MACHINERY COMPANY, Portland
F. J. BALZER COMPANY, Seattle
N. E. OTTERSON COMPANY, San Francisco

LIPPMANN

NOW 2 100% MID-CONTINENT PARAFFIN BASE MOTOR OILS

FOR ALL INTERNAL COMBUSTION ENGINES IN ANY TYPE OF SERVICE

RICHLUBE "Premium"

Richlube "Premium" Motor Oil is solvent refined and multiple filtered from the choicest mid-continent 100% paraffin base crudes. Richlube "Premium" Motor Oils contain additives which further increase its stability in high temperature service and assure a clean gasoline or gas engine. This fine oil is recommended for all types of service except Diesels where a full detergent motor oil such as Tenol is required.

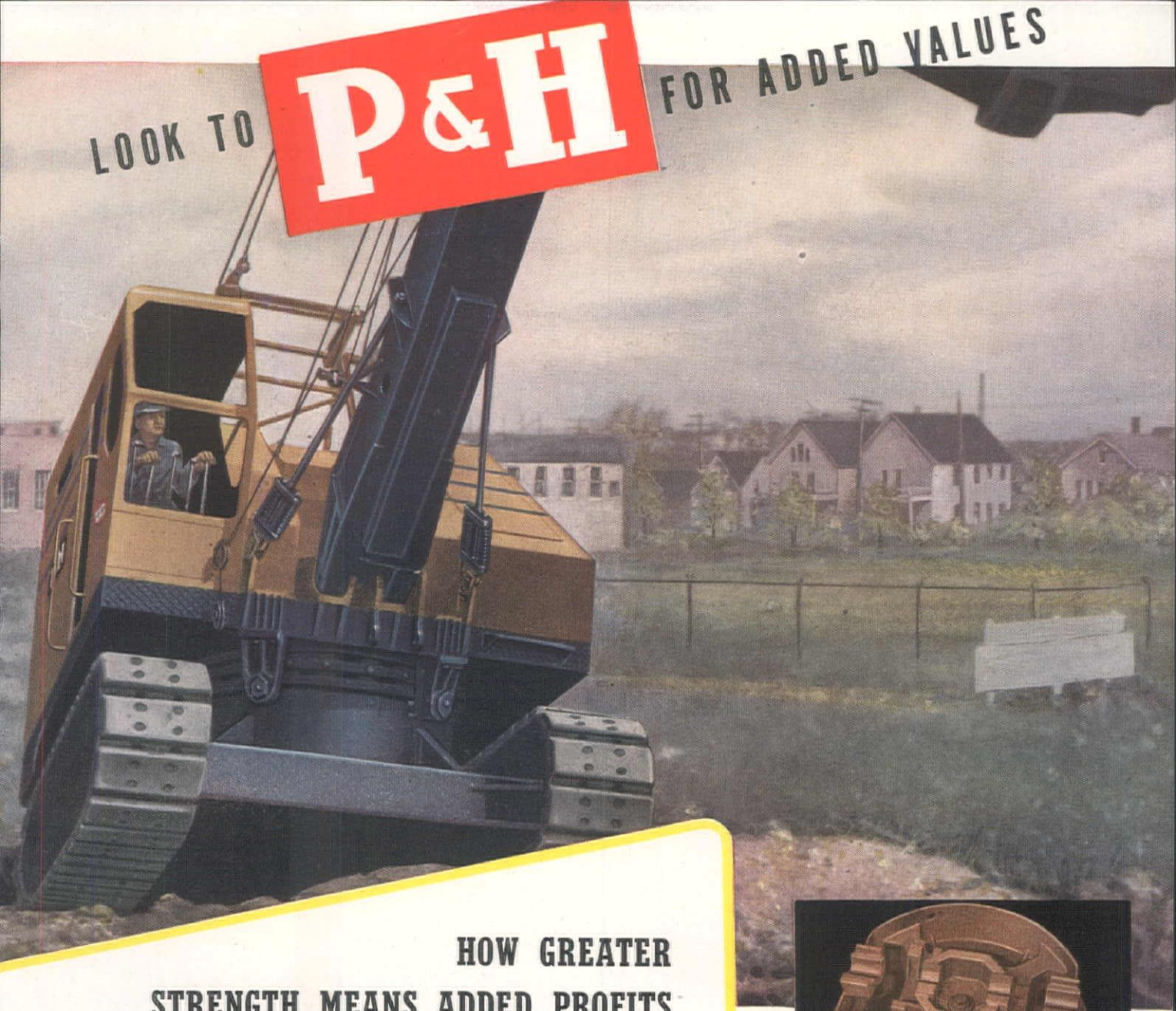
TENOL "Heavy Duty"

Richfield Tenol is the highest quality, heavy duty, full detergent, all-purpose engine lubricating oil obtainable. Tenol is also manufactured from the same fine 100% mid-continent crudes. The high viscosity index of Tenol, plus modern solvent refining methods have made this fine oil exceptionally resistant to both heat and cold. Tenol possesses high detergent qualities in addition to improved oxidation resistance. Tenol should be used in all Diesels. It should also be used in gasoline or gas engines that require a full detergent oil for maximum cleanliness and performance.

There is a scientific Richfield Lubricant for every machine in every type of service.

RICHFIELD

LOOK TO **P&H** FOR ADDED VALUES



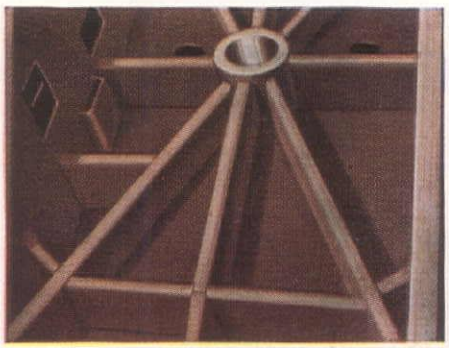
HOW GREATER STRENGTH MEANS ADDED PROFITS

As the originators of all-welded power shovels and cranes, P&H does not limit the advantages of welded construction to a few parts such as booms, etc.

P&H equipment is designed and built — from crawlers to boom point — to gain the full benefits of welded, rolled steel construction. The added rigidity and strength mean better all-around service for years to come.

You'll find a whale of a saving in yardage costs — an upswing in your job profits.

Here's the strongest carbody construction known. Axles are welded integral with turret — and crawler frames with axles. Here's one piece, trouble-free construction.



Here you see the interior web-work of strengthening members in the P&H all-welded revolving frame. Sidestands are welded integral. There are no bolted joints — alignment of machinery is permanent.

P&H

EXCAVATORS

4490 W. National Avenue
Milwaukee 14, Wisconsin

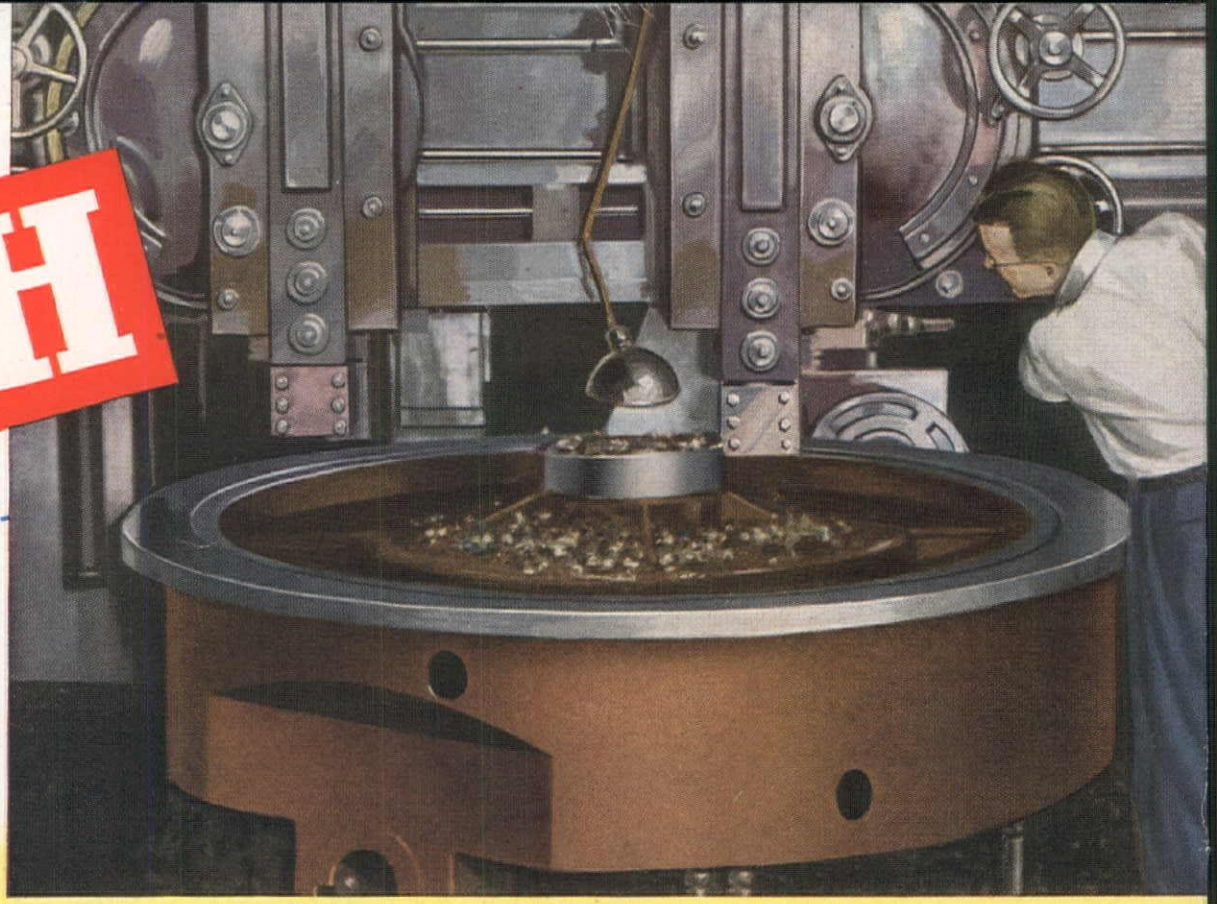
HARNISCHFEGER CORPORATION

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

Another

P&H

added value



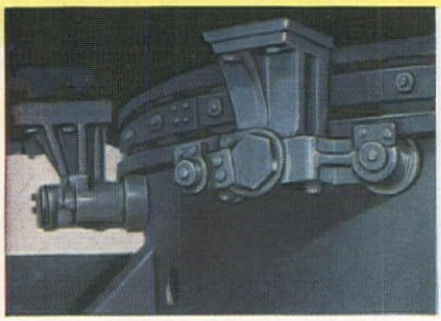
PRECISION MACHINING

As in the case of this carbody turret, each P&H welded assembly is machined, then jig-drilled or bored as a unit to insure exact alignment for shafts, bearings, etc. Since alignment does not depend on bolted joints, it is maintained throughout the life of a P&H Excavator.

Machining the roller path on a P&H 1½ yd. excavator.

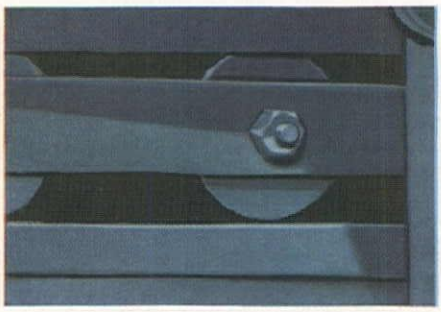
No rocking horse action between lower and upper

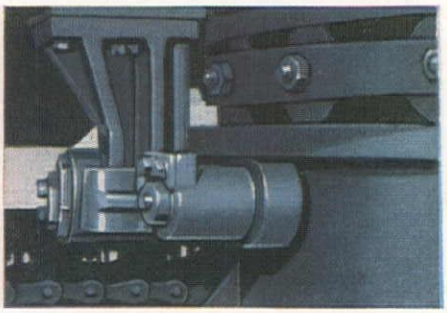
Hook rollers eliminate all stresses and strains on center gudgeon by anchoring the revolving deck, or upper, to the carbody. There's no "rocking" of the upper when dipper bites into the bank.



Live Roller Circle acts as a huge multiple roller bearing; transmits weight between upper and lower, evenly, over the entire path. There's free movement with a minimum of friction.

All weight is carried on rollers. Since no weight is carried on pins or bushings, a costly source of wear and replacement is eliminated. Another P&H added value that saves you money.





Smooth Swinging and faster operation are assured by precision-built, upper and lower structures, adjustable hook rollers and live rollers and live roller circle.

P&H's exacting all welded construction is complete — from crawler frames to boom tip — assuring greater strength and rigidity for years to come. Yet this is but one important added value which P&H offers you. Learn about all of them. Call your nearest P&H dealer, or write us.

HARNISCHFEGER CORPORATION

4490 West National Avenue, Milwaukee 14, Wisconsin

MILWAUKEE, Wis., 4490 W. National Avenue
SAN FRANCISCO, Calif., 82 Beale Street
SEATTLE, LOS ANGELES, SAN FRANCISCO

PORTLAND, OREGON . . . . Loggers & Contractors Machinery Co.
WILLOWS, CALIF. . . . . Willows Motor Sales Co.
BAKERSFIELD, CALIF. . . . . Kern Tractor & Equipment Co.
NAPA, CALIFORNIA . . . . . Berglund Tractor & Equipment Co.
SALT LAKE CITY, UTAH . . . . . National Equipment Co.
BOISE, IDAHO . . . . . Olson Manufacturing Company
EL CENTRO, CALIFORNIA . . . . . Faure Tractor & Equipment Co.
N. SACRAMENTO, CALIF. . . . . Capitol Tractor & Equip. Co.
FRESNO, CALIFORNIA . . . . . Brown Tractor Co.
SAN DIEGO, CALIF. . . . . Southern Equipment & Supply Co.
SPOKANE, WASHINGTON . . . . . F. M. Viles & Co.
RENO, NEVADA . . . . . Dennison Tractor & Supply Company
SEATTLE, WASHINGTON . . . . . Glenn Carrington & Co.

How much . . . how far?

That's all you specify! . . .
with Pioneer Super-Service Conveyors

Here's a new, simple way to order conveyors. It saves you time and money. It assures the most satisfactory conveyor for your job.

It's as easy as this. Tell Pioneer what material you want to move—how much—how far—and Pioneer takes care of all engineering details. You are assured of a Super-Service Conveyor pre-engineered to handle a *maximum load at the maximum incline.*

These new, standardized conveyors range in length from 30 to 120 feet—in five foot increments. Shipped knocked down or partially assembled, Super-Service Conveyors arrive on your job straight and true—ready for quick assembly. They save hours of set up time—meet varied conditions of lift.

For special jobs and fixed installations, Pioneer makes job-engineered conveyors. Write now for complete details.

PIONEER ENGINEERING WORKS

1515 Central Avenue — Minneapolis 13, Minnesota

For Longer Life . . . Lower Upkeep

- ***All welded steel idler*** supports for strength with light weight.
- ***Inverted base angle*** on idler supports for self cleaning.
- ***Dependable Timken bearings*** for lasting performance.
- ***One-shot Alemite fittings*** with labyrinth seals retain grease, keep out dirt.
- ***Troughing idlers tilted*** in direction of travel—keep belts straight and true.
- ***Lattice frame construction*** for strength and rigidity.

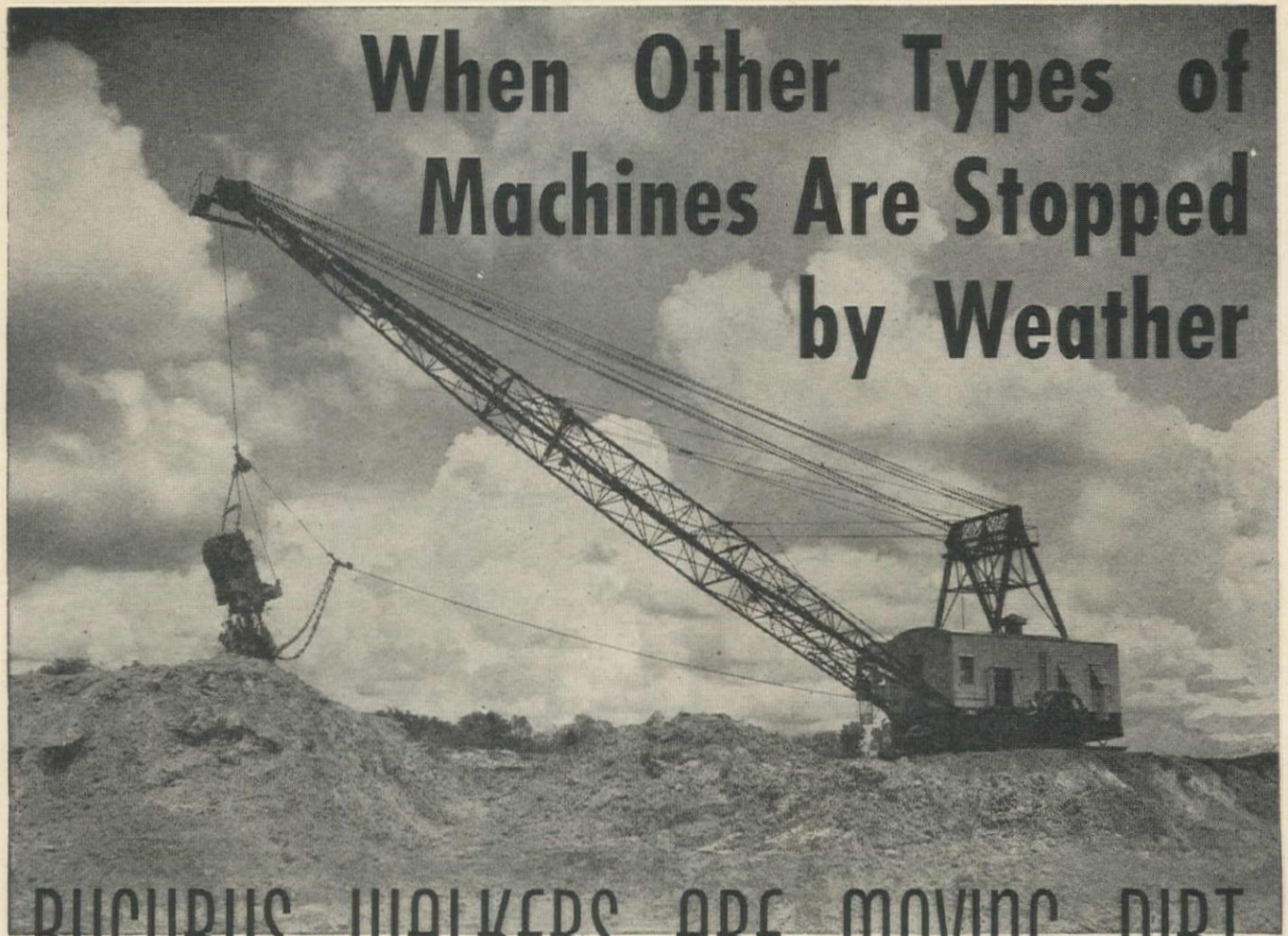
BUY BOTH—

Higher Output, Lower Upkeep!

Pioneer

Continuflo **EQUIPMENT**

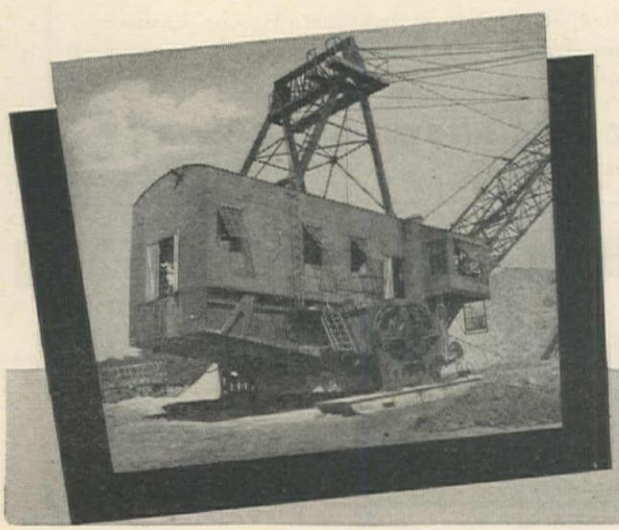
Neil B. McGinnis Company, Phoenix, Arizona; Pioneer Machinery Company, Idaho Falls, Idaho; Tractor & Equipment Company, Sidney, Montana; Westmont Tractor & Equipment Company, Missoula, Montana; Coast Equipment Company, San Francisco; Central Machinery Company, Great Falls, Montana; Wortham Machinery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



When Other Types of Machines Are Stopped by Weather

BUCYRUS WALKERS ARE MOVING DIRT

Let it rain, let footing get soft and muddy, and that's the automatic "quit" signal for most excavators. But with Bucyrus-Erie walking draglines, work goes on as usual under those — and worse—conditions. Their unique stability while digging or moving lets them continue to deliver the big output for which they're famous in the face of such conditions.



For walking, the exclusive rolling cam always produces smooth action, cushioning the machine down, while the large shoes and circular base provide plenty of bearing area to insure safe, sure progress in spite of soft footing. During digging, the machine's center of gravity is always kept within predetermined limits so that rim pressures stay safely low and there's little coning of the ground under the machine. Because the operator knows he can count on Bucyrus-Erie "sure-footedness," he can use all the machine's "years ahead" speed and capacity even when bad weather has halted other units.

BOOMS: 110 to 250 ft.
BUCKETS: 4 cu. yd. to 25 cu. yd.

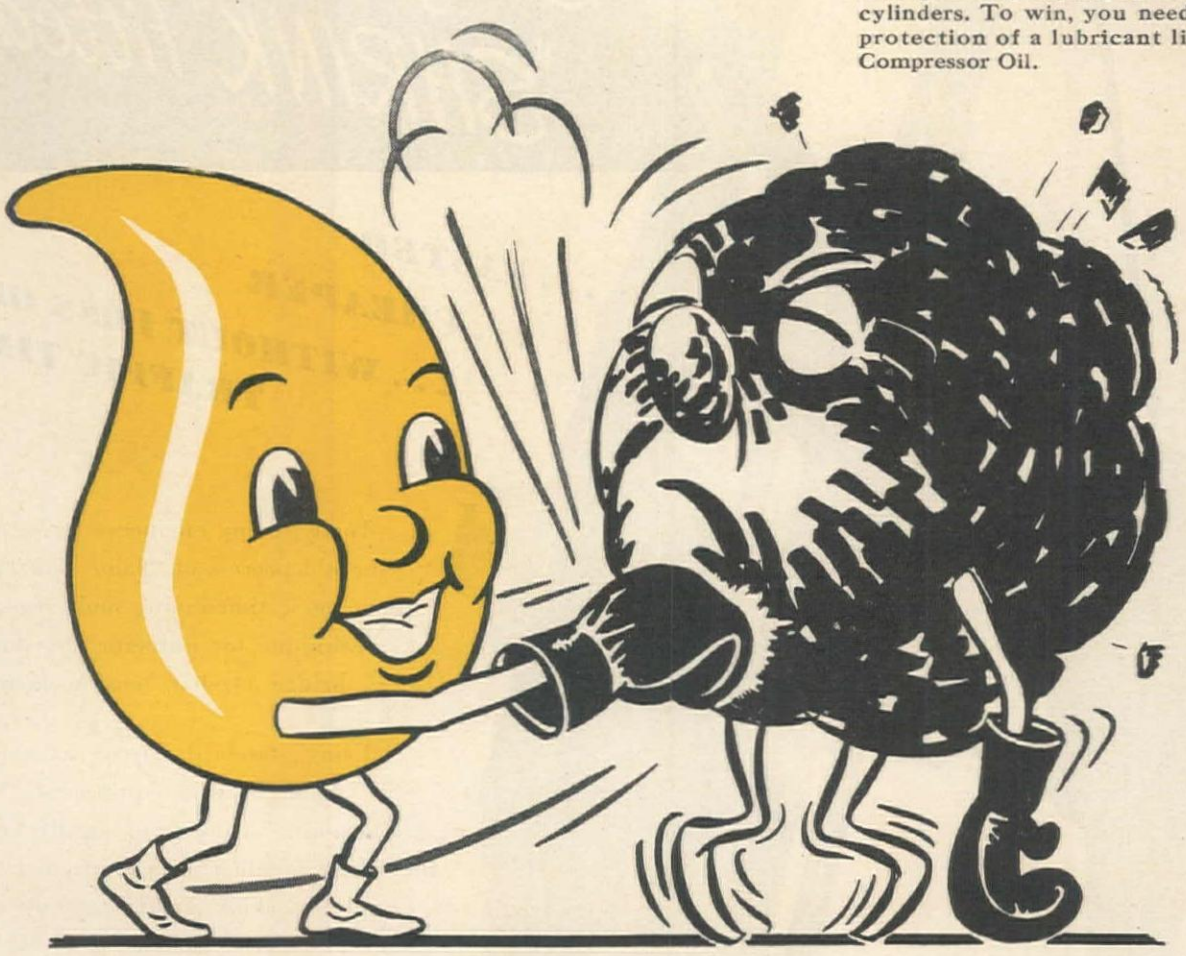
22M47

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

The furious fight against CARBON

is fought every day in your compressor cylinders. To win, you need the full protection of a lubricant like Shell Compressor Oil.



SHELL COMPRESSOR OILS protect your compressor

Your compressor cylinders have extra freedom from ring-freezing, valve-sticking carbon when you are using Shell Compressor Oil. Because this lubricant is defended against oxidation by special refining methods. Moreover, it has effective rust preventive properties that still further protect your compressor.

Ask the Shell Lubrication Engineer to tell you the full story of Shell Compressor Oil. Get his advice on the lubrication of any type of air or gas compressor. For literature, write Shell Oil Company, Incorporated, 50 West 50th Street, New York 20, New York; or 100 Bush Street, San Francisco 6, California.

SHELL COMPRESSOR OILS

SHELL ®

Bridge Braces "SHRINK" fitted

. . . FASTER
. . . CHEAPER
. . . WITHOUT LOSS OF TRAFFIC TIME

Today, many engineers have turned the old process of "flame shortening" into a new time-saving and cost-saving technique for reducing the slack in bridge eye-bar tension members.

Using standard Airco oxyacetylene flame heating equipment, "flame shortening" consists of locally heating the bridge member to be shortened, while applying axial, upsetting pressure to the member by means of a yoke. The yoke is clamped to the member on each side of the spot being heated.

Fast . . . economical . . . without any apparent effect upon the fatigue strength or the static strength of the steel, this modern adaptation of an old process can shorten eye-bars as heavy as 10″ x 2″ . . . and, can be carried on during the heaviest road traffic — an important factor to consider when determining work feasibility.

For further information about this unique process, write your nearby Airco office, or: Air Reduction, General Offices, 60 East 42nd St., New York 17, N. Y. In Texas: Magnolia Airco Gas Products Company, Houston 1, Texas.

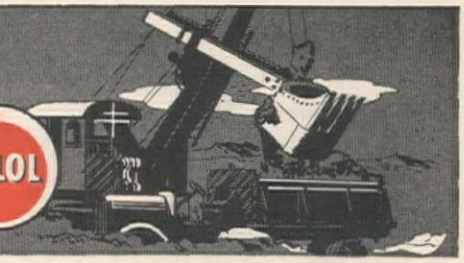
AIRCO **AIR REDUCTION**

Offices in All Principal Cities

Headquarters for oxygen, acetylene and other gases . . . carbide . . . gas welding and cutting apparatus and supplies . . . arc welders, electrodes and accessories

STANDARD ENGINEERS NOTEBOOK

CALOL RPM

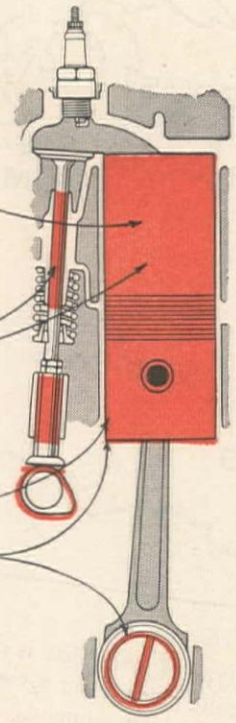


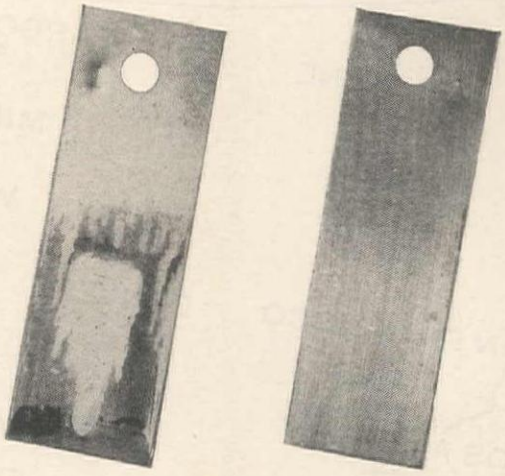
① Adhering agent in RPM Compounded Motor Oil keeps oil film on all parts after engine stops, even on cylinder walls.

② Rustproofing compounds prevent moisture that condenses on cooling parts from contacting metal.

③ No rust is formed to scrape off when engine starts, and cause excessive wear.

④ Constant lubricant film provides adequate and instant lubrication when engine starts.





This actual photograph shows how one HIGH-QUALITY MOTOR OIL "peeled" off almost all of this test strip of steel when it was placed in corrosive-moisture conditions similar to those in a cooling engine. The oil concentrated at one spot and the unprotected surface quickly rusted.

RPM COMPOUNDED MOTOR OIL kept this strip bright and shiny, completely sealed against rusting, when it was exposed to the same conditions. "RPM" compounds keep a constant rust-proofing lubricant film on engine parts at all times, whether they are idle or moving.

How RPM Motor Oil Rust-Proofs As It Lubricates

Rusting, caused by corrosive moisture, is the greatest source of wear in automotive engines (85%, according to some engineers). It can be controlled by using RPM Compounded Motor Oil.

Additional compounding for "RPM," perfected by Standard of California scientists, provides a rust-proofing lubricant film on internal engine surfaces. The heaviest moisture condensation in idle or cold-running engines will not cut through it.

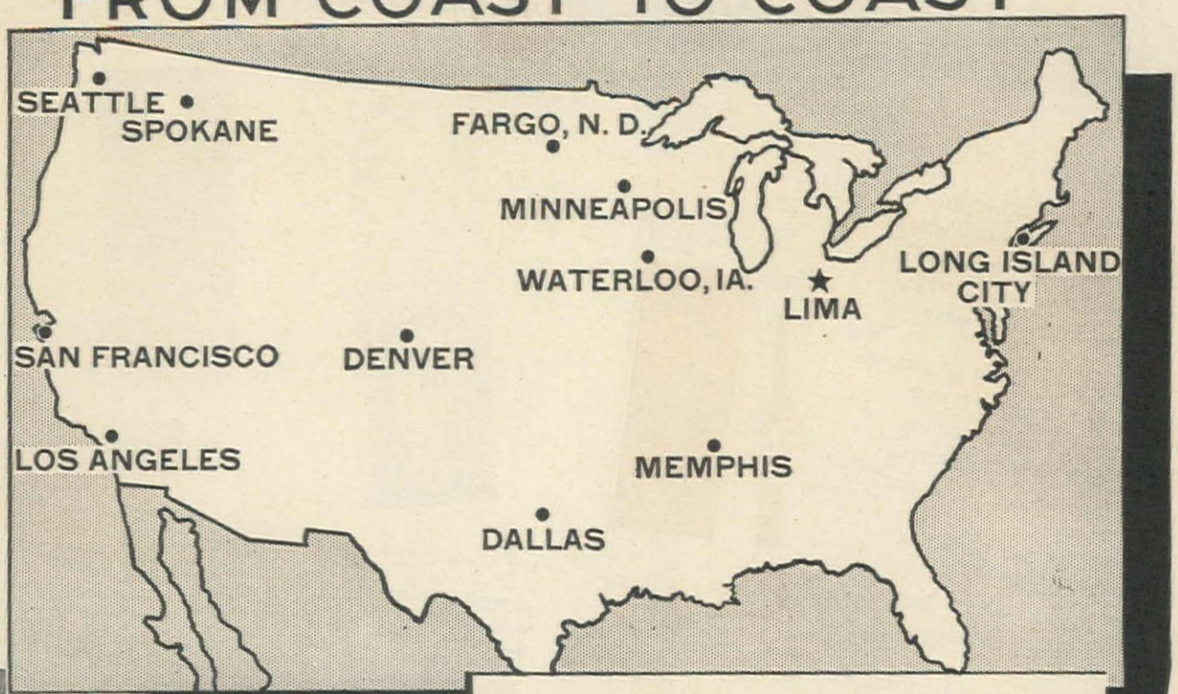
Other compounds in RPM Motor Oil give it adherent qualities so the film stays on parts at all times. They also loosen and remove gum and lacquer, lubricate hot spots, resist sludge formation, bearing corrosion and stop foaming.

Trademark "RPM" Reg. U. S. Pat. Off.

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

FOR EVERY NEED A STANDARD OF CALIFORNIA JOB-PROVED PRODUCT

SERVICE
FROM COAST TO COAST



The type of work that is done by a shovel, crane or dragline places it in a class by itself when it comes to taking punishment. Heavy excavating, overloading, improper care all take their toll. We at LIMA go the limit to build equipment that will withstand a normal amount of rough usage but regardless of how well a machine is built, there are times when parts must be replaced. Our interest in a customer does not end with the sale and delivery of a shovel, crane or dragline. We are ever ready to serve you at a moments notice as long as the machine is in service. A complete record of each machine we build is preserved so that when a part is ordered the customer can be sure that it will fit accurately. Parts are shipped the same day the order is received whenever possible. Special attention will be given to your request for parts service from headquarters located in the cities shown on the above map.

LIMA LOCOMOTIVE WORKS, INCORPORATED

Shovel and Crane Division · Lima, Ohio, U. S. A.

THE LIMA DIAMOND

FOR OVER 75 YEARS AN EMBLEM OF QUALITY WORKMANSHIP

LIMA

LIMA

Capacities . . . SHOVELS ¾ YARD TO 5½ YARDS • CRANES 13 TONS TO 100 TONS • DRAGLINES VARIABLE

Sales Agents: Our Seattle Office: 1932 First Avenue South, Seattle 4, Washington. Our San Francisco Office: 1315 Howard Street, San Francisco 3, California. Feenaughty Machinery Company, 112 S.E. Belmont Street, Portland 14, Oregon; 600 Front Street, Boise, Idaho; Smith Booth Usher Company, P. O. Box 3578 Terminal Annex, Los Angeles 54, California; Hold-McCoy Machinery Company, 3201 Brighton Blvd., Denver 5, Colorado; Smith Booth Usher Company, 1756 Grand Avenue, Phoenix, Arizona; Contractors' Equipment and Supply Company, Springer Building, P. O. Box 456, Albuquerque, New Mexico; Modern Machinery Co., Inc., 4412 Trent Avenue, Spokane 2, Washington; Jameson Engineering Sales, Fairbanks, Alaska; Foulger Equipment Company, Inc., P. O. Box 87, Salt Lake City 8, Utah.

NEW! THE OZALID STREAMLINER

- Reproduces your engineering and architectural drawings in seconds—also your typed, printed, photographic material.
- Moderately priced . . . designed for the thousands of drafting rooms that want these 5 EXTRA VALUES in Printmaking at no extra cost—

1. EFFICIENCY! You always get positive (not negative) prints direct from your tracings . . . prints that are sharper, brighter, much easier for you to read, check, and make notations on.

You produce these without waste of material or waste of motion. Your tracings can be up to 42 inches wide, any length . . . and can be printed either on rolls of Ozalid sensitized paper or on cut sheets of matching size.

Your prints are always delivered dry, ready for immediate use . . . after just two simple operations—Exposure and Dry Development.

2. SPEED! ONLY 25 seconds to reproduce your standard-size tracings, specification and data sheets, etc.

3. ECONOMY! An 8½ x 11-inch reproduction costs you *one cent;* 11 x 17 inches, two cents . . . and so on. The Ozalid Streamliner soon pays for itself . . . in time, labor, and dollars saved.

With it, you can also effect amazing short cuts in design. For example—eliminate redrafting when changing obsolete drawings . . . combine the details of separate tracings on *one* print . . . re-

claim old or worn tracings . . . make transparent overlays in different colors.

4. VERSATILITY! You can reproduce the lines and images of any original in black, blue, red, sepia, or yellow . . . on paper, cloth, foil, film, or plastic.

Simply use the Ozalid sensitized material you think best for job at hand; e.g., use identifying colors for prints of separate departments or operations . . . DRYPHOTO to produce beautiful con-

tinuous-tone prints from film positives (which can be made from any negative) . . . OZAPLASTIC to produce oilproof, waterproof prints for shop or field use. *All* prints are made in same fast, economical manner.

5. SIMPLICITY! NOW—printmaking is an easy desk job, automatic in practically every detail.

Anyone can feed originals and sensitized material into the Ozalid Streamliner. Prints are delivered on top, stacked in order—within easy reach of the operator, who does not have to leave her chair.

You can install your Streamliner anywhere; it requires only 11 square feet of floor space.

Write today for free, illustrated booklet . . . showing all the ways you can use the new OZALID STREAMLINER . . . and containing actual reproductions — like those you can make.

Gentlemen: DEPT. 317
Please send New Ozalid Streamliner booklet . . . containing reproductions of drawn, typed, printed, and photographic material. No obligation.

Name_____

Position_____

Company_____

Address_____

OZALID

DIVISION OF
GENERAL ANILINE AND FILM CORPORATION
Johnson City, New York

Ozalid in Canada
Hughes Owens Co., Ltd., Montreal

over 7,000,000 barrels DELIVERED ON THE JOB ON TIME!

That's PERMANENTE'S war record in the Pacific. After Pearl Harbor, Permanente was called upon to provide all the bulk cement required for the rapidly expanding Pacific Air Bases, fortifications and other military installation. Here's a part of Permanente's record; we are proud of it . . .

- Speeded up delivery by bulk shipment of cement in 2 bulk cargo carriers, each having a capacity of 40,000 barrels. Loading time, *24 hours!*
- Delivered over 7,000,000 barrels of Permanente Cement in bulk to the Pacific War Theatre . . . 1940 to October 1945.
- In addition to bulk deliveries, an emergency order of 532,000 bags was delivered in 15 days! By the war's end, the average *daily* delivery of sacked cement was over 60,000 bags.
- Not a single cargo of Permanente Cement missed a convoy deadline.

PERMANENTE'S WAR PRODUCTION RECORD HAS MADE POSSIBLE OUR PEACE-TIME SLOGAN: "100 BARRELS OR 100,000 BARRELS, DELIVERED ON THE JOB ON TIME!"

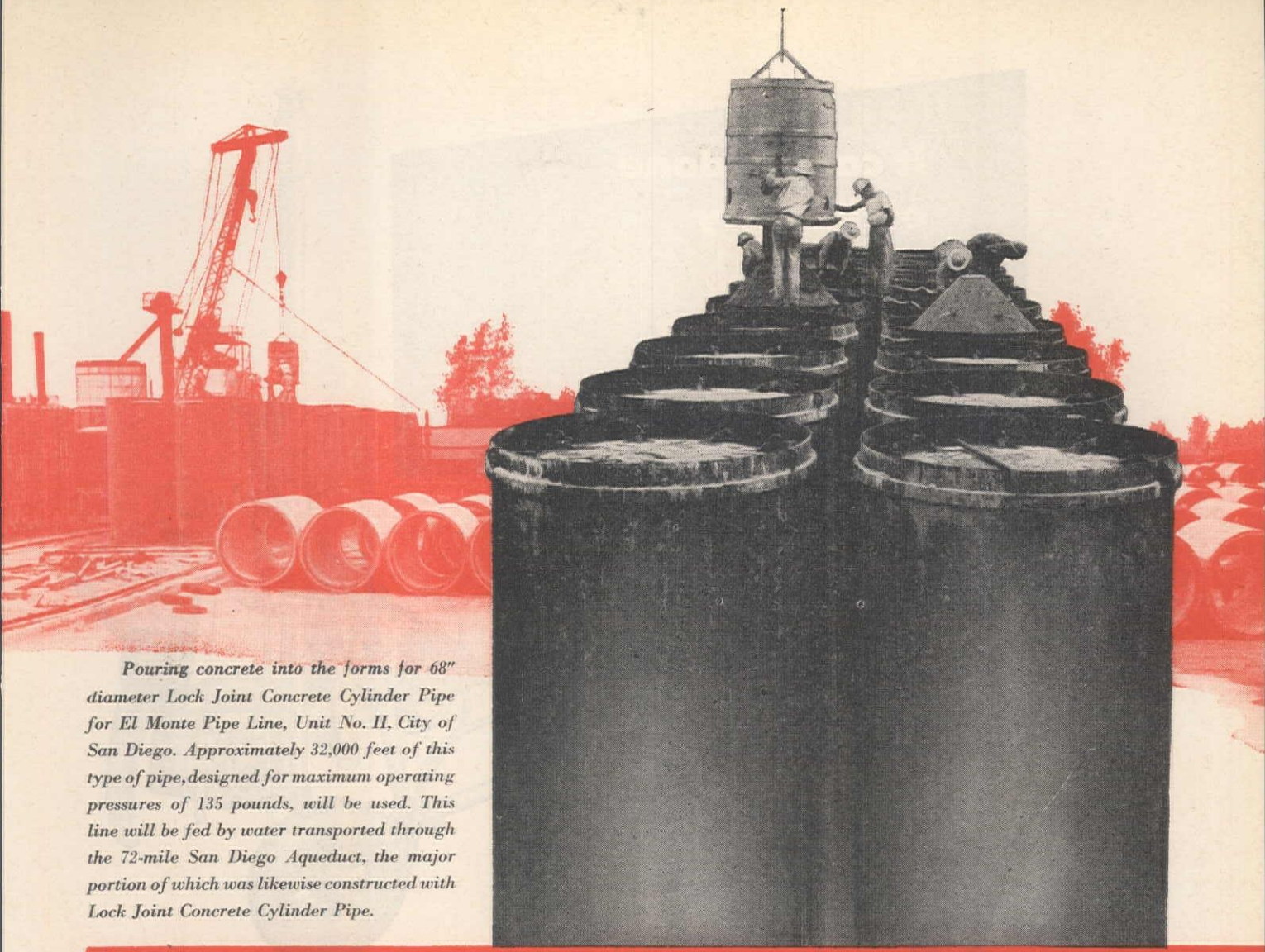
PERMANENTE CEMENT COMPANY

On the job - On time

PERMANENTE CEMENT COMPANY

PERMANENTE, SANTA CLARA, YOSEMITE AND KAISER BRANDS OF PORTLAND CEMENT AND PERMANENTE LIME PRODUCTS

OAKLAND · SEATTLE · HONOLULU



Pouring concrete into the forms for 68" diameter Lock Joint Concrete Cylinder Pipe for El Monte Pipe Line, Unit No. II, City of San Diego. Approximately 32,000 feet of this type of pipe, designed for maximum operating pressures of 135 pounds, will be used. This line will be fed by water transported through the 72-mile San Diego Aqueduct, the major portion of which was likewise constructed with Lock Joint Concrete Cylinder Pipe.

Another step forward – IN THE 75 YEAR HISTORY OF CONCRETE CYLINDER PIPE PROGRESS

One of the first important concrete cylinder pipe line installations in this country was a main water supply line for the City of Portland, Maine. Installed during the years 1868 to 1878, it was comprised of 154,000 feet of 20", 24" and 26" light gauge riveted iron cylinder pipe coated inside and out with natural cement concrete. Some 60 years later this old line was still in service when the need for a system of greater capacity was met by a new 48" line of Lock Joint Concrete Cylinder Pipe. Between the years 1868 and 1947, concrete cylinder pipe has become the foremost main water supply line material in the United States.

This El Monte pipe line is just another in the long series of successful concrete cylinder pipe lines which have been installed in recent years in this and other areas.

This company has enjoyed a wide experience in the field of water supply line engineering and construction over a long period of years and this experience and training are available to water works officials and engineers. Information available upon request.

Quality Pipe Line Products Manufactured and Installed by American Include:

Lock Joint Concrete Cylinder Pipe

Prestressed Lock Joint Concrete Cylinder Pipe

American Concrete Cylinder Pipe

Centrifugal Concrete Pressure Pipe

Main Office and Plant –
4635 Firestone Blvd.
South Gate, California

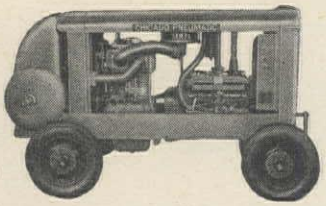
District Offices and Plants –
Oakland • San Diego
Portland, Oregon

American PIPE & CONSTRUCTION COMPANY

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

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

it can be done efficiently with CP construction equipment



- You can count on fuel savings of 15% to 35% with a CP Portable Compressor, with its economical engine and gradual speed regulator. Models from 60 to 315 c.f.m., gasoline-driven; from 105 to 500 c.f.m., Diesel-driven.

- Four feet a minute through gravel is easy with CP-116 Sheeting Driver.

- CP Sump Pump starts instantly; simply turn on the air, lower Sump Pump into water and pumping begins.

One of the many outstanding CP time-savers for contractors is the G-200R lightweight Wagon Drill. With its three roller-bearing, pneumatic-tired wheels, it can be moved with ease and speed, even over rough ground, and it will drill holes at any angle. Designed for one-man operation, and fast drilling with the more powerful CP drifter drills.

The complete line of CP construction equipment includes sinker drills, impact wrenches, backfill tampers, sludge pumps, etc. Your CP representative will gladly give you full information on whatever tools you need for any particular job—or write for Catalog 600.

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

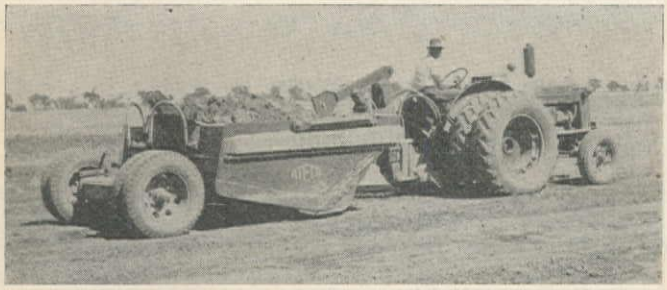
Distributors

WESTERN MACHINERY CO., 760 Folsom St., San Francisco, Calif., Phone: EXbrook 4167; WESTERN MACHINERY CO., 500 North 16th St., Sacramento, Calif.; Phone: 2-1211; WESTERN MACHINERY CO., 5722 So. Santa Fe Ave., Los Angeles, Calif., Phone: LOgan 3371; BALZER MACHINERY COMPANY, 2136 S.E. Eighth Ave., Portland, Oregon; WESTERN MACHINERY CO., N. 808 Division St., Spokane, Washington; HALL-PERRY MACHINERY CO., 812 E. Iron St., Butte, Montana; Lomen Equipment Co., Inc., Seattle-Alaska.

Note (above) the simplicity of the ATECO scraper — no gingerbread, no elaborate maze of pipe, hose and couplings, no multiple cable reevings, no heavy bowl-carrying side members. The ATECO is simply built to get big loads like this quickly and with a minimum of horsepower.

NOW AVAILABLE

ATECO SCRAPERS FOR BOTH CRAWLER and HEAVY-DUTY WHEEL TRACTORS



This combination (above) of ATECO 2-wheel Scraper and International I-9 wheel tractor travels up to 15 m.p.h. Because of its *speed*, you can move more yardage with fewer units and thus save on equipment investment and labor. This combination costs 25% to 40% less than self-propelled scrapers of similar capacity. Can be used on or off the highway. Scraper is easily disconnected so you can use tractor for other work.

Ask your International dealer to show you how ATECO Scrapers compare in simplicity, performance and price with other well-known makes.
Call him NOW... See for yourself.

ATECO Scraper with either wheel or crawler tractor is a complete earthmoving unit . . . no pusher needed . . . check its simple design, performance and price against any other make.

You get big loads right now with the "boiling-bowl" action of ATECO Scrapers whether you're using crawler or rubber-tired tractors. You are able to dig faster in tough materials because the hinged rear truck, operated by a single hydraulic cylinder, puts the full weight of the scraper bowl on the cutting edge. Topheavy overhead structures are eliminated to give you a low center of gravity. This gives you more stability, speed and greater yardage when pioneering cuts, working bad grades or finishing.

Longer Life — More Pay Dirt

ATECO's patented open top design reduces working parts and dead weight. You get longer scraper life, lower maintenance cost and your tractor hauls more pay dirt, less useless weight. Made in 5 sizes—4.5, 5.6, 6.9, 8.3, and 10 heaped yards. Quick delivery on most sizes.

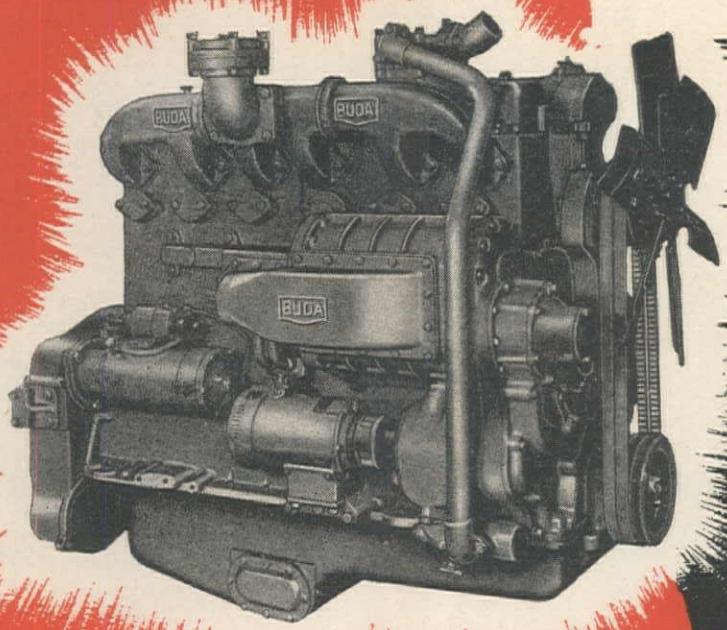
AMERICAN TRACTOR EQUIPMENT CORPORATION

Mack Wooldridge, President — Darrel Wooldridge, Vice President

9131 SAN LEANDRO BLVD. • OAKLAND, CALIFORNIA • Phone SWeetwood 8-2466 • Cable Address: ATECO, OAKLAND, CALIFORNIA

BULLDOZERS . . . ROADBUILDERS . . . SCRAPERS . . . TAMPERS . . . RIPPERS . . . FARM IMPLEMENTS . . . FRONT LOADERS . . . TRACTOR CRANES . . . SUBSOILERS . . . PUMPS . . . VALVES . . . CYLINDERS . . . HYDRAULIC MOTORS . . . OIL HOSE AND FITTINGS

SOLD & SERVICED by INTERNATIONAL DEALERS in California, Oregon, Washington, Idaho, Montana, Wyoming, Utah, Nevada, Colorado, Arizona, Texas, Oklahoma, Kansas, and Missouri.



BUDA *Supercharged* DIESEL

provides *RUGGED POWER*

for the new

LaPLANT CHOATE

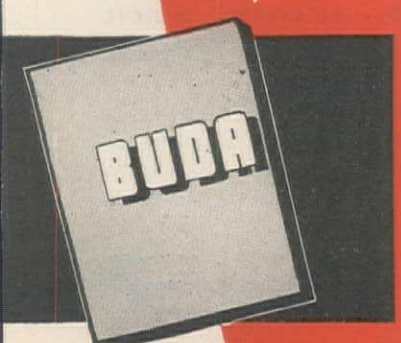
MOTO-SCRAPER

6-cylinder
MODEL 6-DCS-844
225 Horsepower
featuring

- ☆ fast starting
- ☆ high torque
- ☆ slow-pressure combustion
- ☆ low upkeep
- ☆ long life
- ☆ clean exhaust

After a series of comprehensive tests, LaPlant-Choate Mfg. Co., Inc., selected the BUDA 6-cyl. Supercharged Diesel Model 6-DCS-844 as standard motive power for their new high-speed MOTO-SCRAPER. This powerful, high-torque, compact engine provides the kind of rugged, trouble-free power LaPlant-Choate customers need for their toughest earthmoving jobs.

Follow the example of the leading construction equipment manufacturers . . . specify BUDA *power-proved* Diesels for low cost, long term service.



Write for your copy of the new illustrated BUDA Catalog describing the use of BUDA Diesels in all types of highway and off-highway equipment. Ask for Bulletin 1332.

WORLD-WIDE SERVICE AND PARTS

BUDA

15424 Commercial Avenue
HARVEY *(Chicago Suburb)* ILLINOIS

BUDA ENGINE DISTRIBUTORS: Soulé Equipment Co., Freight & Ferry Streets, Oakland, Sacramento & Stockton, Calif.; Production Equipment Co., Inc., 651 East Gage Ave., Los Angeles 1, Calif.; 303 N. Chester Ave., Bakersfield, Calif.; Sierra Machinery Co., 307 Morrill Ave., Reno, Nevada; Nelson Equipment Co., 5251 S.E. McLaughlin Blvd., Portland, Oregon; Buda Engine Sales & Service, 1013 - 23rd St., Denver, Colo.; Buda Engine & Equip. Co., Inc., 427 Ninth Avenue, North, Seattle 9, Washington; Drake & Bullen, 1150 Harbor Dr., San Diego 1, Calif.; Simson-Maxwell, Ltd., 1931 W. Georgia St., Vancouver, B. C.; Craskey-Carlson Co., 16 - 1st Ave., Kalispell, Mont.; J. K. Wheeler Machinery Co., 171 W. South Temple St., Salt Lake City, Utah.

Built Stronger to Last Longer

★ You don't have to worry about those rough, tough, grading jobs—not when you have an Adams Motor Grader on the job.

Adams Motor Graders are built with a big, extra measure of strength and stamina, through and through. They've got everything it takes for handling punishing jobs—for punching shale out of hillsides—making heavy ditch and bank cuts—scarifying hard surface material—bucking through deep snow drifts, etc.

Yet, for all their great strength and stamina, Adams Motor Graders are not bulky or overweight. Theirs is the hard, lean strength of a trained athlete—free of all excess weight. That's why Adams Graders are so economical to operate and maintain—why they can be depended on to deliver efficient, reliable service, year after long year.

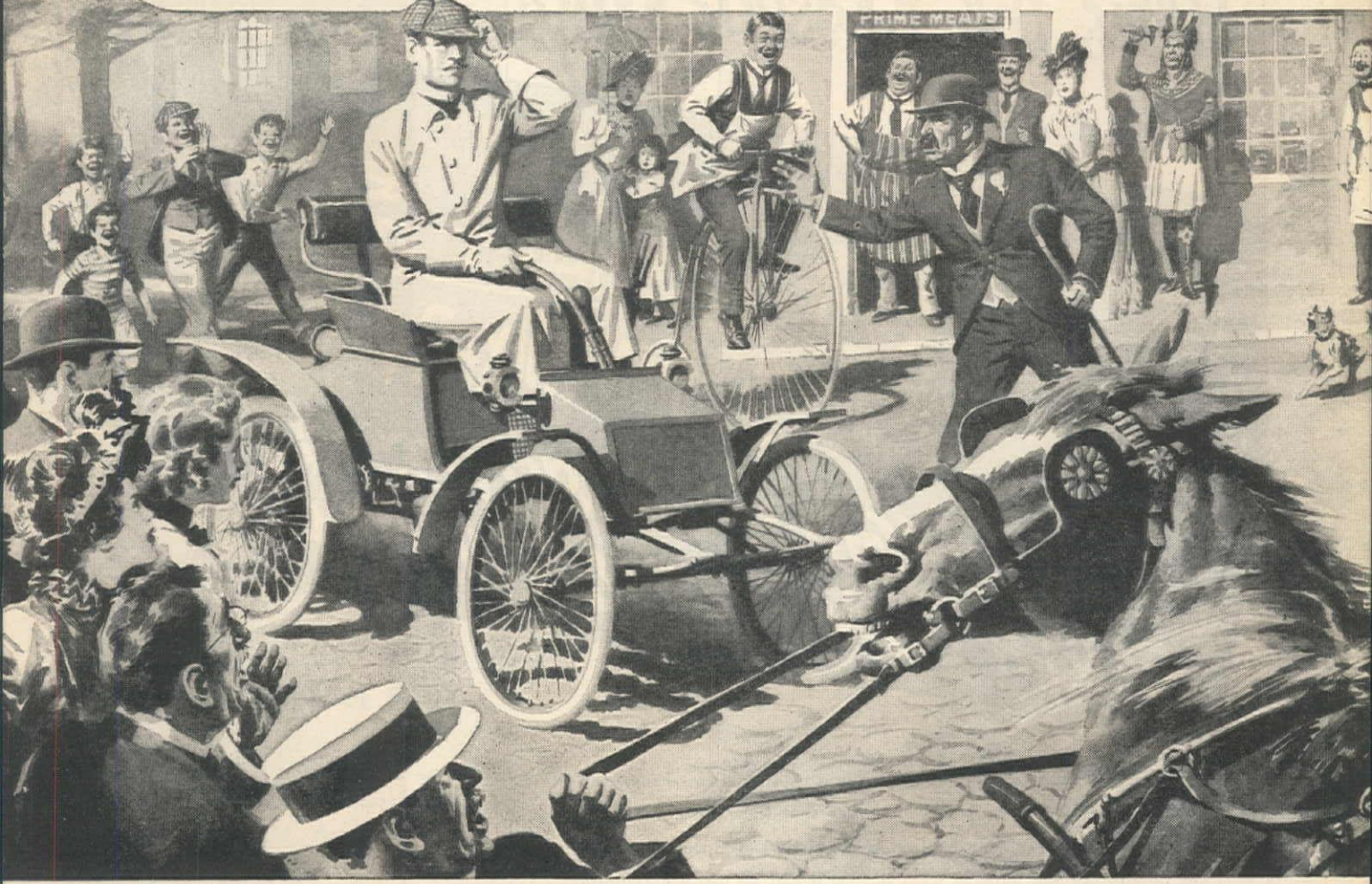
See your local Adams dealer. Let him show you why Adams Motor Graders are *Your Best Buy—All Ways.*

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, Oakland, 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—The O. S. Stapley Company, Phoenix • COLORADO—McKelvy Machinery Co., Denver • IDAHO—Intermountain Equipment Co., Boise, Pocatello • MONTANA—Industrial Equipment Co., Billings, Missoula; Hi-Line Equipment Co., Great Falls • NEVADA—Brown Motors, Reno; Clark County Whse. Merc. Co., Las Vegas • NEW MEXICO—Hardin & Coggins, Inc., 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 Equipment Co., Billings, Montana; The Lang Company, Salt Lake City, Utah.

CONFIDENCE... how much is it worth?



IT WAS NINE YEARS before the first gasoline-driven automobile in the United States was operated by C. E. Duryea that the Brooklyn Bridge was opened in 1883. This fabulous engineering achievement was the culmination of over 26 years of planning and building, of bold vision and heart-breaking struggle, by John A. Roebling and his son Washington.

But the steadfast confidence of father and son in the success of their amazing venture is vindicated daily by the modern traffic this world-famous bridge continues to carry now . . . 64 years later.

How much is that confidence worth to you today . . . and to the John A. Roebling's Sons Company, now embarked on a multi-million dollar expansion program to meet the future's challenge?

Confidence is the driving power behind our efforts to make better products do better work for you.

You Can't Go Wrong—If You Use the Right "Blue Center" Rope

There's no better way to save wire rope dollars than to use the right rope for your job. That means the right grade of steel, the correct construction, the proper size. And your choice is easy when you specify Roebling "Blue Center" Steel Wire Rope.

In "Blue Center" you get what we feel sure is the finest rope steel made. Secondly, you have a wide range of constructions and sizes to choose from . . . in both preformed and non-preformed types.

Why not make the Roebling Field Engineer your right-hand man in selecting wire rope that will give you peak performance at the lowest overall cost? You can call or write him at our nearest branch office.

JOHN A. ROEBLING'S SONS COMPANY
OF CALIFORNIA

San Francisco • Los Angeles • Seattle • Portland

The *RIGHT* steel . . .
The *RIGHT* construction . . .
The *RIGHT* size . . .
—FOR YOUR JOB!

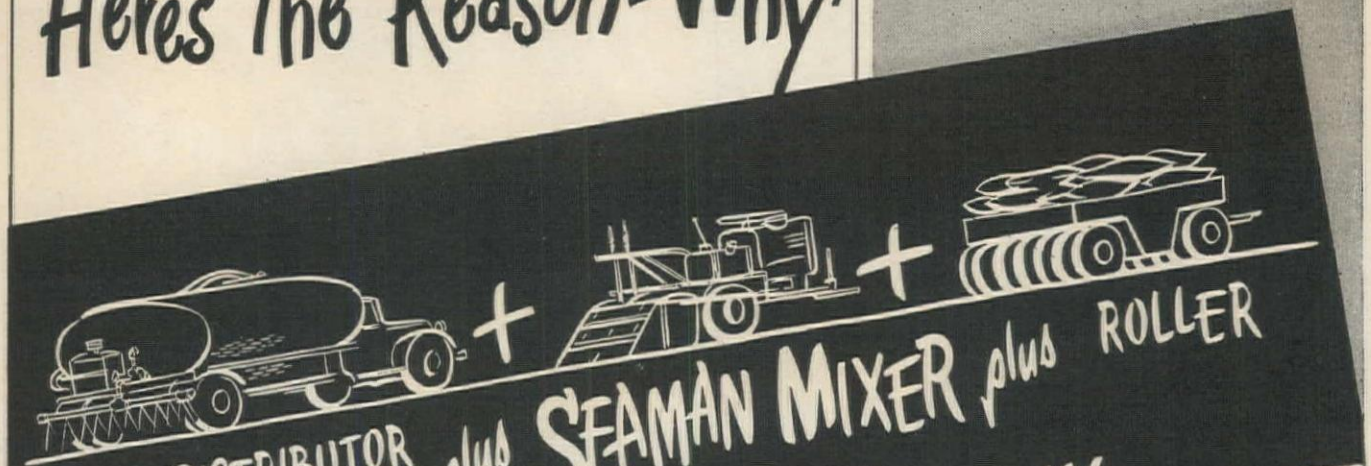
Manufacturers of Wire Rope and Strand • Fittings • Slings • Screen, Hardware and Industrial Wire Cloth • Aerial Wire Rope Systems • Hard, Annealed or Tempered High and Low Carbon Fine and Specialty Wire, Flat Wire, Cold Rolled Strip and Cold Rolled Spring Steel • Ski Lifts • Electrical Wire and Cable • Suspension Bridges and Cables • Aircord, Aircord Terminals and Air Controls • Lawn Mowers

ROEBLING

A CENTURY OF CONFIDENCE

JAR ROEBLING

Here's the "Reason-Why"

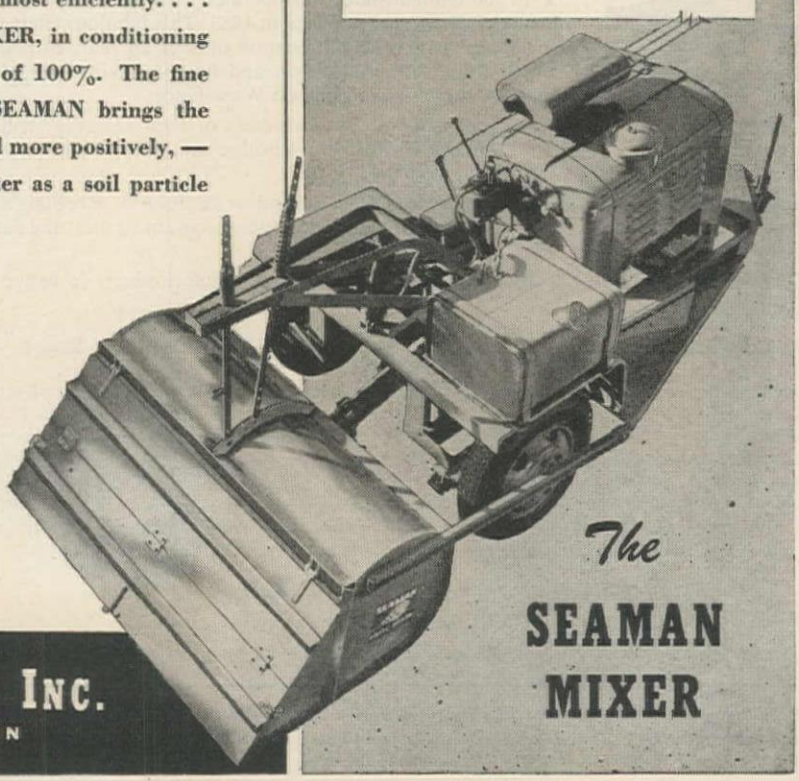


WATER DISTRIBUTOR plus SEAMAN MIXER plus ROLLER MEANS HIGHER DENSITIES IN EARTH COMPACTION WORK

Compaction simply means that the minute soil particles have been moved by pressure, so closely together that they are bound in a dense mass. . . . But soil must first be pulverized (reduced as closely as possible to soil particle size) before it can be given maximum compaction, — for the water addition, which acts as a lubricant to permit the soil particles to move closely together, must form a film around each particle to perform this function most efficiently. . . . There's the vital reason why the SEAMAN MIXER, in conditioning soil for compaction, makes possible densities of 100%. The fine soil pulverization readily produced by the SEAMAN brings the moisture content to optimum more quickly and more positively, — and thus gives maximum efficiency to the water as a soil particle lubricant. . . . Even in compaction operations where no water was used, the SEAMAN, used to pulverize each lift prior to rolling, has repeatedly and consistently developed densities of 95%. . . . So, for all earth compaction work, whether for dams, levees, or fills, — get maximum density more quickly, — and more cheaply with the SEAMAN . . . It's as vital to soil compaction as the rolling equipment.

HAVE YOU YOUR 1947 COPY?

The ever-popular book "Soil Stabilization Methods", compiled by Seaman engineers is yours on request. Just ask for Bulletin N-25.



The SEAMAN MIXER

SEAMAN MOTORS, INC.
MILWAUKEE 3, WISCONSIN

Peerless Equipment Co., Los Angeles, Calif.; Buran Equipment Co., Oakland, Calif.; Contractors' Equipment Corp., Portland, Ore.; Service Equipment Co., Seattle, Wash.; Fred M. Viles & Co., Spokane, Wash.; Intermountain Equipment Co., Boise, Idaho; Sanford Tractor & Equipment Co., Reno, Nev.; Diesel Motor & Equipment Co., Phoenix, Ariz.

HOUGH "HUFF"

The Tractor Shovel with the Power Shovel Crowd!

The Hough Bulldozer-Shovel gives you true crowding action...faster, easier penetration into the face of the cut ...full capacity bucket loads, because the Bucket crowds forward a full 19", exclusive of the forward motion of the tractor. In addition, as the bucket is raised it tips back automatically 38° turning the Bucket cutting edge into the cut for better cutting action, thereby assuring full Bucket capacity as well as preventing spillage.

The Hough 1 Yd. Bulldozer-Shovel, built for International Model T9 and TD-9 Crawler Tractors, has many more yardage producing features—the hydraulic dump, oscillating tracks, down pressure, complete visibility, fast operating cycle, plus ready convertibility for Bulldozer use — features which add up to lower cost yardage on any job. For complete details see your near-by Hough-International Industrial Distributor.

HOUGH "HUFF" Payloader PATENTED

MODEL HF

A MOBILE VERSATILE SHOVEL

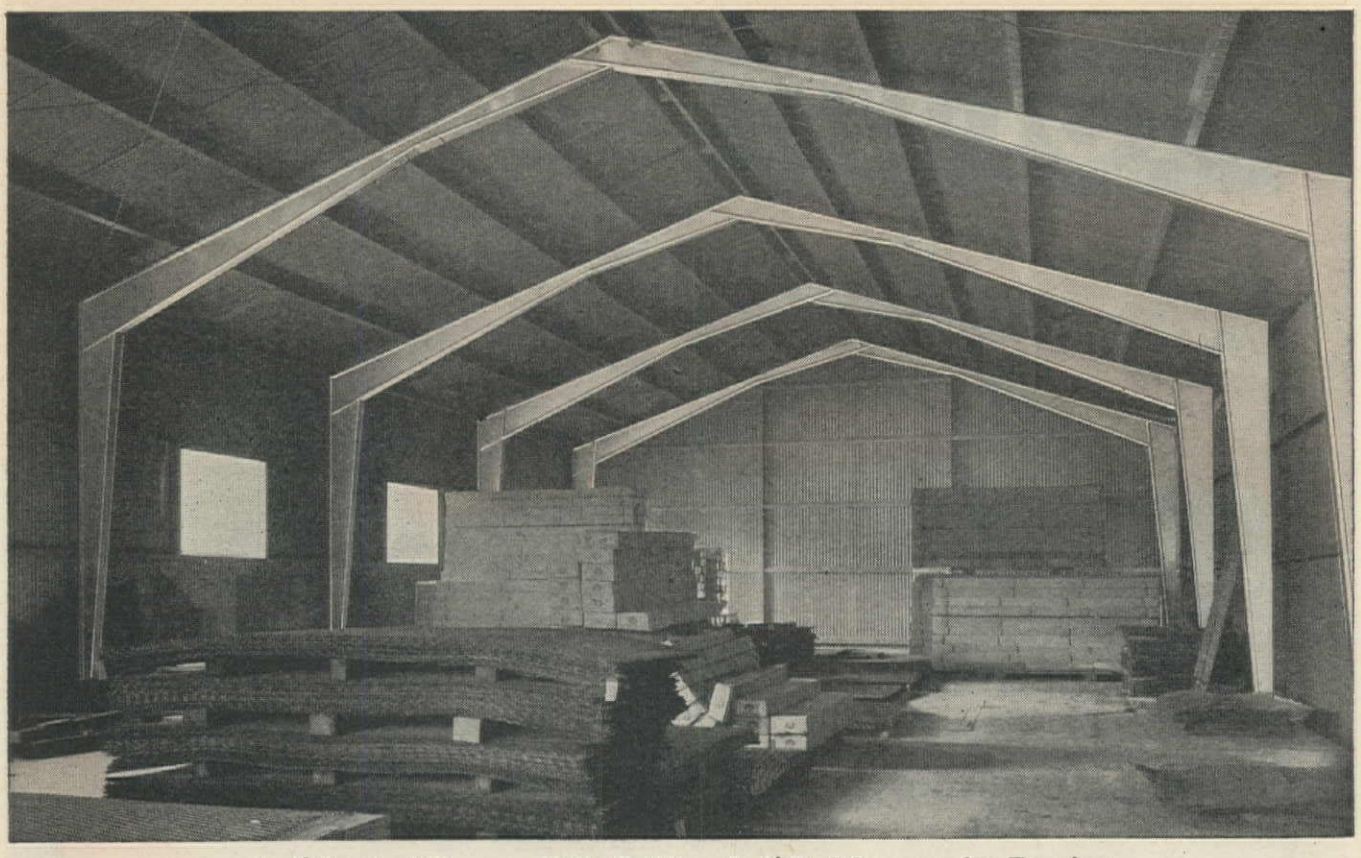
The 3/4 Yd. Model HF is the newest addition to the famous Hough Payloader line. It digs, loads, carries, dumps, grades . . . truly a one man construction crew. Bulldozer blade and crane hook available to increase its utility. Send for complete details in new bulletin No. 166.

PROVEN OVER 6500 HOUGH TRACTOR SHOVELS BUILT PERFORMANCE

THE FRANK G. HOUGH CO.

MATERIAL HANDLING EQUIPMENT SINCE 1920

707 SUNNYSIDE AVENUE, LIBERTYVILLE, ILLINOIS



Soulé Standard Clearspan Utility Building, Soulé Steel Company, San Francisco

How steel's versatility gives construction speed and economy

Typical of steel's versatility is its application in this prefabricated multi-purpose structure . . . made entirely of steel. Speed and economy are the result of centralized low-cost production, reduced shipping costs and fast, on-the-site erection.

For prefabrication . . . for construction of all kinds . . . only steel meets *all* requirements: Construction speed—low maintenance costs—highest resistance to destructive forces.

For timely information on the various building steels and steel engineering products made by the great mills of United States Steel, address the Columbia Steel Company office nearest you.

When you build...for today...for the future...BUILD WITH STEEL.

A Partial List of U·S·S Building Steels

Plates Wire Rods Wire Rope Floor Plate Nails Structural Shapes
Reinforcing Bars Pipe and Tubing Sheet Piling Bearing Piles

Only STEEL can give you all 7 of these structural advantages

Extra Toughness and Shock Resistance • Incombustibility • High Strength-Weight Ratio • Highest Modulus of Elasticity • Versatility of Application • Great Durability • Ultimate Economy.

COLUMBIA STEEL COMPANY

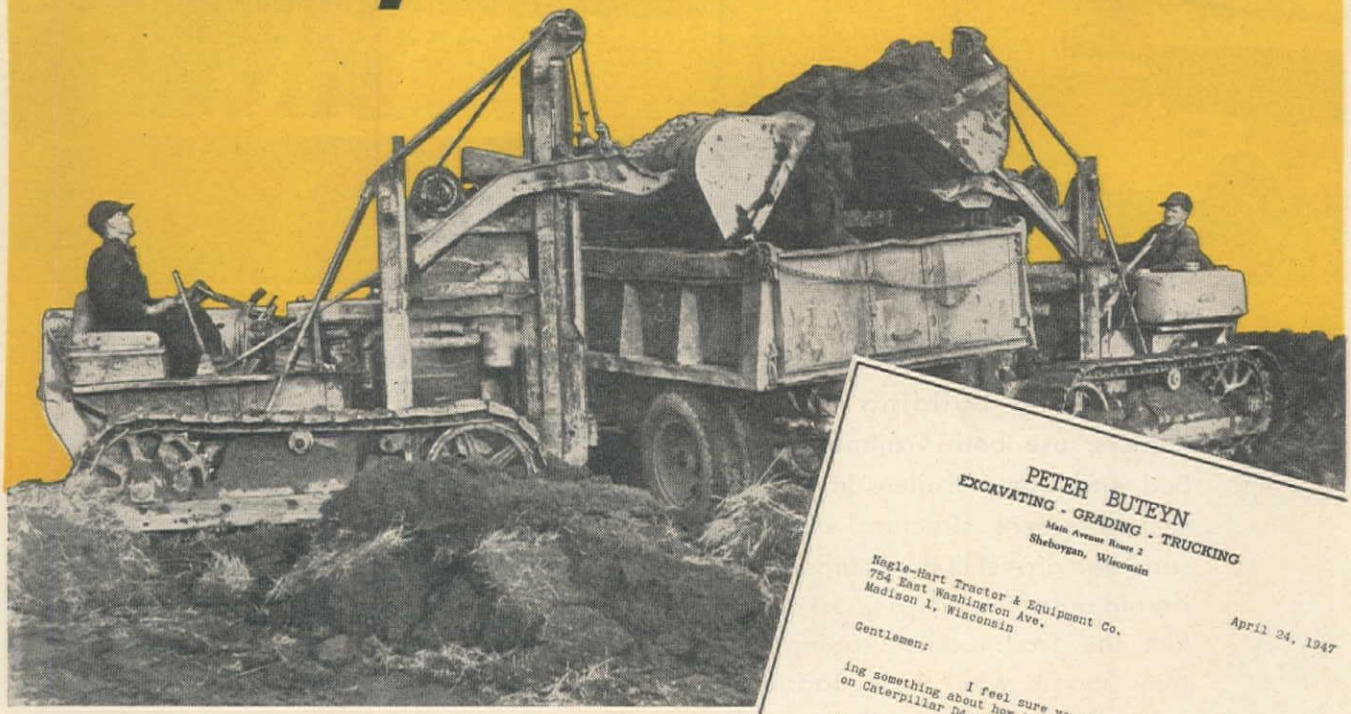
San Francisco · Los Angeles · Portland · Seattle · Salt Lake City
Pacific Coast Distributors for

AMERICAN BRIDGE COMPANY • AMERICAN STEEL & WIRE COMPANY • NATIONAL TUBE COMPANY
CARNEGIE-ILLINOIS STEEL CORPORATION • TENNESSEE COAL, IRON & RAILROAD COMPANY
United States Steel Export Company, New York

USS STEEL UNITED STATES STEEL

UNITED STATES STEEL

360 Cu. Yds. Per Hour on 12,000 Cu. Yd. Job!



PETER BUTEYN
EXCAVATING - GRADING - TRUCKING
Main Avenue Route 2
Sheboygan, Wisconsin

Nagle-Hart Tractor & Equipment Co.
754 East Washington Ave.
Madison 1, Wisconsin

April 24, 1947

Gentlemen:

I feel sure you will be interested in knowing something about how the Trackson Model T4 TRAXCAVATORS on Caterpillar D4 tractors have performed for me.

You are aware that I have used these to excellent advantage on all sorts of operations such as basement digging, grading, landscaping, loading, etc., but I want to tell you in particular about their performance on a 12,000 yard earth moving job which involved taking up top soil from fields and spreading it over 12 acres to create a recreation park for a large industrial plant.

The two one-cu. yd. T4 TRAXCAVATORS were used to load the top soil from the field into 6 trucks, both machines loading into the same truck, one from each side. We loaded a 4 cu. yd. truck every 40 seconds. In other words each TRAXCAVATOR averaged 180 cu. yds. per hour.

T6 TRAXCAVATOR Although we have only had our 1-3/4 yd. Model a short time we have already used it on a variety of jobs with good success, including basement excavating, stripping overburden from gravel pit and other earth moving jobs. Our experience so far proves that this new size TRAXCAVATOR is going to be an important and busy piece of equipment with us.

Sincerely yours,
Peter Buteyn
Peter Buteyn

. . . Contractor makes Record Performance with TRAXCAVATORS

Mr. Buteyn has been a satisfied TRAXCAVATOR owner for years and has recently added a big model T6 to his equipment. The job described is typical of the kind of satisfaction and performance he gets from these powerful tractor-excavators. His letter is proof-positive of the profit-making results owners can expect because TRAXCAVATORS can do more different kinds of jobs at lower costs than any other machine of comparable size, power and capacity.

TRAXCAVATORS, powered by "Caterpillar" track-type tractors, are available in 4 sizes with bucket capacities ranging from ½ to 4 cubic yards. There's a size for every job and purpose. See your TRACKSON-"Caterpillar" dealer about profit-making ways to use TRAXCAVATORS, or write direct to TRACKSON COMPANY, Dept. WC97, Milwaukee 1, Wisconsin.

TRAXCAVATOR

REG. U. S. PAT. OFF.

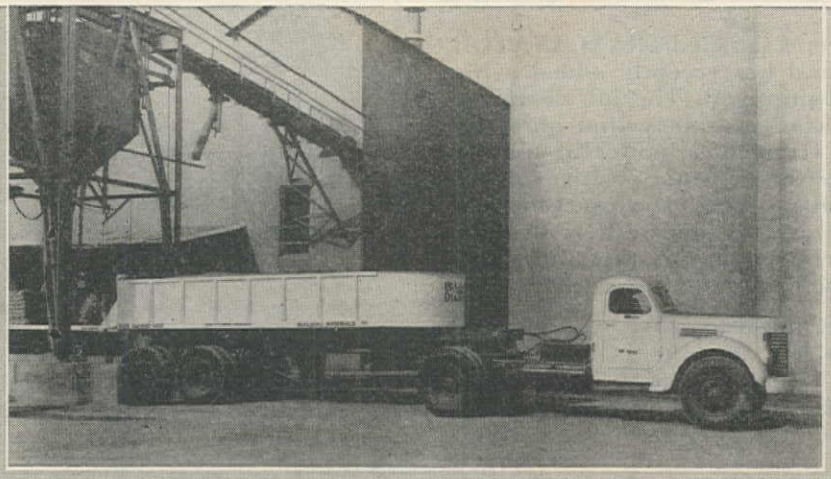
The Original Tractor Excavator

BLUE DIAMOND USES TRAILMOBILE FLAT BED AND DUMP TRAILERS

BLUE DIAMOND CORPORATION, Los Angeles building material dealers, use both Trailmobile Flat Bed and Dump trailers in hauling sacked cement, structural steel and sand and gravel in the Southern California area. The drivers particularly like the Trailmobiles, saying that they handle well, their roadability is good and they like the way the loads ride the trailers.

TRAILMOBILE designs and builds such a wide variety of trailers that it makes no difference what you are hauling — there is a TRAILMOBILE specifically suited to your hauling needs. You may be hauling fresh fruit or gasoline, lumber, steel, or general mixed cargo — whatever your job, you can do it better and easier with TRAILMOBILES. The next time you are thinking of trailers, see what TRAILMOBILE has to offer.

THE TRAILMOBILE COMPANY
BERKELEY, CALIFORNIA



TRAILMOBILE

LOS ANGELES • BERKELEY • SACRAMENTO • SANTA ROSA • FRESNO • SAN JOSE • BAKERSFIELD • STOCKTON • OGDEN • SEATTLE
HONOLULU • SANTA BARBARA • PORTLAND • EUREKA

MORE ENGINES . . . MORE ASSURANCE

More engines . . . because Cummins has completed a $3,000,000.00 postwar expansion program, increasing manufacturing space 44.8%.

More assurance . . . because Cummins dealers have also increased floor space . . . enlarged parts stocks . . . added special tools for rebuilding engines to factory standards, thus assuring Cummins Dependable Diesel owners of continued profits on their "premium" jobs.

CUMMINS ENGINE COMPANY, INC., COLUMBUS, INDIANA

SERVING THROUGH SCIENCE

SAFETY BONDED CORD

Makes these 3 Huskies Stronger and Sturdier!

U. S. ROYAL *Con-Trak-Tor*

For off-the-road service where heavy loads roll over rough ground. Deep cleated tread for two-way traction; heavy buttressed lugs for sure grip in soft going; center running rib for longer wear, easier steering.

U. S. ROYAL *LOGGER*

For all operations where traction, long wear and rugged strength are required. Cut-resisting tread protects against injury from rocks, snags. Self-cleaning design maintains maximum traction, prevents rock retention.

U. S. ROYAL *Fleet Delivery*

For service that subjects tires to abrasive "stop-and-start" wear. Extra-thick, massive tread and buttressed shoulders deliver *more* mileage, protect sidewalls against curb scuffing. Center running rib makes rolling easier, adds to tread life.

These rugged U. S. Royals have the *extra* strength of U. S. Safety Bonded Cord construction! *Each cord* is rubber-coated for heat and friction insulation . . . and "webbed" together into a tire fabric unequaled for wear!

In *all three* the tire body is attached to the steel wire beads by a specially designed bead anchoring that rigidly ties the beads to the carcass. And *all three* have two extra shock pads under the tread to guard against impacts and blowouts.

The *tread* design of each tire is the result of extensive engineering tests *in the field!* The result? *Peak performance!*

U.S. ROYAL TIRES

UNITED STATES RUBBER COMPANY

1230 AVENUE OF THE AMERICAS • ROCKEFELLER CENTER • NEW YORK 20, N.Y.

GET A LOAD OF THIS LOW-COST MIXING!

Speeding to your construction work, the new Ransome Blue Brute Horizontal Truck Mixer has a way of turning out the best in concrete at costs that mean money in the bank for you. Features like these are the secret of its always expert performance:

Exclusive drum design, stronger and lighter, with Ransome's famous mixing action . . . chilled car wheel metal rollers, each on two Timken roller bearings and running on extra-heavy, heat-treated track . . . smooth, positive gear-and-pinion drive . . . improved transmission with single lever control, two speeds forward and reverse, separate engine clutch and multiple disc reversing clutches . . . trouble-free water system with enclosed pump-clutch, leak-proof poppet valves and unbreakable anti-freeze gauge glasses.

Built with capacities of 2, 3, 4½ cu. yds., this new Ransome Truck Mixer is easier to start, to control, to maintain —a sure bet for time-saving, economical concrete production in transit.

Up above, of course, that's another Blue Brute leader — a Ransome "Big" Mixer — top performer at so many central mixing plants and big-time construction jobs . . . and another reason why *there's more worth in Worthington-Ransome.* R7-4

KNOW YOUR

BLUE BRUTES

Your Blue Brute Distributor will be glad to show you how Worthington-Ransome construction equipment will put your planning on a profitable basis.

RANSOME EQUIPMENT

Pavers, Portable and Stationary Mixers, Truck Mixers, Pneumatic Placing and Grouting Equipment and Accessories.

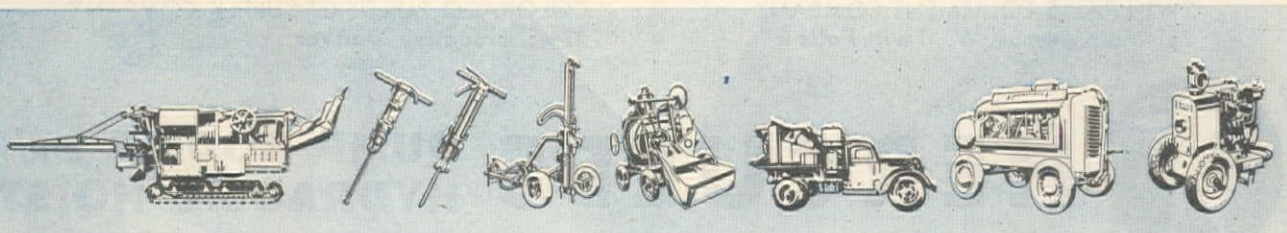
WORTHINGTON EQUIPMENT

Gasoline and Diesel Driven Portable Compressors, Rock Drills, Air Tools, Self-Priming Centrifugal Pumps and Accessories.

WORTHINGTON

Worthington Pump and Machinery Corporation. Worthington-Ransome Construction Equipment Division, Holyoke, Mass.

BUY BLUE BRUTES



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

Look *underneath* for the secret of profitable dump truck operation: Check the understructure first . . . look for plenty of sturdy crossmembers, scientifically placed to absorb all weight and strain. Then check the hoist itself: look for twin-arm construction, a big, powerful cylinder assembly, a precision-built pump and plenty of reserve power. Hercules gives you all these — and more!

To be doubly sure, watch a Hercules-BILT Hydraulic Hoist in action . . . packed with power, it raises the heaviest loads, smoothly, easily, quickly. That's why Hercules Dump Bodies and Hercules-BILT Hydraulic Hoists are the choice of dump truck operators who know how to make a profit on any job. And that's why your next dump truck unit should be Hercules.

Now in service on a New Jersey highway project, this Hercules Dump Body unit, equipped with Hercules-BILT Model 8X Hoist, hauls and dumps 7½ cubic yards of sand per load. Low center of gravity, wide body construction and twin-arm hoist are Hercules features that assure Herman Calvo, owner, of extra profits.

Here's where to look for Dump Truck PROFITS

YOUR HERCULES DISTRIBUTOR WILL GLADLY QUOTE COMPLETE SPECIFICATIONS AND PRICES UPON REQUEST

WASHINGTON—
ALLIED TRAILER & EQUIPMENT COMPANY
2434 First Avenue, South, ***Seattle***

OREGON—
NEWELL TRUCK EQUIPMENT COMPANY
316 N. Russell Street, ***Portland***

CALIFORNIA—
GENERAL TRUCK EQUIPMENT COMPANY
1081 N. Vignes, ***Los Angeles***
A. PASTERIS COMPANY
2200 Wood Street, ***Oakland***

IDAHO—
TWIN FALLS EQUIPMENT COMPANY
251 Main Avenue, W., ***Twin Falls***

MONTANA—
WESTERN CONSTRUCTION EQUIPMENT CO.
505 N. 24th Street, ***Billings***
WESTERN CONSTRUCTION EQUIPMENT CO.
218 W. Pine Street, ***Missoula***

UTAH—
HERCULES BODY SALES COMPANY,
2205 Highland Drive, ***Salt Lake City***

NEW MEXICO—
THE HARRY CORNELIUS COMPANY
1510 N. Second Street, ***Albuquerque***

COLORADO—
COLORADO BUILDERS' SUPPLY COMPANY
324 S. Broadway, ***Denver***

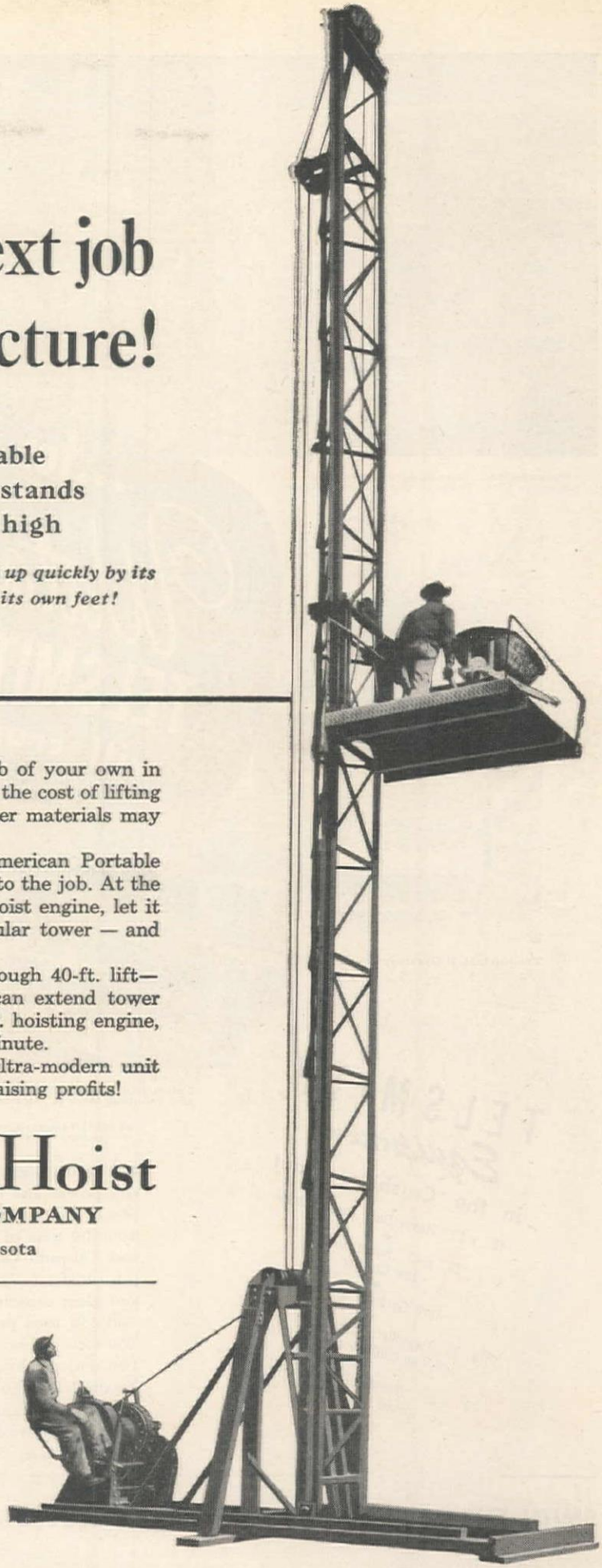
HERCULES DUMP BODIES *and* HYDRAULIC HOISTS

HERCULES STEEL PRODUCTS CORPORATION . . . GALION, OHIO

Put your next job into this picture!

American Portable Material Elevator stands forty-seven feet high

Moves anywhere by truck . . . sets up quickly by its own power . . . and stands on its own feet!



● Just imagine some specific job of your own in this background . . . a job where the cost of lifting brick, mortar, cement and other materials may make or break your profits.

In jig time, you load the American Portable Material Elevator, and move it to the job. At the building site, simply start the hoist engine, let it raise the sturdy, welded triangular tower — and you're ready for action!

Elevator platform travels through 40-ft. lift—and two added mast sections can extend tower height to 67 feet. With 18 H. P. hoisting engine, platform speed is 87 feet per minute.

It's a smooth, stable, safe, ultra-modern unit for saving time, cutting costs, raising profits!

American Hoist
and DERRICK COMPANY

Saint Paul 1, Minnesota

Plant No. 2: SOUTH KEARNY, NEW JERSEY

Sales Offices: NEW YORK • PITTSBURGH • CHICAGO
NEW ORLEANS • SAN FRANCISCO

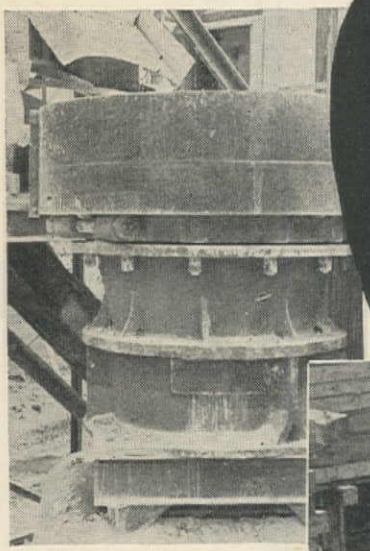
HOISTS • DERRICKS • BLOCKS and SHEAVES
REVOLVER CRANES • LOCOMOTIVE CRANES • DITCHERS
PILE DRIVERS • CROSBY CLIPS

748

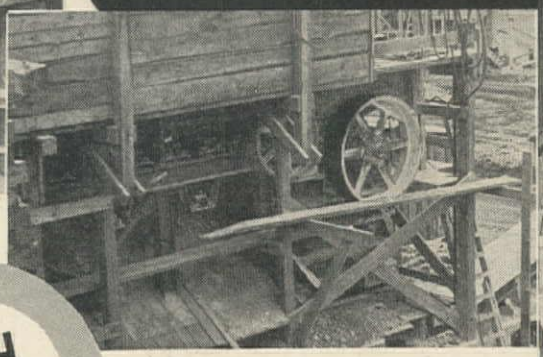
Andrews Machinery, Portland, Oregon; Coast Equipment Company, San Francisco, California; Constructors Equipment Company, Denver, Colorado; Contractors Equipment & Supply Co., Albuquerque, New Mexico; Hall-Perry Machinery Company, Butte, Montana; Harron, Rickard & McCone Co., of Southern California, Los Angeles, California; The Lang Company, Salt Lake City, Utah; Neil B. McGinnis Company, Phoenix, Arizona; Star Machinery Company, Spokane, Washington.

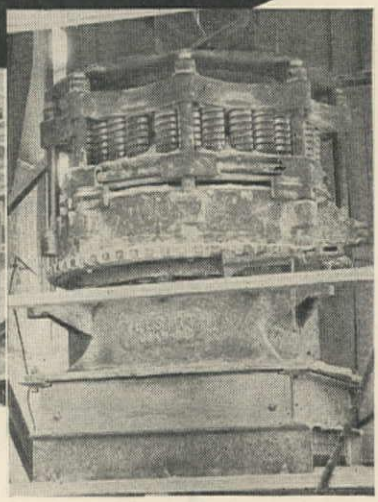
Watauga Dam, near Elizabethtown and Johnson City, Tenn. on the Watauga River

...for TVA's Watauga Dam TELSMITH EQUIPMENT will crush 400,000 tons!



Telsmith 16-B Gyratory Breaker





Telsmith 48" x 12" Heavy Duty Apron Feeder, and Telsmith 30" x 42" Jaw Crusher

(Right) Telsmith No. 36 Gyrasphere Secondary Crusher

TELSMITH *Equipment* in the Crushing Plant

48" x 12" Heavy Duty Apron Feeder

◆

30" x 42" Roller Bearing Jaw Crusher

◆

16-B Gyratory Breaker

◆

No. 36 Gyrasphere Secondary Crusher with fine crushing concave ring

◆

40" x 22" Double Roll Crusher with special backgear case

● The Watauga Dam, now being built by the Tennessee Valley Authority, is a power and flood control project. A rock fill structure with concrete power house, spillway and power tunnel, the dam will require about 400,000 tons of crushed aggregate. The rock is a dense, hard dolomite, and Telsmith Crushers *of four different types* are doing this big crushing job satisfactorily. The various amounts and sizes of aggregate required, and plant capacity are—100,000 tons of minus 12" coarse filter material, 200-250 tons per hr.—150,000 tons of minus 1½" fine filter material, 150 tons per hr.—100,000 tons ¾"-1½" and ⅜"-¾" concrete aggregate, 100 tons per hr., and 50,000 tons of minus ⅜" stone sand produced by Telsmith No. 36 Gyrasphere Secondary Crusher and Telsmith 40" x 22" Double Roll Crusher. Since Telsmith Engineers build *all types of crushers* their recommendations are not biased. Consult them about *your* crushing plant *now*. No charge, no obligation. Get Bulletin E-30.

Q-19

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

Mines Engineering & Equipment Company, 369 Pine St., San Francisco 4

Clyde Equipment Co. Portland 9, Ore.

Clyde Equipment Co. Seattle 4, Wash.

General Machinery Co. Spokane 1, Wash.

Gordon Russell, Ltd. Vancouver, B.C.

Loading Magic

Athey Force-Feed Loader & "Caterpillar" Motor Grader Bring New Ease and Low Costs to Many Highway Jobs....

Wide Range of Uses

The Athey Force-Feed Loader and "Caterpillar" Motor Grader provides a fast, precise "package" for a wide variety of highway jobs. For cleaning or building ditches, road widening or resurfacing, dressing slopes or shoulders, loading oil mix, this team is unexcelled for high output and speedy production.

Clean, Precise Pick-up

The self-propelled, hydraulically-controlled Force-Feed Loader does a neat, clean job of picking up windrows of material left by the Motor Grader. Handles all types of material at a high rate.

Saves Time & Money

No other means of handling material on highway jobs is as fast or cheap as the Force-Feed Loader method. Eliminates taking large machinery from other jobs. A truck driver can quickly learn to operate the one-man Force-Feed Loader. Its end loading permits steady flow of traffic, avoids traffic tie-ups.

For Highway Departments & Road Contractors

Athey Force-Feeder Loaders are a "natural" for Highway Departments. State, county and township officials all over the country have recognized the importance of this machine in getting more out of tax dollars. Road Contractors, too, are finding the versatility and economy of this machine profitable on scores of jobs.

You, too, will find the Athey Force-Feed Loader one of your most useful, most economical and valuable tools. Ask your Athey-"Caterpillar" Dealer or write Athey Products Corporation, 5631 W. 65th St., Chicago, Illinois. Athey products are distributed by the world-wide "Caterpillar" sales organization.

Athey APCOR Products

Athey DEPENDABLE LOADING AND HAULING EQUIPMENT

riding high and easy

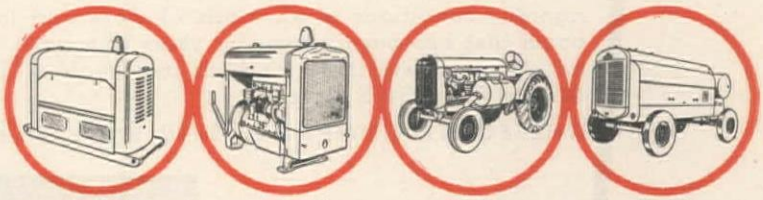
...the smooth, dependable, easy-holding power of LE ROI-CLEVELAND Sinkers reduces drilling costs by drilling more feet of hole per shift—for more shifts

Power for fast drilling in hard rock; power that rotates the steel in "fitchery" formations; power that cleans the holes and improves performance — you get all kinds of power in Le Roi-Cleveland 45-lb. H-10 and 55-lb. H-111 sinkers.

This power, besides producing more feet of hole in a shift, is easy to handle. It is smooth power that seems to flow like the air that drives these outstanding drills. "Kick-back" is reduced to such an extent that both the H-10 and H-111 are easy to run, even on long steels.

And, it is dependable power. The working parts are carefully designed to provide the strongest possible sections — they are heat-treated by men who have more than 40 years of heat-treating experience behind them — and they are enclosed and protected by durable drop forgings.

Put Le Roi-Cleveland sinkers to work, and take a big slice out of your drilling costs — shift after shift. See your Le Roi distributor or write for our latest literature.



Le Roi Engine-generator Set | *Le Roi Heavy-duty Engine* | *Le Roi 105 Tractair** | *Le Roi Airmaster**

LE ROI COMPANY

CLEVELAND DIVISION
Manufacturers of Cleveland Rock Drills
Cleveland 11, Ohio

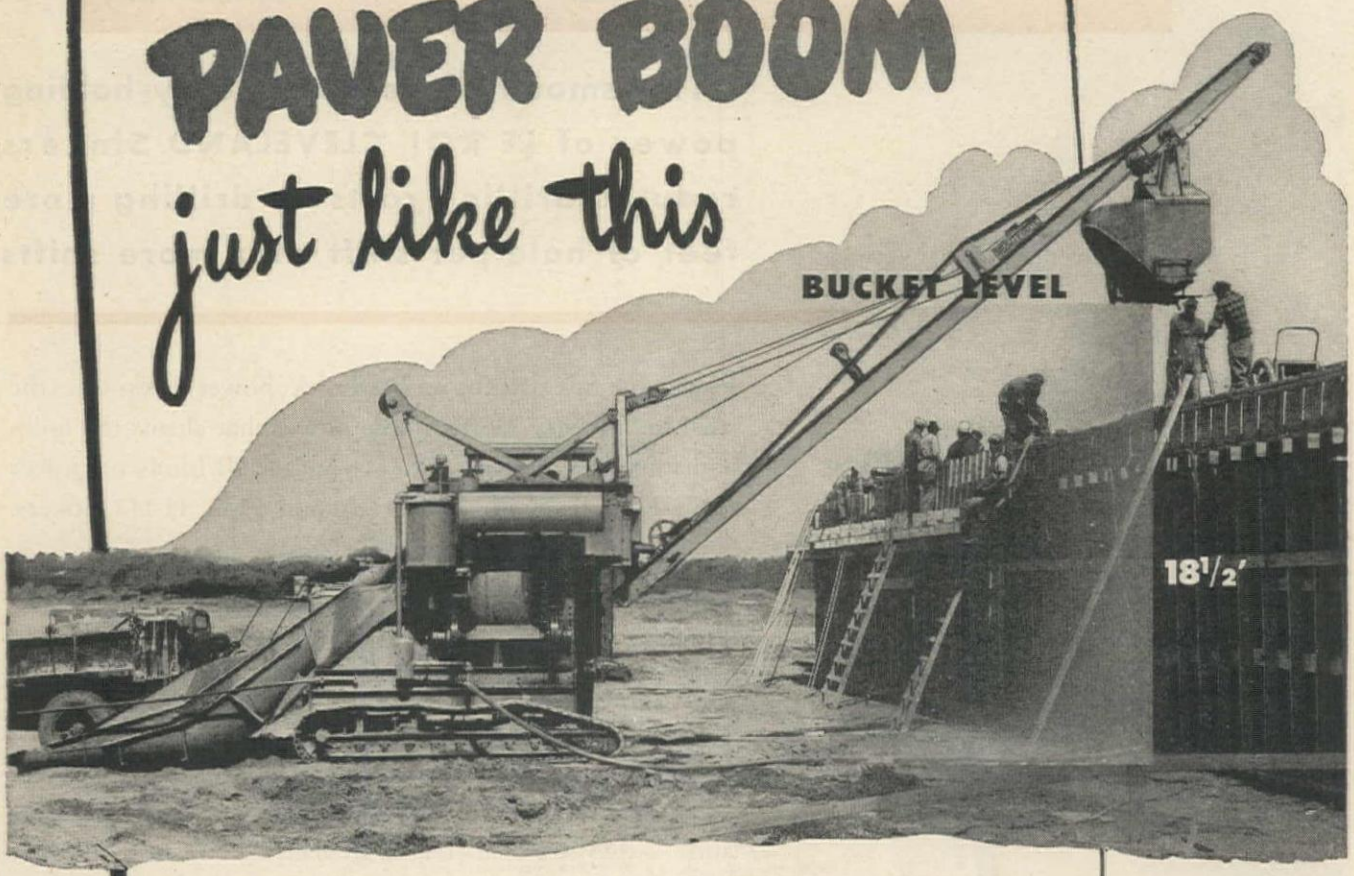
LE ROI COMPANY, General Offices, Milwaukee 14, Wisconsin

NEW YORK • WASHINGTON • CLEVELAND • MILWAUKEE
BIRMINGHAM • TULSA • BUTTE • SAN FRANCISCO

RD-10

*Reg. U. S. Pat. Off.

There is NO other PAVER BOOM just like this



Your MultiFoote Paver, equipped with the MultiFoote Elevating Boom, gives you increased versatility over a wide breadth of jobs. The average retaining wall, bridge abutment, one-story foundation and reinforced concrete wall are all within reach of your Elevating Boom.

With your MultiFoote you mix and place without the aid of a crane or other auxiliary equipment on this kind of work. It means less investment for equipment—less handling of materials—and faster pouring—all of which totals greater profit!

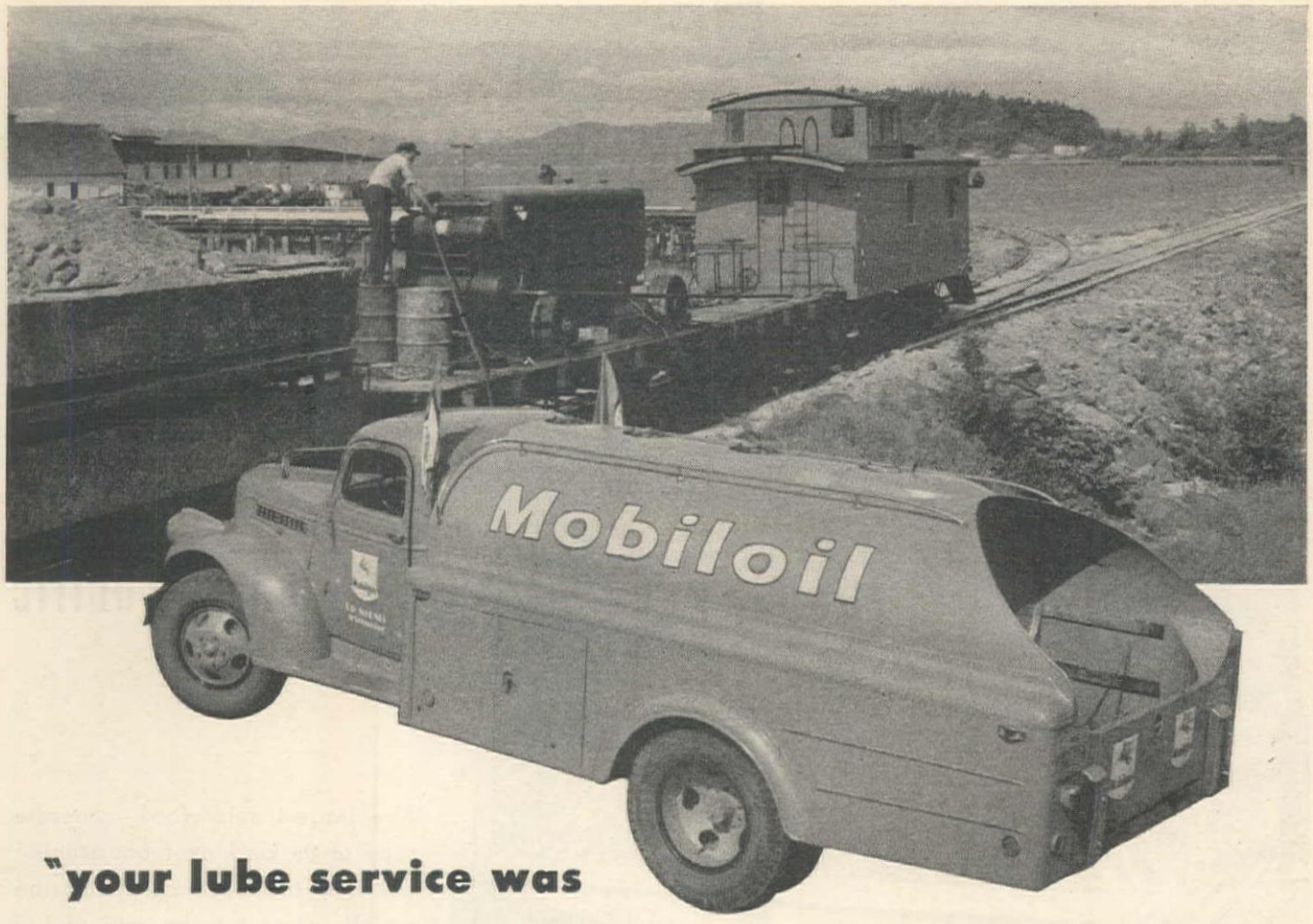
Do not be misled by other terms for standard booms that can be raised to limited degrees. The MultiFoote Elevating Boom was designed specially for pouring to heights beyond the possibilities of the standard boom and was the first of this type. The MultiFoote Elevating Boom has met the rigorous conditions of all kinds of work and is the *only* elevating paver boom that has been proved in years of service. Let us send you complete details. It is available for both the DuoMix (Dual Drum) 34-E and the Single Drum 34-E Pavers.

THE FOOTE COMPANY, 1940 State Street, Nunda, New York

MULTIFOOTE
CONCRETE PAVERS

***Builders of* ADNUN BLACK TOP PAVERS, MULTIFOOTE CONCRETE PAVERS, AND FOOTE KINETIC MIXERS**

Browning-Ferris Machinery Co., Dallas & Houston, Texas; Francis Wagner Company, El Paso, Texas; Smith Booth Usher Co., Los Angeles, Calif.; C. H. Grant Company, San Francisco, Calif.; Smith Booth Usher Co., Phoenix, Arizona; Western Equipment Co., Boise, Idaho, Spokane, Washington; The Colorado Builders' Supply Co., Denver, Colorado; Lively Equipment Co., Albuquerque, New Mexico; The Lang Co., Inc., Salt Lake City, Utah; Howard-Cooper Corp., Portland, Albany, Eugene, Central Point, Roseburg, Ore., Seattle, Wash.



"your lube service was ONE BRIGHT SPOT on a TOUGH JOB"

SOLVE MANY PROBLEMS

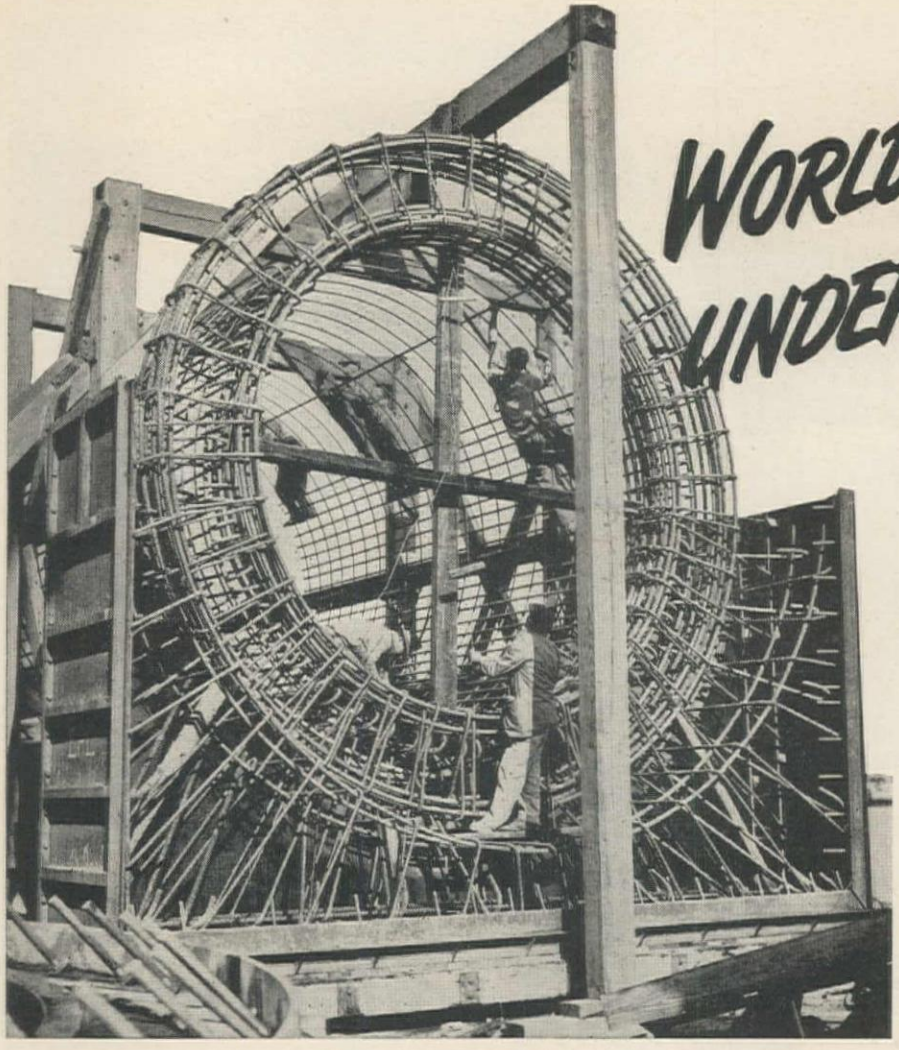
The performance of Mobilubricants in your equipment is improved by the specialized services of G. P. engineers, who work with job superintendents to establish a satisfactory program. This G. P. Contractors' Service includes an equipment survey, lubrication schedules, product recommendations, inventory control, storage and handling, and uninterrupted deliveries. Look into this service for your next job.

Ed Niemi, G. P. distributor at Astoria, confers with Construction Superintendent Bill Kennish.

That's what MORRISON-KNUDSEN reports from Astoria, Oregon, where a 7,100 foot dirt fill is replacing a wooden trestle. On this job bad slides have covered two shovels (one was recovered days later from the bottom of the Columbia River)... wet muck caused the loss of dump cars into the tide flats... material from the first pit chosen was so unstable that another, twenty-five miles away, had to be used. The lube service job wasn't easy, either, for all deliveries had to be made to the fill and the pits by rail. But William J. Kennish, construction superintendent, gives G. P. credit for exceptional service, when he says: "One thing we haven't had trouble with and could always count on was G. P. service. G. P. products have been used on all my jobs, but one, for the past three years. I know we've had lower repair costs and less time lost on the job by using Mobilubricants."

Ask about Contractors' Service and specialized lubricants for construction equipment, at the nearest Mobilgas distributor.

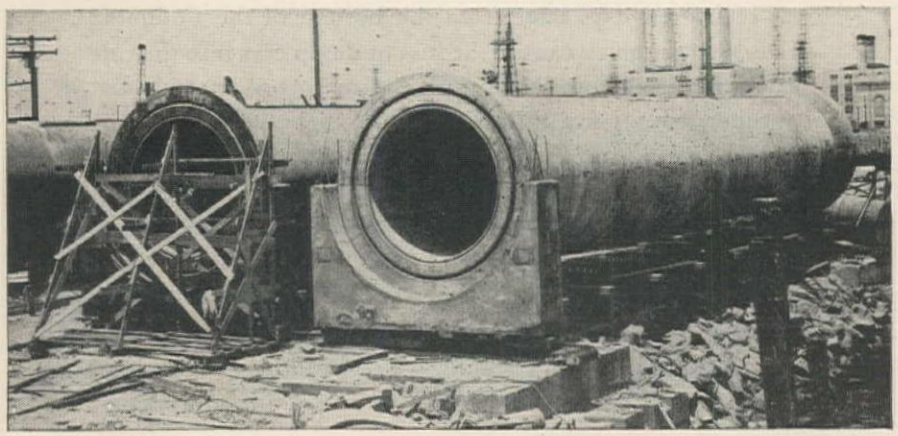
GENERAL PETROLEUM CONTRACTORS' SERVICE



WORLD'S LARGEST UNDERSEA SEWER

-caged in Bethlehem Pacific Bars

Fabricated reinforcing bar cage for a 100-ft section of the Hyperion outfall sewer pipe. Steel for these cages was rolled and fabricated by Bethlehem Pacific for Anthony C. Meehlis Co., subcontractor in charge of placing and welding. Concrete is cast by the Guy F. Atkinson Company, general contractor.



Finished pipe sections after stripping of concrete forms. Each section will be fitted with water-tight bulkheads, launched with buoyancy tanks and towed 30 miles from the casting yard to the sewer site at Hyperion. Then the sections will be lowered into position, the bulkheads removed and the joints sealed with concrete.

The largest reinforced - concrete pipe of its kind ever constructed will form the Hyperion submarine outfall sewer for the city of Los Angeles. This giant pipe will have a 12-foot inside diameter, 14-inch walls, and will extend more than 5000 feet into Santa Monica Bay.

3200 feet of the undersea portion of this pipe is made in 100-foot pre-cast sections each containing a 22-ton cage of reinforcing bars buttwelded in position. Bethlehem Pacific manufactured and fabricated the 725 tons of reinforcing bars used in this project.

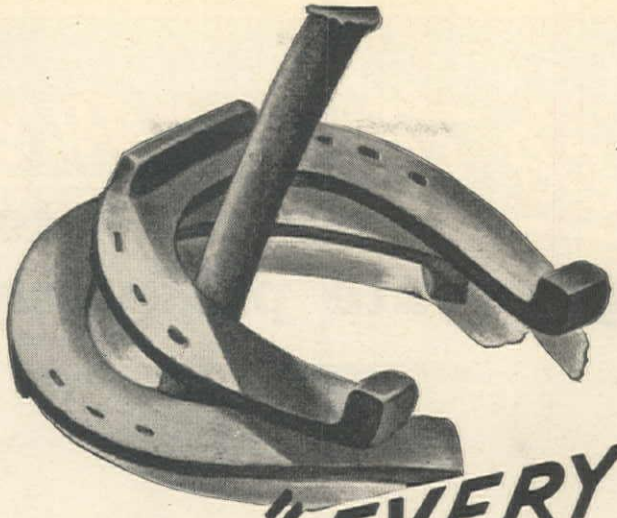
Bethlehem Pacific rolls reinforcing bars in standard sizes and weights at each of its steel making plants . . . at Los Angeles . . . at South San Francisco . . . at Seattle. These plants are also fully equipped to fabricate reinforcing steel to customers' specifications.

BETHLEHEM PACIFIC COAST STEEL CORPORATION

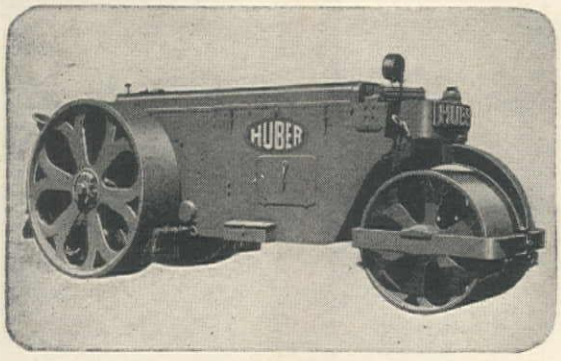
Sales Offices: San Francisco, Los Angeles, Portland, Seattle, Honolulu

BETHLEHEM PACIFIC

★ BETHLEHEM STEEL ★



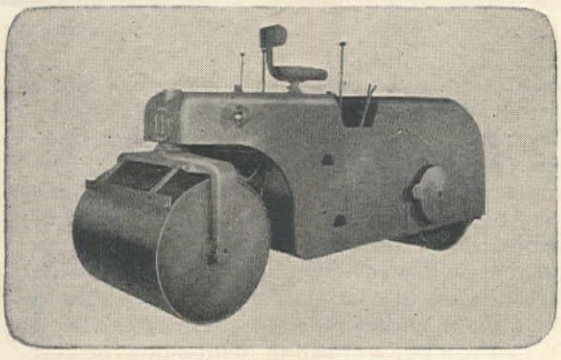
"A Ringer" EVERY TIME



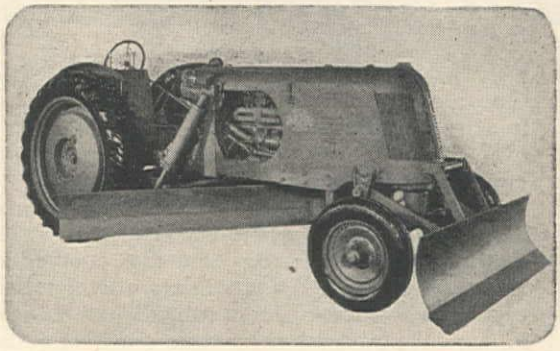
HUBER 3-WHEEL ROLLERS
Automotive type, built in sizes from 5 to 12 ton.

There is no guesswork to buying Huber Road Machinery. Whether you buy a Huber 3-Wheel Roller, a Huber Tandem Roller, or the Huber Maintainer you run up a winning score in simple design for easy maintenance, speedy operation, plenty of power and stamina, maximum economy, and dependable performance. To hold the confidence of Road Builders continuously for better than 35 years – ever since the first Huber Roller was built – cannot be ignored when it comes to selecting future road machinery.

Drop in and see your Huber Distributor for a demonstration.



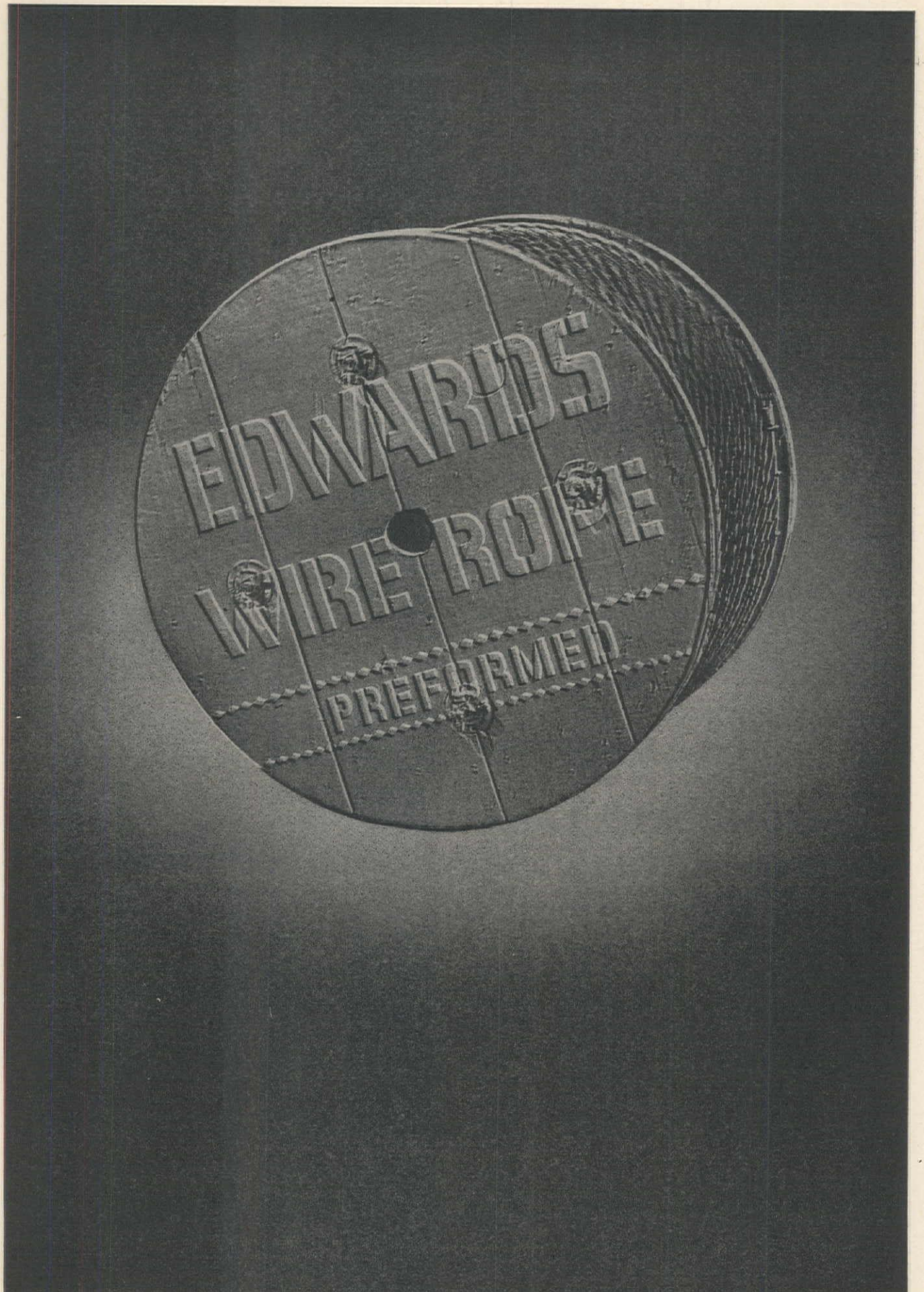
HUBER TANDEM ROLLERS
Variable weight, built in sizes from 3 to 12 ton.

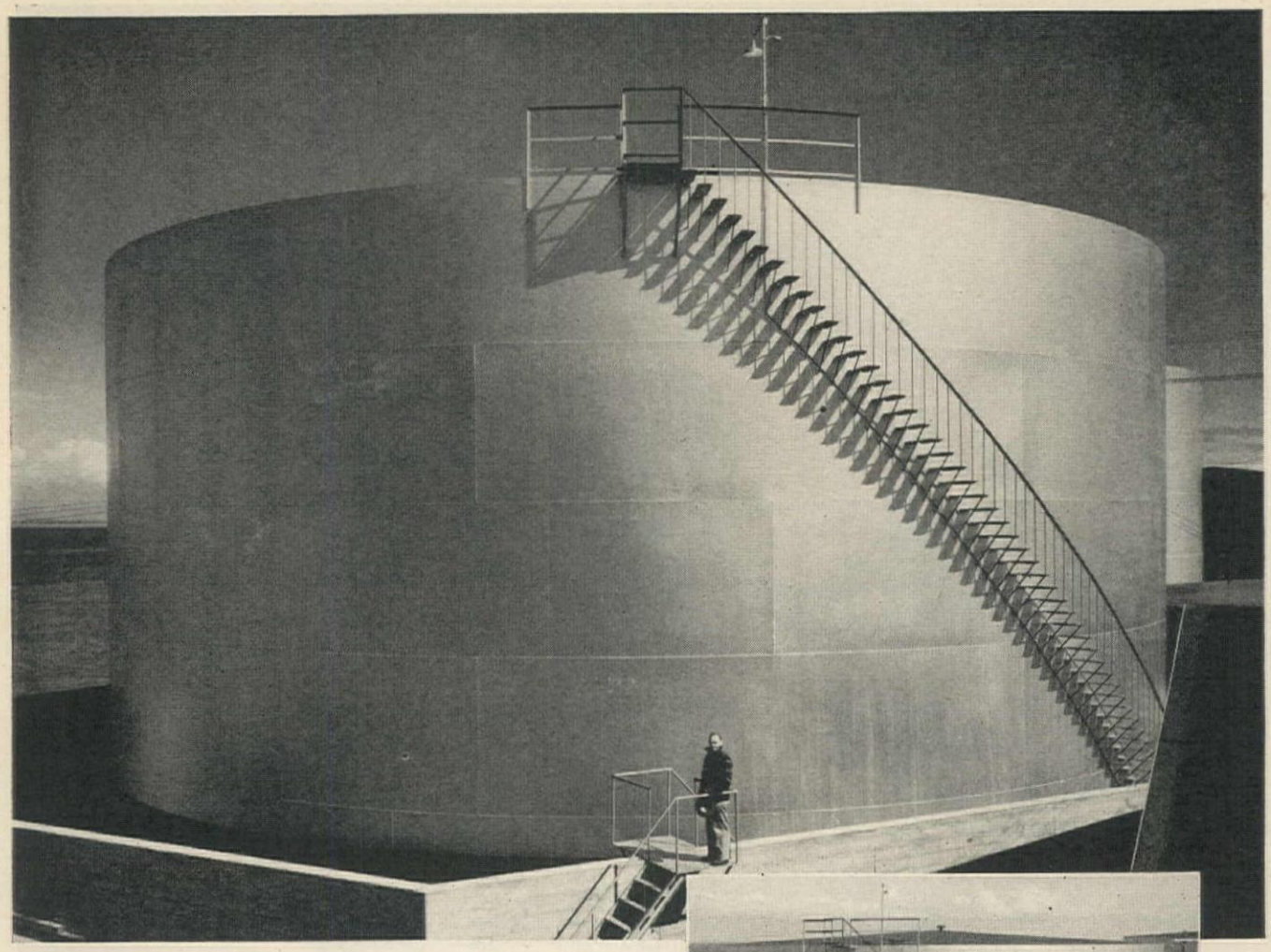


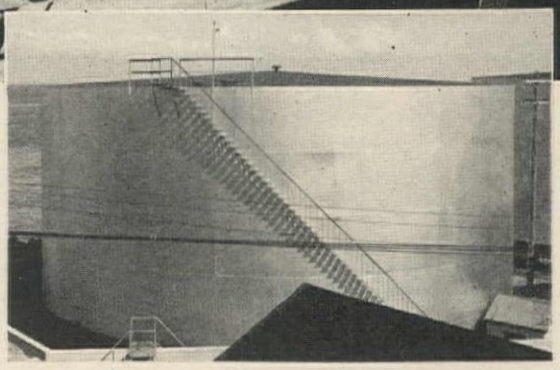
HUBER MAINTAINER
A versatile machine that also serves as a bulldozer, lift-loader, patch roller, snowplow, or rotary broom.

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

LEE & THATRO EQUIPMENT CO.....Los Angeles 21, Calif.
JENKINS & McCLOUD.....Reno, Nevada
CONTRACTORS' EQUIP. & SUPPLY CO., Albuquerque, N. M.
NEIL B. McGINNIS CO.....Phoenix, Arizona
FEENAUGHTY MACHINERY CO.....Portland 14, Oregon
FEENAUGHTY MACHINERY CO.....Boise, Idaho
FEENAUGHTY MACHINERY CO.....Seattle 4, Washington
FEENAUGHTY MACHINERY CO.....Spokane 2, Washington
WESTMONT TRACTOR & EQUIPMENT CO., Missoula, Montana
EDWARD F. HALE CO.....Hayward, California
EDWARD F. HALE CO.....San Francisco 7, California
FOULGER EQUIPMENT CO., INC.....Salt Lake City 8, Utah
THE COLORADO BUILDERS' SUPPLY CO., Denver 9, Colorado
THE COLORADO BUILDERS' SUPPLY CO., Scotts Bluff, Nebr.
THE COLORADO BUILDERS' SUPPLY CO.....Casper, Wyoming







The two photos above show a 30,000-bbl. Horton cone roof tank at the Crown Zellerbach Corporation plant at Port Angeles, Wash. It is 80 ft. in diam. by 40 ft. high and is used to store fuel oil.

IN THE WEST
It's HORTON
WELDED STEEL TANKS

WHEN PROVIDING STORAGE facilities for oil, water, molasses, alcohol and other industrial products, specify Horton welded steel tanks. These tanks are used by many industries throughout the West. They are built in standard capacities from 500 to 150,000 bbls. or they may be furnished in special sizes to meet individual requirements. Cone roofs or umbrella roofs are available. Practically all Horton flat-bottom tanks are of welded construction, although riveted construction may be had if desired.

Horton welded steel tanks require a minimum amount of maintenance. A coat of paint applied regularly to prevent rusting will keep the tank in good condition for years. Why not get estimating figures on *Horton* tanks the next time you require *dependable* storage facilities?

HORTON FLAT-BOTTOM STORAGE TANKS ARE FURNISHED WITH THE FOLLOWING STANDARD ACCESSORIES

20-in. diam. shell manhole.
20-in. diam. roof manhole.
Spiral stairway.
Threaded or flanged openings for usual pipe connections.

CHICAGO BRIDGE & IRON COMPANY

Los Angeles 14.....1444 Wm. Fox Bldg.	Cleveland 15.....Guildhall Bldg.	Birmingham 1.....1598 North Fiftieth St.
San Francisco 11.....1213-22 Battery Street Bldg.	Detroit 26.....LaFayette Bldg.	Atlanta 3.....2183 Healey Bldg.
Chicago 4.....McCormick Bldg.	Philadelphia 3.....1700 Walnut Street Bldg.	Havana.....402 Abreu Bldg.
New York 6.....165 Broadway Bldg.	Tulsa 3.....Hunt Bldg.	Houston 1.....Clinton Dr.

Plants in BIRMINGHAM, CHICAGO, and GREENVILLE, PA. *In Canada*—HORTON STEEL WORKS, LIMITED, FORT ERIE, ONT.

WESTERN CONSTRUCTION NEWS
WITH WHICH IS CONSOLIDATED WESTERN HIGHWAYS BUILDER
September, 1947 Vol. 22, No. 9

Save Conservation Service

THERE SEEMS little sense to the development of a great irrigation system, and a fine educational and advisory system for farmers, if the farm land of the nation is to be despoiled through neglect and improper use. The truth of this position was recognized some years ago, and to aid farmers in conserving their soil and water, the Soil Conservation Service was organized by the Federal government. It performs a great service to the whole nation, because the menace of depleted soil is a threat to the economic stability of the entire country.

Currently in the Congressional mill are two bills (H.R. 4150 and S. 1621) designed to eliminate the Soil Conservation Service by transferring its functions to the Agricultural Extension Service. The latter agency does a fine work in its own field of educating the farmer in such matters as 4-H clubs, weed control, cattle feeding, etc., but neither its state heads nor local county agents are trained or qualified to plan, execute or direct individual farmers or districts in the technical engineering phases of a successful soil conservation program.

A great deal more is involved in soil conservation than just the "contour plowing" which is so spectacular from the air. Land leveling, drainage, irrigation, flood control, erosion control, salinity control, and many other specialized engineering services require the skill of men trained in civil engineering, geology, hydrology, agronomy, and other technical subjects. Clearly the average county agent, though he may be well versed in agricultural practices, is not qualified in these many branches, nor is each county financially able to employ a technician in each of these technical fields.

The regional organization of the Soil Conservation Service, however, is able to supply the services of these experts over a large area, and secure for a great number of farms and farming areas, the benefit of their special training.

Nor does the Soil Conservation Service promote paternalism by giving away its services. Farmers are organized in Soil Conservation Districts, with which engineers of the Service work. A plan of conservation is made up for the whole district, and the farmers carry out that portion of the program on their own farm by their own efforts. If required they may rent equipment from the District. Technical services are supplied only at the **request** of the farmers.

Over 1,900 soil conservation districts are now organized in the country, including about three-quarters of all the farms in the nation. In addition, practices developed in this country are being carried to other lands by foreign engineers who are training with the Service.

No doubt the genesis of these bills is a sincere effort on the part of Congress to economize and to eliminate duplicating functions, an action this paper has consistently espoused. But we feel insufficient study was given in this case, for no other service duplicates the fine work of SCS. Its work is not so well known as that of many other agencies, for virtually no money is spent in "public relations" and propaganda, all of its meager budget going to technical and highly beneficial operations on the land itself.

We respectfully urge Western Congressmen to examine these bills most carefully before acting upon them. In the West perhaps more than any other area, because of steep slopes, flash floods, need for irrigation, and geologic and climatic peculiarities, the soil conservation work is essential. We believe the Soil Conservation Service is essential to national, and particularly to Western, farm welfare. The billions of dollars being poured into great reclamation projects could be an utter loss if the soil thus irrigated is allowed to wash away or become unusable.

Let us not permit our highly commendable desire to conserve government finance permit us to destroy this agency which is so effectively conserving the nation's most fundamental asset, the soil.

Sell Scrap Now

SCRAP IRON (the trade name for all kinds of iron and steel scrap) and pig iron are the metallics which are melted to make all kinds of new steel products.

Pig iron is produced by smelting iron ore in a blast furnace. The country's ability to make pig iron is limited to the capacity of existing blast furnaces, which are more than adequate, due to wartime expansion, to meet normal requirements. A blast furnace having a daily capacity of 1,200 tons of pig iron takes 18 months and $13,000,000 to build.

Scrap iron arises in every place where iron and steel is used, such as farms, factories, homes, railroads, and public utilities. The supply of scrap is flexible compared with the rigidity in the supply of pig iron.

New steel and new castings can be made either from 100 per cent pig iron or 100 per cent scrap iron or any combination of the two. On the average, over a period of years most steel mills use 50 per cent scrap iron and 50 per cent pig iron to make ordinary grades of steel, while iron foundries on the average charge 65 per cent scrap iron and 35 per cent pig iron into their cupolas. Because scrap iron is iron or steel that has already been refined, its use shortens the process and lowers the price of new iron and steel.

Normally, iron and steel is in what is termed a squirrel cage. The steel that is used today for the manufacture of an automobile comes back as scrap seven to ten years hence. But during the war large quantities of iron and steel were sent abroad under lend-lease and this potential source of scrap has been lost. Ships that were sunk, ammunition that was fired, military equipment that was shipped abroad and not returned represent potential scrap that is irretrievably lost.

Meanwhile, in the face of this understandable shortening of the supply of potential scrap, steel mills and iron foundries have been attempting to operate at capacity to produce steel and castings to make up war-created deficiencies in farm implements, construction equipment, automobiles, housing, and other items.

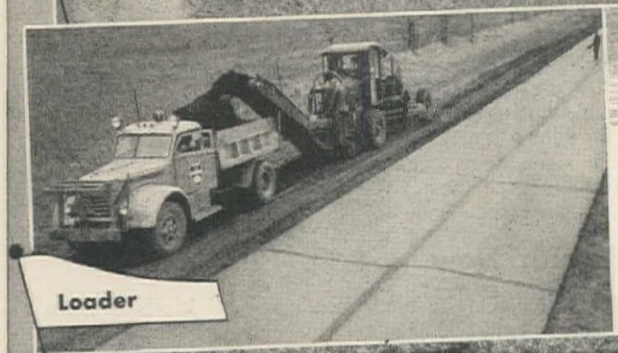
The scrap industry has provided a substantial tonnage, principally for steel mills, which has enabled these mills to operate at close to capacity. The supply of cast iron grades of scrap has been relatively shorter than that of the steel grades. The cast iron grades are generated principally in automobile graveyards and on farms. Because of the shortage of new automobiles, trucks, and farm equipment, these sources have not scrapped old models in any volume.

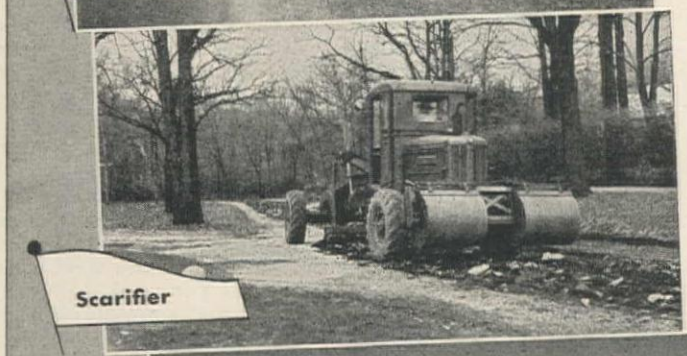
Now, however, in response to almost unprecedented demand, the market price of scrap has risen sharply; in some grades to almost twice wartime ceilings. Likewise, the need for scrap is extremely urgent and the more scrap that can be made available the sooner tractors, automobiles, housing, railroad rolling stock, etc. can be produced.

Many contractors and other individuals have considerable quantities of junk lying about, which could be sold at a nice figure just now, besides helping to alleviate a critical manufacturing situation.

doubly effective

Thanks to All-Wheel Drive and All-Wheel Steer





All-Wheel Drive and All-Wheel Steer make it possible to mount an attachment ahead of or behind the "99-H" Power Grader without sacrifice of operating efficiency or machine control. When the entire weight of the rear end of the machine is transferred to the Roller, the "99-H" drives and steers with its front wheels. When the entire weight of the front end is transferred to the Bulldozer, the "99-H" drives and steers with its rear wheels. An ordinary motor grader would be helpless under such conditions. In addition to making it possible to use attachments that could not be mounted on ordinary motor graders, All-Wheel Drive and All-Wheel Steer provide traction and maneuverability that make every attachment – front, center or rear mounted – just that much more effective than it would be on other motor graders.

AUSTIN-WESTERN CO., AURORA, ILL., U. S. A.

ARIZONA—SMITH BOOTH USHER COMPANY.....*Phoenix*
CALIFORNIA—EDWARD R. BACON COMPANY.....*San Francisco 10*
CALIFORNIA—SMITH BOOTH USHER COMPANY.....*Los Angeles 54*
COLORADO—LIBERTY TRUCKS & PARTS COMPANY.....*Denver 1*
IDAHO—COLUMBIA EQUIPMENT COMPANY.....*Boise*
MONTANA—WESTERN CONSTRUCTION EQUIPMENT COMPANY.....*Billings*
MONTANA—WESTERN CONSTRUCTION EQUIPMENT COMPANY..*Missoula*
NEVADA—C. D. ROEDER EQUIPMENT COMPANY.....*Reno*
NEW MEXICO—N. C. RIBBLE COMPANY.....*Albuquerque*
OREGON—COLUMBIA EQUIPMENT COMPANY.....*Portland 14*
UTAH—WESTERN MACHINERY COMPANY.....*Salt Lake City 13*
WASHINGTON—COLUMBIA EQUIPMENT COMPANY.....*Seattle*
WYOMING—WILSON EQUIPMENT & SUPPLY COMPANY.....*Cheyenne*

OVERALL VIEW of the Electra powerhouse site of Pacific Gas & Electric Co. near Jackson, Calif., taken from the head of the penstock. The long building is the existing plant, while excavation at left is the site of the new plant now being built.

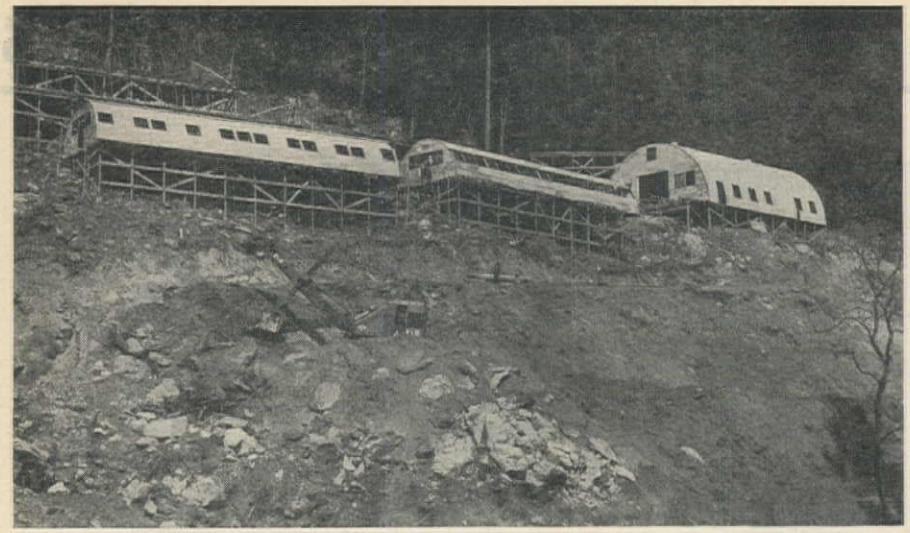
Power Development—
P. G. & E. Expands Mokelumne System

Eleven miles of tunnel replace 35 mi. of winding canal in program to increase existing generating capacity of 91,000 kva. to a total capacity of 185,-000 kva., to partially supply augmented post-war power demand in San Francisco Bay area and other northern California localities

REPLACEMENT of 35 mi. of winding mountainside canal with 57,000 ft. of hard rock tunnel is now being carried out by Pacific Gas & Electric Co. on its Mokelumne River project, east of Jackson, Calif. The new facilities will increase the generating capacity of the Mokelumne system from the present 91,000 kva. to 185,000 kva., and will at the same time eliminate the difficult and costly maintenance of the canals, which had but limited carrying capacity at best, and were wasteful both of water and power head.

The tunnels, along with two new powerhouses, penstocks and other incidental facilities are a part of the company's $350,000,000 postwar expansion program, which will add 1,000,000 hp. to the company's generating capacity by the end of 1951. Total cost of the Mokelumne improvement will approximate $20,000,-000.

Already in operation on the Mokelumne River above Jackson, are three powerhouses, with their required reservoirs, conduits, etc. These existing plants are: (1) Salt Springs powerhouse, located immediately below Salt Springs dam, a rock-fill structure with a reservoir capacity of 131,403 ac. ft.; this plant produces 11,000 kva. of electricity at a static head of 244.5 ft. (2) Tiger Creek powerhouse, producing 60,000 kva. of power at a static head of 1218.6 ft.; its water supply is transported from the afterbay at Salt Springs through 17.34 mi. of conduit, 2.72 mi. of tunnel, and 0.26 mi. of pipe; additional water is introduced from several intersecting creeks and one regulating reservoir of 535-ac. ft. capacity and one forebay reservoir of 40-ac. ft. capacity are located on the line. (3) Electra powerplant, a 7-unit plant of out-dated design, producing 20,000 kva.; water for some of its units is conveyed through a tortuous canal fed from the afterbay of Tiger Creek powerhouse and called the "Upper Standard Canal," and the remainder are served from a second ditch, known as "Lower Standard Canal" which takes water from the river a short distance



CAMP ERECTION at Adit 3 of the Electra tunnel. All contractors' camps were built by Daley Bros. of San Francisco and are each located in close proximity to the working area where the men will be employed. All camps are made of quonset huts and some interesting hillside foundation work was required in this and other locations.

below the Tiger Creek plant and follows a roughly parallel course around the mountains; this plant and its double canal system will be dismantled when the new project is completed, although the forebay for existing Electra plant, Lake Tabeaud, will be maintained and will serve as forebay for the new Electra powerhouse.

The new construction, which will carry water in tunnel for the entire distance from Tiger Creek afterbay to Lake Tabeaud, provides so much better hydraulic flow characteristics that it is possible to conserve some 312 ft. of static head formerly lost in the steeper gradient and much greater length of the two canals. This additional head will be utilized in a new powerplant to be called West Point powerhouse, roughly a quarter of the way from Tiger Creek to Electra.

A 12-ft. 10-in. x 15-ft. 6-in. tunnel will take water directly from the afterbay at Tiger Creek powerhouse, which is a reservoir of 2,527 ac. ft. capacity, and convey it 14,160 ft. to the penstock of the new West Point powerhouse. No forebay is provided for this plant, except as the Tiger Creek afterbay can be simultaneously considered to answer that purpose. A circular differential head type surge chamber will be provided at the head of the penstock.

The single penstock at West Point will be of 3/8-in. to 5/8-in. steel plate, 96 in. in diameter at the top, decreasing to 84 in. at the bottom, and lined with a coal tar enamel. One 17,000-hp. Pelton impulse type, vertical shaft turbine, will be installed in the West Point plant. It will motivate a 15,000-kva. Allis-Chalmers generator.

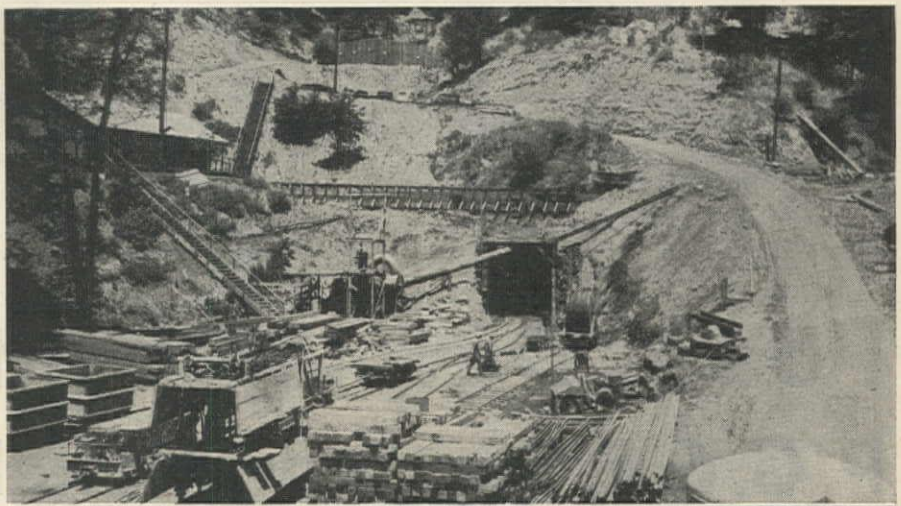
Water from the tailrace at West Point will then go directly into the inlet of a 42,850-ft. tunnel of similar cross-section, through which it will be conveyed to Lake Tabeaud, serving, as stated previously, as forebay for the new Electra plant. A uniform grade of .0014 is maintained throughout the length of both tunnels, each of which will operate as a pressure bore.

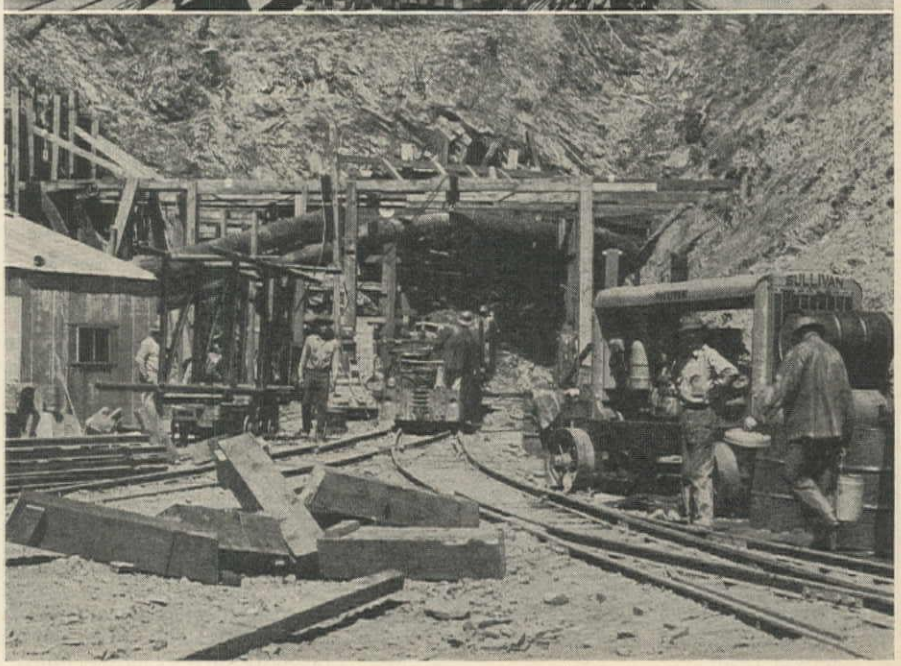
An overflow spillway type diversion structure 100 ft. long and about 25 ft. high at the center line, will be constructed across the Mokelumne River a short distance above West Point powerhouse, so that if for dispatching or any other reasons, the powerplant is closed down and no water is passing through it into the afterbay, river flow may be diverted directly into the Electra tunnel and to pick up additional river flow for Electra plant. Similarly, by-pass facilities will be provided so that water may be discharged from the afterbay back into the river, if it is not desired to send water through the Electra tunnel.

No alterations are to be made at Lake Tabeaud, except the enlargement of the penstock, of which 2,900 ft. now existing will be concrete lined circular tunnel, 12 ft. in diameter, and 3,000 ft. of which will be of welded steel pipe varying in diameter from 114 to 90 in. for supplying water to the plant. The effective head will be 1,223 ft.

The new Electra powerplant will consist of six 19,000-hp. Pelton impulse type

TYPICAL ADIT entrances on the Mokelumne River tunneling project. The upper view is the adit on T. E. Connolly's West Point tunnel work, while the lower is the entrance to Walsh Construction Co.'s Adit 3 of the Electra tunnel. Two-deck drilling jumbo used by Connolly, and other mechanized mining equipment is shown.





EXCAVATION for penstock and powerhouse at Electra power plant site. Some of the excavation for the interesting forked penstock installation can be seen through the deep cut. Powerhouse switching yard will be located on the level bank at center.

turbines. These are mounted in three groups of 2, each pair on a single horizontal shaft, upon each of which one 33,000 kva. Allis-Chalmers generator will operate at 225 rpm. The powerhouse at Electra will be 230 x 88 ft. in exterior dimensions, and operation of the machinery will be protected by use of steel dust-proof doors on the powerhouse building. About 65,000 cu. yd. of excavation have been necessary for the powerhouse and switch yard at the site.

An interesting succession of bifurcations has been designed by the company's engineering department for the lower end of the Electra penstock, to divide the water in the 90-in. single penstock into six 36-in. lines feeding the six water wheels. At the first fork, a 72-in. and a 52-in. pipe divide the water from the 90-in. penstock. The 72-in. line divides after 15 ft. into two more 52-in. lines, and each of the three 52-in. lines splits into two 36-in. lines to serve the two turbines for each of the generator units. The lengths of smaller cross-sections vary according to the requirement for reaching the turbines.

Heavily reinforced concrete anchors are designed for the several junction points. The heaviest of these is of course located at the base of the single penstock and the first point of bifurcation. Here an irregularly shaped block of concrete will completely encase the steel pipes. It will be 12 ft. wide over the end of the 90-in. penstock and cover the last 6 ft. before the centerline angle to the left. It will completely encase the 15-ft. branch of 72-in. pipe and continue 8 ft. past the centerline fork into the two 52-in. branches. The same block of concrete will extend 19 ft. 9 in. along the 52-in. pipe branching to the right from the bottom of the single penstock.

Reinforcing this monolithic anchor will be 1¼ in. square hoops on 6-in. centers longitudinally and 10-in. centers radially. A total of 37 hoops will circle the 9-in. pipe, 28 will go around the 72-in. pipe, and 26 will encircle the 52-in. pipe. Longitudinal spacers will also be 1¼-in. square steel.

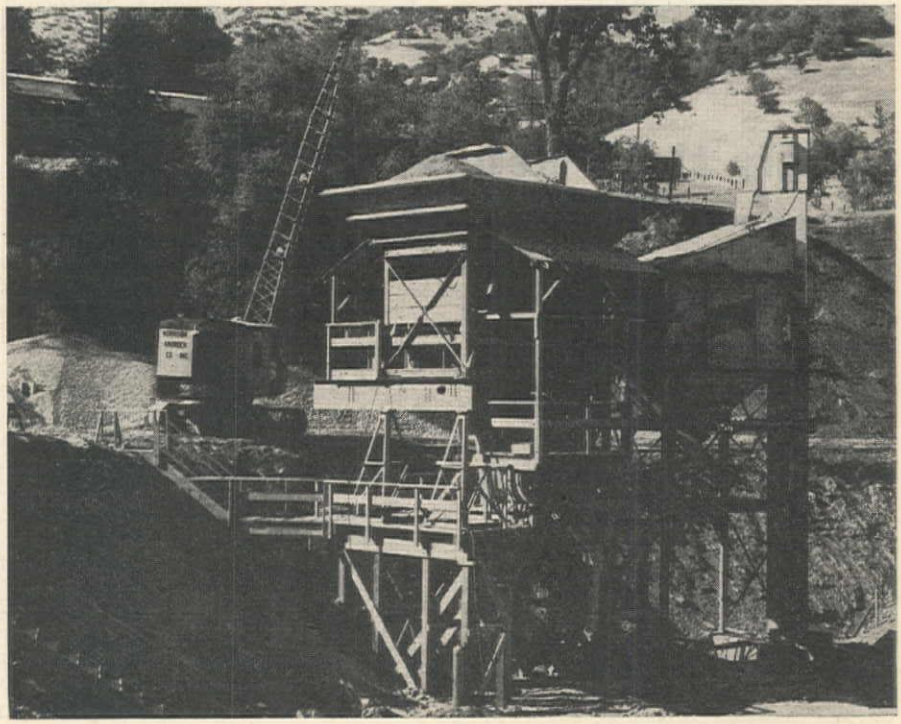
At the head of the penstock will be constructed a circular surge chamber of the differential head type. This will be located 70 ft. off the center line of the tunnel and will be 72-ft. deep. The diameter of the outside shell will be 50 ft. at the base, with walls tapering outward at 1:6 slope. The base will be 2 ft. higher than the top of the tunnel. In the center a reinforced concrete pipe, 10 ft. in diameter and 72 ft. high connected directly to the tunnel with three portholes having a total effective discharge area of 30 sq. ft. will be installed. The maximum anticipated differential in head between water in the outer chamber and the center 10-ft. pipe is 10 ft.

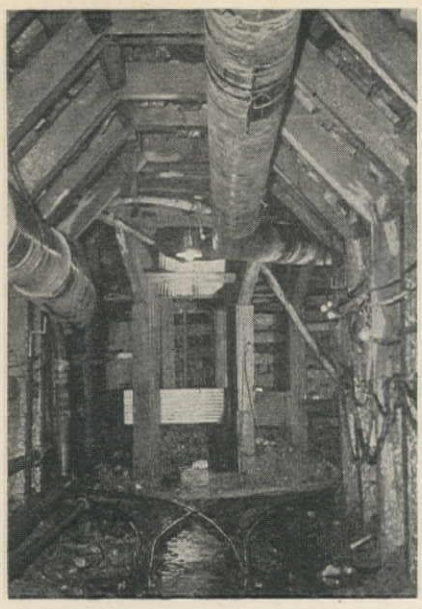
A small afterbay dam is being constructed below Electra powerhouse, to regulate discharge into the river. It is designed as a slotted weir type structure 250 ft. long and 15 ft. high at the crest. Additional abutment sections at the ends total about 30 ft. in length. Slots in the structure are 6 ft. wide and the interspaced blocks 40 ft. wide. Provision is made for placing bulkheads over the slots if desired.

Construction on the project is divided among several general contractors. The 14,160-ft. tunnel from Tiger Creek to West Point is being driven by T. E. Connolly of San Francisco, working both directions from an adit. The 42,850-ft. tunnel was awarded to a joint venture consisting of Utah Construction Co., San Francisco, Morrison-Knudsen Co., Inc., Boise, Ida., and Walsh Construction Co., San Francisco. Three adits were established, which divide the total length of tunnel roughly in three, and the joint venture assigned one of its members to each adit, and each is driving from two faces simultaneously and will continue until he holes through to the section of his neighbor. The Utah Construction Co. is working from Adit 3, the furthest downstream; Morrison-Knudsen Co., Inc. has the Adit 2, or central section; and Walsh Construction Co. is operating from Adit 1, the furthest upstream.

Morrison-Knudsen Co., Inc., Power Division, is constructing Electra powerhouse, while Utah Construction Co. is

MIXING PLANT of Morrison-Knudsen Co., Inc., contractor for Electra powerhouse. Of particular interest is the low mounting of the cement hopper at the right, with feed pipe passing upward at a 30-deg. angle to feed cement into batcher and mixer.





WYE AT inner end of Adit 2 of Electra tunnel. under construction by Morrison-Knudsen Co., Inc. All four contractors on tunnels are working two faces simultaneously from short entrance adits.

building the West Point powerhouse. Penstocks are being fabricated and will be erected by Western Pipe and Steel Co., San Francisco. Daley Bros., San Francisco, erected the contractors' camps at the various sites, being mostly quonset huts situated on steep mountain slopes. Approximately 35,000 ft. of access roads had to be built to reach the various operations areas, and these were constructed by A. Teichert & Sons, Inc.

Standard tunnelling operations are employed by all of the contractors on that portion of the work. Six and seven-drill jumbos, mostly field constructed, are used for drilling the faces. In some cases, detachable bits are employed, in others the standard drill is used, this being determined by the hardness of the rock and preference of the contractor. From 40 to 50 holes are drilled in the faces, shot in several delays to secure maximum breakage and minimum of overbreak. Mucking in every case is performed by Conway muckers, somewhat cut down for operation in the available space. Cars are moved by electric locomotives and empties moved into position behind the mucker by using a cherry picker to remove the last load. Design of these cherry pickers varies a little on the several contracts, but all perform the same service.

A number of variations have been encountered in the rock. Walsh's upstream face is in the hard Sierra granite, but others are working in limestone, schist, and other kinds of rock. Occasional pockets of water have been encountered but none so far which have failed to drain out quickly. Seams of talc have been uncovered occasionally which have proved to be difficult to break and to handle. Since the tunnels traverse a section of California's Mother Lode country, miners have been much interested in watching for possible gold-bearing quartz veins. Thus far only minor such veins have been intersected, but interest is still intense.

The tunnels in the main do not require timbering and these sections of sound rock will not be lined. In occasional sections where surface disintegration has penetrated to the tunnel depth, or seams of soft or unstable rock are encountered, the bore will be lined to a horseshoe section, allowing the timbering to stay where placed with a minimum of 4 in. of concrete covering it. A minimum of 6 in. of concrete will compose the invert. In a few sections where timbering has not been required, but which will be lined, a minimum of 4 in. of concrete, if poured, and 2½ in. if gunited, will be required over rock points.

Organization

The project on the Mokelumne River was designed by Pacific Gas & Electric Co. engineers under the direction of I. C. Steele, vice president and chief engineer; Walter Dreyer, chief civil engineer; and J. A. Koontz, hydroelectric and transmission engineer. Construction is being supervised for the company by O. W. Peterson, general construction

CONCRETE CULVERT through which West Point penstock will pass underneath a new state highway. Intricate design was required, as the culvert is both on a skew and steep grade of penstock.

engineer; H. W. Haberkorn, hydroelectric construction engineer; J. E. Cooney, project superintendent; and George Thatcher, project engineer.

For the contractors: Martin Johnson is superintendent for T. E. Connolly, Inc., while on the section being driven by the Utah company, Joe Ivy is general superintendent, with Fred G. Arp project manager and Thomas M. Ayers engineer. On the Morrison-Knudsen tunnel contract, Oscar Benson is superintendent, B. A. Peters project manager and L. L. Wheeler engineer. General superintendent for Walsh Construction Co. is E. H. Hatch. S. M. Wicks is camp construction superintendent for Daley Bros.

It is anticipated that the project will be placed in operation in June, 1948.

Hungry Horse Reservoir to Be Cleared Under New Contract

CLEARING at the Hungry Horse dam site and a small part of the Hungry Horse reservoir area in Montana has been placed under contract by the Bureau of Reclamation. The contract was awarded to J. J. Reese, Columbia Falls, Mont., on his low bid of $408,320.

The acres to be cleared are in the immediate vicinity of the site for Hungry Horse dam and the site selected for excavation and stockpiling of concrete aggregates for construction. The work is situated on the south fork of the Flathead River, approximately 30 mi. northeast of Kalispell, Mont.

The Hungry Horse multiple-purpose project will regulate the Columbia River to develop power to meet the increasing demand in the area and to protect the agricultural lands in the Flathead Lake area against floods.

Studies on the size of the storage reservoir and on the other features of the construction are still under way. Recent considerations indicate that the maximum usable and feasible project features would involve a reservoir of 3,500,000-ac. ft. capacity and a power plant of 286,000 kw. capacity at the Hungry Horse site. Until final decisions are reached, the program is based upon a reservoir of 1,500,000-ac. ft. capacity, with a power plant having an installed generating capacity of 142,000 kw. Studies by the Bonneville Power Administration show a need for all the power that can be produced on the project, and also for the additional power to be gained at downstream plants through the winter releases of water from the Hungry Horse reservoir.

Denver Contributor to WCN Succumbs to Heart Attack

Nelson R. Love, well-known Denver, Colo., engineer, died August 13 in Denver of a heart attack at the age of 55. He had been ill a month. Love was chief engineer for the Denver Tramway Co. for many years. He belonged to the Engineering Council, Colorado Society of Engineers, and was a fellow of the American Institute of Electrical Engineers. He was a frequent contributor to the columns of *Western Construction News*.

Western Construction Project Bids to Be Advertised Soon

SEVERAL IMPORTANT bid calls are expected this month, according to the advance construction bulletin issued by the Bureau of Reclamation from Denver, Colo.

Invitations for bids on tunnel excavation for the Hungry Horse project, in Montana are expected to be issued about Sept. 16. This calls for excavation for a diversion tunnel, 1,050 ft. long and 36 ft. in diameter, 25 mi. northeast of Kalispell, Mont. Also on Sept. 16, invitations will be issued for switchyard excavation, footing, and surfacing for Keswick Dam, part of the Central Valley project near Redding, Calif. Specifications call for construction of 115-kv. and 230-kv. switchyards, and a left abutment parking area.

Street, sewerage, and water distribution systems are to be built at Canyon Ferry Government Camp, in the vicinity of Helena, Mont., and bids will be invited about Sept. 23 for the 300-day project. On Sept. 26 invitations will be issued for construction of steel penstocks at the Davis Dam project for the Davis Dam and Powerplant, 30 mi. west of Kingman, Ariz. On the same date, bids will be invited for a cableway and gaging station at Davis Dam, on the Colorado River, 30 mi. west of Kingman, Ariz. Construction of transmission lines for the same Davis Dam project in the vicinity of Yuma, Ariz., will also be opened to bidding on Sept. 26.

Invitations are to be issued near Sept. 26 for spillway gates, hoists, and a bridge on Altus Dam, near Altus, Okla., part of the W. C. Austin project. On the same date, bids on a pump house for the Boulder Canyon project, Boulder City, Nev., and for drain inlets and farm bridges on the Tucumcari project, in the vicinity of Tucumcari, N. Mex., will also be invited.

Bid calls expected the first part of October include a garage erection at the Davis Dam project, in Arizona-Nevada, and a prefabricated house erection at the same site. Invitations on both projects will be issued about Oct. 1.

Laterals and structures on the Tucumcari project, N. Mex., construction of a transmission line at the Davis Dam project, and erection of transmission lines at the Missouri Basin project and the Colorado-Big Thompson project are other jobs, invitations for which will be issued about Oct. 1.

Bid calls on a wasteway for the Owyhee project, near Nyssa, Ore., will be issued near October 1, as will bid calls for construction of Medicine Creek Dam, Frenchman-Cambridge Unit, Missouri Basin project, Neb.

Invitations for a Central Valley project canal near Visalia, Calif., will be expected Oct. 7, while on Oct. 15, bids on construction of Heart Butte Dam and subsequent highway relocation will be asked. Erection of a pumping plant at the Klamath project, near Merrill, Ore., will be opened for bidding at that time.

Other bid calls expected Oct. 15 include pipeline and storage tanks, at Boulder Canyon project, Nev.; construction of a wasteway for the Payette division, Boise project, near Caldwell, Ida.; construction of earthwork and structures for Willow Creek Wasteway, near Middleton, Ida.; construction of a lateral system on the Deschutes project, near Madras, Ore.; and erection of a canal for the Central Valley project, near Fresno, Calif.

Bids will be invited about Oct. 24 for construction of earthwork, lining and structures for 10 mi. of the Horsetooth Feeder Canal, Colorado-Big Thompson Project. A diversion dam and tunnel are included in the job.

Post War Cat-Cracker On-Stream At Texas Company's Wyoming Plant

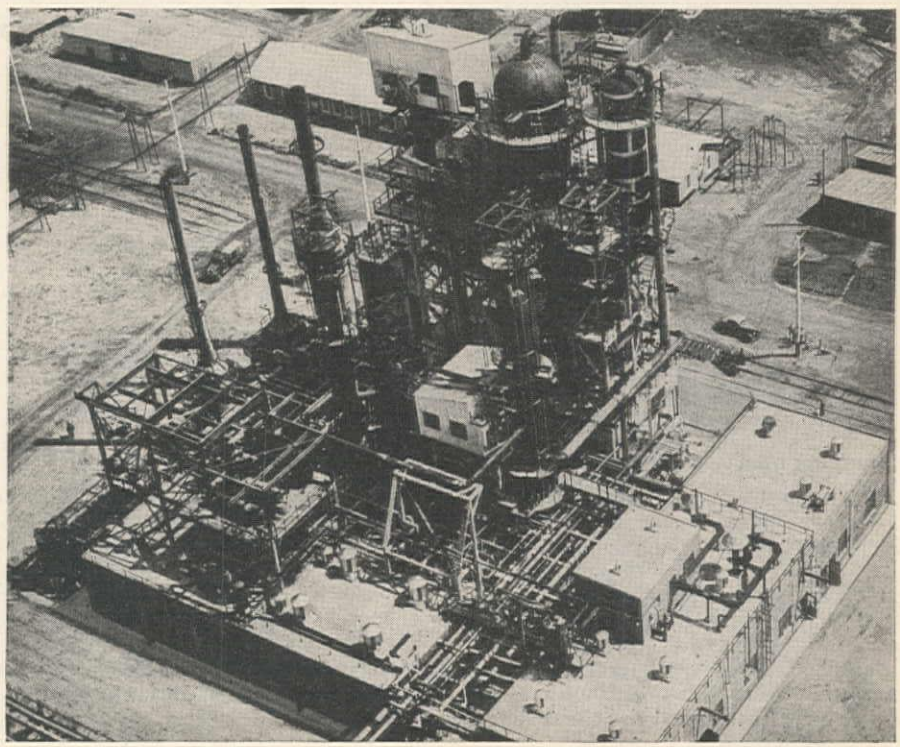
THE FIRST small fluid cat-cracker to be built since the end of the war went on-stream recently at the Casper, Wyo., refinery of The Texas Company. Rated at 4,000 bbl. per day capacity, the new unit is intended to serve as the focal point of an expansion and consolidation program of The Texas Company at Casper, which will make its Casper Works (10,000 bpd. crude charge rate) a model of small refinery planning.

The cat-cracker was designed and constructed by The M. W. Kellogg Company, petroleum engineers, who are also revamping and building catalytic polymerization, naphtha reforming and pressure coking facilities in the same refinery.

A new "balanced pressure" design is embodied in the unit. As a result, reactor and regenerator are supported at the same levels; an overall reduction in height has been effected; and standpipe heights have been reduced. Piping, too, has been simplified, with short direct runs to all major vessels and with only one expansion joint in the whole unit.

The plot plan, arranged in the shape of an elongated oblong, brings the reactor, regenerator, and precipitator into line in a main structure at the extremity of the battery limits. At the opposite face of the oblong, a second row of vessels brings the fractionator and gas recovery equipment into line. This oblong arrangement, open on all four sides with all big vessels on the outside, enabled each vessel to be lifted into position as soon as it arrived on the job site without interfering with other erection proceeding simultaneously. The installation of piping, structural steel and internal auxiliary vessels was not delayed by this outside arrangement of the big vessels, nor did each large vessel in position interfere with the installation of its neighbor. As a result, the unit is a model of construction efficiency and clearly shows the effect of plot plan and vessel arrangement on construction costs, construction time and ease of maintenance.

CAT-CRACKER designed by M. W. Kellogg Co., located in Casper, Wyo., built to the new "balanced pressure" design, which should increase plant capacity to 10,000 bpd.



PLACING AND FINISHING reinforced concrete lining on one section of the Pasco lateral system of the Columbia Basin project. All equipment rolls on same tracks on the bank of the canal.

Experimental Canal Linings

Large-scale experimental construction undertaken at Pasco, Wash., where costs and performance of concrete, gunite and asphaltic canal lining are being studied after installation in the Pasco Lateral System — Ultimate development of Columbia Basin Project will depend on experiment's results

By MAURICE C. LIPP
Engineer
Bureau of Reclamation
Denver, Colo.

THE PASCO Lateral System of the Columbia Basin Project in Washington, now under construction by the Bureau of Reclamation, was designed to provide an opportunity to study the costs and performance of several types of canal lining. This large-scale, experimental construction was undertaken by the Bureau in connection with its recently inaugurated lower-cost canal lining program aimed at the development and improvement of canal lining design, materials, and construction methods to provide durable linings at lower costs both in initial construction and service maintenance.

The ultimate development of the Columbia Basin Project provides for water to be delivered to the Pasco system by gravity from the Potholes Reservoir via the Potholes East Canal. But in order that irrigation may be started in this district prior to the eventual completion of the gravity system, a temporary pumping plant is now being constructed on the Columbia River to serve the project.

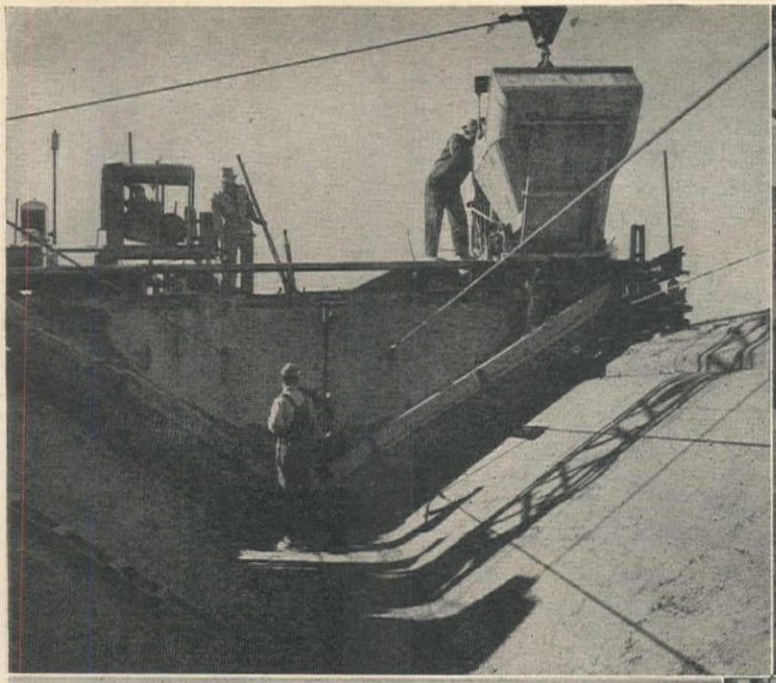
Pumping plan

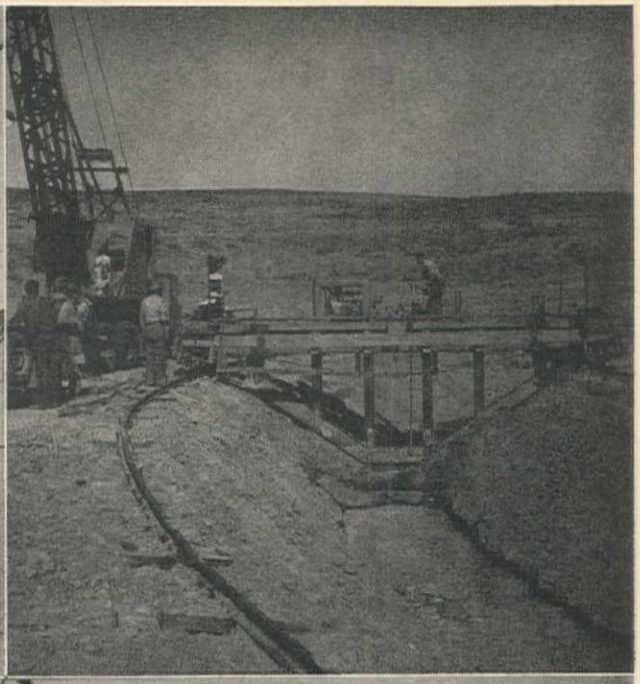
Irrigation water for this initial 5,400-ac. development over 100 mi. downstream from the Grand Coulee Dam will be pumped from the Columbia River by two centrifugal pumps, each rated for a discharge of 63 cfs. against a total head of 167 ft. There are six relift pumping plants located on the lateral distribution system. The largest relift pump, located on the Pasco Lateral has a capacity of 60 cfs. against a head of 31 ft. Five smaller relift pumps will provide delivery to small laterals and range in capacity from 3 to 14 cfs.

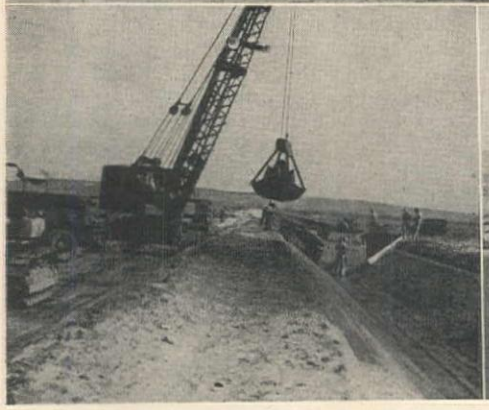
Due to the sandy soils on the project and high probable seepage losses from unlined canals, the entire lateral system, totaling approximately 23½ mi. was constructed of open, lined sections or of concrete pipe. Approximately 4¾ mi. of the system is concrete pipe and the remaining 18¾ mi. open, lined ditches. Concrete pipe is used essentially for pump discharge lines and in locations where the topography will not permit the use of open laterals. The lined sections consist of: 3.1 mi. of unreinforced Portland cement concrete lining 2 and 3 in. thick, 4.8 mi. of unreinforced 1½-in. thick pneumatically applied mortar, and 11 mi. of unreinforced 2-in. asphaltic concrete. The ditch sections, with 1½ = 1 side slopes, vary in base width from 2 ft. to 5 ft. and from 1 ft. to 5 ft. in depth.

The hydraulic design of the lateral sections was prepared using a value of Kutter's "n" of 0.014 for Portland cement concrete, "n" = 0.015 for asphaltic concrete, and "n" = 0.016 for pneumatically applied mortar. In order to simplify the construction of the lining, the intersection of the side slopes with the canal base is rounded on an 18-in. radius. The top edge of all linings will extend 8 in. horizontally into the canal bank to provide protection from erosion and surface water.

Specification provisions for the construction of the earth section to receive the lining are identical for all types of lining. Embankment, where required to shape the earth section, is compacted in layers of 6-in. maximum depth. Specifications required that all earth sections be finished to accurate dimensions.







SLIP FORM used in placing the 3-in. concrete lining in the lateral system is shown, upper left. Method and machine for trimming laterals for the lining are shown in picture at upper right, while picture middle left shows gunite equipment for placing of 1½-in. thick pneumatically applied mortar lining on system. Placing and finishing of the mortar lining on lateral is shown in picture at middle right. Below, left, shows a general view of asphaltic lining operations. Hot mix is placed in paver by a ¾-cu. yd. clamshell. Paver is shown laying and finishing lining (middle) and being lifted over canal structure (right).

CURING COMPOUND is being applied to the newly placed 3-in. concrete lining on the Pasco Pump Lateral system. The rails along the berms are used for trimming machine, concrete placing and finishing machine and compound sprayer.

Concrete linings

Concrete for the Portland cement concrete linings has a water-cement ratio of 0.53 by weight and contains ¾-in. and 1½-in. maximum size aggregate in the 2-in. and 3-in. linings, respectively. Dummy type contraction joints, ⅝-in. in depth and ¼-in. in width, are spaced at 6, 9, and 12-ft. intervals; each joint spacing is used for approximately a third of the concrete lining. The concrete was finished to a smooth surface by use of a long-handled steel trowel. Membrane curing, using a white pigmented compound, was specified for all concrete lining. The dummy contraction joints are filled with a cold-applied, mastic type asphalt prior to application of the curing compound.

The unreinforced pneumatically applied mortar lining is constructed of a 1:4 mix, by weight, of cement and sand. Specification provisions required 35-psi. pressure in the placing machine for a 100-ft. length of hose with a uniform water pressure 15 psi. greater than the pressure in the placing machine. The curing procedure and contraction joint spacings are the same as provided for Portland cement concrete lining. No provision is made in either the concrete or pneumatically applied mortar linings for expansion joints.

Asphaltic lining

The asphaltic concrete lining, mixed and laid hot, consists of a well-graded aggregate of ¾-in. maximum size, with an asphalt content of from 8 per cent to 10 per cent of 60-70 penetration asphalt cement. If the asphaltic mix is correctly designed and compacted, reducing the air voids to a minimum, it has been found that the resulting impermeability obviates the necessity of a surface seal. Another important factor favoring the elimination of seal treatment is the increased resistance to mud curling which tends to erode asphaltic concrete. Seal treatments which are sufficiently hard to resist this destructive effect may readily check and crack.

On the Pasco Lateral System, except for one short length of canal, the subgrade will not be sterilized to prevent weed growth. This decision was made in view of the rather high cost of such sterilization, the relatively sterile condition of the natural sandy soils, and the possibility of controlling the weed growth by careful maintenance. On a short length of canal, approximately 4,000 sq. yd., the subgrade soil will be treated with sodium chlorate and a sodium chlorate-boric acid mixture. The latter area will be used as a control in determining the effect of the soil sterilants on weed growth.

In order to speed the development of equipment for asphalt canal lining construction, it was required by the specifications that the asphaltic concrete be spread, shaped and finished by a power-operated machine capable of producing a surface free from defects without segregation of the materials and of securing 90 per cent of the compaction obtained in the laboratory by a testing load of 3,000 psi. applied for two minutes.

In view of this high degree of compaction specified, a seal treatment consisting of a 50-60 penetration, semi-blown asphaltic cement is placed only over certain areas such as hand-placed and hand-tamped lining around structures, using hand-spray methods, at the application rate of approximately 0.25 gal. per sq. yd.

J. A. Terteling & Sons, contractors under Specifications No. 1230 for the lining work, are placing the asphaltic concrete by use of a paving machine manufactured specially for the job by Madsen Iron Works, Huntington Park, Calif. This project is the first Bureau of Reclamation canal lining project of any magnitude to require machine-placed asphaltic concrete lining.

Comparative costs

Based on unit bid prices and the estimated cost of materials to be furnished by the government, the following approximate total unit costs of the various linings to the government have been computed: 1½-in. pneumatically applied mortar, $2.33 per sq. yd.; 2-in. Portland cement concrete, $2.39 per sq. yd.; 2-in. asphaltic concrete, $2.47 per sq. yd. without soil sterilants and $2.83 per sq. yd. with sterilants; 2-in. pneumatically applied mortar, $2.67 per sq. yd., and 3-in. Portland cement concrete, $2.71 per sq. yd. These prices include trimming of canal section, sealing of the asphalt lined section, lining materials and placing for all linings, and joints and curing costs for the concrete linings.

As a matter of comparative interest, the estimated cost to the government of irrigation pipe in place is $1.62 per ft. for 12-in. diameter pipes, $2.27 per ft. for 15-in. diameter pipe and $2.84 per ft. for 18-in. diameter pipe. On the basis of costs for a 2-in. Portland cement lining, the cost of a typical lateral with a 2-ft. base, and a 1½-ft. depth of lining is estimated at $1.14 per lin. ft. For a larger lateral with a 2-ft. base and a 2-ft. depth the cost of lining is estimated at $1.36 per lin. ft. On the basis of these costs, the construction of open, lined sections is considerably cheaper than the installation of pipe, except where the alignment is located on very steep slopes. The cost comparison is based entirely on costs of original construction; if right-of-way and future maintenance costs were considered the comparison for concrete pipe would no doubt be more favorable.

Since the costs of this work are of basic interest in the economic analysis and comparison of the different types of linings, the Bureau has established a detailed cost accounting procedure on this project in order to determine the actual field costs of the work. From the data to be thus made available a more accurate and detailed study can be made than is possible, utilizing unit bid prices. The various operations involved in lining construction can be reviewed from a standpoint of costs and as result economies in future construction may be possible through modifications in the design and specifications of new work.

Project tests

Through provision of Parshall flumes and weirs, the measurement of water deliveries and losses from the system can readily be determined. Tests will be made after the system is in operation to determine the comparative hydraulic efficiencies of the various types of linings and also the accuracy of the assumed value of Kutter's "n" factors.

The total lining project includes 42,400 sq. yd. of Portland cement concrete lining, 29,100 sq. yd. of pneumatically applied mortar lining, and 88,800 sq. yd. of asphaltic concrete lining.

The construction of the distribution system, including the lined canals and pipe lines, was completed September 1, 1947. The pumping plants on the project are also under construction; completion of this work will be contingent upon delivery of materials and equipment.

Future construction for the Columbia Basin Project will require the lining of many canals and laterals. Experience gained from the Pasco unit will serve as a guide in the design and construction of these future projects.

Colorado Edits New Specifications

Method of preparing book of road and bridge specifications by consultation between highway department and contractors deemed unusual — Basic principles dictated in writing specified results rather than methods

By R. E. LIVINGSTON
Assistant Design Engineer
Colorado Highway Department
Denver, Colo.

THE COLORADO State Highway Department has delivered to the printer the text of a new book of standard road and bridge specifications. Normally this would be no more newsworthy than the fabled "dog bites man." But, the method followed in preparing this particular book of specifications is sufficiently different from the normal approach to warrant an outline of the procedures involved.

Early this year, Mark U. Watrous, the State Highway Engineer of Colorado, ordered the preparation of a new book of standard specifications. The directive under which they were to be prepared ordered that certain basic principles should be observed in their writing.

First, that in general, the construction procedures should specify results rather than methods.

Second, that all requirements that added to cost without appreciable benefit to the job be eliminated.

Third, that construction specialists from the contracting organizations should be consulted to assure that the final draft of the specifications would include the latest, best and most economical methods of securing the desired results.

Obvious requirements

Colorado has not issued a book of standard specifications since 1940. As a result of the improved methods of construction resulting from recently developed equipment, plus the new and improved materials introduced since the last issue, it was apparent from the start that the new standards would require a complete rewrite of the previous book.

It immediately appeared that there were four groups of interested parties:

1. The administrative officials and technicians of the Department who would have to interpret and administer the completed specifications;

2. The contractors who would be charged with the responsibility of building projects under the specifications;

MARK U. WATROUS, Colorado State Highway Engineer, ordered new book.

3. The suppliers of material and equipment who must deliver to the contractor products which would comply in all respects with requirements of the specifications.

4. Engineers of the Public Roads Administration who would, on Federal Aid work, have joint responsibility with the engineers of the State Highway Department.

In order to secure the best correlation of the four affected groups, the following procedure was worked out and followed throughout the preparation of the text.

First, the writer of this article, who is also the author of the book of specifications, would prepare a rough draft specification for a bid item, such as "Road Mix Oil Processed Surfacing." The rough draft would then be sent to the following men in the Highway Department for their review and comments:

1. The Highway Engineer.
2. The Assistant Highway Engineer who is the Chief of the Engineering Division.
3. The Construction Engineer.
4. The Design Engineer.
5. The Bridge Engineer.
6. The Materials Engineer.

The review copies would then be assembled, the comments digested and if necessary, conferences held to arbitrate any existing differences between the affected parties. The revised copy of the original, including corrections resulting from the interdepartmental review, was then handed to the Specification Committee of the Colorado Contractors Association for their review.

Contractor's committee

The Contractors Association in Colorado has, for a number of years past, had a Specification Committee that has attempted to present the contractor's viewpoint to all parties preparing construction specifications. The committee this year had as its able chairman, Mr. Charles Berry. Mr. Berry appointed subcommittees to review sections of the specifications with which they were most familiar. Thus the sub-committee on grading included men who were specialists on grading operations; the subcommittee on pavements included men who were specialists in pavement construction procedures, and so on through the other specialties involved.

During the period the contractors were making their review and preparing a digest of their comments, material and equipment specialists were called in and the text gone into in detail as it related to their specific fields. Engineers from the Portland Cement Association were called in on all items using Portland cement. Engineer consultants from the Asphalt Institute, from the many fabricators of steel and timber and other suppliers of engineering materials and equipment were called in to review their specialties. Each of these groups offered courteous and effective cooperation and no issues of dispute remain unresolved. For their very fine spirit of cooperation, the State Highway Department is deeply grateful.

The specifications were handed to the Contractor's Committee in sections covering a specific subject, i.e., grading, surface courses and pavements, steel bridges, etc. In this manner, the review was expedited and only one sub-committee at a time was involved. Upon completion of the review of a section of the book, a conference was held with Highway Department personnel and the appropriate contractor's committee in attendance. All review comments offered by the contractors were carefully gone into and in all cases a solution satisfactory to all concerned was worked out.

PRA concurrence

Corrections resulting from the conferences with the contractor's commit-

CHARLES BERRY, chairman, Colorado Contractors Ass'n. specification committee.

tee, and material and equipment specialists were then made in the text and it was forwarded, section by section, to the District and Division offices of the Public Roads Administration for a final review. It should be noted that the Public Roads Administration engineers were consulted throughout the earlier processes of writing and correction. As a result of the constant contact during preparation, changes resulting from the Public Roads Administration review have been held to a minimum.

After completion of the Public Roads Administration review and conference to adjust any required changes resulting therefrom, the final text was put in shape and delivered to the printer.

The method of preparation described may at first glance appear to be slow and unwieldy. It is believed, however, that in the long run it will prove to be justified. Many things which might have become points of issue, have been straightened out during the course of preparation of the book. In addition, the vast fund of knowledge and experience of the construction and material specialists, which was made available during preparation, should pay off in savings to the Department and through the Department, to the taxpayer.

Men in the construction industry would probably like to know what points of issue were found, also how close the combined studies were able to follow the original directive in preparation of the text. The following paragraphs will be devoted to comments on these items.

Typical problems

In the first place, how close is it possible to come to writing a specification which will specify a result without describing the equipment and construction procedure to be followed? The answer to that is fairly simple. It can be done exactly that way **unless** it affects the method of payment for the work to be done. As an example, the Colorado Highway Department assumes the responsibility for securing the proper density of embankments and subgrades instead of making it an obligation of the contractor. By this is meant that instead of specifying a density and asking the contractor to submit a bid based on placing material to a specified density, the department asks for bids on watering and rolling. The department then directs the amounts of water to be used and by making tests of the material indicates when the rollers are to be used. The contractor is compensated for the amounts of water actually used and is further paid for the number of hours of rolling consumed to achieve the desired result. In this way, and in order to secure equity in the bidding, it becomes necessary to specify the type of rolling equipment which must be used. On the other hand, if the contractor is charged with the responsibility of securing a specified result, it is only fair and equitable to allow him to use his own judgment regarding the equipment and construction procedure to be used.

It developed in the review with the contractor's committee that there is one phrase commonly used by practically all specification writers which should be labeled "Poison—Use with Caution." The phrase referred to is "or as the Engineer may direct." As a usual thing, it was found that where such terminology is required, it can usually be written "in a manner approved by the Engineer" and thus leave to the discretion of the contractor the election of method of proceeding with the work. The good sense of this procedure is self evident, considering that the Engineer might elect to have work done in a manner more expensive than the method selected by the contractor with no difference in the end result. Inasmuch as a saving to the contractor will ultimately result in a saving to the contracting agency, the State recommends that the method be followed wherever it does not result in lowering the standard of the finished work.

Material and equipment specialists were instrumental in making changes which will result in cost savings without adversely affecting the usefulness and efficiency of Colorado's highway work. Both Highway Department engineers and Colorado contractors are pleased with the results of the cooperative effort, and more cordial relations, as well as better highways in the state are anticipated.

JAMES D. BELL, assistant highway engineer for the State of Colorado.

Engineers Economize, Move Seattle Offices

THE SEATTLE District office of the Corps of Engineers has moved from its offices in the Textile Tower Building, it has been announced by Col. L. H. Hewitt, District Engineer. At the time the engineers moved into the Textile Tower, in January of 1943, the war-time personnel roster of their central office reached a peak of 1,854 employees, handling military construction projects totaling some $403,000,000 in continental U. S. and Alaska. Returning to a peacetime basis in 1946, the main office complement now totals 335 employees.

The Engineers are moving to offices at the former Seattle General Depot at 4735 East Marginal Way, the site recently vacated by the Quartermaster Corps. The Depot includes the old Ford plant and additional office and warehouse buildings constructed during the war. The installation is government-owned and the move will effect a saving for the War Department of approximately $65,000 a year in rent monies.

Barnes Co. Awarded Contract For Fresno Vets' Hospital

CONTRACT FOR the Fresno, Calif., Veterans Administration hospital was recently awarded to the James I. Barnes Construction Co., Santa Monica, Calif. by the Corps of Engineers. The $5,645,700 contract was the first let under the new program procedure developed by General Omar N. Bradley, administrator of Veterans Affairs, and Lt. Gen. Raymond A. Wheeler, chief of engineers, calling for the revision of designs and space to meet budgetary considerations.

The Barnes company submitted the low bid, $5,863,000 for the Fresno job at the initial opening and the Office of the Chief of Engineers took this bid under consideration. After revisions of design to meet budget needs, however, the Barnes firm reduced its figure to $5,645,700, which was accepted.

The Fresno hospital will be a 250-bed general medical and surgical installation and is the only air-conditioned hospital in the whole program.

Suspended Cantilever-Type Concrete Canopy Used in B. C. Department Store

A SUSPENDED concrete canopy designed on the cantilever principle by J. C. Page, Vancouver, B. C., architect is a principal installation on the west and south sides of Woodward's Ltd., who are constructing a new Port Alberni, B. C., department store.

The first time such a method has been used in British Columbia, it provides a canopy around the building above show windows which will be free from maintenance costs. Weight of the canopy is balanced inside the building by a similar construction which will form the ceiling of the display windows. The outside canopy slopes inward to prevent rain water falling over the outside edge.

Five-ply plywood has been used in some cases for the concrete forms. This material is treated with banana oil to prevent the cement from adhering to the plywood as the concrete sets. It causes the concrete to take on the "grain" of the plywood. This type of form leaves the concrete with a very smooth surface which does not need to be plastered.

Space is left on the basement floor for four passenger elevators and an escalator. W. E. Townsley is superintendent of construction for Woodward's Ltd.

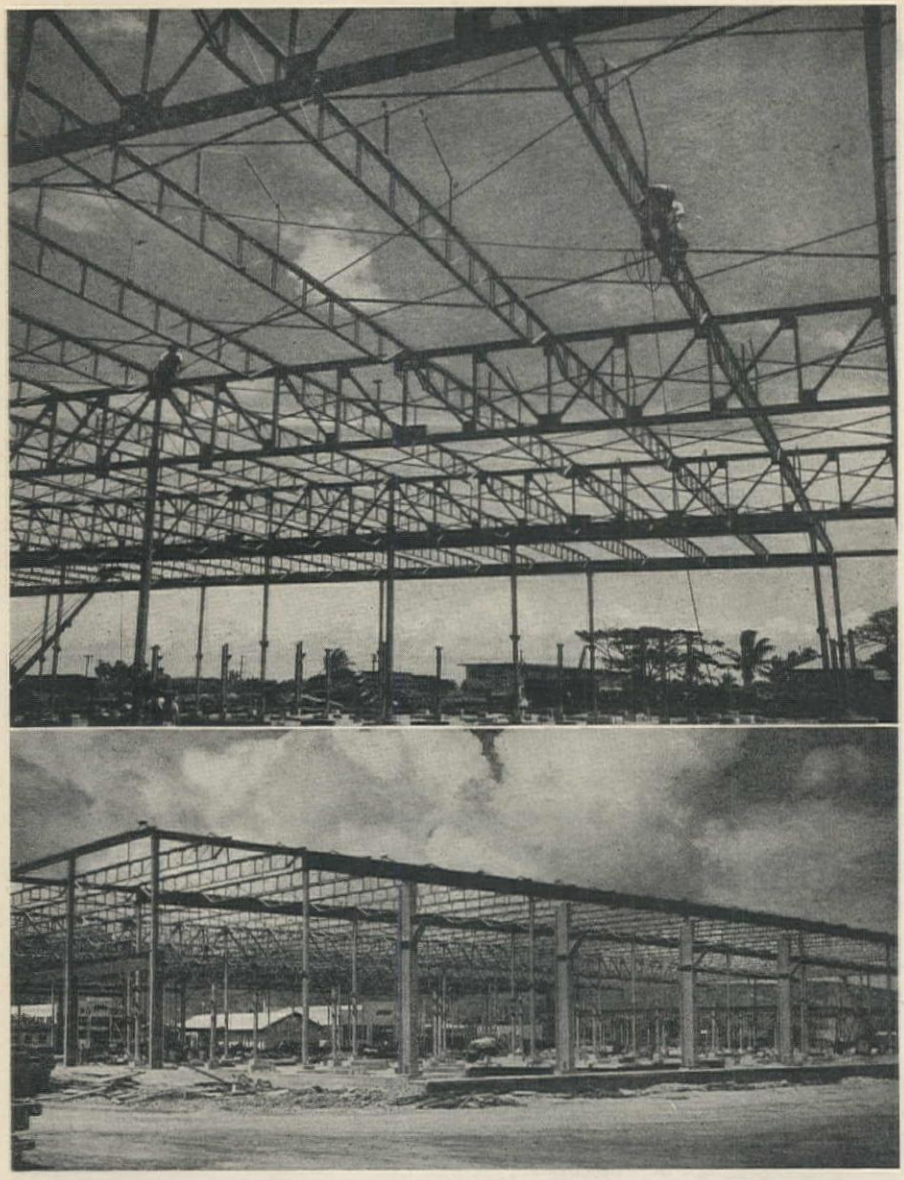
Large Warehouse Erected in Hawaii

Being built by Glover, Ltd., Honolulu building will have floor area of 96,000 sq. ft. with added mezzanine—Nearly all the 300 tons of steel used for job supplied by Bethlehem Co.

ONE OF HAWAII'S largest warehouses is under construction by James W. Glover, Ltd., contractor of Honolulu, for Lewers and Cooke of that city. It will have a floor area of 96,000 sq. ft., and an added mezzanine with floor area of 46,400 sq. ft. Steel erection on the structure is by Industrial Electric and Steel, Ltd., also of Honolulu, and Guy Rothwell & Associates were architects on the planning.

Over 500 tons of steel will be used on the job, practically all supplied by Bethlehem Pacific Coast Steel Co., and fabricated at the company's Alameda, Calif., plant. One hundred tons are used as long span joists, 40 ft. long and spaced on 10-ft. centers.

ERECTION of built-up long span steel joists is shown in upper picture of the warehouse construction. Below, the cylindrical columns are 8- and 10-in. black steel lap welded pipe. Welded brackets will support mezzanine floor.



ERECTORS INSTALLING a 1-in. bracing rod on the new Lewers and Cooke warehouse are shown at top. Below, steel erection is shown 80 per cent complete. Frames welded to the top chords of long span joists support purlins to which corrugated wire glass will be attached. Building will have 8 such monitors, all being 275 ft. long.

Four types of columns are being used in the building. The marginal wall columns are built up channels, fabricated locally. To support the mezzanine and a fully cantilevered 30-ft. marquee, built-up deep web channels are used as columns, and as support under the mezzanine, pipe columns in 10- and 20-ft. lengths are used. The 10-ft. pipes support the mezzanine only, but the longer sections support both mezzanine (by means of welded brackets) and roof.

Cylindrical columns

The cylindrical columns are 8- and 10-in. black steel lap welded pipe. The smaller diameter pipe is used in 25- and 28-lb. sections, and the 10-in. size in 31-lb. sections. The latter was used as necessary because of local shortages in the 8-in. material.

The designers chose the pipe section for columns because (1) it is a very economical design, structurally speaking, while the attachment of clips and brackets is no more different than it would have been for other types of column, and (2) the smooth round exterior contour of pipe is highly desirable in a warehouse where vehicular traffic is heavy, and all steps to reduce snagging of equipment and merchandise on projecting surfaces are considered advantageous.

Built-up roof girders are erected by mobile crane operating on the warehouse floor, where the roof does not cover the mezzanine. Over the mezzanine area, however, heavy wide-flange beams are used, as all the stresses of the cantilevered marquee are carried back into the interior of the building through these girders. The long span joists are welded to the girders and on their long chords are welded frames to support purlins to which corrugated wire glass is attached. The building will have eight monitors, formed in this manner, and each 275 ft. long.

The accompanying photos, showing work in progress, were supplied by Bethlehem Pacific Coast Steel Co.

Multi-Million Dollar Hotel Planned Near Grand Canyon

A NEW HOTEL will be built near Williams, Ariz., the gateway to the south rim of the Grand Canyon of northern Arizona. The new structure, to be known as the Bill Williams Hotel, will cost $2,500,000 and is to be constructed in the very near future.

Daniel P. O'Shea, president of the Bill Williams Hotel Corporation, has announced that Millard Sheets, one of the world's foremost artists and designers, is in charge of designs. The new structure will be a luxurious type building, to be operated all year round and will offer every comfort and convenience for vacationers and tourists.

A swimming pool, stables and golf course are included in the plans as well as a 6,000-ft. ski run and natural lakes which will provide ice-skating facilities for the winter sport enthusiasts.

Other officers of the hotel corporation include Vroman J. Dorman, San Diego, vice president; Urban R. Miller, Williams, Ariz., secretary; Clayton V. Smith, Los Angeles, hotel operator and Vaughn Paul of Hollywood, directors.

Plans Made for New Reno Sewage Disposal System

ENLARGEMENT OF Reno, Nevada, sewage disposal systems has advanced beyond the discussion stage with four definite steps authorized by city and council officials after a meeting with Harry N. Jenks, consulting engineer.

Jenks and E. C. Frisch, city engineer, were authorized to proceed immediately with completion of plans and specifications for the new two-and-one-half-mile 6,000,000-gal. daily capacity outfall line and pumping station along the eastern city boundaries.

Preparation of designs for the enlargement of the city sewage disposal plant from its present six to eight m.g.d. capacity for primary treatment to sixteen and a half m.g.d., secondary treatment, was also authorized. City and county officials are also preparing to study desirability of instituting sewer rental ordinances for the two governmental subdivisions to raise funds for operation and maintenance of the sewage disposal systems.

The county is also authorized to determine what is agreeable for the county to do in creating and operating its sanitation district.

Officials who attended the meeting included Jenks, county engineer A. E. Holgate, Frisch, Bill A. Ligon, city councilman; James G. Peckham, county commissioner; John Bartlett, assistant district attorney, and Wallace W. White, state sanitary engineer.

Plans and specifications for the 24-in. outfall line, to cost approximately $300,000, will be ready for letting of bids in the fall, Jenks said. This line will be designed to carry city sewage in that area, plus 1,500,000 gallons daily from the county sanitation district.

Machine-Built Desert Houses

CONSTRUCTION MEN placing pumice concrete from 7-cu. yd. Tournamixer in the building walls for one of the Mojave desert houses. Vibration with internal vibrators must be done carefully in order to keep aggregate from floating.

LeTourneau house-building machine used in constructing lightweight concrete houses unique in design for naval personnel at Inyokern ordnance test station on California's Mojave Desert—Thermal insulation, noise absorption, earthquake resistance are features of the low-cost units

A. E. NIEDERHOFF
Civil Engineer
Naval Ordnance Test Station
Inyokern, California

THE U. S. NAVAL Ordnance Test Station near Inyokern on the Mojave Desert of California has awarded a contract to William Radkovich Co. of Los Angeles for the construction of 122 lightweight concrete dwellings of unique design and construction. New developments in low cost housing for desert conditions have been utilized to obtain a concrete building with excellent thermal insulation, freedom from condensation, noise absorption, and earthquake resistance. Construction with high early strength cement, pumice aggregate, and machines built by LeTourneau, makes this job of interest to architects and engineers on the West Coast.

Two types of dwellings are under contract. The first is a single story, flat roof, three bedroom, concrete house for married officers. The bid price for this house including air conditioning, heating, hot water generator and storage tank, laundry tray and the usual plumbing fixtures, electric fixtures, and cabinet work was $9,652.00. This is at a rate of $7.18 per square foot. The houses for married enlisted men are smaller, two bedroom apartments of similar construction and were bid at $5,600 each. The cost per square foot amounts to $7.14.

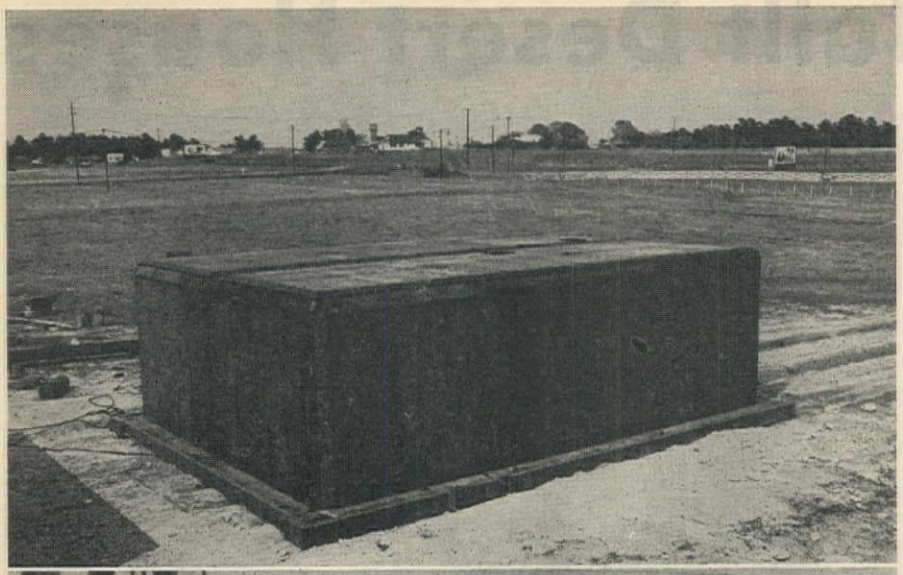
The LeTourneau method of building concrete homes is based upon mass production of a permanent structure right on the building site from lightweight, insulating concrete. The method is simple, speedy, low cost, and results in a structure that is fireproof, termite proof, and storm proof.

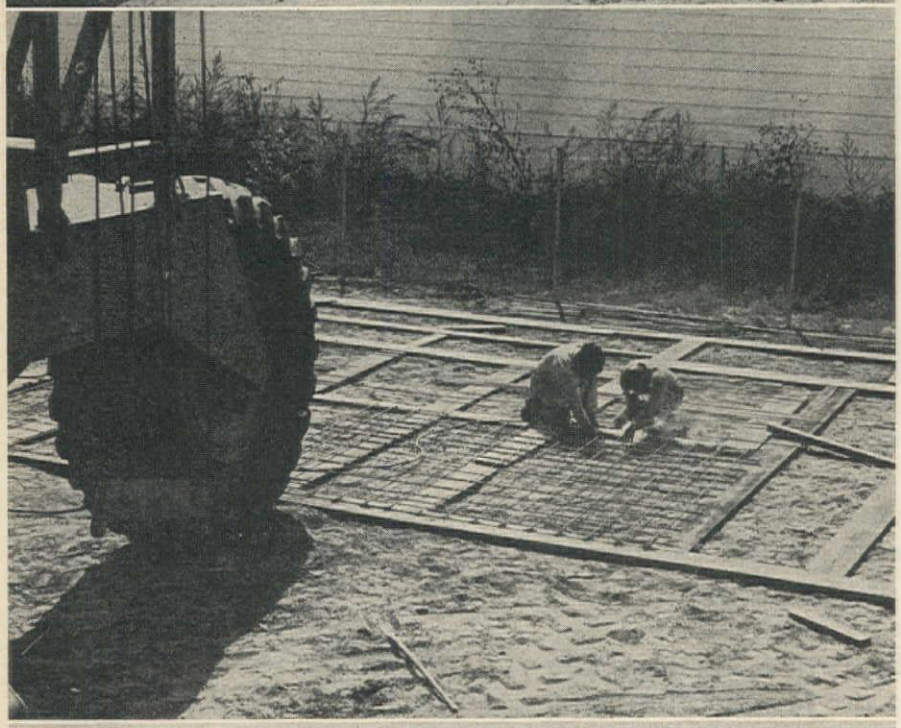
Design

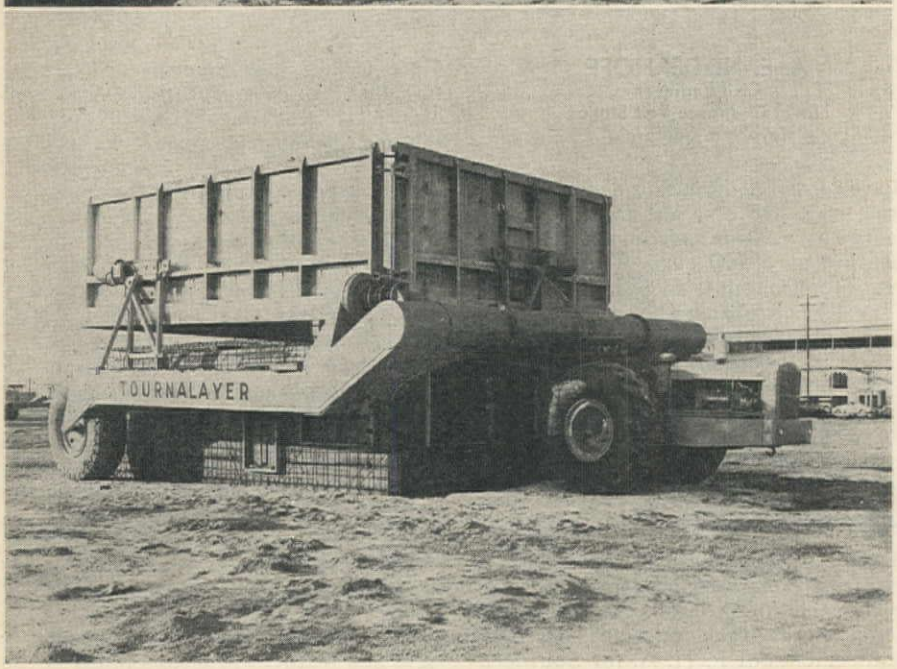
Design of the structures is based upon 1,500-p.s.i. concrete and stressing reinforcing steel up to 20,000 p.s.i. Allowable flexural stress in the concrete is 675 p.s.i. Requirements of F. H. A. for Southern California and the Uniform Building Code of 1946 govern except that the minimum load bearing wall thickness was reduced to five inches and concrete partition walls have a minimum thickness of two inches. In the married officers' quarters a view window of 55 sq. ft. and venetian blinds are provided. All sash and exterior door frames are of metal. Colored concrete is provided for a floor slab laid on the ground except for the kitchen and bathroom which are provided with a floor covering of asphaltic tile. The roof is an eight inch thick concrete slab with overhanging eaves extending 3½ ft. out from the building walls. The roof slab is water proofed with a curing compound that has a moisture transmission rating of less than 2.5. It is Master Bond Clear Water Proofing No. 326, manufactured by Graham & Ellingson Co. and guaranteed for five years. A covered terrace is provided for both types of quarters.

Design roof loads are based upon 20 lb. per sq. ft. live load and 60 lb. per sq. ft. dead load. The use of an eight inch thick roof slab is dictated by the method of construction and not by design loads and spans. Excellent thermal insulation and total freedom from condensation is obtained in this thick roof slab. Foundation pressure is limited to 1,500 lb. per sq. ft. for footings located 20 in. below grade.

The box-like structure is exceedingly rigid and features generous fillets at the intersection of the walls and roof slab







and at the corners where the exterior walls intersect. Non-bearing partition walls are precast concrete slabs of tongue and groove construction set in a shallow keyway cast in the floor and held in place at the ceiling by wood trim on each side. Interior concrete walls are not plastered but are given a paint finish. Cabinet work is largely prefabricated and mounted directly on the pumice concrete walls. In this respect the ability of the pumice concrete to take and hold nails cuts down on the amount of joinery work required in the field.

Construction

The contractor is making good use of LeTourneau machines and steel forms to accomplish the job within the 250 days allotted to him. The inner steel form is set up, cleaned, oiled, and all window and door frames for the completed building are mounted in place against the formwork. Reinforcing steel is then placed on the outside of the inner form and welded at all bar intersections and at all laps. Electrical conduit and receptacles are also held in place against the inner form. When all work is completed the outer steel form is lifted up and placed over the inner form by a huge machine called a "Tournalayer."

The Tournalayer is a new machine on the West Coast although it has been used successfully at Longview, Texas. It consists of two main parts: a two-wheeled Tournapull and two-wheeled trailer. The assembled machine is 54 ft. long, 36 ft. wide, and 16 ft. high. It weighs about 44 tons and is equipped with generators, motors, and cable hoists. The prime mover is steered by a steering motor and is arranged to turn in an 82-ft. circle. Control is by hand operated switches mounted on a control panel which allows selective operation.

The trailer, or hauling frame is shaped like a huge "U" with the open end at the rear. The three motorized cable hoists are mounted, one over each rear wheel, and the third at the midpoint of the torsional cross beam at the bottom of the "U". Any individual motor hoist or any combination of motor hoists can be operated from the control panel so that the concrete house in the outer form embraced by the trailer can be lifted and leveled prior to transportation to the building site. Transportation of all formwork can also be done with the trailer and Tournapull provided there is a 35-ft. wide roadway over which it can operate.

The base on which the inner form slides is a fabricated steel box composed of sections bolted together. The inner form is made of steel and is cam-operated so that it will retract about two inches when stripping away from the concrete house. The base merely forms a foundation for the other forms. The

INNER STEEL form on steel base is shown above. Chamfers on corners provide fillets in concrete, reducing shrinkage. Steel reinforcing bars are made to templates and tack welded at each bar intersection (middle). Below, outer steel form is lifted over the inner form by the Tournalayer. Sash, door frames, electrical conduit and reinforcing steel are in place before placing outer form.

inner form looks like a huge steel box with the top corners and vertical wall corners chamfered. The stationary top plate serves as a ceiling mold. Walls are provided with bolt holes for anchoring window and door frames. With the four inner form walls retracted by the ingenious device mentioned above, the Tournalayer can lift the entire concrete house and the outer form right off the base plate. The inner form remains on the foundation and is not lifted during the entire job.

The outer form is made of four steel walls with expansion hinges at the corners permitting a movement of six inches to release the form from the concrete house. At the bottom of the outer form is an outward flared footing which decreases the unit bearing pressure of the structure upon the permanent house foundation. Between the inner and outer forms is a rigidly maintained space of five inches for wall thickness.

Pouring concrete

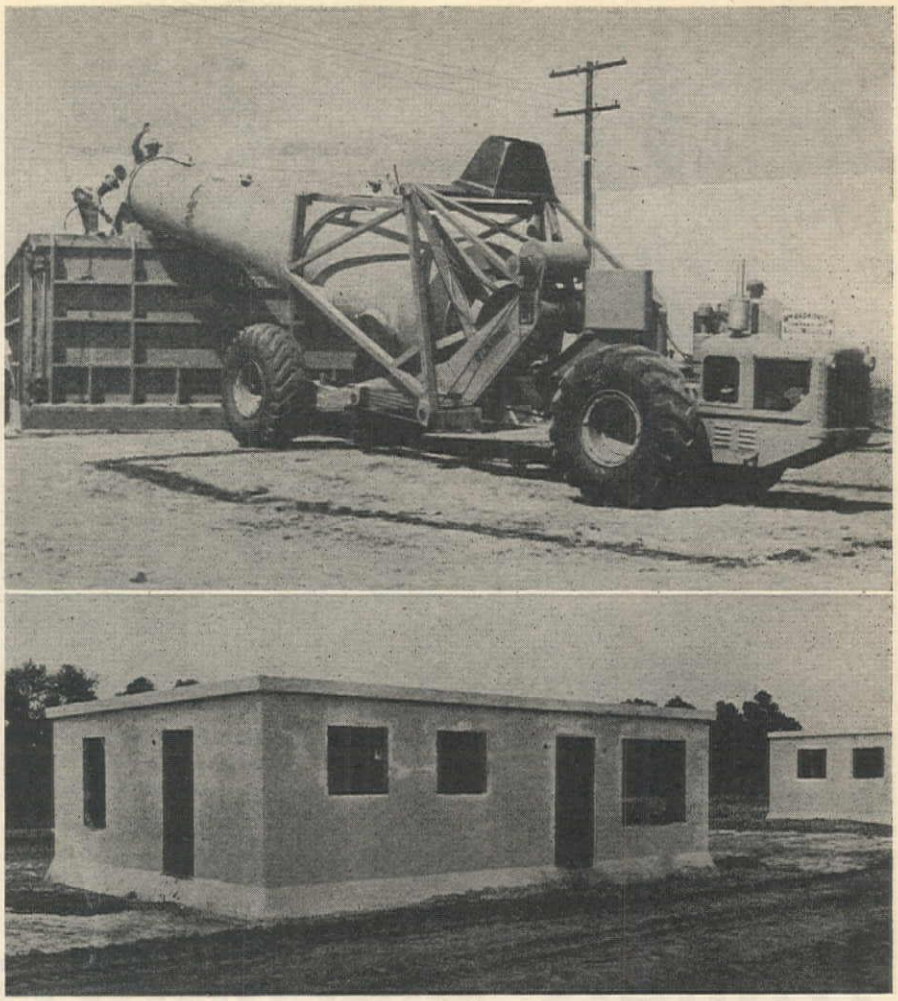
To pour concrete, the contractor makes use of a Tournamixer. This is a special 7-cu. yd. mixer that looks like a cannon suffering from elephantiasis. The machine self-mixes the concrete while enroute from the batching plant. Upon reaching the single story house, it ejects the concrete onto the roof. By means of these machines the contractor pours and delivers a complete house on its permanent foundation every twenty hours per set of forms used. The Tournamixer can supply six sets of forms.

The technique of pouring pumice concrete into the forms is slightly different than conventional methods using hard rock as an aggregate. The pumice weighs only 864 lb. per cu. yd. and because it actually floats in water it must be presaturated for 48 hours before being batched. When it has absorbed 35 per cent of its weight in water it is mixed in the following proportion: six sacks of cement, 720 lb. of fine pumice sand, 472 lb. of coarse pumice aggregate, and 36 gal. of mixing water to make one cubic yard of lightweight concrete. The weight of the concrete is 75 lb. per cu. ft. and has a "K" factor of thermal transmission of 1.95. The "K" factor is defined as the BTU/sq. ft./inch/hour/degree Fahrenheit. The "K" factor for hard rock concrete is approximately 12.

Vibration of the concrete is done with internal vibrators and unless there is good supervision there are apt to be voids under window frames. The concrete mix is deposited on one side of the frames and continued until it appears on the other side indicating complete filling of the area underneath the window. Concrete is then poured on the other side of the window frame. When the walls have been entirely completed the roof is cast and finished with a strike that provides a slope to a center sump. A single drain from this sump carries water to the side of the roof. In a region that has only four inches of rainfall per year the drainage of the roof is not a serious problem.

Finishing the house

With the inside forms collapsed the Tournalayer backs the U trailer around the outer form and proceeds to lift the house and outer form some ten feet to clear the inner form. Transportation to the site is a matter of minutes with the house supported in the outer form by the overhanging eaves.



TOURNAMIXER holding 7 cu. yd. of concrete ejects mix onto roof of building forms, above. After steel forms are removed, house resembles picture below. Concrete weighs 75 lb. per cu. ft. and is 6 times better as heat insulator than hardrock concrete.

The foundation for the house is prepared by excavating a trench 3 ft. wide and 20 in. deep into which a 3-in. thickness of coarse gravel is placed. Just before setting the house in the trench, fresh grout is placed on this gravel with at least a one inch cushion on top for leveling purposes. By placing the house on this fresh mortar the bearing pressure is distributed uniformly.

With a large wrench furnished for the purpose, a workman swings open the expansion hinges on the four corners of the house and the outer form is then removed. The Tournalayer lifts the outer form off the house and travels back to the central concrete casting spot. Here the outer form is again placed over the inner form and the cycle is completed. The concrete floor slab within the house is poured on the ground after all interior plumbing and conduit work has been completed.

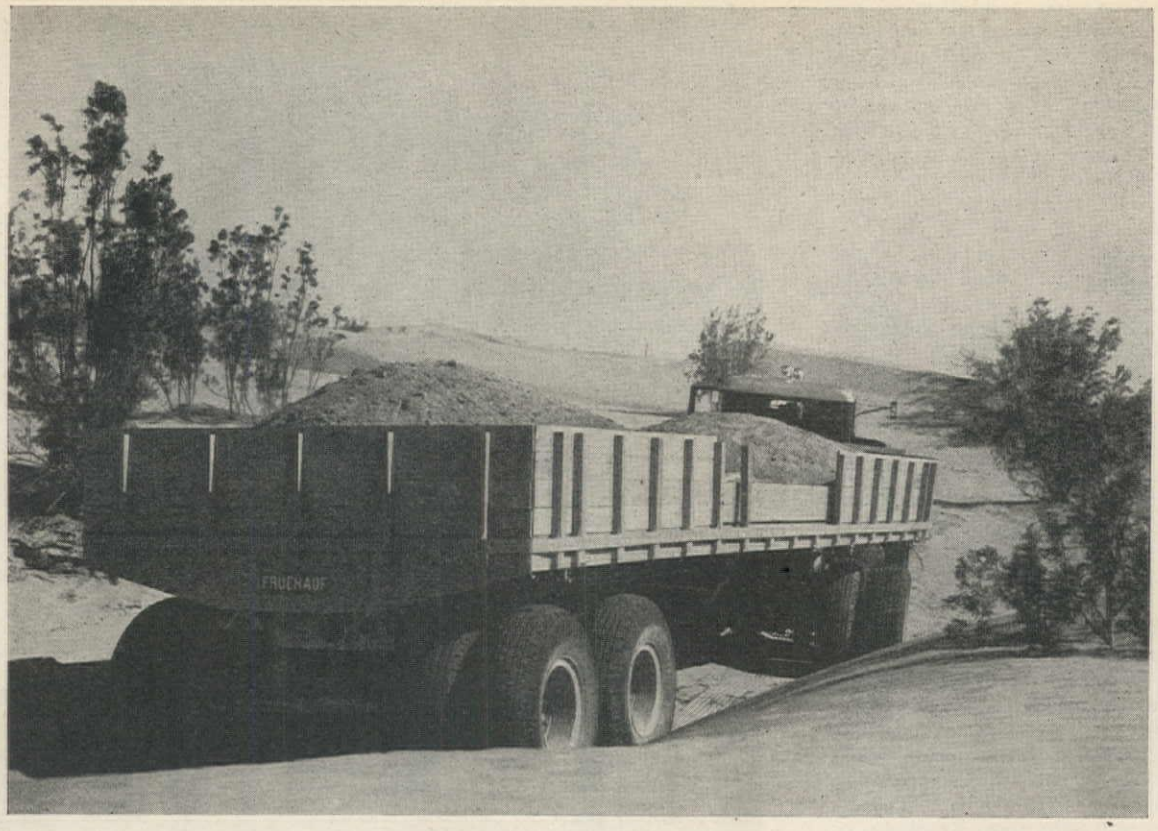
Actual finishing work such as interior painting, cabinet work, and installation of fixtures is done in the usual manner and is probably the slowest part of the job. Mass production of details has cut down completion time to an average of two days per house.

The design of the basic unit was done by LeTourneau. William Radkovich employed architects and structural engineers to produce a finished structure that was acceptable to the Navy. The Officer-in-Charge of Construction for the Navy is Captain H. L. Mathews, assisted by Lt. C. S. McKenzie, Design Superintendent.

Interstate Gas Pipe Line to Supplement Denver's Supply

INTERSTATE GAS Co.'s 240-mi. Lakin-Denver (Colo.) gas pipe line reached the east Denver control station four miles east of Aurora recently, three weeks ahead of the original completion date, according to G. F. Brunston, general superintendent.

Construction has already begun on the north arm of the Denver loop to connect with the north Denver meter station. When this construction is completed, the south link connecting with the present Amarillo-Pueblo-Denver pipe line south of Denver will be built. Gas from the new line is expected to be turned into the city's mains by Oct. 15, at which time Denver will have an additional 100 million cu. ft. of gas per day.



CARRYING A FULL LOAD, this flat-bed truck-trailer heads through the desert on one of the two rigorous test courses set up near Yuma, Ariz. Initial order for the Arabian company amounts to more than 300 units.

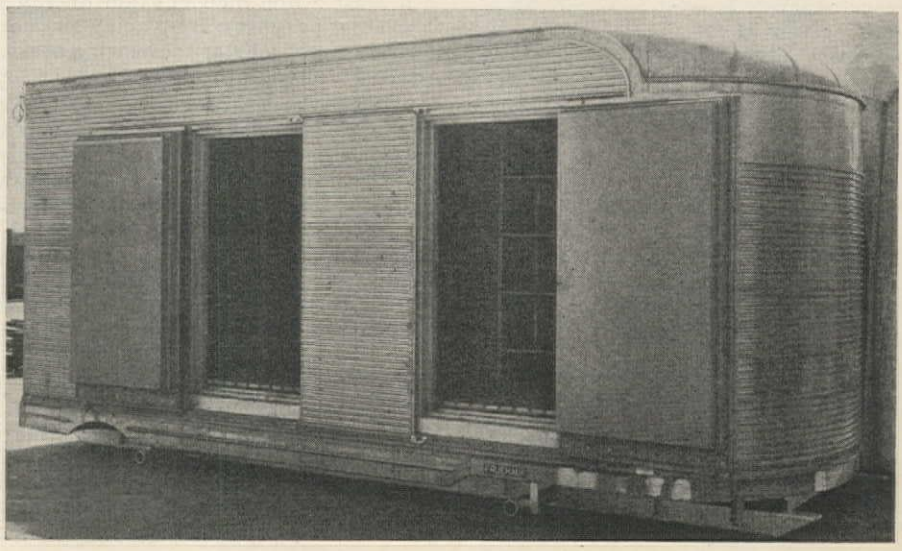
Trailers Mechanizing Arabia

Built in the West, specially designed truck-trailers are being supplied for Trans-Arabian pipe line work — Units first tested under Yuma, Arizona desert conditions

TRUCK-TRAILERS built in the West are becoming the modern burden bearers of Saudi Arabia as they play an essential role in the vicinity of Ras Tanura on the Persian Gulf to the Mediterranean Sea. East and south from Beyrouth (Beirut) on the eastern Mediterranean a surfaced road, usable in part, will permit operation of trailers of the highway type, but the 900 miles of desert country between this road and the Gulf require equipment of special design and construction. Fruehauf Trailer Co. of Los Angeles is supplying an initial order for more than 300 units.

Built for the Trans-Arabian Pipe Line Co. at an estimated total cost of $125,000,000, the project will be handled by two contractors. Bechtel International Corp. of San Francisco is constructing 600 mi. of main line and four pump stations at the Mediterranean end of the line, while Williams Bros. Overseas, Tulsa, Okla., will build the 450 miles of line at the western end and the Mediterranean Tanker Loading Terminal. The line will transport oil, through 30- and 31-in. steel pipe, for Arabian American Oil Co. and the Bahrein Petroleum Co., Ltd. The entire petroleum venture is owned jointly by Standard of California and the Texas Company. Standard of New Jersey and Socony-Vacuum will participate in ownership through guarantee of a loan. Consolidated Steel Co. of Los Angeles is supplying 980 mi. of pipe, with National Tube Co. furnishing 70 miles.

Trailer equipment used in construction consists of dual-axle "pole dollies" for pipe hauling, stainless steel vans for



STAINLESS STEEL insulated and refrigerated trailer mounted on skids instead of wheels, will store perishable food for the company while the pipe line is being built.

dry freight, 40-ton lowbeds and three dollies, 25-ton lowbeds with two dollies, 25-ton machinery beds, 2,500 and 3,500-gal. dual-axle semis for tankers, 25-ton "floats," platform semis, stainless steel reefers, and a number of holsters, drawbars, fifth wheels and other equipment.

Tests conducted

Prior to acceptance of any vehicular equipment, extensive tests were conducted on two test courses in the desert near Yuma, Ariz. Vehicles were required to perform fully loaded with sand and pipe. Pipe hauling experiments were made with loads of ten 50-ft. joints, seven and ten 60-ft. joints, and six lengths of 120-ft. When six 120-ft. lengths were hauled, the load exceeded 72,000 lb. This is said to have been the first time pipe 120 ft. long was hauled by truck and dolly, and where hauling is feasible in Arabia, the 120-ft. lengths are contemplated.

Because of large tires, 14 x 20 with a tread of 82 in., the dollies have high flotation. Yuma experimental tests showed they will support loads of twenty tons under desert conditions. Customarily, pile trailers are designed to surmount an obstacle projecting 12 in. above the level without causing the tires to rub against the frame. The trailers to be used on the pipe line can negotiate obstacles and surface irregularities of 18 in. with no loss of tire contact and traction and without measurably affecting the level of the trailer frame.

Forward end of the pipe is carried on a holster mounted on a fifth-wheel on the tractor. Should the power unit fail, this method, an adaptation of the tractor-trailer shuttle system to pipe hauling, permits another tractor to be substituted without unloading and without long delay.

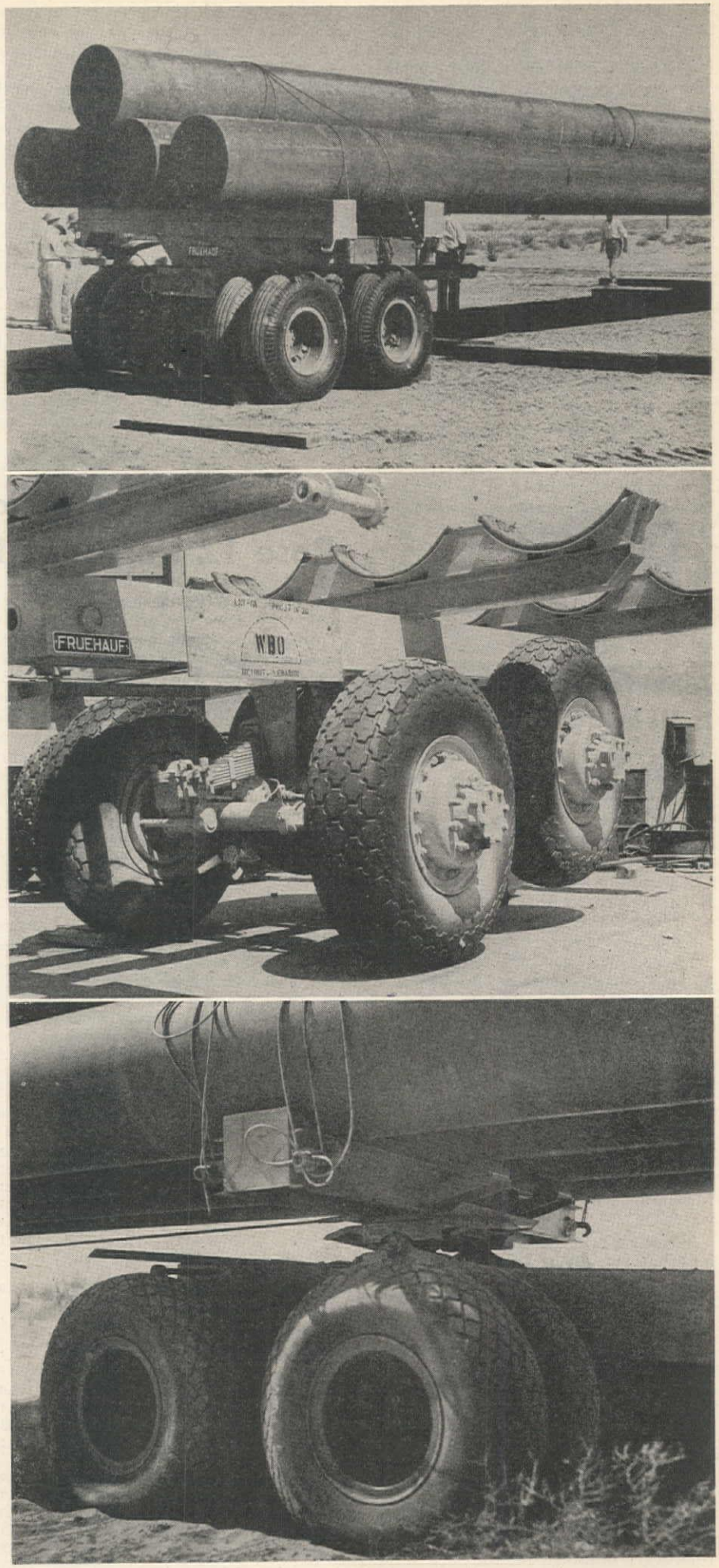
Special fixtures used

Conventional "stiff legs" under a loaded semitrailer at rest in desert sands would sink. This is prevented in the Fruehauf trailers by a 16-in. metal saucer on the end of each leg. These swing into position as the legs are lowered.

Some of the low-bed units can be towed from either end, thus eliminating the problem of turning a weight of 70 tons in loose sand.

Water and fuel tanks on trailers are frame-integral design. This lightens the unit, an important factor in hauling heavy loads over sand. Each fuel trailer is equipped with a two-way pump powered by a separated gasoline engine. Since there is no overhead means for loading the tank, the pump comes into service. When gravity discharge is not ample, the pump again functions. It is estimated the interior temperature of an empty tank of the desert will approximate 200 deg.

Among the miscellaneous equipment



PIPE DOLLY, above, has 82-in. tread axles, 14:00 x 20 tires. Closeup of trailer wheels, center, showing ability to surmount surface irregularities. Fifth wheel (bottom) is mounted to frame for pipe hauling, enabling tractor to be detached and another substituted without removing the load.

supplied by Fruehauf are forty guards for tractor cabs designed to prevent possible forward thrust of pipe from crushing the cab with injury to the occupants. They also prevent cab damage when loading pipe by crane.

In addition to the pipe line construction purposes of the contractors, several more trailers will be required for maintenance of the line and in connection with oil field operations. Stainless steel refrigerated trailer bodies will have a new use. In addition to the standard type in service, there will be fifteen that have no wheeled undercarriage but will be mounted on skids. They will have combination kitchen and food storage sections and may be moved from camp to camp where they can be dismounted from the trailer section, freeing it for other uses.

Saudi Arabia is the fifth largest oil producing country in the world. Current production exceeds 200,000 barrels daily. Proven reserves in Abquaiq field are 4 billion barrels. Arabian American has a refinery at Ras Tanura handling an average of 80,000 barrels of crude oil daily in 1946. The refinery of the Bahrein Petroleum Co., Ltd. on Bahrein Island processed an average of 93,000 barrels daily in 1946.

Alberta Power Project Is Nearing Completion

WORK HAS NOW been practically completed by the Calgary Power Co., Ltd., on its Kananaskis River hydroelectric project at Barrier, Alberta.

Being carried out as joint venture by Fred Mannix Co., Ltd., and Northern Construction Co., both of Vancouver, B. C., the project slowed down to a virtual stop for the winter, but work was resumed in April.

Diversion of the swift-flowing river had been made early last year by closing a rock-filled crib, 250 ft. long and opening the gate of the diversion tunnel, 500 ft. long and 12 x 14 ft. in inside dimension.

The earthfill dam is 1,800 ft. long with a maximum height of 140 ft. Its crest presents a gradual S-shape, fitting the natural contour of the canyon at this point. The reservoir created by the dam is 3½ mi. long and has an area of 761 ac. Maximum volume is 35,982 ac. ft. of water.

Through a 12-ft. penstock 437 ft. in length, water drops 150 ft. to the power plant, where 13,500 hp. will be generated, boosting the power company's output of electrical energy to 105,000 hp.

Impervious clay was placed in the central core of the structure and pervious material on its upstream and downstream slopes. The clay was obtained from pits located nearby and hauled directly to the dam by work road. Much clearing and stripping was necessary to get at the clay, but the work was justified by the short haul to the dam. Gravel pits also were located in the nearby river valley and from them two sizes of rock were obtained for the face slopes. For heavy rock riprap on the upstream and downstream toes of the embankment, large rock was hauled from an old rock slide 1½ mi. away.

The powerhouse has been built at the right downstream toe of the dam, its reinforced concrete foundation extending 37 ft. below ground and its superstructure 37 ft. above, being built of steel frame and concrete blocks with brick facing. The building is 55 ft. long and 33 ft. wide and will contain a single, vertical generator with a capacity of 11,250 kva. from a 151-ft. head of water.

The work has been under the direction of Fred Mannix, Jr., with William N. Woodall, project manager, in complete charge of all operations in the field. The engineering responsibilities for Calgary Power have been vested with H. J. McLean, construction superintendent, Montreal Engineering, Montreal, and B. A. Monkman, resident engineer.

Continental Oil Co. to Build New Refinery at Billings

A CONTRACT for construction of a modern refinery, to have an initial capacity of 7,500 bbl. of crude oil daily, has been awarded by Continental Oil Co. to Jones & Laughlin Supply Co. of Tulsa, Okla. The new plant will be located at Billings, Mont., and construction work will probably start next spring. Building of railroad sidings, temporary warehouses, and other preliminary features will get under way at once. Total cost of the new installation will be in the neighborhood of $8,500,000, according to W. H. Ferguson, Conoco vice-president. Oils from the Frannie, Elk Basin, South Elk Basin and Cat Creek basins will be processed at the plant. The site covers 100 ac., and a storage tank farm for 700,000 bbl. will also be built.

Cost of Construction Machinery Rose 12 Per Cent During Past Year

CONTINUING the upward movement begun after the end of the war, prices of construction machinery rose approximately another 3 per cent in the three-month period April-June, 1947, the Bureau of Labor Statistics announces. During the first half of this year, prices for these types of machinery have increased nearly 6 per cent. Construction machinery prices in June were 12 per cent higher than in June 1946 and almost 37 per cent above August 1939.

Prices increased each month during the period from April through June 1947, advancing 0.3 per cent in April, 1.4 per cent in May and 1 per cent in June. During the quarter, prices for scrapers, maintainers and graders and for track type tractors rose approximately 5 per cent. Smaller increases ranged from 2.8 per cent for material processing equipment to less than 1 per cent for mixers, pavers, spreaders and related equipment. Prices for drilling and boring machinery and air compressors were unchanged.

Index numbers of prices of the more important types of machines for selected dates during the period from August 1939 to June 1947 are shown in the following table:

(August, 1939 = 100)

Group I: Construction Equipment, Tractor Mounted.
Group II: Construction Machinery, Specialized.
Group III: Construction Material Mixers, Pavers, Spreaders and Related Equipment.
Group IV: Construction Material Processing Equipment.
Group V: Power Cranes, Draglines, Shovels, and Related Equipment.
Group VI: Scrapers, Maintainers and Graders.
Group VII: Drilling and Boring Machinery.
Group VIII: Tractors, Track Type.
Group IX: Portable Air Compressors.

Year and Month	All Groups	Group I	Group II	Group III	Group IV	Group V	Group VI	Group VII	Group VIII	Group IX
1940	101.3	100.2	100.9	100.2	99.7	100.8	100.2	100.0	103.2	100.7
1941	107.0	105.4	107.3	103.7	106.0	107.1	104.8	100.0	110.2	100.3
1942	110.5	108.8	111.5	106.3	112.7	110.9	107.2	100.0	114.4	98.5
1943	110.5	108.8	111.6	106.3	112.7	110.9	107.2	100.0	114.4	98.0
1944	110.6	109.2	111.8	106.3	112.7	110.9	107.3	100.0	114.4	97.9
1945	111.2	109.9	111.8	106.1	114.5	110.9	106.6	100.0	116.7	97.7
1946	120.8	116.6	120.9	114.2	128.4	120.1	115.5	107.3	128.6	104.1
1939 August	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1941 October	110.0	108.8	110.8	106.3	110.9	110.5	107.2	100.0	113.4	100.0
1945 December	113.3	110.5	113.6	107.3	116.6	112.5	109.7	100.0	120.1	97.6
1946 January	114.2	110.5	114.6	108.0	119.5	114.7	109.7	100.0	120.3	97.6
July	122.2	117.9	121.3	115.4	127.5	120.7	116.6	112.0	131.8	106.7
September	122.8	118.5	122.3	115.3	133.6	120.8	116.9	112.0	131.5	111.1
December	129.1	120.2	132.4	118.1	137.1	130.0	122.3	112.0	138.0	111.9
1947 January	131.6	120.9	132.6	120.9	141.3	132.3	126.2	120.1	140.8	114.4
February	132.6	121.2	133.6	124.9	141.3	134.0	126.7	120.1	140.8	115.8
March	132.9	121.1	133.9	125.0	142.8	135.0	126.7	120.1	140.7	118.4
April	133.3	121.1	135.4	125.9	142.8	135.4	127.3	120.1	140.8	118.4
May	135.2	121.8	135.9	125.9	143.2	136.5	129.5	120.1	144.9	118.4
June	136.6	123.9	136.2	125.9	143.2	137.0	133.1	120.1	147.4	118.4

Interstate Highway Plan Is Approved

Most heavily traveled routes in present Federal-aid system selected for national interstate highways — Routes approved by Public Roads Administration with few changes, to connect all major cities of the nation

ROUTES SELECTED by the state highway departments for inclusion in a national system of interstate highways have been approved with few changes by the Public Roads Administration, the Federal Works Agency announced last month.

The new interstate system as mapped by the state highway departments, in cooperation with the Public Roads Administration, comprises the most heavily traveled highways in the present Federal-aid system, and includes extensions of the system through urban areas. Final designation of routes in the system was reached after careful consideration of proposed routes and a series of conferences between representatives of the highway departments and field officers of Public Roads to settle differences involving proposed alternate routes and connections at state lines.

The integrated system, as approved by the Federal Works Administrator, consists of north-and-south, east-and-west, and diagonal routes that will make it possible to travel from any section of the country to any other section by a direct route.

The system contains 37,681 mi. of the Nation's principal highways, including 2,882 mi. of urban thoroughfares. Additional urban circumferential and distributing routes are to be designated later, and 2,319 mi. have been reserved for these routes.

Rural sections of the interstate system comprise only 1.1 per cent of all rural roads but carry 20 per cent of all rural traffic. The system reaches 42 state capitals and will serve directly 182 of the 199 cities in the country having a population of 50,000 or more persons. Average traffic on routes comprising the system, exclusive of urban sections, was 2,693 vehicles per day in 1941 as compared with 1,439 on the Federal-aid system, 972 on state highways and 155 on all rural roads.

In many large cities depressed or elevated expressways will be built, making possible city travel at an average speed of 35 to 45 mi. per hr., without stops for traffic signals and free of interference by cross-traffic. Depressed portions of expressways will be supplemented by parallel frontage roads for "local" traffic, and bridges will be constructed at intersections to serve cross-traffic. The urban expressways will be integral parts of the national interstate system.

In recommending routes for inclusion in the system, state highway departments were governed by provisions of the Federal-aid Highway Act of 1944, which required that "there shall be designated in the continental United States a national system of interstate highways not exceeding 40,000 mi. in extent, so located as to connect by routes as direct as practicable the principal metropolitan areas, cities and industrial centers, to serve the national defense and to connect at suitable border points with routes of continental importance in the Dominion of Canada and the Republic of Mexico.

The Federal-aid Highway Act of 1944 authorized $500,000,000 in each of the three fiscal years following the war to assist the states in developing a three billion dollar highway program which would include improvements on the regular Federal-aid system, on highways in urban areas where the population is 5,000 or more, and on a Federal-aid system of secondary or farm-to-market roads in each state.

No specific sum was provided for development of the national interstate system; however, since the system is made a part of the Federal-aid system, the amounts provided for this system are available for the interstate system. The appropriations authorized have already been apportioned among the states.

Although the new interstate system follows, in general, the principal routes in the present Federal-aid system, it may be necessary in many instances to relocate existing highways or build alternate routes for express traffic in order to meet essential standards of width, grade, alinement, and control of access, Public Roads Commissioner Thomas H. MacDonald said.

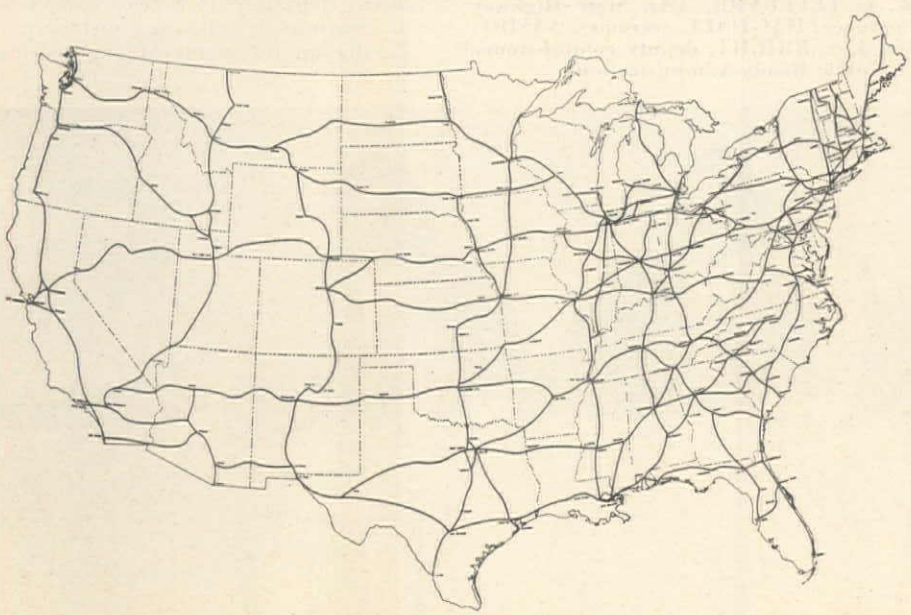
Routes included in the system, as well as the adopted standards of design and construction, conform in broad outline to recommendations contained in the report submitted to the president in 1944 by the National Interregional Highway Committee, of which Commissioner MacDonald was chairman.

Design standards for the system approved by the American Association of State Highway Officials on Aug. 1, 1945, call for four-lane divided highways wherever the traffic volume is 800 motor vehicles in peak hours. For such highways in rural areas, a right-of-way of 250 ft. is advocated as desirable. Traffic lanes 12 ft. wide are recommended on all heavily traveled routes. Where traffic density exceeds 3,000 vehicles in peak hours, elimination of all cross traffic at grade is advocated.

Control of access to the interstate routes, particularly in and near cities, is considered essential. Large streams of traffic cannot move swiftly and safely if obstructed continually by vehicles entering and leaving an express route. Access points are to be placed as frequently as they are needed, but accomplishment of the main objective prevents permitting access at every cross road or street, business place, or residence. Many states do not yet have adequate legal authority to control access.

Meanwhile work has been started on improvements on sections of the Federal-aid system included in the national interstate system, for which plans had been completed prior to V-J Day. Commissioner MacDonald emphasized, however, that development of a national interstate system of highways embodying standards of design recommended by the Public Roads Administration and the American Association of State Highway Officials is a long-range program to be carried out over a period of years.

MAP OF the United States, showing the network of routes selected by state highway departments for interstate highways. System contains 37,681 mi. of principal roads.



WASHO Men Meet at Missoula

Forest highways and public relations occupy most of time of Western highway officials in annual convention, but materials, costs, equipment, and salaries all come in for comment and discussion

PROBLEMS OF THE post-war highway program with particular emphasis on the financing of forest highways were the principal subjects of discussion at the twenty-sixth annual meeting of the Western Association of State Highway Officials held in Missoula, Mont., on Aug. 6-8. The advantages of a public relations program to the individual state highway department received probably as much attention during the meeting as any other single subject.

In opening the meeting President Al F. Winkler, chairman of the Montana Highway Commission, warned that the development of a major interstate highway system must not be permitted to take place at the expense of the intermediate highways which are the life blood of local economic development. "It would appear," Winkler said, "as sound economic development that the Federal Government assume a larger than 50-50 share on the interstate system, especially in light of the stupendous revenue the highway users are paying in anticipation of local benefits."

Pointing out that the forest road problem had not received adequate appropriations since its inception, Winkler urged that the association consider whether the time had not come to undertake some drastic action in the form of support for additional legislation. "Out of the 75 million dollars authorized by the 1944 highway act," Winkler told the highway officials, "only $9,800,000 has been appropriated to date for these roads. In the West only 38 per cent of forest highways are completed, and 41 per cent of the cost has been paid by the states out of funds other than were intended for forest highway construction."

Western States are definitely more advanced in the consummation of their postwar highway programs than are all of the states of the country, according to H. E. Hilts, deputy commissioner of the Public Roads Administration.

Intermediate types of highway surfacing have shown increasing use in the West at the expense of the higher types of surfacing, according to Hilts, but correspondingly the maintenance of higher type surfacings costs much more in the West than the maintenance of intermediate type surfacing. The conclusion from this observation was that highway engineers should review their construction plans with the aim in view of reducing future maintenance costs.

Public relations

"Well organized public relations divisions are essential to all state highway departments today," Hal H. Hale, executive secretary of the American Association of State Highway Officials, told the western state highway officials. "Undoubtedly, one of the first comments in the establishment of such a department will be something like this, 'They are setting up a propaganda organization to perpetuate themselves in office.' This is a hazard that must be met and overcome."

Hale went on to say that highway officials too frequently find themselves weakly defending their work against unfair and unwarranted criticisms. Although the public generally does not need to be told that it needs good highways, it does need to be told of the economic benefits that result from good highways; how much good highways cost; how good highways must be financed; how much money is available for highway construction and how it is being spent; how much road the money will build and whether or not the highway user taxes it is paying are all being used to build roads. With the passage of the Federal-Aid Highway Act of 1944, highway officials had placed on their shoulders the responsibility for a public relations program far greater than any they had ever shouldered before.

Highway officials then became responsible for two new programs—the urban and secondary, or farm-to-market programs. In a measure the highway officials entered a hostile field. Relations between cities and counties and the state highway departments were not all good. These agencies of local government do not generally conceive of road construction in the same manner as do the highway officials, and, therefore, it became incumbent upon the highway official to sell the program to the local governments before any actual construction could take place.

Engineer shortage

In the discussion of post-war highway programs, W. L. Anderson, assistant chief engineer for the Utah State Road Commission, said that Utah's program is lagging. The main contributing factor for not getting the program out faster has been the lack of engineers, especially for field work and for bridge design. Utah needs now, as never before, competent, experienced engineers with long, continuous service to put into effect the long range program being undertaken.

Urging that the highway program be accelerated, H. E. Foreman, managing director of the Associated General Contractors of America, told the highway officials that contractors in most states have the capacity to undertake more work than is being given them, that materials and equipment are generally becoming more plentiful and more generally available, and that in general highway departments cannot expect to secure savings by delaying construction.

Taking up the point of engineering

ATTENDING WASHO-AGC dinner were, l. to r.: GORDON BALL, Calif. contractor; DR. L. I. HEWES, PRA Western chief; W. C. LEFEBVRE, Ariz. State Highway Engineer; HAL HALE, secretary, AASHO; and J. S. BRIGHT, deputy commissioner of Public Roads Administration.

personnel shortage, Foreman said, "An economical and efficient highway construction program requires an adequate number of good engineers to design projects and administer the contracts. In the AGC survey more than one-third of those replying reported that state highway departments would have difficulty in administering larger programs because of shortage of engineers. The cause of this shortage is well known. It is the low pay scale which many states have for these men who must have extensive education and training in technical procedure."

Retain consultants

"In your efforts to secure adequate salaries for the personnel of highway departments in your states, I can assure you of the cooperation of the AGC. Contractors understand the necessity for adequate numbers of good engineers in the execution of a highway construction program.

"To augment engineering and administrative forces of the highway departments, the employment of private engineering firms on a contract basis is recommended as a possible solution in planning and administering urgent highway construction."

E. H. Thomas, bridge plans engineer for the Montana State Highway Commission, in discussing the effects of industrial trends on bridge design made four recommendations for a thorough study of the problem. "Begin now," Thomas said, "a broad program for the elimination of sub-standard bridges on our primary highways. Strengthen or replace bridges of less than H15 rating, widen or rebuild structures having less than 24-ft. roadways. Priority for reconstruction should be based on present traffic requirements.

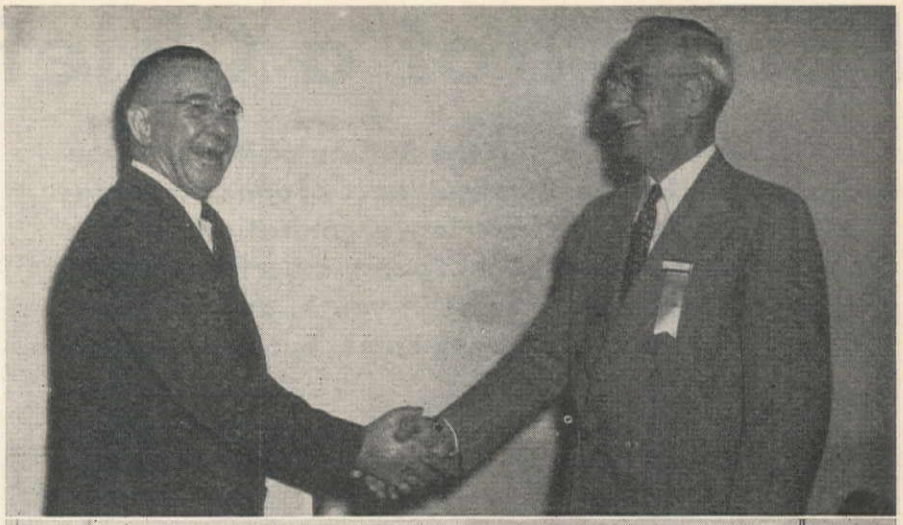
"Re-examine present design loadings for bridge floor slabs, stringers, and short span structures being designed for H15-S12 and H20-S16 loadings in light of present legal loadings and probable future requirements. Reductions in loadings for long spans may also be in order.

"Institute a systematic examination into the factors affecting construction costs for the purpose of adopting procedures leading to the reduction of such costs."

Uniform vehicle code

Reviewing legislative action toward the adoption of the AASHO uniform vehicle code, E. L. Mathes, traffic engineer for the Idaho Bureau of Highways, reported that Montana alone of the eleven Western states appears to have taken any cognizance of the uniform code. The 1947 legislature of this state enacted a new code which is essentially, although not entirely, in agreement with the uniform policy.

Production of construction equipment is well caught up with the exception of shovels and cranes, William A. Danner, president of the Associated Equipment Distributors, said in a report on the construction equipment situation. New models will generally be available next year, and additional services will be provided for contractors and highway departments by the distributors of equipment.



AL F. WINKLER, left, top, retiring president, congratulates TOM W. HOLMAN, incoming president. Below, State highway engineers in attendance included, front, l. to r.: J. R. BROMLEY, Wyo.; MARK U. WATROUS, Colo.; M. T. HOLCOMB, Nev.; ROY W. McLEESE, Utah; JAMES O. REID, Ida. Standing, l. to r.: FRED J. GRUMM, Assistant, Calif.; C. B. SHAIN, Wash.; B. G. DWYRE, N. Mex.; R. H. BALDOCK, Ore.; R. W. HENDRY, construction chief, Hawaii; and W. C. LEFEBVRE, Ariz.

The greatest change taking place in construction equipment, Danner said, is that of mounting on pneumatic tires. He predicted that within ten years 95 per cent of all construction equipment will be on tires. This should make possible the moving of higher type equipment to smaller jobs, but at the same time he recommended that contractors be given larger jobs to support the investment required by larger equipment.

Center line differences

The report of the committee on uniform traffic control devices presented by D. E. Morris of Washington, chairman, indicated a considerable degree of disapproval of the national standard adopted last year by the AASHO. Forty per cent of the membership of WASHO cast negative votes on pavement markings. After summing up the opinions of the various state officials, the committee recommended that the association go on record as being in favor of a broken center line used in conjunction with a solid barrier line; that the color or combination of colors be left to the discretion of the individual states, and that the problem of the proper color to use from the standpoint of visibility and durability be submitted to the National Research Board, and the results be submitted to the 1948 meeting.

At the closing session Tom W. Holman, chairman of the Washington Highway Commission, was elected president to succeed Al F. Winkler, chairman of the Montana Highway Commission. Other officers included W. C. Lefebvre, state highway engineer of Arizona, elected vice-president; and E. V. Miller, highway planning engineer of Arizona, re-elected secretary-treasurer. Elected to the executive committee were J. R. Bromley, superintendent and chief engineer of the Wyoming highway department; James O. Reid, director of highways for Idaho; and Mark U. Watrous, state highway engineer of Colorado.

Portrait of a Chief Engineer

Career of 36 years in the Bureau of Reclamation climaxed by successful guidance of one of the largest and best engineering organizations in the United States—Walker Young, a perfectionist in design, exhibits interest in youth, and is known not only as a builder of dams, but also of men

By BETTY THOMPSON
San Francisco, Calif.

"HOW CAN WE get water to the farmer—at a price he can afford to pay?"

The importance of these related questions has always been emphasized by Walker Young, Chief Engineer of the Bureau of Reclamation at Denver. And since 1911, when he joined the Reclamation staff that was starting construction of the world's then highest dam, at Arrowrock, Idaho, "Brig" Young has figured prominently and continuously in the greatest water utilization program the world has ever seen.

Chief Engineer Young was born in Butler, Indiana, May 7, 1885, and in 1908 graduated from the University of Idaho with a Bachelor of Science degree in Mining Engineering. Although he has not touched it for over twenty years, he still retains the violin that he played in the University orchestra which, along with summer work in the mines, helped finance his education.

Two years after graduation he shifted from Mining to Civil Engineering and was employed in the office of the State Engineer at Boise until he joined the Reclamation Bureau in 1911. After three years he was placed in charge of designing at Arrowrock Dam, and in 1915 was made responsible for operations at the dam under the Supervising Engineer located at Boise.

To the Chief's office

In 1916, Young was transferred to the Chief Engineer's office at Denver to work on designs and soon became head of the Mechanical and Dams Division, reporting to the Chief Designing Engineer. During his four years in this position he was in charge of the preparation of preliminary designs and estimates of many dams then being studied in connection with various proposed projects and was responsible for the design and standardization of many of the gates and hoists now used by the Bureau.

From December, 1920 to 1924 Young was engaged in investigation of dam sites on the Colorado River and the preparation of the preliminary designs and estimates which ultimately led to the selection of the site for Hoover Dam. When, in 1930, he returned to supervise construction of the dam and power plant, he enjoyed the unique experience of having been investigation engineer and construction engineer on the same project.

Characteristically, Mr. Young does not regard mighty Hoover Dam as either his most difficult or most interesting job. That honor goes to his work on the cooperative investigations of the Barrier Dams, which he directed during the middle '20's.

The salt water barrier

This project was concerned with studies of methods for preventing the intrusion of salt water into California's Sacramento-San Joaquin delta area. The effectiveness of a series of barrier dams across the bay was contrasted with the method of salinity repulsion now in use, by which fresh water from the reservoirs is released in quantities sufficient to push back the encroaching salt water.

For Mr. Young, this was a highly personal project and one presenting a stimulating challenge. The wide diversity of difficult engineering problems was complicated by the magnitude of tidal forces to be considered, and friends recall the many hours he spent alone in a small boat on the bay, checking and rechecking his observations. Considering the time of California's potential water shortage, when every drop of water will need to be conserved, it is entirely possible that the barrier dams may yet be built.

WALKER YOUNG, chief engineer of the Bureau of Reclamation, at his desk in Denver headquarters of the Bureau.

In the years following he directed construction of Easton Diversion Dam, and the canal and lateral systems for the Kittitas Divison of the Yakima Project in Washington. Young also made investigations of the proposed Iron Canyon Project in California, and for five years served consecutively as Construction Engineer and Supervising Engineer on the Central Valley Project.

In 1940 he was appointed Assistant Chief Engineer, with headquarters at Denver, and in 1945, on the retirement of Sinclair O. Harper, became Chief Engineer of the Bureau of Reclamation and Director of the Branch of Design and Construction.

As an executive, Mr. Young may be compared to the sea captain who keeps a "tight" ship. He is impatient of inefficiency and insincerity, loyal to his associates and quick to recognize ability. He believes that an organization always should provide itself with sufficient young men to balance the experienced but older heads at the top. For this reason, and because of his interest in, and sympathy with youth, Mr. Young has become known as a builder of men.

Precision and perfection

He also is known for his precision and insistence upon perfection. His fondness for blue-penciling official letters three years ago earned him the unofficial title of "Wrecker of Good Correspondence." This was on a humorous scroll presented to the then Chief Engineer, S. O. Harper, on the occasion of his retirement. For years, Mr. Young has kept a complete daily account in diary form of all important Bureau happenings.

During his service with the Bureau Mr. Young has seen many changes, culminating in the reorganization of 1944. Previously, the Denver office had been in charge of both design and construction. Now, under Regional Directors, the various projects largely control themselves. The Construction Engineers report administratively to the Regional Directors but technically to the Chief Engineer. Both of the latter report in turn to the Commissioner at Washington. Denver remains in charge of design and technical procurement.

Because of the greater size and complexity of the present set-up, Bureau personnel in Washington is required to have considerable administrative experience, which often results in other than engineers being appointed to posts in the Commissioner's office. Naturally, there are occasions when friction arises between the engineers in the field, and the non-technical administrators. However, since most of the Regional Directors and Construction Engineers attached to the Bureau know and have worked with Walker Young in the past,

WALKER YOUNG, right, with R. A. CALLAND, Assistant Regional Director at Sacramento, examines Monticello dam site during a field trip.

relations between his office in Denver and the engineers of the seven regional areas continue to be highly cooperative and cordial.

Another fairly recent policy change relates to the aforementioned question of "How much can the farmer afford to pay for water?" The vastness of such projects as Hoover Dam and the Central Valley Project means that the farmer no longer can shoulder the whole burden of payment and part of the cost must be borne by other means. This gradually has shifted emphasis from irrigation alone, to irrigation plus power plus flood control.

Other activities

The fast tempo and increasing complexity of the huge reclamation program has forced Walker Young to give up his hobby of gardening, but until his work became too heavy he used to attack his garden with the same zest with which he approaches an engineering assignment. Needless to say, his horticultural standards were high and woe to the rose bush or dahlia that failed to meet specifications.

Despite the press of work, however, he always has time for old friends, who call him "Brig" after the redoubtable Mormon Elder, Brigham Young. It is typical of his informality and simplicity that one of his most faithful correspondents is a janitor at Hoover Dam, who feels quite free to write the Chief Engineer about all the latest problems of Boulder City, whenever he thinks conditions are getting out of line.

Young is a member of the American Society of Civil Engineers and the Colorado Society of Engineers, and of Phi Delta Theta and Tau Beta Pi fraternities. He has contributed engineering articles to the leading technical publications. He married Marguerite Bush of Boise in 1911 and they have one daughter, now Mrs. William R. Ayers.

Young takes pride in his long association with the Reclamation Bureau, whose great achievements have made it a model for other countries. Bureau engineers are often requested to act as consultants on foreign reclamation projects and engineers from every part of the world have gained valuable experience by working for the Bureau in the United States.

The Chief Engineer sees to it that the Federal Government gets a dollar's worth of construction for every dollar it spends. But in contractor circles the boys go down the line for "Brig" because they know that while he is strict in the enforcing of specification requirements, he will fight tooth-and-nail to see to it that the contractor gets a square deal. The friendly relations existing between Chief Engineer Young and representatives of construction firms are proof that he is never unreasonable in maintaining the Bureau's extremely high standards and rigid specifications.

As "Brig" himself puts it, being Chief Engineer of the Bureau is not the easiest job in the world, but there is a lot of fun in it.

Monument Dedicated On Historic Utah Spot

A NEW and notable example of American sculpture was dedicated near Salt Lake City as a part of Utah's Centennial observance this year. The monument stands near the mouth of Emigration Canyon on the spot where Brigham Young first viewed the Great Salt Lake valley 100 years ago and takes its name —"This is the place"—from the pioneer leader's famous utterance on that occasion.

The structure, 60 ft. high with an over-all length of 86 ft., is surmounted by 12-ft. bronze figures of Brigham Young, Heber C. Kimball and Wilford Woodruff. On the sides of the central pylon and the base wings are high-relief and bas-relief depictions of other noteworthy figures and events in the state's history from the time the area was first explored by the Catholic Father Escalante and his group from the California missions. The sculptor was Mahonri M. Young, grandson of Brigham Young and one of this country's top-ranking artists.

The main structure (wings and central pylon) are of granite masonry construction on a reinforced concrete foundation. The architects were Wooley & Evans of Salt Lake City and the contractor was Daniel McCarthy of Oakland, Calif.

The granite blocks were quarried in Little Cottonwood canyon, where the pioneer builders got the granite for the famous Salt Lake Mormon Temple.

Cost was approximately $350,000, of which the state legislature appropriated $125,000. The remainder was raised by popular subscription.

Agitation to build such a monument first started in 1930 but it was not until 1937 that the plans began to take definite form. At that time the legislature authorized the governor to appoint a committee to procure a suitable design and appropriated the $125,000 with the condition that at least an equal amount be raised by private subscription.

As a part of the monument project the state has constructed a highway from Henefer, Utah, to the Salt Lake Valley, paralleling the last 36 mi. of the old Mormon trail. The area immediately surrounding the monument will be landscaped and the 36-mi. section of the trail will be restored as nearly as possible to the condition it was in when it was a part of the Pony Express route.

Construction Soars Over Normal Seasonal Level

NEW CONSTRUCTION put in place during July 1947 had an estimated total value of $1,139 million, a more than seasonal gain of nearly 8 per cent above the June estimate of $1,059 million, the Construction Division, Department of Commerce, has announced. The July figure also represents a gain of 16 per cent over the total of $982 million for July 1946.

Total private construction in July 1947, estimated at $850 million, represented a slightly more than seasonal gain of 6 per cent above the June figure of $799 million. Of this total, private residential construction (exclusive of farm) totaled $415 million, a more than seasonal gain of 9 per cent over June. July privately financed nonresidential building totaled $253 million, a less than seasonal gain of 1 per cent over the June figure.

Privately financed public utility construction in July was $122 million, 4 per cent above the June figure.

Total public construction in July 1947 is estimated at $289 million, 11 per cent above the June volume, more than a seasonal advance. July public highway construction, estimated at $135 million, showed a more than seasonal gain of 15 per cent over that for June. Sewer and water construction in July totaled $26 million, the same as in June. New conservation and development construction during July totaled $36 million, an increase of 9 per cent over June.

Wyoming Refinery Expanding

LAND NEAR Casper, Wyo., is being cleared for modernization of the Standard Oil Company's refinery, next step in the company's expansion program. Plans have been made for consolidation of the Standard refinery at Greybull, Wyo., with the Casper plant, and for processing the high sulphur crude, S. T. Story, Wyoming sales manager announced. New distillation equipment will be installed, a fluid catalytic cracking plant added, along with other vapor recovery facilities.

A.S.C.E. Dues Editorial Criticized

ON THE EDITORIAL page of *Western Construction News* for July appeared an item urging members of the American Society of Civil Engineers, in which two of our editors are associate members, to vote negatively on the proposal for raising membership dues.

Naturally, a storm of protest arose from officers of the Society, though no criticism came from non-officer members. To be completely fair, we publish herewith several of the letters of protest, and instead of an editorial reply, we follow with the letter written by the editor to John H. Gardiner.

We will probably make further comment on this matter in our next issue.

In Protest:

Dear Mr. Server:

In the July issue of *Western Construction News* appears an editorial entitled, "Don't Raise Dues Now," which has as its objective defeat of the issue of raising A.S.C.E. corporate and junior member dues, a matter now under consideration by A.S.C.E. and shortly to be voted upon. Inasmuch as you have felt at liberty to express yourself so forcibly in this matter on the negative side, I feel that the presentation of the affirmative is of equal importance and take this opportunity to state my views to you in the hope that they may find some publicity in the pages of your very excellent journal.

In making these comments I am prompted by two admonitions. First, that if I am to feel free to express my opinion, then I and all others of the same opinion must defend your right to do the same thing and, second, that it is somewhat dangerous to argue with an editor because he goes to press so often and reaches a very great audience not available to the non-editor. As to the first admonition, I do, and certainly always will, believe in your right to express yourself in your columns or elsewhere in any manner consistent with your views and, as to the second, I feel sure that your sense of fairness will prompt you to afford one who disagrees with you the same opportunity of expression that you have already exercised.

Your editorial took me completely off guard. Before reading it I thought I knew something about the reasons which are prompting the raise in dues. Upon reading it I wondered if I had been misled in my conclusions and immediately made further inquiry into the entire matter with the following results:

Your statement speaks of raising annual Society dues from $20 to $25 for non-resident (outside New York) members and associates and a graduated rise in dues of juniors. The first part of the statement is correct. All corporate members will have their dues raised $5 per year if the constitutional amendments are acted upon favorably by the membership. The second part of the statement is entirely wrong. A graduated rise in the dues of juniors is not proposed and the amendement is to the effect that dues of all juniors be made uniformly $12.50 per year, thus eliminating a long standing and controversial differential between junior dues in District 1 and elsewhere. The increase in junior dues beginning at age 32 of $2.50 each year for three years is already a constitutional provision.

Your editorial states that but 7 per cent of the total publicized budget of the Society for 1947 is devoted to professional activities; whereas the suggested increase in dues amounts to 25 per cent. A casual analysis of the Society's budget might indicate this but, actually, of the Society's income, about $150,000 is devoted annually to Society professional activities and the demands upon the Society to increase its interest in the economic welfare of its members is so great and the pressure is so strong in this direction, that the Society must either forsake many of the objectives which in the past have made it great in order to devote its resources to this new work, or must have more funds to pursue the new objectives.

The highlights of your editorial are that an increase in the dues is not going to help in the work which the Society is doing upon the economic welfare of the engineer and, in characteristic, forthright style, you have narrowed the economic objective to the one which impresses you most greatly (and I might say, all of us, to a very marked extent); namely, that insufficient work is being, or will be, done in the direction of increasing engineers' salaries, and implies that even if more working funds are provided, the Society will not increase its interest in the welfare of its members. To this view I take exception.

I served on the Board when A.S.C.E. took the most drastic and controversial step in its long history; namely, the recognition of the rights of its members to be free from inclusion and regimentation in trade unions, at the same time, defending the right of these same members to take full advantage of the law and bargain collectively with their employers in their own behalf. You may recall the storm of protest which descended upon the Board, particularly from eastern members, and you may similarly recall, the firm position from which the Board of Direction did not recede in this matter.

All of the benefits which have accrued from the Society's position are not immediately apparent, but the salary studies and recommendations which the Society has made; its interest in the organization of professional bargaining units; its influence in the Taft-Hartley amendments to the Wagner Act; the establishment of regional or field offices—the principal concern of which latter are the economic welfare of the members; the Society's influence in the drafting of economic treaties with foreign countries; establishment of engineering fees; its influence upon engineering registration, and its collaboration with other founder societies in a review of engineering salaries thruout the country, with the objective of correcting inequities, are but some of the straws which point the Society's course.

With the growth of the Society; its almost top-heavy junior membership; the deflated value of the dollar, and the increased cost of everything—including particularly staff salaries — we must either provide more money or forsake some of our new objectives. Certainly, no large influential organization such as ours can stay abreast of the times without preparing with funds for the doing of just that.

Yours very truly,

A. M. RAWN
Chief Engineer and General Manager,
Los Angeles County Sanitation Districts.

(Night Letter)

Am astonished at your editorial "Don't Raise Dues Now." I trust it was written from a lack of knowledge regarding the purposes of the proposed constitutional amendments rather than prompted by a malicious and studied attempt to injure the American Society of Civil Engineers. As amended at Duluth the Society proposes first to give voting privileges to Juniors, second to raise dues for all Juniors $12.50 per year which means a reduction for Juniors in District One of $2.50, this eliminating a long standing injustice. Your statement 7% Society funds devoted to salary service to Society members is utterly absurd. I am convinced that the Society is spending at least 40% of its income to enhance the professional standing of its members. Only 60% of the Society's income comes from entrance fees and dues and the proposed increases add only 14%. Salary services have not been curtailed and there is no intention of doing so. I sincerely trust you will give this rejoinder the same prominence in the News as you did your editorial.

JOHN C. STEVENS,
Past President,
American Society of Civil Engineers.

* * *

This editor replied to Mr. Stevens' night letter at some length, and Mr. Stevens in turn wrote a long letter in reply, which for reasons of space cannot be printed, but he stated that the "professional activities" item in the published budget did not adequately express the amount spent for this sort of activity. He included his estimate of the proper breakdown of the funds, as follows:

Item	Professional	Technical	Total
General Service to Members	8.0	5.7	13.7
Capital Expense	.4	.5	.9
Retirement	1.0	1.7	2.7
Administration	4.0	3.4	7.4
Rent	2.0	2.9	4.9
Overhead	1.2	1.2	2.4
Local Sections	3.6	2.0	5.6
Regional Offices	4.5	.7	5.2
Meetings	1.0	2.4	3.4
Board of Direction	2.6	1.7	4.3
Civil Engineering	7.0	10.9	17.9
Professional Activities	6.6	.4	7.0
Technical Activities	1.6	23.0	24.6
	43.5	56.5	100.0

* * *

Dear Mr. Server:

Your editorial in the July issue of *Western Construction News* deals with a very serious subject. It is difficult for me to understand why a magazine should adopt a policy on the internal affairs of a great engineering organization based on evidently superficial knowledge. I do not question your personal position as an Associate Member of the American Society of Civil Engineers in saying to the membership "Don't raise dues now" but I am shocked to find a magazine, which I had believed of the essential reading nature, making statements without basic research.

We who are members of the Board of Direction of the American Society of Civil Engineers labor in the interest of the membership, and for the advancement of the

Society and the profession. The presidency of our Society has become practically a full-time job and even those in a directorial capacity, such as myself, find ourselves devoting some four months of the year to Society business. As a result, members of the Board become pretty intimately acquainted with the affairs and the needs of the Society. Consequently we may become rather bitter about casual opinions and superficial attitudes such as expressed in your editorial and by a magazine not faced with the responsibility and the labor of maintaining the Society.

The Society did not submit a constitutional amendment to the Annual Convention. This was done by 1,233 members of the Society, four times the required number of petitioners. I did not know this to be a controversial issue and, although a lively and healthy discussion took place at Duluth to some extent, where the two amendments were passed to ballot in the business session by a representative membership group, I saw no controversy in the basic issue involved in either of these.

I check you as mathematically correct in your reference to a "25 per cent" increase in dues, excepting for those corporate members in District one who will continue to pay a $5 differential. But in your reference to "professional activities" you are using restricted terminology in quoting these as "7 per cent of the total." This, as you use it, is an item name to cover Society committee work in contrast to committees which are purely technical. You use this term in the broad sense, in referring to it as an "expanded program," and you will find on investigation that 35 per cent of the total 1947 budget is devoted to the professional activities to which you refer.

Where did you obtain this fact that the Society is "completely out of the salary scale business"? Has Mr. A. M. Rawn, my predecessor on the Board, been putting something over on me? I have yet to see Mr. Rawn head any project that was "ineffectual". Did I only dream that his salary committee presented a report on faculty salaries at Duluth as the initial step in that new-type salary investigation? Is the Society not retaining its salary research expert, Allen P. Richmond? I don't get it. In the past eight years the Society has conducted salary studies in 5 states, 2 counties, and 1 city, on request. Do you suggest that we go out and solicit such business? Have you looked over some of our almost remarkable highway construction in Arizona? Do you know that the salary scale of these engineers is not dependent upon legislative action but on Commission adoption, and that the Commission is guided by the standards recommended by the Society?

Your editorial urges "a negative vote by members on the proposal." That might be urged if you would first define the proposal so that the membership could draw its own conclusions. Why would it not be sporting to state that the current dues, the basic factor in Society income, are based on budgets set up in 1921? Did you determine that 74% of the 1921 income came from dues against a maximum estimate of 54% today? Did you determine that there were 500 junior members in 1921 against 7,000 today; that the average dues paid in 1921 for members served was $19 against $16 today? What do you want us to do, drop the juniors, ask them to meet corporate dues (they cost us relatively nothing in 1921), or have an increase across the board? There should be only one answer.

Do you know that local sections have increased from 34 to 66 and student chapters from 39 to 124 since 1921? Do you credit the Society with three field offices instead of confining its activities to a New York headquarters office as was possible in 1921? Obviously members are now costing $33 per capita against $26 in 1921. Do you consider this 27% cost increase out of line with the nation's change in economic conditions?

If dues are not to be raised "now", what would you recommend be done?

Very truly yours,

JOHN H. GARDINER,
Director, District 11, A.S.C.E.

* * *

And in Reply:

Dear Mr. Gardiner:

Thank you for your letter answering the editorial which appeared in our July issue entitled "Don't Raise Dues Now." It is a thoughtfully-worded letter, and although it doesn't change my view of the situation, I appreciate the time you took to prepare it. Too, I'm gratified to see that the editorials are read, even if the sentiments are protested.

I shan't attempt to answer every detail of your letter, but will attempt to reply to some of your points.

First, I was a trifle hesitant about voicing an opinion on the subject in *Western Construction News*, since it is not a Society organ. But it appeared to me that since all the organs of the Society are controlled by those who favor the increase, it would be necessary for anyone opposed to it to use another medium. Furthermore, I reasoned, if it is acceptable for Engineering News-Record to favor the increase (or appear to do so) editorially, it must be equally acceptable for *Western Construction News* to express its opinion.

Next, as to whether I was uninformed in making statements: I had at my disposal all of the material which was available to every other member of the Society, including the published budget for 1947, appearing in the April issue of Civil Engineering, various statements that have appeared in that magazine, and the speeches of Colonel Carey, President Hastings, and others. Every other member is asked to base his decision on these statements; why not I also?

For you to state that the Society did not submit the amendment, but that 1,233 members did so, is begging a point, is it not? I'm sure that 1,233 members did not simultaneously, spontaneously, and independently decide that the operating officials of the Society should, out of a clear sky, be given $5 more per member to work with. Nor in fact do I believe that even one member, not active in the official bodies, saw that light. I am sure that the petitions were prepared in the New York office and were circulated at the instigation of officers of the Society. Now, don't misunderstand me—I do not mean to say those who are most closely familiar with conditions should not do this; of course they have that right—I am only discounting the spontaneity of the thing as it is indicated in your letter.

And then I'd like to make a comment on your reference to the amount of time officers of the Society devote to its interests. You do indeed, and I'm sure every member honors and respects you all for doing so. I have never held any high office in A.S.C.E., but was for twelve years financial secretary of a certain church, and have had fairly important posts in fraternal, as well as civic and business organizations. I have always found that it's very easy for the person in executive position to get so ensnared by the enormity of the forest that he cannot see the trees. Always, expanded activities are being undertaken, but none of the old ones are curtailed. Always, we could do such a far greater job if we had only a slightly larger budget. Always, we cannot see how we can possibly continue if funds are not granted for the program as we've outlined it. It has happened within the year in the financial structure of *Western Construction News*, for instance. The price of art work, as a single example, has risen markedly. I was obliged, on the virtual order of the business department, to keep the total bill on the same level as formerly. I could use less pictures, or smaller ones, or make certain charges for them. They didn't care how it was done, but I **dare** not increase the total expense. Although I nearly got apoplexy explaining how impossible that was, **we are now doing it.** It **was** possible. In all phases of our operation, we find that we can eliminate or revise or limit so as to meet conditions.

I am not so intimately familiar with the operations of A.S.C.E. as you are, of course. But I'll wager anything there are services or operations or personnel that could be curtailed to keep the business functioning without the proposed increase. Without meaning the slightest of personal reflection, I am confident there are activities that you, being so intimately connected with the organization, would feel absolutely essential, yet which would cause no stir of protest were they dropped.

On the basis of the information I have at hand, only two corrective measures immediately appear to me, namely, (1) that Civil Engineering be caused to operate on a self-sustaining basis, which I am sure could be done, as it is a first-class publication; and (2) that less general meetings be held—perhaps two per year instead of four. But beyond any doubt in my mind, there are office techniques, membership activities, employed personnel which could be altered or reduced, at substantial savings.

Both you and I have at various times, I'm sure, been told by our superiors, "You'll make that change, or effect that saving, or by Gad, we'll find somebody who will." And we've done it! Colonel Carey is an excellent secretary, and I should hate very much to see him leave that post, yet I believe the Board of Direction, his superiors, should be just that firm. Operating on a deficit budget, as indicated in the April issue, is an impossible situation. Most members of the Society have been vociferous in their denunciation of the Federal government for operating that way, and I think should be equally distressed when their society attempts to do so.

This letter is already too long, but I would refer to one other matter in your letter. In referring to "professional activities," I have used it in exactly the same sense the Society did in the published budget. "Technical" activities, in that statement are a different thing. Statements by Colonel Carey and others indicate that by "professional activities" they refer to salary and working condition phases. They do **not** refer to Proceedings, Transaction, research work, etc. The activities which they wish to expand are what might be called "social" or "welfare." And in the 1947 budget, only 7% is devoted to that work. A statement by a Junior in the same issue of Civil Engineering says that he favors the increase because the Society is now promising to "do something for the Juniors." The things they are interested in, and which they have been promised will be forthcoming, are those "professional activities" which deal with the economic status of the young engineer. So

(Continued on page 111)

Resumé of Great Columbia Basin Hydro Power Potential

By W. D. B. DODSON
Washington Representative,
Portland Chamber of Commerce

IN 1920 A GENTLEMAN called upon me in my office in Portland, Oregon, and introduced himself as Ernest Bevin, Secretary of the Transport Workers Union of London, England. He explained that he had been named by Prime Minister Lloyd George one of the labor members of a joint management-labor committee chosen by the Prime Minister to investigate the reason why American industrial workers during World War I were producing almost twice as much per unit as the British industrial worker. After discussing local data Mr. Bevin informed me that he had reached the conclusion that our heavy unit production in the United States was due to the greater use of power in our industrial operations. He said that they found the average American industrial worker having under his control something like 5 hp. per individual, whereas the British industrial worker had under his control only about 2½ hp. Mr. Bevin rated one horsepower as the equivalent of 10 human beings working with their bare hands. This appraisal gave the American industrial worker an industrial capacity equal to about 50 human beings working with their bare hands as compared with 25 in Great Britain.

I informed Mr. Bevin that the potential hydroelectric energy of the Columbia Basin was then rated from 25 to 30 million kilowatts. He heard the statement with amazement and said that, if Great Britain had this power at her command within her own territory, it would result in the employment of a heavy army of industrial workers — possibly running to one million or more.

Greatest potential

The Columbia Basin has the largest potential of hydroelectric energy of any basin on the North American Continent and possibly in the Western Hemisphere. This is due to the fact that the discharge of the Columbia into the Pacific was, in earlier years, rated up near that of the Mississippi River. The Columbia drained an area only about one-fifth the size of the Mississippi Basin and flowed from the highest elevations of the North American Continent. A natural result of this volume of water flowing from the highest mountains has been the cutting of deep canyons and gorges through the entire territory, thus providing most economical potentials for power development. Short dams, often built on exposed rock formations, and with a very limited human development in areas where pools are formed and consequent low cost of indemnities, give a natural situation for large volume, low-cost power.

The flow of the Columbia at Bonneville a few years ago varied from 48,000 sec. ft. to 1,200,000 sec. ft. This fact reveals the necessity for heavy pooling operations in the basin in order to equalize the flow, increase the volume of power as a whole and raise the level of prime power. The latest figures I have seen on this subject indicate that, if the Columbia Basin flow were equalized the year through, it would be about 212,000 sec. ft. at Bonneville, which is the dam already built at tidewater on the trunk of the Columbia.

The fall of rain and snow in the Columbia Basin is very large. On some sections of the Cascade Range there are as high as 200 in. of snow and rain within a year. The higher levels of the Rocky Mountains also have heavy falls of snow and rain. This combination makes the Columbia Basin one of the most remarkable power potentials of the world and also, in due course, would insure for all time, under natural economic plans, a stupendous hydro energy potential at amazingly low cost.

Comparison with St. Lawrence

The St. Lawrence is the nearest competitor. This river is favored by the five Great Lakes which act as a natural pooling reservoir for the water discharge from that area. The flow at Niagara has been rated as high as 156,000 sec. ft. However, the Columbia Basin has a much greater power potential than the St. Lawrence. Only 1,500,000 hp. is now generated at Niagara where there is a potential of 5,000,000 hp. Further diversion for power at Niagara Falls is unlikely because of the demand for perpetuating that scenic grandeur. Canada takes one million horsepower of the Niagara development, leaving us only 500,000 hp. In the St. Lawrence, between Thousand Islands and Ogdensburg, there is a rated 2,200,000 kw. of energy, but when this is developed America only gets one-half of the total. Other large potentials on the river are wholly in Canada. Therefore, the St. Lawrence offers the United States only a limited quantity of power, whereas in the Columbia, after the stream crosses British Columbia into Washington, it is all the property of the U. S. A.

On crossing the Canadian boundary the Columbia's flow is from 70 to 80 million ac. ft. and crosses the line at 1,284 ft. above sea level. From this point to Bonneville the great river is practically always in canyon or gorge. The Snake River in earlier years discharged 48 million sec. ft. of water into the Columbia. Due to heavy irrigation and pooling done in southern Idaho, this volume has been appreciably reduced.

Transportation also

In the trunk of the Columbia between the Canadian boundary and Bonneville and in the Snake up through Hell's Canyon there is a potential of something like 10 million kw. of energy. Under effective control conditions of the water flow, it could be made much greater.

From an industrial viewpoint, this power in the trunk of the Columbia and in the lower Snake will be made accessible by barge transportation when the series of power dams are completed. Barge transportation on pooled water is naturally at an exceedingly low cost. When the Corps of Engineers made a survey of the Columbia Basin several years ago they found that the rail transportation rate between Portland and Lewiston, Idaho, was 27 mills a ton mile for all distances and all commodities in that section. Barges operating on pooled water can haul bulk commodities for as low as two to three mills a ton mile.

If and when American economy is given proper consideration and industries are permitted to locate at dam sites with power available at generating costs and all of these dam sites are served by barges, and many of them also by rail and highway transportation, the Columbia Basin undoubtedly must attract national attention. In the fierce competitive struggle of certain lines of industry needing large power loads Russia, Germany, Norway, perhaps later China, will make it necessary to have cheap power available under our flag. The Columbia Basin offers this opportunity in magnificent form when we get away from political control of the power problem and place it on a sound, economical footing.

Cost of power

At the Bonneville Dam today, when the Columbia is flowing at a capacity operating all ten generators, the cost of producing power is slightly under one-half mill per kilowatt hour and, taking the operation for the year through, generating charge at Bonneville is placed at about .8 of a mill. Bonneville is on ship, barge, rail and highway transportation and practically at tidewater. Yet power from Bonneville is taken two or three hundred miles from the dam and sold at the same rate charged for a location 10 mi. from the dam. This artificial burden, forced through some New Deal political scheme, reduced the value of Bonneville from an industrial view point very materially. If the Bonneville situation were applied to other streams on the trunks of the Columbia and Snake, we would not have the attraction for industry at the dams which Nature showered upon us. It is my conviction that the time will come when a sound, economical system of selling Columbia power will prevail.

West of the Rockies water is a vastly important factor in human progress. The Colorado River has an annual flow ranging from 6 to 26 million acre feet, with an average of 16 million acre feet a year. The Sacramento discharges 12 to 14 million acre feet and the San Joaquin had a primary flow of 8 to 9 million acre feet. This illustrates the stupendous importance of the Columbia Basin as an industrial powerhouse. In view of the further fact that barges can operate up the Columbia River after dams are built at amazingly low cost of transportation, the combination must impress the nation, in due course, with the tremendous value of that region.

HOW IT WAS DONE

JOB AND SHOP TIPS FROM THE FIELD

Corrugated Steel Tube Installed as Stock Pass

A CORRUGATED multi-plate culvert of oblong cross-section manufactured by Armco, has been specially developed to serve as a stock pass under railroad or highway fills. Shown here are two such installations on the Oregon Trunk Railway near Wishram, Wash. They are 91 in. high and 67 in. wide, which is sufficient dimension to accommodate a man on horseback.

The top picture shows one of the stock passes in place with the fill stabilized with cemented rubble, and the

lower photo shows another of the culverts under construction. It will replace a timber trestle, and will be 38 ft. long and be covered by 3 ft. of fill.

The stock passes are specially designed by Armco for their special purpose, being built in horseshoe shape, with the floor plates nearly level and the upper plate rounded. The pre-formed plates are riveted in place in the field.

Special Hoist Built on Truck to Raise and Lower Irrigation Pumps

AN INGENIOUS idea of R. H. Hopkins, of LeGrand, Calif., was converted into reality recently, when he designed and built a rig to pull out and install irrigation pumps. Built by Hopkins for W. P. Merrill of Chowchilla, Calif., the equipment was installed on a flat bed truck, raising up at the rear end of the truck to a height of 33 ft., taking about 5 min. to do so.

The derrick attachment, which is constructed of 3-in. tubing and is 33 ft. long, is raised by starting the hoist which pulls on a 5/8-in. cable fastened to the truck. Three-inch and 1-in. pipe are used to hold the derrick in place. Back braces are 1½-in. and cross braces ¾-in. and 1-in. pipe.

The drum of this hand-built installation is made of a Model T truck worm gear and run with a power takeoff from the transmission. Three pulleys are attached to the top of the derrick, with a three-pulley block at the bottom.

JOINTED SPRAYER DESIGNED TO SPRAY NOXIOUS ROADSIDE WEEDS

A SPRAY BOOM which may be mounted on a pump truck has been devised by Dow Chemical Co. to distribute weed-killing chemicals along roadside contours. It is built in 3 sections, with the two end sections hinged to the center portion, so that complete flexibility is available for spraying land of variable elevations. The three sections are manipulated from the cab of the truck by light ropes on pulleys.

Construction Design Chart

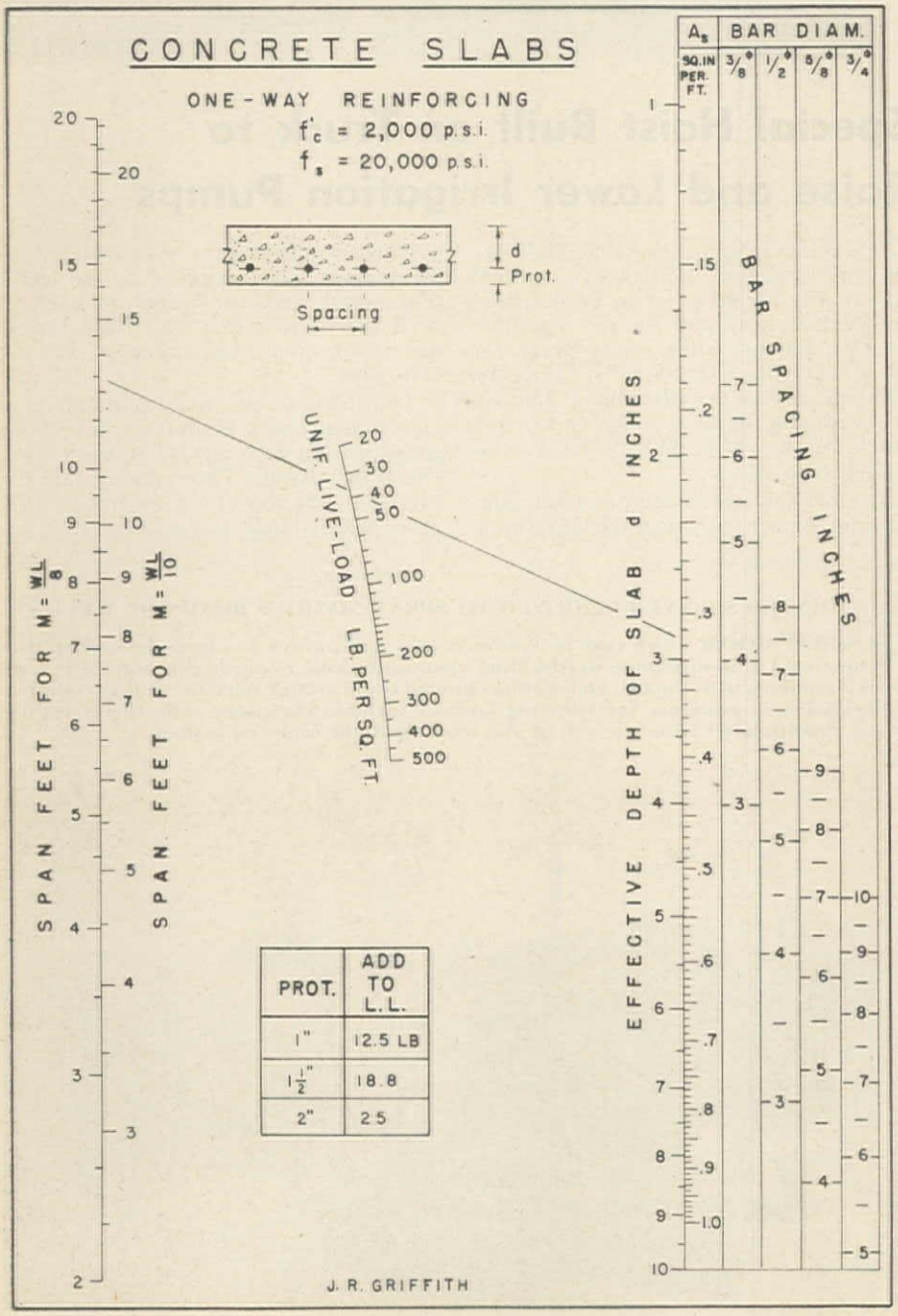
LXXXVII... Reinforced Concrete Slabs

By JAMES R. GRIFFITH
Civil Engineer
Seattle, Washington

A CHART was presented in the Nov., 1937, issue of *Western Construction News* for the solution of concrete slabs with one way reinforcing, based on $f'_c = 2{,}000$ and $f_s = 18{,}000$ p.s.i. The accompanying chart is similar, and is based on an allowable steel stress of $f_s = 20{,}000$ p.s.i. It has likewise been prepared to conform to the 1940 Joint Committee Report which allows a maximum concrete stress of $f_c = 0.45\,f'_c$.

The chart has been prepared to automatically take care of the slab dead-load for the effective depth d. A table is given on the chart for the additional dead-load below the center of the reinforcing steel. This should be added to the live-load when using the chart. One basic change from the former chart has been made wherein an A_s scale has been substituted in the space formerly giving the spacing for ¼-in. round bars. With the present shortage of small reinforcing bars, a substitution of reinforcing mesh is frequently advantageous.

As an illustrative problem, let us assume that it is desired to design a concrete roof slab for a residential garage having walls of concrete block. The allowable stress limits will be taken to conform to those on the chart. A total live load of 25 p.s.f. will be assumed on a total span of 12 ft.



Conforming to the Uniform Building Code which requires a minimum coverage of ¾ in. for slab steel, I will add 12.5 lb. to the live-load, thereby using on the chart a value of 25 + 12.5 = 37.5 p.s.f. This will then allow for reinforcing bars up to ½ in. in size if necessary. Since the walls are of concrete block, the slab will have no restraint at the supports and thus a simple span should be used. A solution line has been drawn on the chart for the conditions assumed. Accordingly, it is indicated that a slab with an effective depth of $d = 2.8$ in. with reinforcing equivalent to $A_s = 0.315$ sq. in. per foot of slab, will be adequate. Thus the total slab thickness would be

$$t = 2.8 + 1 = 3.8 \text{ in.}$$

which gives a total load of

Dead-load = 47.5
Live-load = 25

Total load = 72.5 lb. per sq. ft.

On the basis of a one foot width of slab, we then would have

$$M = \frac{w L^2}{8}$$

$$= \frac{72.5 \times 12^2 \times 12}{8} = 15{,}650 \text{ in. lb.}$$

Since

$$M = K b d^2$$

then

$$d = \sqrt{\frac{M}{Kb}} = \sqrt{\frac{15{,}650}{157 \times 12}} = 2.88 \text{ in.}$$

and

$$A_s = p b d$$

$$= 0.0091 \times 12 \times 2.88 = 0.315 \text{ sq. in.}$$

Since in all probability the total slab thickness would be made $t = 3$ in., it will be seen that the chart agrees with the values obtained by substitution in the formulas.

Horizontally, on the chart, from the A_s scale will be found the necessary spacing for various size reinforcing bars. Thus if ½-in. round bars are used, they must be spaced at 7.5 in., which coincides with the maximum spacing usually allowed of 2.5 times the total slab thickness. If smaller bars were available, I would personally prefer them at a smaller spacing, and not forgetting to include temperature steel for shrinkage stresses.

I have found such a chart a valuable means of quickly estimating the necessary wall thickness for such minor structures as valve boxes, tanks, etc. Since the chart has been prepared for horizontal slabs and includes dead-load, the results obtained by using it on vertical walls with horizontal reinforcing will be somewhat greater than theoretically necessary. In obtaining quick estimates for such structures so as to not delay the draftsman, I will use the chart on page 136 of *Construction Design Charts*, the reprint of this series, to obtain the pressure on a unit width of wall. Then applying this as live-load on the slab chart, I will obtain a value for the wall thickness which will be ample.

NEWS OF WESTERN CONSTRUCTION

SEPTEMBER, 1947

California Highway Division Reorganized to Expand Work

APPROVAL by the California State Personnel Board of a reorganization of the Division of Highways to more efficiently handle the expanded state highway program made possible by legislative increases in highway revenues, has been requested by Director of Public Works C. H. Purcell.

The several functions of the Division at headquarters in Sacramento will be coordinated into six major groups, each under the direction of an assistant State highway engineer or comparable position.

On recommendation of State Highway Engineer George T. McCoy, Assistant State Highway Engineer Fred J. Grumm will become Deputy State Highway Engineer, and under his direction will be four assistant state highway engineers in the Sacramento headquarters.

R. M. Gillis, Construction Engineer, will become Assistant State Highway Engineer in charge of Operations, with the following departments: Construction, Earl Withycombe, Principal Highway Engineer; Maintenance, T. H. Dennis, Principal Highway Engineer; Materials and Research, T. E. Stanton, Principal Highway Engineer; Equipment, R. H. Stalnaker, Principal Equipment Engineer.

Richard H. Wilson, Office Engineer, will become Assistant State Highway Engineer in charge of Administration, with three Principal Highway Engineers, as follows: Henry C. McCarty, Office; L. V. Campbell, City and Cooperative Projects; Harold B. LaForge, Secondary Roads; and Stores Department, Milton Harris, Staff Highway Engineer.

J. W. Vickrey, present Traffic Engineer, will advance to the post of Assistant State Highway Engineer, with the following personnel: Traffic, J. C. Young, Principal Highway Engineer; Surveys and Plans, A. M. Nash, Principal Highway Engineer; Planning Survey, K. A. MacLachlan, Highway Economist; Budget, Harry L. Kile, Staff Highway Engineer.

F. W. Panhorst, Bridge Engineer, will move up to Assistant State Highway Engineer, with the following departments: Bridge Construction, I. O. Jahlstrom, Principal Bridge Engineer; Bridge Design, Stewart Mitchell, Staff Bridge Engineer; Bridge Office Engineer, E. L. Walsh, Staff Bridge Engineer; San Francisco-Oakland Bay Bridge, Howard C. Wood, Principal Bridge Engineer.

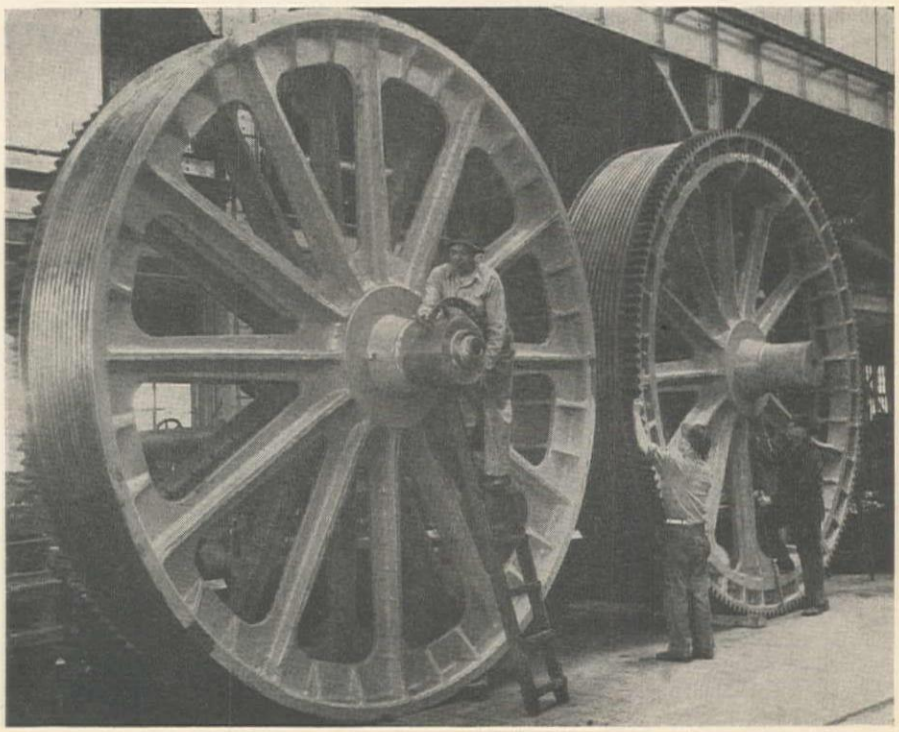
In the Right of Way Department, Frank C. Balfour, Chief Right of Way Agent, will have an assistant chief in the person of R. S. J. Pianezzi, in charge of office administration, and an assistant chief in charge of appraisals to be selected. In southern California, Elton F. Wagner will head Field Supervision, and a similar position in northern California is to be filled later.

J. G. Standley, now Principal Assistant Engineer in headquarters, will be elevated to an Assistant State Highway Engineer.

In District IV, San Francisco, and in District VII, Los Angeles, the present district highway engineers, John H. Skeggs and S. V. Cortelyou, respectively, will be promoted to Assistant State Highway Engineers. Each will have two principal highway engineers under them in handling the work of the districts. Each of the principals will be allotted two staff positions for further subdivision of the administrative work. In all other districts except District IX, embracing Inyo and Mono counties and a small portion of Kern County, not to

PULLEY WHEELS FOR TERMINAL ISLAND BRIDGE UNDER CONSTRUCTION

NEARLY COMPLETED in the shops of American Bridge Co. at Gary, Indiana, are two giant sheaves upon which will wind the cables that will lift the tower span of the drawbridge now under construction on Terminal Island, in Los Angeles Harbor, linking that important Naval and industrial area with Long Beach and the mainland. These giant grooved pulleys are 15 ft. in diameter and weigh 28 tons each.



exceed two additional staff positions will be created.

Cortelyou will have as Principal Highway Engineers, Paul Harding, now District Highway Engineer at Stockton, and Albert D. Griffin of the Los Angeles office.

Skeggs will have B. W. Booker and L. A. Weymouth as Principal Highway Engineers to assist him.

C. E. Waite, District Construction Engineer in District V, San Luis Obispo, will replace Harding at Stockton as District Engineer.

Bids to Be Called for Huge Garrison Dam in N. Dakota

GARRISON DAM, on the Missouri River in North Dakota, may soon be out of the blueprint stage and under construction, as the Corps of Engineers announced opening of bids on the project in September.

Bids for the first stage of construction of the rolled-fill dam, as advertised in August, include a mammoth excavation job for the intake and powerhouse areas, two holes which will rival the Mesabi Range open-pit mines in size. Other important items in the first stage construction will be driving 54½ mi. of steel sheetpiles for cutoff walls, placing 7,000,000 cu. yd. of embankment in the main dam, and driving a 37-ft. test tunnel 300 ft. long, as well as a large amount of stripping, clearing, trenching, lignite salvage and miscellaneous drainage.

In conferences held recently for interested bidders, Col. W. W. Wanamaker, then district engineer of the Garrison District, Bismarck, N. D., accompanied contractors to the proposed damsite 80 mi. from Bismarck. Changes and suggestions in construction procedure were then discussed.

Excavation for the intake and powerhouse areas, on the right abutment of the dam, involves removal of nearly 6,000,000 cu. yd. Intake area, with a top area of 1,300 x 1,400 ft., a 195-ft. depth, and bottom of 550 x 700 ft., will require 2,700,000 cu. yd. of excavation. Powerhouse area will take care of another 3,000,000 cu. yd., with an area from 520 x 830 ft. at the bottom to 900 x 1,200 ft. at top and a maximum depth of 185 ft.

Excavation for this part of the project will be in the main in Ft. Union formation, consisting of well-consolidated clay and silt, fairly hard and containing seams of limestone, sand and lignite. Two water-bearing lignite seams appear at the bottom and about 20 ft. above. Since the seams are from 4 to 6 ft. thick and much inflow of water is expected from both holes, a separate bid item was issued for pumping.

A narrow drainage channel may be dug along the line of the permanent outlet channel from the powerhouse to the river. If it is dug, it will reduce pump head in the powerhouse area to 30 ft.

Instead of following original plans for cut-and-cover conduits between intake towers and powerhouse, seven 37-ft. dia. tunnels 1,100 ft. long have been substituted. To lie directly under the extreme west end of the embankment, they will be driven through Ft. Union formation. A 300-ft. full-section test tunnel is also included in the first stage contract. To be completed in 210 calendar days, the tunnel will test several types of lining to determine stresses.

An access drift is to be driven in the center of the invert of the big tunnel from the bottom of the powerhouse excavation. Since plans show an enlargement from the back end of the 7 x 9-ft. timbered drift to full tunnel size, it constitutes a problem. Possibilities suggested include raising the roof of the drift to reach main tunnel at crown level, or a shaft access.

Steel sheetpiling amounting to 286,400 lin. ft., or 54½ mi., of which 31,000 ft. is to be furnished by the contractor and the remainder by the government, is to be driven through glacial till areas in a trench length of 800 ft. The cutoff trench, included in the next contract, will be excavated under the west end embankment.

Single men working on the construction will be housed in a 160-man dormitory in the construction town of Riverdale. Other provisions for families must be made with the contractor.

The dam project is under direction of Brig. Gen. Lewis A. Pick, head of the Missouri River Division of the Corps of Engineers, and Col. John S. Seybold, who succeeded Col. W. W. Wanamaker as engineer of the Garrison district on Aug. 7.

Material Supply Better In First Half of Year

DURING THE FIRST half of 1947 the supply of most construction materials continued to improve mainly because of high levels of production, the Construction Division, Department of Commerce, has announced.

The Department's composite production index indicates that the average for the first 6 months this year was 19.1 per cent above output in the same period of 1946, and 5.4 per cent above the monthly average for 1946 as a whole. The composite index for June, 1947, indicates a current rate of output 37 per cent higher than the monthly average for 1939 and almost equal to that for 1941.

As compared with monthly average production in 1946, the larger advances during the first half of this year were registered in hardwood flooring, softwood plywood, clay sewer pipe, cast iron soil pipe and fittings, gypsum board (including lath), asphalt roofing materials, concrete reinforcing bars, wire nails and staples, cast iron radiation, rigid steel conduit and fittings, warm air furnaces, and water heaters (except electric).

Despite the encouraging over-all picture, there are a few materials for which supply has not caught up with demand, the report points out. For example, sheet steel continues very short. Several other materials, notably millwork and flooring; cast iron soil pipe and pressure pipe, and electrical supplies in general, apparently are still short in several areas, indicating that areawise, at least, the flow of construction materials has not yet come into balance.

"It seems unlikely that construction material prices will decline during the rest of 1947. In fact, they may rise slightly because of the repercussions of the recent increases in the prices of coal and steel," the report states.

MONTANA BUILDING Chapter of A.G.C. received its charter from the national organization recently. DON McKINNON, president, is handed the charter by H. E. FOREMAN, national managing director, while LES M. SHERIDAN, president of the Montana Contractors Association, looks on. Headquarters for both chapters is in Butte.

WASHINGTON NEWS

. . . for the Construction West

By ARNOLD KRUCKMAN

WASHINGTON, D. C.—Even here in the Capital there are many usually well-informed people who do not realize that the Lilienthal-Krug-etc. miracle of the Tennessee Valley, with its apparently low power rates, is more or less a hoax; a hoax that has cost you and me and other taxpayers, no matter where we live, $348,239,240. It is noticeable, however, that, usually, when the same people become aware how the miracle was performed, they cool amazingly to the idea of any similar miracles in the form of Authorities elsewhere. The difficulty with which the truth was smoked out, after years of effort, also has made an impression on many former enthusiasts.

Sen. George W. Malone, the Republican from Nevada, is scheduled to go down into the Tennessee Valley some time this Fall to look into some other aspects of the "miracles" credited to Lilienthal, Krug, and their followers, and there is some prospect that the result of this, and similar pokings by authorized individuals, may reveal why the Bureau of Reclamation, and its vast directive head, thinks it is one of the functions of the Bureau of Reclamation to build dams in Wyoming so that the candy store in Thermopolis may have electricity. The persistent and autocratic insistence of Straus, Krug, et al., on the need to build power enterprises under the guise of irrigation projects, is stirring more and more irritation in Congress.

TVA curb

The McKellar Bill, S. 1277, will drastically curb TVA's tremendous fiscal powers, and route all TVA revenues back to the Treasury, where they should have gone from the very beginning. The $350,000,000 already foxed out of the tax revenues are to be repaid within 40 years in 40 equal payments with 2½% interest. The Bill also provides that new TVA investments in power projects must be limited to those specifically approved by Congress, and also must be amortized in 40 years.

The purpose is, henceforth, to make power and other commercial adventures of TVA completely self-sustaining, and to compel TVA, hereafter, to obtain from Congress specific and exact appropriations for research and development programs, which hitherto have been financed out of power revenues, at TVA's own sweet will. This bill has the implied approval of the General Accounting Office, and it is expected the GAO will make these ideas formal in the report it must file early next year.

Meanwhile, of course, some of the GAO recommendations have already been put into effect by the 1948 Government Corporations Appropriations Bill. TVA is now very definitely prohibited from adding to its capital plant without approval of Congress; and the 40-year amortization of the $350,000,000 was set up on the basis of one-fourth to be liquidated every ten years. GAO approves of the intent, but says the method is not fiscally proper. Congress and its fiscal advisers are determined that the miracle workers of TVA hereafter shall pay for their money from the U. S. Treasury at the same rate as Treasury must pay for its money when it borrows from the people. In fact, interest-free financing of revenue-producing projects, by the use of your money and mine, in the U. S. Treasury, is to be halted all along the line, according to thought here.

Spotlight on Reclamation

This intent definitely puts the spotlight, and the microscope, on Mike Straus' Reclamation Empire. Congress apparently intends to bring the spreading Straus empire back within its legal confines. Mike has been refreshingly and naively frank in serving notice that he proposes to force Congress to give the Bureau another $36,000,000 in deficiency appropriations next January. Some of you out there in the West may think that Mike is a hero for what he is trying to get for you; but bear in mind that the only way economical plans may be made effective is by retrenchment, where retrenchment is possible; and also, get it fixed in your mind, that the vast majority of the members of both Houses of the Congress are earnestly and sincerely striving to do their utmost for all the country, in the broadest possible manner.

If our huge Mike gets his deficiency appropriation, he says he will use the bulk of it on the Colorado-Big Thompson, the Columbia Basin, and the Davis Dam. A great number of the members of Congress wish to know why. They will ask some pointed questions. They are especially interested in the Davis Dam program. You know, of course, that the Davis Dam presumably would implement the Mexican Treaty commitments.

Congress is now mostly interested in the proposed transmission line from Hoover Dam to Davis Dam. It is to cost $1,950,000. Mike's Bureau says this line will be used only to transmit power to Arizona until the Davis Dam is in operation; thereafter it is to be used in reserve, as a guarantee that power will be firm. Congress wants to know why this line, a subsidiary, is regarded as so necessary when many other lines are vitally needed. And they want to know how the appropriation can be repaid if the line is not practically productive.

It has been remarked here that this Davis Dam adventure would mean that the Reclamation Bureau will have a transmission grid connecting three of the West's biggest dams — Hoover, Davis, and Parker, the very essence of a huge integrated system to dominate Federally a great part of the old Spanish Southwest. You see, Congress begins to realize that our miracle workers have all kinds of smooth plans to create the basic regional coalition sometimes called an Authority, which smells just as bad by any other name. Obviously, it is clear that many persons in Washington who are collective and social minded believe that political control of electrical energy will determine the socio-political economy of the future.

Straus' view of the future

At Salt Lake City recently Straus galvanized the attenton of the members of the Congress, wherever they were, by the statement that the present program of the expenditure of $195,000,000 on reclamation in the West before June 30, 1948, **"commits the Bureau" to a program calling for additional expenditures of $1,335,000,000 through 1954.** This led the astute Congressional leaders to point out a major part of this current expenditure will go into installation of 549,000 kw. of new Federal power, to be established before next July. The installations are: Grand Coulee, 324,000 kw.; Central Valley, 225,000 kw.; which, by the process of "commitments," are supposed to pull in their wake more power installations in 1949 to a total of 394,000 kw., if the Congress doesn't upset the Reclamation blackjack applecart. These added installations will include the first power units on the Colorado - Big Thompson project, and the three generators at Davis Dam. Straus' purpose is to have the 15 new multipurpose dams built and complete by 1954.

He told the Salt Lake City meeting that the budget for the next 6 years would require: in 1949, $254,000,000; 1950, $295,000,000; 1951, $252,000,000; 1952, $200,000,000; 1953, $181,000,000; 1954, $153,000,000. Total installation is estimated at 2,250,000-kw. capacity. This six-year plan, curiously redolent of the Stalin 5-year plan, is expected to catch many votes in the Democratic net out West next year.

Construction funds

Reclamation funds, 1947-48, will be spent thus: Arizona, $2,190,000; Yuma-Mesa Division, Gila Project, canals and laterals; farm-land planning and initiation; Welton-Mohawk Division construction. Arizona-California, $1,290,000 for Parker Dam, power house, and transmission lines; Colorado levee system, channel maintenance and local flood protection. Arizona-Nevada: $21,-300,000; Boulder Canyon for drilling, grouting, drainage, and miscellaneous operations; Davis Dam, construction and transmission. California: $47,040,-000; Friant Dam drum gates, penstocks; two generators at Shasta; two generators at Keswick; Contra Costa, Clayton, and Ygnacio canals; Delta-Mendota and Friant - Kern canals;

Tracy pumping plant; two transmission lines, and tapline; Kings River, surveys and negotiation; All-American Canal, Imperial Division, repairs to dam and desilting works; Coachella Division, main canal for distribution system and flood protection. Colorado: $2,240,000, Mancos Project; Jackson Gulch Dam; Paonia Project, land classification, economic surveys, surveys and design work on canal system, and start on Spring Dam; San Luis Valley, Platoro Dam specifications, investigation and development work. Colorado-Big Thompson: $18,320,000; construction of Granby reservoir and pumping plant; Horsetooth reservoir and feeder canals; Estes Park aqueduct and power system; Olympus Dam; transmission lines. Idaho: $8,545,000, Anderson Ranch Dam; Cascade Dam; Lewiston Orchards; canals and laterals Minidoka Project. Idaho - Wyoming: $780,000, studies and investigations, Palisades Dam. Montana: $8,110,000, Hungry Horse Dam; studies Sun River Project; Canyon Ferry Dam construction; Moorhead Dam; Yellowstone pumping unit; Buffalo Rapids Project; Buford-Trenton Project main canal system. New Mexico: $1,830,000, construction and drainage Carlsbad; canals and laterals Tucumcari Project. Oregon: $5,080,000, Deschutes project work on Crane Prairie reservoir and Wickiup Reservoir and North Unit Division; rehabilitation Arnold Irrigation District siphon; Owyhee canal system work; Adams pumping plant, canals, irrigation and flood control work on Klamath project. Utah: $3,150,000, Newton Dam and reservoir; South Ogden lateral system; Salt Lake Aqueduct and Jordan Narrows siphon; Scoffield Dam. Washington: $35,050,000, pump and lateral work on Roza Division of Yakima Project; work on Columbia Basin Project, including installation of generators, construction of reservoirs and canal system. Wyoming: $8,825,000, Boysen Dam; Kortes Dam; Keyhole Dam; Riverton Project, canal and drainage work; Shoshone Project, Heart Mountain division, canal laterals, transmission line; Kendrick Project, canals and laterals. The Missouri Basin was allocated $7,400,000 for preliminary work, and for construction of transmission lines.

As finally approved, the Rivers and Harbors and Flood Control appropriations to be dispensed chiefly by the Corps of Engineers, and in a minor way by the Reclamation Bureau, and the Department of Agriculture, provide $37,176,700 for new rivers and harbors work; $50,000,000 for maintenance; $3,500,000 for advance planning; $20,000,000 for operation and care; $3,645,000, surveys, etc.; $2,397,000, miscellaneous; $500,000 alteration of bridges. This makes a total of $117,218,700. There is $231,800,925 for new flood control work; $2,400,000, maintenance; $4,500,000, planning; $500,000, snagging and clearing; $5,000,000, surveys; $497,000, salaries; $1,375,000, emergency repairs. The total for flood control is $246,072,825.

Other appropriations included funds for a 1,000-bed Veterans' hospital at Los Angeles; 200-bed hospital at San Diego; 1,000-bed hospital at San Francisco; and 500-bed hospital at Denver. Bonneville Power Administration was given $6,096,400 new funds for construction, together with $4,035,500 authority to make contracts. Bureau of Indian Affairs obtained $3,000,000 for roads, $1,822,000 for utilities and buildings, and $1,012,500 for irrigation. The National Park Service may spend $1,415,000 for new parks and roads, and $735,000 for new buildings and utilities.

The Alaska Railroad received $19,000,000 in funds and authority for new work; and Alaska highways have a new fund of $4,130,000. The Public Roads Administration was supplied with $247,711,146, plus $8,000,000 for pre-war obligations and $3,000,000 for roads on public lands. The Civil Aeronautics Authority obtained $32,500,000 to go ahead with the billion dollar civilian airport program. Forest Service Roads, under the Department of Agriculture, has a new fund of $16,300,000. State Department has $4,000,000 for construction related to the Mexican water treaty.

Housing

By Executive Order, the President wiped out the old and various housing units of the Federal Government and wrapped them all up in a new package called the Housing and Financing Agency. The House disapproved, but the Senate voted in favor, which made it possible for the President to proceed. Under the new arrangement there is a consolidation of the functions of the Home Owners' Loan Corporation, the Federal Savings and Loan Insurance Corporation, the Federal Housing Administration, the U. S. Housing Administration, the Defense Homes Corporation, the Federal Home Loan Bank Board, and one or two others not generally known. The over-all agency is headed by Raymond M. Foley as Administrator, at $10,000 per year. The subordinate agencies, which keep their identities despite the over-all supervision, are the Home Loan Bank, now headed by John H. Fahey of Massachusetts; the Federal Housing Administration, now headed by Franklin D. Richards, of Utah; and the Public Housing Administration, now headed by Dillon S. Myer, of Ohio, who previously was the head of the Federal Public Housing Administration. All new officers receive $10,000 per year.

Incidentally the Office of Housing Expediter is not touched by this reorganization. The Executive Order does, however, create a National Housing Council, consisting of the new officials named, and the head of the Veterans Administration, plus the chairman of the RFC, and the Secretary of Agriculture.

In the meantime, the construction of homes suddenly has jumped to an unprecedented high, never before reached except for a short time in 1925.

Soil Conservation Service

That bill, H.R. 4150, abolishing the services or subordinating the highly respected Soil Conservation Service of the Department of Agriculture to other parts of the Department, is not based upon a desire to achieve more economy, but is a part of the old fight by the Farm Bureau crowd against those activities which have not come under their thumbs. They are striving to turn over the entire Conservation program to State Agricultural agencies, and State Extension units, thus obviously increasing the overhead measurably.

The Soil Conservation Service, now headed by Hugh H. Bennett, is known in the Government as the unit in the Department of Agriculture with next to the lowest overhead in Government. Bennett has guided this agency very sincerely and very efficiently since its inception, and has sought to do the job which is reflected in its achievements. He has been opposed by the Southern farm bloc, and particularly by the State Soil Conservation people of Missouri. It would be easy to transform the Soil Conservation Service into a pork barrel and a soft spot for political hacks. The housekeeping practiced by Bennett and his associates has prevented such results. There is some danger that the Service may be emasculated unless those at interest arouse themselves and do something about it.

The radicals of the old FDR persuasion are not very friendly to Bennett. For this reason the dispatches going out of Washington almost deliberately distort the news, and attribute to the Soil Conservation Service huge appropriations running into hundreds of millions, while, in fact, the Soil Conservation Servce received less than $38,000,000 for all phases of its work the year.

There is considerable collusive chicanery here which it is difficult to make clear to the average person who lives far away. This is the condition that prompts many of us to hope that the day may not be far distant when the Congress proceeds on its oft threatened object of holding a public trial to bring into the open the illegal encroachments of the bureaucrats upon the proper functions of other parts of Government.

Agree on Natural Gas Split

NORTHERN CALIFORNIA'S limited natural gas supply is soon to be augmented by nearly 100,000,000 cu. ft. daily, according to a recent agreement with the southern California gas companies now completing a pipeline from Texas.

The agreement, which will enable the northern part of the state to benefit from the increased supply to be brought in by the Texas pipeline and originally intended for southern California alone, was approved by the State Public Utilities Commission recently.

Firms agreeing to the contract are the Pacific Gas and Electric Company, the Southern California Gas Company and the Southern Counties Gas Company. Contract is effective in April or before, if the volume available through the new pipeline is sufficient.

FWA, REA Continue Loans to Many Western Communities

THE FEDERAL Works Agency and the Rural Electrification Administration are continuing their advances to western states, and many more loans have been announced. FWA advances are to finance preparation of plans and specifications, and are to be repaid when actual construction is begun.

Nearly 396,000 farm families and other rural consumers in 44 states and Alaska will get electric service as a result of REA loans during the past fiscal year. The 1947 funds will enable the borrowers, many of whom are in the western states, to build over 135,000 mi. of new power lines and to increase the capacity of some of the systems already built. Funds advanced by both agencies during the past month are listed below.

FWA

California

San Fernando received a loan of $2,500 for additions to sewage treatment plant and collection system, estimated cost of which was $84,500. San Ysidro School District of San Diego County, elementary school at San Ysidro, estimated cost $43,395 and Federal advance $1,950; South San Francisco, pre-treatment plant for industrial wastes, $184,000 and $9,000; Willits, additions to sewage treatment plant and collection system, $57,000 and $3,000.

Hawaii

The Territory of Hawaii was advanced $8,500 by FWA for an addition to the Territorial Judiciary Building at Honolulu, estimated to cost $185,000.

North Dakota

A Federal advance of $20,000 was granted to Bismarck, Burleigh County, for additions to the War Memorial Building to enlarge the auditorium-gymnasium and provide city hall office space, at an estimated cost of $534,800.

REA

Idaho

Fall River Rural Electric Cooperative, Ashton, Idaho, was awarded $185,000 by the REA for completion of previously approved construction and for 63 mi. of line to serve 97 rural consumers.

Montana

Beartooth Electric Cooperative, Red Lodge, Mont., was loaned $175,000 for system improvements and for 120 mi. of line to serve 177 rural consumers. Mid-Yellowstone Electric Cooperative, Hysham, Mont., received a loan of $100,000 for system improvements and for 39 mi. of line to serve 32 rural consumers.

Nebraska

Burt County Rural Public Power District, Tekemah, was approved a loan of $125,000 for completed construction which included 96 mi. of line serving 254 consumers. Franklin County Electric Membership Corporation, Franklin, was loaned $251,600 for acquisition and rehabilitation of 4 mi. of line serving 128 consumers in and about the village of Upland, for 23 mi. of transmission line and for 113 mi. of distribution lines to serve 238 rural consumers. Loup Valleys Rural Electric Membership Association, Ord, received $331,000 for system improvements and for 220 mi. of distribution lines to serve 434 rural consumers.

North Dakota

McLean Electric Cooperative, Inc., Garrison, was loaned $300,000 for completion of previously approved construction and for 152 mi. of distribution lines to serve 174 rural consumers. Mer-Gran-Sou Electric Cooperative, Inc., Flasher, was given $365,000 for system improvements, for completion of previously approved construction, and for 179 mi. of distribution lines to serve 247 rural consumers. Mountrail Electric Cooperative, Inc., Stanley, was granted $300,000 for completion of previously approved construction and for 163 mi. of line to serve 199 rural consumers.

South Dakota

FEM Electric Association, Inc., Ipswich, a new borrower, was approved a loan of $610,000 for 443 mi. of line to serve 546 rural consumers.

Texas

Denton County Electric Cooperative, Inc., Denton, received $300,000 for system improvements and for 218 mi. of distribution lines to serve 615 rural consumers, while Magic Valley Electric Cooperative, Inc., Mercedes, was allotted $150,000 for system improvements and for 95 mi. of line to serve 235 rural consumers.

DeWitt County Electric Cooperative, Guero, received an REA loan of $250,000 for system improvements and for 153 mi. of line to serve 261 rural consumers.

Washington

Stevens County Electric Cooperative, Colville, Wash., was granted $340,000 for completion of previously approved construction and for 167 mi. of line to serve 354 rural consumers.

Manufacture of Prefab Homes Increases Rapidly

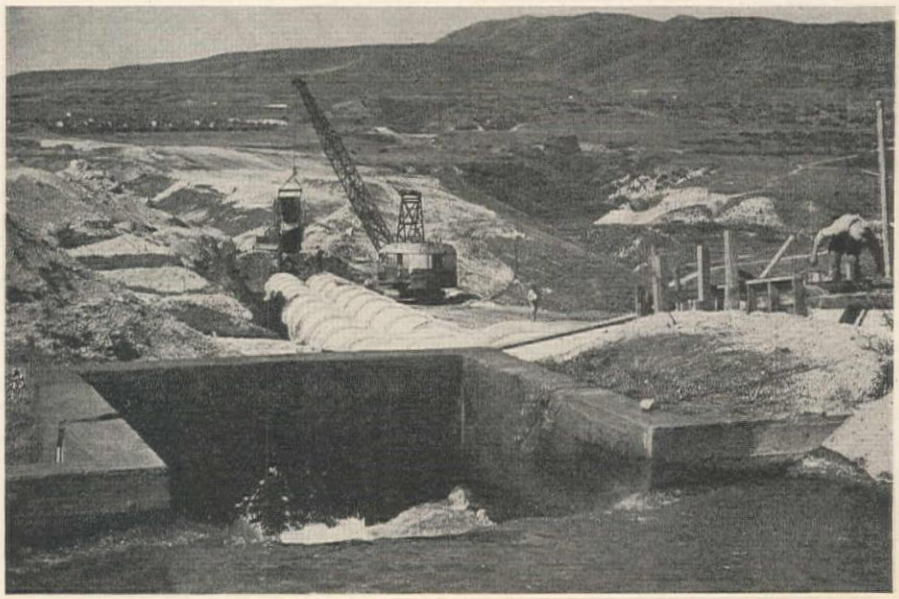
MORE THAN 250 American manufacturers are now producing prefabricated or ready cut homes or have indicated their intention to do so in 1947, according to a list released by the Construction Division, Department of Commerce.

The list was prepared to serve as a guide to individuals seeking information on prefabricated homes. It comprises names and addresses of manufacturers in most of the States. Some manufacturers distribute their product on a national basis, while others confine distribution to local or regional areas.

Wherever sufficient information was

JORDAN NARROWS SIPHON AND PUMPING PLANT UNDER CONSTRUCTION

STORAGE water from Deer Creek Reservoir, shown flowing into the old siphon of the Provo Reservoir Canal (foreground), will be conveyed underneath the Jordan River to distribution canals on the west bench north of Camp Williams (left background) upon completion of the Bureau of Reclamation construction of the Jordan Narrows siphon and interconnected pumping plant penstock at the Point of the Mountain near Provo, Utah. The dragline is backfilling sections of 69-in. concrete pipe, first portion of the new siphon.



available, a brief outline of the materials used, the number of stories, the method of distribution, the distribution area, and the location of producing plants is given.

The Construction Division points out that the prefabricated homes industry has been subject to such rapid changes of plans and production that the preparation of a directory with precise information on products or covering all producers is almost impossible. Details as obtained are shown in the compilation. However, since considerable time necessarily was consumed in preparation, the list cannot be said to be entirely accurate in coverage of either concerns now in production or their product.

Copies of the list may be obtained on request from the Construction Division, Department of Commerce, Washington 25, D. C.

Army Engineer, Other Funds Earmarked for Western States

THE RIVERS and Harbors Bill and the Flood Control Bill passed Congress and were signed by the President in the last days of the recent session of Congress. Funds approved for construction in these fields, which are administered by the Corps of Engineers, include the following funds in the Western States:

Project	Rivers and Harbors	Flood Control
California		
San Diego Harbor	$ 50,000	
Mission Bay, San Diego	1,000,000	
Big Dry Creek Reservoir		$ 771,000
Burbank Western System		100,000
Isabella Reservoir		1,250,000
Kings River, Pine Flat Dam		1,750,000
Los Angeles River		4,016,000
Merced County Streams		500,000
Pajaro River		500,000
Sacramento River		500,000
San Gabriel River		1,085,000
Santa Fe Reservoir		730,000
Ventura River		500,000
Colorado		
Cherry Creek Dam		4,500,000
John Martin Dam		550,000
Idaho		
Snake River		500,000
Kansas		
Missouri River	4,500,000	
Fall River Reservoir		3,000,000
Kanapolis Reservoir		2,900,000
Kansas Citys		5,000,000
Wichita		500,000
Montana		
Missouri River	150,000	
Forsyth		171,000
Fort Peck Power Plant	657,500	
Nebraska		
Harlan Co. Reservoir		9,000,000
Aten (bank protection)		500,000
Omaha		1,500,000
North Dakota		
Baldhill Reservoir		900,000
Garrison Reservoir		20,105,625
Park River Reservoir		300,000
Oklahoma		
Canton Reservoir		2,200,000
Fort Gibson Reservoir		5,000,000
Hulah Reservoir		1,000,000
Jenks		107,000
Polecat Creek		1,000,000
Red River		2,500,000
Tenkiller Ferry Reservoir		2,000,000
Wister Reservoir		2,950,000
Eufaula Reservoir (planning)		500,000
Oregon		
McNary Dam	4,500,000	
Columbia River	201,000	
Umpqua River	127,500	194,000
Yaquina Bay	495,000	
Salmon River	7,000	
Coos Bay	500,000	
Columbia River (at sea)	770,000	
Coquille River		131,000
Detroit Reservoir		1,250,000
Dorena Reservoir		3,750,000
Amazon Creek		305,000
Arlington		156,000
Fern Ridge Reservoir		20,000
Lookout Point Reservoir		4,000,000
Mill Four District		116,000
Nehalem River		23,000
Pudding River		110,000
Willamette River		500,000
South Dakota		
Fort Randall Reservoir		9,000,000
Oahe Reservoir (planning)		850,000
Hot Springs		200,000
Texas		
Gulf-Intercoastal Waterway	2,187,000	
Neches-Angelina Rivers	1,300,000	
Sabine-Neches Waterway	1,000,000	
Brazos Island Harbor	685,500	
Port Aransas Waterway	150,000	
Buffalo Bayou		1,854,700
Hords Creek Reservoir		1,303,800
San Angelo Reservoir		1,000,000
Trinity River (3 reservoirs)		2,600,000
Whitney Reservoir		5,200,000
Utah		
Redmond and vicinity		583,000
Washington		
Mud Mountain Reservoir		448,000
Tacoma		1,350,000
Yakima		202,000

Reclamation

THE BREAKDOWN of appropriations for the Bureau of Reclamation for the fiscal year 1948 is given herewith. After being deeply cut by the House of Representatives, a considerable portion of the Bureau's original request for funds was restored by the Senate. The differing measures were finally reconciled in committee and the compromise was signed by the President. The following items are from the approved appropriation. Construction projects approved to use general funds were: Gila Project, Ariz., $1,400,000; Davis Dam, Ariz.-Nev., $9,700,000; Central Valley Project, Calif., $9,141,288; Kings River Project, Calif., $100,000; Colorado-Big Thompson Project, Colo., $9,500,000; Hungry Horse Dam, Mont., $2,500,000; Columbia Basin Project, Wash., $17,500,000; Fort Peck Project, Mont., $1,500,000; Missouri Basin, $17,000,000; Boulder Canyon Project, $1,500,000; Hoover Dam, $435,000; All American Canal, Calif., $3,245,000; Colorado River Development Fund, $500,000, and Colorado River front work, $1,000,000.

Construction projects to be built using Reclamation funds were: Boise Project, Ida., $897,000; Anderson Ranch Dam, $3,874,000; Lewiston Orchards Project, Ida., $500,000; Palisades Project, Ida., $930,750; Carlsbad Project, New Mex., $21,000; Rio Grande Project, New Mex.-Tex., $755,000; Deschutes Project, Ore., $1,626,000; Klamath Project, Ore.-Calif., $1,800,000; Ogden River Project, Utah, $30,000; Provo River Project, Utah, $1,000,000; Shoshone Project, Wyo., (power) $443,000.

Operation and maintenance appropriations were: Parker Dam Power Project, Ariz.-Calif., $1,600,000; Yuma Project, Ariz.-Calif., $162,000; Central Valley Project, Calif., $800,000; Colorado-Big Thompson Project, Colo., $130,000; Boise Project, Ida., $185,000; Minidoka Project, Ida., $75,000 plus $196,000 from power revenues; North Platte Project, Neb.-Wyo., $136,000; Rio Grande Project, New Mex.-Tex., $220,000; Deschutes Project, Ore., $50,000; Owyhee Project, Ore., $260,000; Klamath Project, Ore.-Calif., $200,000; Columbia Basin Project, Wash., $1,300,000; Yakima Project, Wash., $300,000; Kendrick Project, Wyo., $200,000; Riverton Project, Wyo., $89,000 and Shoshone Project, Wyo., $50,000.

Funds granted for general office salaries and expenses amounted to $3,130,000 and for general investigations $2,000,000.

Aeronautics

THE FEDERAL aid program for airport development in the fiscal year 1948 has been announced by T. P. Wright, administrator of Civil Aeronautics. Congress appropriated $32,500,000 for work during that fiscal year, but inasmuch as only a very small proportion of the program planned for 1947 actually got under way during that fiscal year, the new appropriation has been combined with the $45,000,000 appropriated for 1947, and the program as announced includes the combined appropriations.

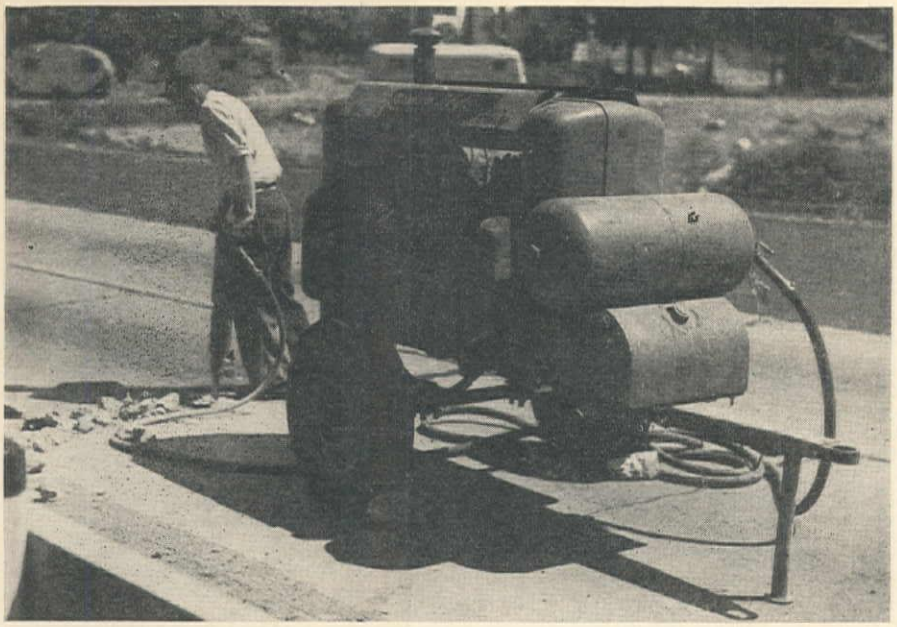
Of the $77,500,000, the sum of $4,087,500 will be used for administrative purposes, $3,315,500 for projects in the territories, $52,572,750 for construction in the states, and $17,524,250 for a discretionary fund. The program includes 896 projects in the continental United States and twelve in the various territories.

These Federal appropriations are to be matched by sponsor funds and the total of $140,702,885 is to be divided as follows: 10% for land, 8% for buildings and 82% for other items of airport construction.

Federal appropriations by states in the western half of the country follow: Arizona, $1,066,575; California, $2,726,618; Colorado, $1,109,142; Idaho, $814,048; Kansas, $1,057,945; Montana, $1,360,652; Nebraska, $918,309; Nevada, $960,313; New Mexico, $1,138,919; North Dakota, $727,986; Oklahoma, $1,059,944; Oregon, $1,041,162; South Dakota, $782,364; Texas, $3,549,984; Utah, $830,662; Washington, $945,797; Wyoming, $881,188.

The appropriation for Texas is the largest to any state, and that to California is the third largest in the country. Details of the projects by states will appear in a subsequent issue of *Western Construction News*.

The CAA requested another appropriation of $45,000,000 for fiscal 1948, but $32,500,000 was granted by Congress.



AIR COMPRESSOR INSTALLS EXPANSION JOINT IN WASHINGTON HIGHWAY

MODEL 60 Jaeger compressor operating a single hammer with pavement breaker tool is used for cutting concrete pavement for installation of an expansion joint on U. S. Highway 99 between Seattle and Tacoma, Wash. The highway is to be resurfaced with asphaltic concrete. The contract is held by Washington Asphalt Co.

Southern California to Be Site for Western Equipment Dealers Meeting

PASADENA'S Huntington Hotel is to be the locale for the second annual Associated Equipment Distributors regional conference of Region 11 for A.E.D. member firms in California, Arizona, Nevada and Hawaii, when they meet October 9th and 10th. Most of the 68 active and allied member firms in the western region are expected to be in attendance.

The Associated Equipment Distributors is a national association of construction equipment distributors and manufacturers with a membership of approximately 1,000 active and allied member firms in the United States and Canada. It was organized to promote and maintain cooperative spirit between the legitimate distributors of construction equipment and their sources of supply.

The national convention is held each year in Chicago, with each of the 15 regions holding regional conferences yearly also in their respective regions. A. F. Garlinghouse of Garlinghouse Brothers, Los Angeles, is director for Region 11, as well as executive vice-president of the national organization.

Two business sessions are on the agenda for the regional conference—a dinner meeting the evening of October 9th, the topic for which will be "National Affairs," with a prominent guest speaker, and a conference meeting on the morning of October 10th, consisting of open forum discussions with chairman supervision on subjects pertinent to the construction equipment distributor business. Attendance at both of these sessions will be limited to representatives of member firms.

Social events scheduled for the meeting include a golf tournament to be played on the Annandale and San Gabriel Country Club courses the afternoons of October 9th and 10th, a theater party for the ladies Thursday evening, and an informal dinner dance to be held at the Huntington Hotel on Friday night, October 10th.

Members of the program committee include: A. F. Garlinghouse, Garlinghouse Brothers, chairman; Willis Blakeslee, Pneumatic Machinery Co., Los Angeles; Harry Norris, Crook Company, Los Angeles; L. T. Pockman, Hyman Michaels Co., San Francisco. Golf committee is composed of W. W. Colley, Industrial Equipment Co., Los Angeles, and H. S. Warnock, LeRoi Rix Machinery Co., Los Angeles. John Carroll, Harron, Rickard and McCone Co., Los Angeles, and Bert Forniciari, Forniciari Co., Los Angeles, are members of the entertainment committee.

Structural Engineers To Convene in Yosemite

THE STRUCTURAL Engineers of California will meet in annual convention at Yosemite Valley, October 16 to 19. The Structural Engineers Association of California is a Western organization with two units: one in Los Angeles known as the Structural Engineers Association of Southern California, and the other unit with headquarters in San Francisco and known as the Structural Engineers Association of Northern California. Each of these units include the most prominent structural engineers in California and consists of two hundred fifty members each.

Recently the structural engineers connected with the State Bridge Department and the Division of Architecture of the Bureau of Public Works in Sacramento, organized under the name of Structural Engineers Association of Central California.

At the convention the theme will be "Structural Engineering and Public Relations." The three day session will include technical papers, discussions of policy within the Association, and general business matters affecting Western engineers. Some members will arrive in advance to play golf and a number of sightseeing trips have been arranged by the Committee. Mr. William W. Moore is president of the State Association and will preside. George Washington of San Francisco is in charge of arrangements for the convention.

Many Sanitary Projects Anticipated for Utah

THE CONSTRUCTION industry can reasonably anticipate an expanding volume of sewer and disposal plant work in Utah during the next year or two.

In response to insistent prodding of the state department of health, at least 21 Utah communites and suburban areas have started working out tentative plans for projects and a few of these are nearing the construction phase. Most advanced of these is the suburban area immediately south of Salt Lake City. A sewer district has been formed, a purchaser has been found for revenue bonds and engineers are engaged in drawing plans and estimating costs. The project will involve an expenditure of between $2,000,000 and $3,000,000.

A second but smaller district has been formed in Salt Lake county but it is waiting for the first one to pioneer the revenue bond financing plan, something new for sewer construction in the state.

The City of Lehi has voted bonds for a sewer system and disposal plant and plans are currently being prepared. The financing plan in this case is a combination of revenue bonds for the collection system and general obligation bonds for the disposal plant.

State health department officials expect that 20 or more projects will reach the active stage during the next 12 months.

A. S. C. E. Dues

(Continued from page 101)

much for my definition—it parallels the Society's own.

That the Juniors' hopes will be realized, I rather doubt. The Society was so completely reluctant to engage in any form of social or economic activity for its young members, until virtually forced to do so, and has been so active in seeking modifications of the Wagner Act, so as to eliminate

engineers from its provision, that I can see little hope that it will suddenly reverse its trend. At the Phoenix meeting the collective bargaining agencies were even **more** than "semi-dormant," as shown by their reports at the local section conference. One after another they reported, "We are organized and ready should there be any need, but none has yet arisen." Do you honestly believe that in virtually every local section in the West, the survey crews, the draftsmen, the junior, and even the supervisory engineer are so well paid that there is "no need" for affirmative action? I don't! In fact, I raised the question in that meeting, whether they were ready to meet the need for defeating onslaughts of some other organization or union which might aggressively try to secure better salaries and working conditions (a defensive motive, that is), or the need to improve the economic status of the engineer. From the meaningless jumble of words which answered that challenge, I determined that in most cases, the principal objective was the defensive one. I believe Sterling Green and a few others have a positive and progressive viewpoint, but they carry no weight in the policy-making levels, which are dominated (and well enough so) by employer or executive engineers.

I make this long statement to answer your unspoken question: "Why do you criticize the little work done, and then urge that no new funds be made available?" Several reasons: (1) I'm sure the Society has no sincere desire to engage in those activities, so much desired by the Juniors, and would not do so, in any affirmative sense, if the money was made available. (2) I'm not sure the Society **should** do so. Technical work, for which the Society has such a high reputation, does not naturally collaborate with the often unpleasant, sometimes definitely hard-boiled, and never simple work of the "social" problem, if it is to be effective. (3) I repeat the earlier statements, that if one activity is to be increased, another must be curtailed, or other readjustments made to keep within a balanced budget.

Yours sincerely,
JOHN M. SERVER, JR.
Editor.

California Utility Company Begins Largest Development

PACIFIC GAS and Electric Company's $61,800,000 construction project on the North Fork of the Feather River of California is the largest single hydroelectric development in the company's history. The project includes two new power plants which will add 270,000 hp. to the present 244,000-hp. generating capacity of P. G. and E.'s Feather River system.

Rock Creek Powerhouse, to be located near Storrie, Plumas County, will have a capacity of 169,000 hp. and will cost $35,400,000. Cresta Powerhouse, to be located near Cresta, Butte County, will have a capacity of 101,000 hp. and will cost $26,400,000. Together they will generate a peak of 812,000,000 kw. hr. annually.

The Feather River project is part of P. G. and E.'s six-year $350,000,000 postwar expansion program which will add 1,000,000 hp. to the company's generating capacity by the end of 1951, bringing the total capacity to more than 3,500,000 hp.

Construction schedules place the Cresta plant first for both starting and completion dates. The first major contract—for construction of a section of 26-ft. horseshoe tunnel to bring water to the Cresta plant—has been awarded T. E. Connolly, Inc., of San Francisco, whose crews started work on the tunnel adit above the mouth of Grizzly Creek early in August. The Connolly bid was $1,081,762 for the first 3,000-ft. section of the 21,054-ft. tunnel.

Bids will be called early in September for the remainder of the tunnel work, shortly after the first of the year for construction of a diversion dam, and next spring for construction of the powerhouse and penstocks. According to the company's tentative schedule, bids on the Rock Creek tunnel and diversion dam will be called for early next spring.

Completion of the Cresta plant is scheduled for the winter of 1949 and the Rock Creek plant will be finished a year later.

Approximately 10½ mi. of huge horseshoe-shaped tunnel through solid granite will be a spectacular engineering and construction feature of the project. Cresta will have 21,054 ft. of 26-ft. tunnel and Rock Creek will have 34,235 ft. of 25-ft. tunnel. More than 1,100,000 cu. yd. of granite will be excavated in the two tunneling jobs.

The new plants will be interconnected with three other P. G. and E. powerhouses in the Feather River system which have a total generating capacity of 244,000 hp. They are the 87,000-hp. Big Bend Powerhouse in Butte County which was commissioned in 1908; the 90,000-hp. Caribou Powerhouse in Plumas County, commissioned in 1921, and the 67,000-hp. Bucks Creek Powerhouse in Plumas County, commissioned in 1928.

Concrete diversion dams will be constructed for both the Cresta and Rock Creek plants. The Cresta dam will be approximately one-half mile upstream from the mouth of Grizzly Creek and the Rock Creek dam will be about two miles downstream from Belden.

Company estimates indicate that there will be approximately 2,500 men employed on the construction project during the peak work period. The peak work load on the first section of tunnel will be 150 to 200 men and on the diversion dam an estimated 300 to 400 men.

P. G. and E. headquarters and a dormitory for workmen are being constructed at Storrie by Hugh M. Cooper, Chico building contractor. The Connolly firm is clearing space for an assembling plant and workmen's camp in the vicinity of the damsite. Other work camps will be built by the company and contractors as construction progresses.

The Company does its own designing and engineering on all of its hydroelectric projects but assigns the actual construction work to private contractors. Coordination of the several contractors' work, supervision of construction and inspection of completed work will be handled by P. G. and E.'s general construction department.

John W. Woodward, P. G. and E.'s resident engineer, is now stationed at Storrie and will occupy the new headquarters building upon its completion. Jack E. Cooney is the Company's general superintendent of hydroelectric construction and George B. Thatcher is project engineer.

OBITUARIES . . .

Robert A. McMenimen, vice president and director of the Raymond Concrete Pile Co., New York, died Wednesday, July 30, in Monrovia, Liberia, Africa, where he had gone to inspect work and participate in the centennial celebration of the independence of the Republic of Liberia. He had direct management of the huge harbor development project at Monrovia which is rapidly approaching completion. Well-known in the construction field, he was an associate member of the American Society of Civil Engineers. One of the outstanding jobs of which he had charge was building the San Francisco Bay Toll Bridge between San Mateo and Hayward, Calif.

* * *

Vernon L. Glaze, chief of exploration work in the Sacramento Army Engineer District for the past two years, died Saturday, July 12, of a heart attack near the Pine Flat Dam site. During the war Glaze served as civilian engineer in charge of military construction in the Sacramento area and directed construction at McClellan and Mather Fields and Camps Stoneman and Kohler.

* * *

H. Macy Jones, 55, past president of the Los Angeles Section of the American Society of Civil Engineers, and for many years with the County Surveyor's office, died July 18 at his home on Balboa Island. Jones was for many years after its formation, secretary of the California Board of Registration for Civil Engineers, with headquarters in Los Angeles.

* * *

James B. Anderson, 59, died in Fallon, Nev. Saturday, Aug. 8 of a heart attack. A resident of Fallon for 11 years, he had been employed as a construction worker.

* * *

Cecil M. Miller, 55, civil engineer of Seattle, died July 24. He had been employed in the Seattle district, Corps of Engineers.

* * *

Jack Meehan, 55, blacksmith foreman at McNary dam, was fatally injured at the dam site on Aug. 7.

Bureau Organizes New Design Offices

TWENTY-FIVE field design offices are being organized by the Bureau of Reclamation to relieve the overload in designing work scheduled for construction in fiscal year 1948 and to comply with the Congressional appropriation limitations for the Denver engineering offices. A "transition" plan has been adopted to reduce the delay in engineering progress that naturally comes during transfer of functions to new offices.

The Denver office will continue to be the focal point where the more complicated engineering problems involved in the design of dams and other major structures in the Reclamation construction program will be solved. The field offices will be responsible for the production of the detail designs on minor structures appurtenant to the dams, camps, roads, design of transmission lines and irrigation distributon systems. This procedure will place the detail design work closer to the site of the many Reclamation projects. The basic technical control over the designs and specifications will continue to be exercised by the Chief Engineer. Experts to head these field offices will be detailed to those positions from the Chief Engineer's staff. An experienced nucleus for each of these offices will be provided from available personnel. The Chief Engineer will utilize a small group of traveling experts to effect supervision and coordination.

The tentative locations of the design offices are as follows: Arizona, Phoenix and Yuma; California, Friant Dam, Sacramento (transmission lines), Antioch, Redding, and Coachella Valley; Colorado, Grand Junction and Estes Park; Idaho, Boise and Lewiston Orchards; Montana, Great Falls and Miles City; Nebraska, Indianola; Nevada, Boulder City; North Dakota, Bismarck; Oregon, Klamath Falls; South Dakota, Pierre; Texas, Amarillo; Utah, Provo and Salt Lake; Washington, Coulee Dam and Ephrata; Wyoming, Heart Mountain and Casper.

Positions for the design offices are being filled wherever possible from within the Bureau of Reclamation engineering staffs. Some recruitment will be necessary where suitable qualified personnel are not available within the organization.

In some cases, Bureau of Reclamation project or other offices already are in existence at the selected locations, and the new units will become adjunct units.

The Editor's Mail...

Austin, Texas, August 21, 1947

My Dear Mr. Server:

Thanks for sending me advance proof of the editorial page from the August issue of Western Construction News.

I would certainly go along with Mr. Hagie's appointment as Secretary of the Interior. In fact, I know of no one in the United States better qualified than Floyd for this important Cabinet office which means so much to the West.

Yours very truly,
J. E. STURROCK,
General Manager, Texas
Water Conservation Assn.

* * *

Huron, S. Dak., Aug. 21, 1947

Dear Sir:

I have read your editorial in the August issue of the Western Construction News. I can agree with you that Floyd would make a good man for Secretary of Interior, but I can't see any of the public power boys in Truman's advisory group considering such a move. I don't know Floyd's politics although I've known him for a number of years. If you realize the set-up in the Department of Interior, I don't believe you'd find any of those birds favoring such an appointment. It might be far better to hold back and advance Floyd for such a position if and when we secure a change of administration.

Yours very truly,
MILLARD G. SCOTT

* * *

Washington, D. C., August 18, 1947

Dear Sir:

Your communication of recent date with tear-sheet from Western Construction News in which Floyd O. Hagie is recommended for the post of Secretary of the Interior when same becomes vacant by the resignation of J. A. Krug, noted.

I have known Mr. Hagie over a long period of years and I feel his knowledge of the West and its economic requirements would be a decided asset to the West if his appointment were possible. When the time comes for consideration of a successor to the Honorable J. A. Krug, you may rest assured I will be very pleased to interest myself in Mr. Hagie's appointment.

Yours truly,
HARRY R. SHEPPARD, M. C.

* * *

Bakersfield, Calif., Aug. 18, 1947

Dear Sir:

Thank you for sending me a copy of the editorial page from the August issue of Western Construction News.

I think your suggestion is an excellent one and certainly the invitation to Mr. Krug to be on his way is not only timely but very much to the point. All three articles are very well written and I want to commend you for the frankness in which the subjects were handled.

With cordial personal regards, I am

Sincerely yours,
ROLAND CURRAN
Secretary-Manager,
Central Valley Project Association

PERSONALLY SPEAKING

Members of the Chamber of Commerce of the United States' Natural Resources Department Committee for the current year number many western committeemen, including committee chairman **Dechard A. Hulcy,** president of Lone Star Gas Company, Dallas, Tex., it was announced by **Ralph Bradford,** executive vice-president of the organization. Others from the west are: **Donald A. Callahan,** Callahan Consolidated Mines, Inc., Wallace, Ida.; **Ralph Carr,** Denver, Colo.; **Frederick P. Champ,** Logan, Utah; **G. F. Coope,** president, Potash Company of America, Carlsbad, N. Mex.; **Floyd Hart,** president, Timber Products Co., Medford, Ore.; **Richard K. Lane,** president, Public Service Company of Oklahoma, Tulsa, Okla.; **Albert C. Mattei,** president, Honolulu Oil Corp., San Francisco; **F. S. Mulock,** vice-president and general manager, United States Smelting, Refining & Mining Co., Salt Lake City, Utah; **Kinsey M. Robinson,** president, the Washington Water Power Co., Spokane, Wash; **W. S. Rosecrans,** president, W. S. Rosecrans, Inc., Los Angeles, Calif.; **H. M. Seaman,** vice-president and general manager, Kirby Lumber Corp., Houston, Tex.; **W. J. Wehrli,** Casper, Wyo.; and **Wm. B. Wright,** president, American National Live Stock Assn., Deeth, Nev.

* * *

Maino Zan, a member of the field staff of the San Francisco office of the Contractors' State License Board of California, is retiring on Sept. 30 after 14 years with the Board. Zan, who was instrumental in securing passage of the licensing law originally, has investigated complaints with such sympathy and understanding that in the 14 years of his service, only five of his cases have resulted in formal complaints.

* * *

Rear Admiral John E. Gingrich, Assistant Chief of Naval Operations, is the newly appointed director of the division of Security and Intelligence, an organization closely related with the United States Atomic Energy Commission. Responsible for the physical security of the Atomic Energy Commission installations, the control of classified information, the development and operation of clearance procedures, and coordination with the Federal Bureau of Investigation, he will be in constant coordination with the Central Intelligence Group and other intelligence and security agencies of the government.

* * *

Clyde C. Spencer, presently construction engineer in charge of the Deschutes project of the Bureau of Reclamation at Bend, Ore., has been appointed to a similar position at Hungry Horse Dam in northwestern Montana. The dam is to be built on the south fork of the Flathead River and will be the third or fourth highest dam in the world when completed. Spencer has been on the Deschutes project since September, 1938, and has been in charge of construction of Wickiup Dam and other works.

RAY B. GILES

New president of the East Bay Engineers Club, Oakland, Calif., is **Raymond B. Giles** of the Pacific Coast Engineering Company, Alameda, who was elected at a recent meeting. Other new officers include **Thos. B. Bridges,** secretary, and **Herman V. Leffler,** recording secretary. **A. Vander Naillen, Jr.** commences his 21st year on the advisory board, with **D. H. Burrowes, Don C. McMillian, H. L. Thackwell, John S. Ritche, Victor W. Sauer,** and **Bruce Brownlea** completing the roster of the board.

* * *

William J. Baker, a U. S. Forest Products laboratory technologist at Madison, Wisc., has joined the staff of the Oregon Forest Products laboratory at Corvallis, Ore. He was one of the original founders of the Forest Products Research Society, and the first secretary-treasurer of the organization. He is succeeded at Madison by **Thomas R. C. Wilson.**

* * *

Howard E. Robbins, of McAllen, Tex., a career engineer of the Bureau of Reclamation, is the new acting director of the Bureau's Region No. 5, with headquarters in Amarillo, Tex. He replaces **Wesley R. Nelson,** who was appointed assistant commissioner of Reclamation in Washington, D. C. Robbins, an associate member of the American Society of Civil Engineers, has been with the Bureau since 1916, and was one of the men who worked on the design of Hoover Dam.

* * *

John H. Morrison, consulting engineer of Helena, has been selected chairman of the Montana board of registration for engineers and land surveyors. Other officers of the board, elected at the first meeting late in July, include **Richard J. Hale,** Missoula County surveyor, vice-chairman; and **Eldon R. Dodge,** head of the civil engineering department at Montana State College, secretary.

* * *

W. C. "Dutch" Williams, division engineer at Portland, has been appointed assistant state highway engineer in charge of design and construction for the Oregon highway department. **William W. Stiffler,** assistant maintenance engineer in the Salem headquarters, has been made assistant state highway engineer in charge of maintenance and operation. The two appointments are intended to fill the vacancy left more than a year ago by the death of Conde B. McCullough. To succeed Williams at Portland **Albert G. Skelton,** division maintenance engineer has been appointed division engineer, and **L. R. Chandler,** resident engineer at Pendleton, has been appointed maintenance engineer for the Portland division.

* * *

Hubert H. Hall, chief engineer of the Standard Oil Co. of California, has been named director and vice-president of the Trans-Arabian Pipe Line Co., and will also continue to serve Standard in the capacity of consulting engineer. Replacing Hall as chief engineer and chairman of the Board of Engineers of Standard Oil Co., is **J. M. Evans,** formerly Hall's assistant.

* * *

Walter E. Blomgren was appointed assistant regional director of Region 7, it was announced recently by acting Commissioner of Reclamation **Kenneth Markwell.** Blomgren, who has been serving in irrigation engineering for 30 years, becomes assistant to Regional Director **Avery A. Batson,** whose headquarters are in Denver, Colo.

* * *

O. L. Hoffman, chief of the engineering planning branch of the Portland district, Corps of Engineers, has been transferred to the real estate division which he will head as chief. Hoffman has been with the Portland district since 1939.

* * *

I. C. Steele, chief engineer for the Pacific Gas & Electric Co. since January, 1944, was recently named to the position of vice-president, while **Walter Dreyer** is now chief of the division of civil engineering. Dreyer is a member of the Structural Engineers Association of Northern California.

* * *

William J. Wenzel, consulting engineer of Great Falls, Mont., has been appointed head of a newly formed department of public works for the city of Great Falls. The department will have charge of city planning and public improvements including a major storm and sanitary sewer system, water works and street improvements.

* * *

Alfred L. Miller, professor of mechanics and structures at the University of Washington, Seattle, has been appointed a member of the Coast and Geodetic Survey committee on the design of earthquake resistant structures.

* * *

William P. Price, Jr., has been designated to take charge of construction activities on the Canyon Ferry Unit of the Missouri Basin project, it was announced by **Kenneth F. Vernon,** director of Region 6, Bureau of Reclamation. Price, who has been in the bureau since 1934, was formerly head of the contract administration section of the construction engineering division, office of the Chief Engineer, Denver, Colo.

* * *

Edward C. Dohm, consulting engineer of Olympia, Wash., has been appointed executive secretary of the Washington state board of registration of professional engineers and land surveyors. Dohm had previously served as secretary for the old 3-man board which has now been superceded by a 5-man board following adoption of a new engineers' registration act by the state legislature.

* * *

William E. Corfitzen of Denver, Colo. is the Bureau of Reclamation's irrigation adviser in rehabilitation of irrigation works on 800,000 ac. of farmlands in northern Greece, as part of the American Mission for Aid to Greece. Commissioner Corfitzen's task will be to expedite the reconstruction. The goal is full restoration by June, 1948.

* * *

G. Edward Jacoby, city building inspector for Grants Pass, Ore., for the past two years, has resigned to accept a position with Timber Structures, Inc. Jacoby will make his headquarters in Eugene, Ore. **Warren Baker,** mechanical engineer at the city water filtration plant, has been appointed building inspector to succeed Jacoby.

* * *

Johnnie Card, for many years a key man on concrete ships at National City, Calif., and later superintendent for contractors in San Diego, is now in business for himself at 989 Scott St., San Diego. A registered contractor, he specializes in fine home construction.

* * *

Harold M. Leighland, Salmer A. Leighland and **Jane L. Noble** of Great Falls, Mont., have formed a partnership to be known as the Power Construction Co., to enter the general construction field. Headquarters of the organization will be at Great Falls.

* * *

J. H. Frasher is new Mono, Calif., county road commissioner under the provisions of the Burns-Collier highway act of 1947. He assumes his duties the first of the year and will have charge of the construction and maintenance of all county roads.

* * *

S. H. Graf, head of the mechanical engineering department at Oregon State College, was re-elected president of the Oregon state board of engineering examiners at the biennial organizational meeting of the board in July. **John W. Cunningham,** consulting engineer of Portland, was re-

WILLIAM P. PRICE, JR.

elected vice-president. Both men have served in their respective offices since 1939. **Elmer A. Buckhorn** was re-elected secretary of the board.

* * *

Harold W. Merritt and **George R. Cooley** have opened a consulting engineering office in Seattle. Both Merritt and Cooley were formerly with the Federal Public Housing Authority. Merritt is a civil engineer, and Cooley an electrical engineer who was formerly engaged in electrical construction in Seattle.

* * *

A. W. Chedister, engineer for the Canal & Siphon Division of the Design and Construction Department of the Bureau of Reclamation at Denver, Colo., has been transferred to Friant, Calif. There he will be Reclamation engineer with the Friant Kern Canal, part of the Central Valley Project.

* * *

D. S. Culver has been appointed office engineer for the Hungry Horse project northeast of Kalispell, Mont. Culver has been in the Washington, D. C., office of the Bureau of Reclamation for the past 3 yr., and spent 11 yr. in the Denver office prior to going to Washington.

* * *

Ben F. Heinz, formerly secretary-director of the Portland traffic safety commission, has been appointed city manager of Cottage Grove, Ore. The city began operations under the manager form of government on Aug. 1.

* * *

Reopening of their western office was recently announced by the Bates and Rogers Construction Corp., Chicago, Ill. **Frederic L. Copeland,** vice-president, is in charge of the San Francisco branch, with offices at 483 Pine St.

* * *

Harold Shandrew, formerly employed with Kaiser Engineers, Inc., is now an associate civil engineer with East Bay Municipal Utility District in charge of soil surveys on the District's sewage disposal project.

* * *

R. M. Hendrickson, one time division engineer for the Great Northern railroad at Great Falls, Mont., and former Cascade County (Montana) surveyor, has been transferred from Washington, D. C., to the Alaska district, Corps of Engineers.

* * *

Paul Kilkenny, recently released from the Army, has been employed by East Bay Municipal Utility District as a junior engineer.

* * *

Stephen C. Jayne, resident engineer for the Washington state highway department at Cathlamet, has been appointed county engineer for Clark County, Wash., with headquarters at Vancouver. He succeeds **Charles Deako.**

* * *

Gordon H. Klippel, formerly an engineer with A. Teichert & Co., is now on the staff of the California Division of Architecture as an assistant engineer.

* * *

Alvin C. White has been appointed district engineer for the North road district of King County, Washington. He succeeds **Grover C. Gaier.**

H. P. O'LEARY

H. F. Faulkner, formerly resident engineer on the Ross Dam being constructed at Rockport, Wash., by the Seattle Department of Lighting, has retired and is living in Seattle at present.

* * *

New city manager of Berkeley, Calif., is **Ross D. Miller,** formerly Santa Rosa city manager. He will take office in October, according to **Dr. Laurence Cross,** Berkeley mayor.

H. P. O'Leary was recently named to the post of special representative in charge of public relations for all of Santa Fe Railway Co.'s Coast Lines, with headquarters in Los Angeles, it was announced by **Lee Lyles,** assistant to the president. O'Leary, who has been with the company since 1927, succeeds **E. G. Ryder,** who retired August 7. Ryder entered the line's service in the spring of 1918 in the freight claim division in San Francisco.

* * *

J. R. McBurney, city engineer for Boise, Idaho, for the past 10 yr., resigned his position on July 31. He served the city in engineering matters for more than 35 yr. prior to his resignation, having joined as office engineer in 1911. He was made assistant city engineer in 1917, and city engineer in 1937.

* * *

Shannahan, Inc., is the new firm name of the Los Angeles structural steel contractors formerly operating under the name Shannahan Bros. New company office is located at 282 W. Santa Barbara Avenue.

* * *

Olaf W. Lindgren, acting superintendent of the Yakima, Wash., project since last March, has been formally appointed superintendent of the irrigation project.

* * *

John Fasnacht has been appointed manager of city utilities for Bandon, Ore., succeeding **A. E. Pitts,** who recently resigned. Fasnacht previously served in the position from 1936 to 1944.

SUPERVISING THE JOBS

Project manager on the mammoth job of building four power plants at Hagerman, Ida. for Morrison-Knudsen is **L. E. Steelman,** with **D. C. "Joe" Thomas, Mark Rimer** and **Grant Ferre** as job superintendents, and **Alb Gregg** and **Fred McCormack** as resident engineers. Carpenter superintendent on the $6,500,000 job is **Amos Dean,** with **James Rutherford** as batching plant foreman, **J. L. "Whitey" Wixson** as concrete foreman, and **Wm. "Bill" Mosher** as general foreman. Office manager for the job is **Perry Oxley,** with **Chas. Harris** as chief of party, **W. W. Peak** concrete foreman, and **Geo. H. White** as electrical engineer.

The project, which was started in October, 1945, is expected to be completed by April of 1949. Others listed in important positions on the job include: **Harry Moulton,** excavation superintendent; **Jerry Cannon, Saul Wixson, Bill Hinchy,** and **Dean Straw,** grade foremen; **Ernest Cantrell,** pile driver foreman; **Roscoe Davis,** labor foreman, **C. E. Argo, Lloyd Condit, John Erickson, Gordon Watson, Al Higgins, Roger Bryor, Roger Thomas, B. B. Shaffer,** and **R. J. McKevitt** as carpenter foremen; and **Frank DeYoung** as rigger foreman with **D. E. McCurdy** and **L. J. Carney** as riggers.

Floyd Mercer is electrical superintendent with **Frank Patton** as steel superintendent and **Leonard M. Kinyon** as master mechanic. **Gordon Marquiss** is superintendent of installation, **John Woodhead** is erection foreman, with **R. H. Shoemaker** as general electrical engineer and **N. E. Fordham** as erection foreman. **Betty Harris** is paymaster and **Paul Roberts** chief accountant. **John F. Cantillon** is safety engineer on the extensive project.

* * *

Construction of permanent officers' quarters at Mountain Home Air Base, Mt. Home, Ida., is under way by the Morrison-Knudsen Co., with **J. H. Gaskill** as their general superintendent, and **C. W. Austin** as his assistant. Resident engineer for the job is **Leland W. Garrett,** while **Paul Reiman** is carpenter foreman with **Walter Chahanovich** as labor foreman and **Esdras Whittaker** as office manager. The $874,100 job, consisting of 30 units of 4-family frame and brick apartments, is expected to be completed by January, 1948.

* * *

Tavares Land Co., formerly known as Tavares Construction Co., is constructing 117 houses of concrete construction and 35 of frame construction in the "rolling hills" section, near El Cajon, Calif. Superintendent on the $1,500,000 project is **Tex Geneski,** with **Terry W. Eisenman** as gen-

eral manager. The job is under the personal supervision of **Carlos Tavares,** with **R. H. Walker** as controller. The company claims to have a record on concrete pouring of houses per day. The system is successfully used on both single and double story dwellings. Other key men employed on the site include: **C. C. Duschel,** yard foreman; **O. W. Chambers,** steel foreman; **Wm. McCoy,** framing foreman; **John Hammer** and **F. C. Taylor,** finishing foremen, and **C. C. McCulley, Ed Plataka, Wm. Hale** and **Harry Loman** as labor foremen.

* * *

Sam King, construction superintendent for Nettleton, Baldwin & Anderson of Seattle, is in charge of the erection of four buildings moved from two former military projects to the campus of Washington State College at Pullman. Erection of two 150 by 25-ft. buildings from Baxter General Hospital has been completed and two from Farragut Naval Training Station are nearing completion.

* * *

W. J. "Bill" Porter is general superintendent for Roy L. Bair & Co. and their highway construction job on the Geneseee-Linville highway, Idaho. **Morris Thompson** is resident engineer, with **W. L. Bolkcam** as general grade foreman, **L. P. Gorton** as crusher foreman, **Les Sheldon** as master mechanic, with **Randall Crisp** working with him. The $98,000 job is 5 mi. of grading and surfacing.

* * *

Wm. "Bill" Anderson is Morrison-Knudsen's superintendent on a job of railroad construction and repairs at Fort Steele, Wyo. Grade foremen on the project are **Arnold Draper** and **Ray Wright,** with **Johnnie Johnson** as master mechanic. **Johnnie Williamson** is welder and **Richard Kreger** grease foreman on the construction.

* * *

Haddock Engineers, Ltd., have **Roger Neal** as their superintendent on a $60,000 job of building a warehouse addition in Los Angeles. **Chas. Haight** is assistant superintendent, with **Mike Quedado** as concrete superintendent and **Robert Powell** as grade foreman. **C. L. Clayton** is blade operator, with **Don Cameron, See Clayton, Jr.,** and **Henry Coleman** in other key positions.

* * *

Dick Farnsworth is supervising construction of airport facilities 5 miles south of Twin Falls, Idaho, for the Triangle Construction Co., Boise. General foreman on the project is **C. L. Wright,** with **Wesley Reagan, Art Smith, Geo. Kochis** and **Frank Yeasley** as grade foremen. **J. J. Fackler** is master mechanic on the $588,000 job, to be completed in November.

* * *

Len Trimlett is supervising erection of a new telephone building at San Jose, Calif. for Swinerton & Walberg Co. **W. G. "Bill" Marr** is engineer on the job. Raymond Concrete Pile Co. have just completed the contract for foundation with **Harry Tobey** and **Cy Tollefson** as superintendents. The four story structure is estimated to cost $1,000,000.

* * *

Clarence Webb is general superintendent on a job of crushing borrow and oiling in Oneida Co., Ida. **Bill Jones** is resident engineer for the contractors, Duffy Reed Construction Co., while **Joe Book** is foreman and **Geo. Easley,** timekeeper.

GUS OBERG

Gus Oberg is general superintendent for Morrison-Knudsen Co., Inc., on their construction of Cascade Dam, Cascade, Ida. **Earl Hormon** is resident engineer, with **V. A. Roberts** as project manager and **Russell Madsen** as his assistant. **Thomas Barber** is job engineer, with **R. G. Vaden** as safety engineer and **W. Forrest Johnson** as office engineer. Foremen on the project include **Jim Raffery** and **Fred Herman,** concrete; **Ralph Jones** and **Grant Peacock,** day excavation; **Bull Huff** and **Harold Martin,** night excavation; **Roy Connor,** batching plant; **Elmer West,** steel reinforcing; and **Virgil Norwood,** master mechanic. **John Meinzer** is office manager for the job, to be completed around the first of the year.

* * *

I. E. "Tex" Wiginton is supervising a highway construction project at Roger's Pass, Wolf Creek, Mont., for Clifton & Applegate, Spokane, Wash. Resident engineer on the $417,000 job is **Don B. DeVore,** with **Cloyd Sisty** as office manager and **Ed Carlson** master mechanic. Foremen on the construction include **F. A. Borden,** shovel; **L. W. Withrow** and **Ronald Simmons,** grade; and **Wm. Davis,** truck.

* * *

H. C. Studer is general superintendent for Peter Kiewit Sons' Co., on their estimated $1,500,000 job of construction from Latigo Canyon to Malibu Road 10 mi. south of Santa Monica. **Roy Price** is Studer's assistant, with **John F. McLaughlin** as job engineer, **Wally St. Jaques** as equipment superintendent, and **O. K. Hoeppner** as office manager.

CLARENCE WEBB

Richard "Dick" Foster is supervising construction of Hungry Horse Dam townsite at Hungry Horse, Mont., for S. Birch & Sons, Great Falls, Mont. General foreman on the project is **Andy Anderson,** with **Chas. Loser** as grade foreman and **Geo. Lindseth** as sewer foreman. Other foremen include **Harry Petersen** and **Ed Nordtome,** with **A. A. "Andy" Van Teylingen** as office manager and **A. W. McIntyre** as assistant superintendent.

* * *

Fred Hoops was project manager for the Hoops Construction Co. on their job of grading, graveling and oiling the Sacramento Pass to Baker Junction in White Pine Co., Nevada, completed in August. **V. W. Clyde** was resident engineer on the project with **E. J. Warren** as foreman and **Wm. R. Hoops** in another key capacity.

* * *

Geo. Keys is superintendent and **A. W. Meyers** grade foreman on the new highway contract for Frederick & Kasler, north of San Luis Obispo, Calif. **Carl A. Nelson** is powder foreman and **Noel Carmack** master mechanic on the $700,000 contract.

* * *

Jim White was in charge of supervising the black top surfacing of all streets and cottage driveways in the resort town of McCall, Ida. for the Canyon Construction Co. Resident engineer for the construction, finished in August, was **Sam Johnson.**

* * *

Frank Despins is Cahill-Mooney Construction Co.'s general superintendent on a bridge construction 4 mi. south of Dillon, Mont. **Jim Clayton** is resident engineer on the project, to be completed in September, with **Don Stanich** as carpenter foreman.

* * *

A. T. Bennett is job superintendent for the Klay-Bennett Construction Co., Palo Alto, Calif., on their $141,800 job of constructing a girder bridge across the Kings River, near Hardwick. **A. C. Figueroa** is foreman on the project.

* * *

Bill O'Connor is supervising construction of an earth fill dam in Minidoka County, Idaho, for the Duffy Reed Construction Co. **M. Perrine** is resident engineer on the job.

* * *

Jim Kennedy is supervising the Carl E. Nelson Company's job of highway construction at Murtaugh, Ida. Grade foremen for the job are **W. R. "Bill" Cazier, Earl Booth,** and **Jim Stanger.**

* * *

F. B. Buxton, formerly foreman with Stone & Webster, San Jose, Calif., on work on the International Chemical Building, is now supervising construction on the new state employment building there.

* * *

Joe Bingham is Duffy Reed Construction Co.'s general superintendent on a job of making ready mix concrete in Twin Falls, Ida. **E. Anderson** is the company's resident engineer.

* * *

LeFay Pace is supervising repairs to a railroad draw span over the Chehalis River near Aberdeen, Wash., for Morrison-Knudsen Co. **Frank Barrett** is in charge of the project for the Union Pacific railroad.

Is Your "RIGHT NUMBER" among these WIRE ROPE Constructions?

Many factors determine the ultimate service you may expect from a Wire Rope. Among these are size, grade, construction and quality. But equally important is selecting the correct combination of these and other vital factors. Unless a rope fits the particular job to be done, the best results will not be had.

As "HERCULES" (Red Strand) Wire Rope is made in a wide range of both Round Strand and Flattened Strand constructions—Preformed and Non-Preformed—it offers the 'right number' for *any* heavy duty job.

And our Engineering Department is always ready to help you select the rope that will give you the most service for each dollar of its cost. Call on us anytime.

No. 1—Style B Flattened Strand—Hemp Center
No. 2—6 x 41 Round Strand—Metallic Core
No. 3—Style G Flattened Strand—Hemp Center
No. 4—6 x 19 Filler Wire Round Strand—Hemp Center
No. 5—6 x 19 Filler Wire Round Strand—Wire Rope Center
No. 6—6 x 37 Round Strand—Hemp Center
No. 7—6 x 19 Seale Round Strand—Hemp Center
No. 8—6 x 19 Round Strand—Metallic Core
No. 9—6 x 19 Warrington Round Strand—Hemp Center
No. 10—8 x 19 Filler Wire Round Strand—Hemp Center
No. 11—18 x 7 Non-Rotating
No. 12—6 x 7 Round Strand Haulage Rope—Hemp Center.

All of these constructions are available either Preformed or Non-Preformed.

"HERCULES"

REG. U.S. PAT. OFF.

RED-STRAND WIRE ROPE

MADE ONLY BY

A. LESCHEN & SONS ROPE CO.

ESTABLISHED 1857

5909 KENNERLY AVENUE • ST. LOUIS 12, MISSOURI

NEW YORK • CHICAGO • DENVER • SAN FRANCISCO • PORTLAND • SEATTLE

UNIT BID SUMMARY

Water Supply . . .

Utah—Salt Lake County—Bur. of Recl.—Pumping Plant

Carl B. Warren of Pleasant Grove submitted the low bid of $549,299 to the Bureau of Reclamation, Provo, for the construction of the Jordan Narrows pumping plant, siphon penstock, discharge pipes and wasteway, Deer Creek Division, Provo River Project. Following is the list of unit bids:

(1) Carl B. Warren.....$549,299
(2) Gibbons & Reed Co..... 569,918
(3) The Utah Construction Co.....$571,238

		(1)	(2)	(3)
	Lump sum, Unwatering foundations for siphon and penstock	$12,000	$15,000	$29,965
	Lump sum, Unwatering foundations for pumping-plant site	$15,000	$20,000	$25,880
8,000	cu. yd. excavation for pumping-plant structures	1.05	1.25	1.57
11,000	cu. yd. excavation for pipeline and wasteway	1.70	1.60	1.70
13,000	cu. yd. excavation for pipe trenches	1.85	2.10	2.04
2,200	cu. yd. excavation for wasteway channel	.70	.50	.69
10,000	sta. cu. yd. overhaul	.03	.02	.06
15,000	cu. yd. backfill	.90	1.00	1.37
7,000	cu. yd. compacting backfill	1.25	1.10	1.02
1,000	cu. yd. compacting embankments	1.60	1.50	1.37
70	sq. yd. dry-rock paving	15.00	20.00	16.20
1,100	cu. yd. rip-rap	5.00	4.00	8.20
90	cu. yd. gravel surfacing	20.50	17.00	5.45
5,000	bbl. furnishing and handling cement	5.00	4.75	6.35
450,000	lb. furnishing reinforcement bars	.075	.08	.075
450,000	lb. placing reinforcement bars	.05	.04	.035
140	cu. yd. concrete in pumping plant and valve house	68.00	75.00	82.00
620	cu. yd. concrete in substructures and sump	57.00	70.00	68.00
170	cu. yd. second-stage concrete in pumping plant	32.00	40.00	82.00
2,800	cu. yd. concrete in pipeline and wasteway structures	69.00	75.00	60.00
85	cu. yd. concrete in tunnel lining	73.00	60.00	90.00
100	lin. ft. constructing control joints	3.50	4.00	2.75
10	sq. ft. furnishing and placing elastic joint filler	1.00	1.50	1.22
150	lin. ft. furnishing and placing metal seals	1.90	2.00	1.57
480	lin. ft. placing rubber water stops	2.20	2.50	1.37
950	sq. ft. furnishing and placing cellulated-glass roof insulation	1.50	1.00	.41
1,300	sq. ft. furnishing and placing coal-tar-saturated-felt roofing	1.50	1.00	.48
20	sq. yd. furnishing and applying damp-proofing	1.50	1.50	8.20
19,000	lb. installing gate valve, check valve, bypass valve and bypass valves with energy absorbers	.12	.11	.20
7,600	lb. installing butterfly valves	.19	.15	.11
620	lb. installing slide gate and hoist	.22	.18	.14
51,000	lb. installing pumping unit	.10	.08	.16
3,500	lb. installing miscellaneous equipment	.25	.25	.17
4,000	lb. installing crane	.07	.06	.16
5,000	lb. installing crane rails, appurtenant parts and beams	.19	.17	.16
4,000	lb. installing trashrack sections	.07	.06	.11
5,000	lb. installing pipe, fittings, and valves less than 6-in. diam.	.12	.10	.34
7,700	lb. installing pipe, fittings, and valves 6 in. and larger	.10	.10	.19
690,000	lb. installing welded plate-steel siphon, penstock and discharge pipes	.09	.08	.065
1,200	lin. ft. furnishing and laying 36-in. concrete pipe	15.00	12.50	14.80
900	lb. installing pipe hand rails	.12	.11	.34
19,000	lb. installing embedded metal frames for openings in floors, roof, and walls	.15	.14	.16
	Lump sum, furnishing and installing metal accordion door	$2,850	$2,000	$1,888
	Lump sum, furnishing and installing metal swinging doors	$1,500	700.00	348.00
	Lump sum, furnishing and installing metal-sash windows	625.00	425.00	420.00
	Lump sum, furnishing and installing metal louvers	335.00	375.00	96.00
800	lb. installing miscellaneous metalwork	.15	.14	.41
750	lin. ft. installing electrical metal conduits	1.25	1.05	1.02
370	lb. installing electrical conductors, ground wires and rods	1.25	1.05	.82
400	lb. installing miscellaneous electrical equipment	2.50	2.00	.82

Bridge and Grade . . .

California—Los Angeles County—State—Structure and Sewers

James I. Barnes Construction Co., Santa Monica, submitted the low bid of $1,296,595 to the Division of Highways at Sacramento, for the construction of a four-level reinforced concrete separation structure, graded approaches and for the installation of storm drains and sanitary sewers at the intersection of Hollywood Parkway and Arroyo Seco-Harbor Parkway. The following unit bids were submitted:

(1) James I. Barnes Construction Co.....$1,296,595
(2) Guy F. Atkinson Co..... 1,437,700
(3) Bressi & Bevanda, Inc..... 1,619,739
(4) J. E. Haddock Ltd..... 1,627,124
(5) M. H. Golden Co.....$1,638,540
(6) Peter Kiewit Sons Co..... 1,786,882
(7) Winston Bros. Co..... 1,946,817

		(1)	(2)	(3)	(4)	(5)	(6)	(7)
4,000	cu. yd. rem. conc.	3.00	2.50	2.50	4.50	4.00	5.00	6.00
20	acres clear and grub	100.00	150.00	90.00	500.00	200.00	550.00	900.00
185,000	cu. yd. rdwy. excav.	.45	.60	.90	.79	.65	.85	1.40
31,000	cu. yd. struct. excav.	2.00	3.25	2.50	3.00	2.15	2.50	4.00
3,000	sq. yd. comp. orig. ground	.10	.10	.10	.12	.30	.05	.10
59,000	cu. yd. imported borrow	.90	.70	1.35	1.68	1.10	.95	1.60
	Lump sum, dev. water sup. and furn. water equip.	$2,000	$7,500	$1,000	$6,000	$1,500	$2,000	$5,000
1,500	M. gal. applying water	1.50	1.75	1.50	2.50	1.50	2.00	2.00
250	tons P.M.S.	5.50	7.00	5.50	6.00	6.00	7.50	6.00
14,980	cu. yd. Class "A" P.C.C. (structs.)	41.00	44.00	53.00	51.00	50.00	60.00	56.00
210	cu. yd. Class "C" P.C.C. (pipe reinf.)	14.00	16.00	17.00	16.00	15.00	27.00	20.00
135	lin. ft. rubber waterstops	2.00	2.50	3.50	3.85	3.00	2.50	3.00
89,000	lbs. misc. iron and steel	.29	.33	.35	.28	.32	.30	.35
19,252	lin. ft. furn. 10-in. steel piling	1.90	1.70	1.60	1.72	2.15	2.00	2.50
10,400	lin. ft. furn. 12-in. steel piling	2.35	2.25	2.10	2.15	2.70	2.50	3.15
1,455	ea. driving piles	30.00	20.00	20.00	27.50	25.00	25.00	42.00
145	ea. steel pile splices	25.00	12.00	10.00	22.00	15.00	15.00	17.00
60	cu. yd. Cl. "A" P.C.C. (curbs, gutters and sidewalks)	30.00	35.00	35.00	32.00	32.00	43.00	30.00
10	lin. ft. 21-in. R.C.P. (Std. str.)	5.00	4.50	5.50	4.45	4.00	7.20	5.00
66	lin. ft. 24-in. R.C.P. (1,500-D)	5.60	6.00	6.50	5.10	6.00	8.25	6.50
220	lin. ft. 24-in. R.C.P. (1,700-D)	5.30	5.50	6.00	4.80	16.00	8.00	6.00
220	lin. ft. 24-in. R.C.P. (1,750-D)	5.30	5.50	6.00	4.80	16.00	8.00	6.00

(Continued on next page)

ROLL ON RUBBER *And Roll Up Greater Profits with a...*

LORAIN MOTO-CRANE

Reg. U. S. Trade Mark

SPEED PAYS PROFITS . . . and Lorain Moto-Cranes give you speed. They roll on rubber at fast 30 m.p.h. travel speeds to take you places in a hurry . . . across city or country . . . for lifting, rigging, excavation or material handling jobs. Moto-Crane mobility and versatility open up unlimited job possibilities. More jobs can be handled. Job moves are faster. Transportation costs go down . . . profits roll up.

When you select your rubber-tire unit, consider these facts. Back in 1918, Thew-Lorain pioneered the rubber-tire crane idea. Years of experience with rubber-tire units has resulted in the development of today's modern Moto-Crane with many exclusive, time-tested features. Check these features below, and remember . . . *"It Isn't A Moto-Crane Unless It's Built By Thew-Lorain."*

THE THEW SHOVEL COMPANY, LORAIN, OHIO

The Lorain-41 Series shown, embraces Moto-Crane Models MC-414 and MC-416 of 20 ton capacity. Moto-Crane mountings also available for Lorain TL-20 series.

MC414 & MC416 CRANE CARRIER FEATURES

1. 3 axle mountings supported on 10 big rubber tires.
2. Driving power on 2 or 3 axles—"6x4" or "6x6".
3. Built of standard automotive parts serviced nationally.
4. Special chassis frame design eliminates costly, "patch-work" reinforcing. No Moto-Crane frame has ever failed.
5. 8 or 10 speeds forward (1 to 30 M.P.H.)—2 reverse speeds.
6. Soft ground flotation builds its own road on off-the-road travel.
7. Built by the originator of, and world's biggest producer of, rubber-tire shovels and cranes.

MC414 & MC416 TURNTABLE FEATURES

1. Simplified Center Drive direct-to-the-point power application on the turntable.
2. Sloping machinery frame places machinery far back of tipping point where it works to maximum to counterbalance loads lifted.
3. Roller bearing mounted Swing Drums, actuated by long life shoe clutches.
4. Steel Erectors Precision Boom Hoist, with "Micrometer" power control of boom lowering.
5. Easily assembled pin-connected crane booms, with center sections and tips.
6. Fully convertible and fully efficient as chain crowd shovel, crane, clam, drag, hoe.

See Your **THEW Lorain** Reg. U. S. Trade Mark *Dealer*

BUNTING TRACTOR CO., Inc. *Boise, Twin Falls, Gooding, Fairfield, Burley, Carey, Idaho La Grande, Oregon*

CATE EQUIPMENT CO. . . . . *Salt Lake City 4*

CENTRAL MACHINERY CO. . . . *Great Falls and Havre, Mont.*

COAST EQUIPMENT CO. . . . . *San Francisco 3*

A. H. COX & COMPANY . . . . . *Seattle 4, Wash.*

P. L. CROOKS & CO., INC. . . *Portland 10, Ore.*

LE ROI-RIX MACHINERY CO. . . . *Los Angeles 11*

LIBERTY TRUCKS & PARTS CO. . . . . *Denver 1*

MOUNTAIN TRACTOR CO. . . . . *Missoula and Kalispell, Mont.*

LEE REDMAN EQUIPMENT CO. . . . *Phoenix, Arizona*

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

TRACTOR & EQUIPMENT CO. . . . . *Sidney, Mont.*
Branch: Miles City Equip. Co., Miles City, Mont.

WORTHAM MACHINERY CO. . . . . *Cheyenne, Wyo., Billings, Mont. Branches: Sheridan, Greybull, Casper and Rock Springs, Wyo.*

140 lin. ft. 27-in. R.C.P. (2,000-D)	7.50	8.00	8.00	6.80	18.00	11.80	8.50
120 lin. ft. 30-in. R.C.P. (1,750-D)	7.00	7.50	8.00	6.60	20.00	11.50	8.50
130 lin. ft. 36-in. R.C.P. (2,000-D)	10.50	10.50	12.00	9.60	19.00	15.30	12.00
170 lin. ft. 60-in. R.C.P. (1,250-D)	17.00	18.00	19.00	16.50	26.00	27.00	22.00
550 lin. ft. 60-in. R.C.P. (1,500-D)	17.80	18.50	19.50	17.30	27.00	25.00	22.00
214 lin. ft. 12-in. C.M.P. (16-ga.)	2.00	2.00	3.00	1.70	2.10	2.50	2.00
10 lin. ft. 6-in. vit. clay pipe (std. str.)	1.50	1.00	3.00	3.60	10.00	2.20	2.00
36 lin. ft. 8-in. vit. clay pipe (extra str.)	1.75	1.00	3.00	5.00	10.00	4.60	3.00
930 lin. ft. 15-in. plain conc. pipe	1.80	2.00	2.50	2.00	7.00	3.90	2.50
130 lin. ft. 4-in. std. drain tile	1.00	.50	1.25	1.20	5.00	1.00	3.00
30 cu. yd. filter material	4.00	15.00	5.00	4.80	10.00	5.00	5.00
15 lin. ft. Type "B" manholes	16.00	25.00	75.00	29.00	30.00	26.80	30.00
15 lin. ft. pipe shaft manholes	20.00	20.00	70.00	15.00	30.00	18.50	20.00
3,511,000 lbs. furn. bar reinf. steel	.05	.06	.055	.055	.07	.052	.055
3,511,000 lbs. placing bar reinf. steel	.02	.02	.0225	.025	.03	.039	.03
5,486 lin. ft. Steel railing	7.00	8.00	6.80	6.25	8.00	8.00	7.00
Lump sum, elec. conduit and anchor bolts	$16,000	$25,227	$24,000	$15,750	$29,000	$20,500	$26,650
Lump sum, Engineer's office	$3,000	$5,000	$5,000	$3,000	$2,000	$4,000	$6,000

Utah—Utah and Salt Lake Counties—State—Bridge and Surf.

W. W. Clyde & Co., Springville, submitted the low bid of $466,002 to the State Road Commission at Salt Lake City, for approx. 5.5 mi. of 3-in. plant mixed bituminous surfaced road and the construction of one concrete bridge over 20-ft. span on the Lehi-Draper highway. The names of the bidders and their unit bids follow:

(A) W. W. Clyde & Co. $466,002
(B) Parson & Fife Construction Co. 511,618
(C) Reynolds Construction Co. 513,811
(D) Gibbons & Reed Co. 518,187
(E) Whiting & Haymond Construction Co. 556,046
(F) Olof Nelson Construction Co. $592,790
(G) Carl E. Nelson & Co. 605,491
(H) Strong Co. 628,705
(I) Utah Construction Co. 672,657

(1) 3,400 tons plant mixed bituminous surfacing
(2) 36,100 gal. bitum. material, 200-300 pene.
(3) 137,000 gal. bitum. material, Type MC-1
(4) 14,200 gal. bitum. material, Type RC-2
(5) 44,900 gal. bitum. material, Type RC-4
(6) 2,350 tons cover material
(7) 102,000 tons cr. rock or cr. gravel surf. crse.
(8) 290,000 cu. yd. unclassified excavation
(9) 1,770,000 sta. yd. overhaul, Class "A"
(10) 323,000 yd. mi. overhaul, Class "B"
(11) 4,800 hr. rolling
(12) 5,600 M. gal. watering
(13) 2,500 cu. yd. channel excavation
(14) 18,650 sq. yd. removal of existing pavement
(15) 8,146 lin. ft. 12-in. underdrains
(16) 2,006 lin. ft. 15-in. underdrains
(17) 6,952 lin. ft. 12-in. concrete pipe
(18) 1,630 lin. ft. 18-in. concrete pipe
(19) 1,443 lin. ft. 24-in. concrete pipe
(20) 291 lin. ft. 30-in. concrete pipe
(21) 208 lin. ft. 36-in. concrete pipe
(22) 410 cu. yd. concrete, Class "A"
(23) 110 cu. yd. concrete, Class "B"
(24) 8,000 cu. yd. excavation for structures
(25) 25,500 lb. structural steel
(26) 59,500 lb. reinforcing steel
(27) 5,600 cu. yd. gravel backfill
(28) 9,600 lin. ft. moving fence
(29) 29,000 lin. ft. right-of-way fence, Type "B"
(30) 3,800 lin. ft. guard rail
(31) 24 ea. 14-ft. gates
(32) 23 ea. 16-ft. gates
(33) Lump sum, moving monument
(34) 44 ea. right-of-way markers
(35) 1 ea. F.A.P. marker

CONCRETE BRIDGE

(36) 800 cu. yd. excavation for structures
(37) 400 cu. yd. concrete, Class "A"
(38) 101,300 lb. reinforcing steel
(39) 151 lin. ft. concrete handrail

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
(1)	1.95	2.35	2.20	2.25	2.20	2.40	2.75	2.39	3.00
(2)	.105	.11	.10	.105	.11	.12	.12	.125	.125
(3)	.115	.11	.12	.12	.12	.12	.12	.125	.125
(4)	.12	.11	.12	.13	.13	.12	.12	.13	.125
(5)	.13	.12	.12	.13	.13	.12	.12	.13	.125
(6)	2.50	2.50	2.50	2.75	2.50	3.00	3.00	3.50	3.10
(7)	.55	.58	.60	.62	.61	.80	.74	.80	.78
(8)	.18	.20	.20	.26	.22	.25	.23	.24	.20
(9)	.01	.012	.01	.015	.015	.01	.015	.015	.015
(10)	.12	.15	.15	.10	.15	.20	.16	.20	.22
(11)	3.00	3.50	4.00	5.00	4.50	4.00	5.00	6.00	6.50
(12)	1.25	1.25	1.25	2.00	1.50	1.50	1.50	2.00	2.50
(13)	.40	.50	.50	.30	.60	.50	1.00	1.00	.66
(14)	.40	.65	.50	.30	1.00	.75	.75	.60	.85
(15)	1.00	1.25	1.30	1.20	1.65	1.00	1.40	2.00	1.96
(16)	1.55	1.80	1.72	1.70	2.00	1.50	1.50	2.34	2.72
(17)	2.00	2.00	2.15	2.10	2.45	2.00	2.00	2.37	3.20
(18)	3.15	3.20	3.20	3.45	3.35	3.40	3.25	3.40	4.55
(19)	4.25	4.35	4.30	4.40	4.35	4.40	4.20	4.50	6.00
(20)	5.70	5.70	5.70	5.75	5.65	6.00	6.00	6.00	7.85
(21)	9.25	10.50	9.00	9.60	8.75	11.00	10.00	10.00	11.40
(22)	40.00	40.00	45.00	41.00	45.00	50.00	45.00	55.00	60.00
(23)	40.00	40.00	50.00	41.00	40.00	50.00	45.00	50.00	32.00
(24)	1.00	1.00	1.50	.80	1.50	1.50	3.00	2.00	1.78
(25)	.24	.30	.20	.19	.30	.40	.25	.20	.27
(26)	.10	.105	.10	.10	.10	.12	.10	.11	.12
(27)	1.50	1.00	1.00	.95	1.75	1.50	1.00	1.25	2.10
(28)	.15	.16	.20	.20	.21	.10	.15	.15	.38
(29)	.24	.24	.25	.25	.25	.25	.25	.25	.35
(30)	2.25	2.50	2.50	1.50	2.50	2.50	2.50	2.50	2.20
(31)	35.00	26.00	35.00	27.70	30.00	35.00	37.00	50.00	39.00
(32)	37.00	28.00	37.00	29.40	33.00	38.00	39.00	50.00	44.00
(33)	250.00	300.00	$1,000	200.00	750.00	500.00	$1,000	$1,000	650.00
(34)	4.00	3.00	5.00	5.00	4.00	5.00	5.00	4.00	9.00
(35)	20.00	20.00	20.00	10.00	20.00	15.00	20.00	15.00	20.00
CONCRETE BRIDGE									
(36)	2.50	1.50	2.00	3.00	2.00	1.50	7.00	2.00	1.78
(37)	40.00	40.00	50.00	41.00	45.00	45.00	50.00	55.00	55.00
(38)	.10	.105	.10	.10	.10	.12	.10	.11	.12
(39)	10.00	8.00	10.00	8.80	10.00	12.00	20.00	5.00	17.00

California—Mendocino County—State—Superstruct.

J. H. Pomeroy & Co., Inc., San Francisco, submitted the low bid of $459,532 to the Division of Highways at Sacramento for the construction of the superstructure for a bridge across Noyo River about one mile south of Fort Bragg. The following unit bids were submitted:

(1) J. H. Pomeroy & Co., Inc. $459,532
(2) Columbia Steel Co. 471,335
(3) Guy F. Atkinson Co. $472,205
(4) George Pollock Co. 479,615

	(1)	(2)	(3)	(4)
447 cu. yd. Class "A" P.C.C.	80.00	65.00	100.00	60.00
2,615,000 lb. furnishing struct. steel	.1095	.11	.12	.11
2,615,000 lb. erecting struct. steel	.044	.05	.035	.055
108,000 lb. furnishing bar reinf. steel	.055	.08	.065	.06
108,000 lb. placing bar reinf. steel	.0225	.03	.02	.03
Lump sum, removing existing bridges	$14,000	$12,000	$13,000	$11,600

"When we were awarded this contract, we had to buy additional equipment to handle some of the earth-moving problems involved without any lost motions. The investment would have placed a heavy strain on our working funds, so we asked C.I.T. to help us make the purchase.

"They quickly agreed to furnish 75% of the money required and we're repaying the loan in 24 monthly instalments. The increased earning capacity of the new equipment is showing a profit already and we did not have to struggle along with worn out inefficient models. Instead, we've got the *right* equipment on the job and we conserved our operating funds too!"

Here is a situation where a contractor needed—and was able to obtain promptly—financial assistance that helped him earn larger profits and handle a difficult construction job more efficiently. Our financing facilities are at the disposal of contractors to help them acquire the *right* equipment needed to complete their contracts on time—and at a profit.

When you need construction equipment, do as this contractor did, LET C.I.T. FURNISH THE FUNDS TO COMPLETE YOUR PURCHASE. We finance any amount, promptly and at reasonable cost, on terms arranged to suit the needs of your business. Any of these offices will furnish full information on request.

Send for NEW booklet describing C.I.T. financing facilities

C.I.T. "The mark of leadership"

C. I. T. CORPORATION

Industrial and Equipment Financing

One Park Avenue	One N. La Salle St.	66 Luckie Street, N. W.	660 Market St.	416 W. 8th Street
NEW YORK	CHICAGO	ATLANTA	SAN FRANCISCO	LOS ANGELES

AFFILIATED WITH COMMERCIAL INVESTMENT TRUST INCORPORATED

Arizona—Pinal County—State—Piers and Abutments

H. J. Hagen, Globe, was low before the State Highway Department at Phoenix, with a bid of $212,381 and was awarded the contract to construct piers, abutments and approach spans of a new bridge over Pinto Creek. The work is located about 11 mi. northeast of Superior and about 6 mi. southwest of Miami. Completion date is March 31, 1948. Unit bids are as follows:

(1) H. J. Hagen.....$212,381 (2) Vinson Construction Co.....$212,974

		(1)	(2)
1,500	cu. yd. constructing roadway fill from stockpiles	1.00	1.50
1,332	cu. yd. structural excavation (unclassified)	4.00	12.00
60	hr. mechanical tamping	7.00	4.00
2,240	cu. yd. Class "A" concrete	51.00	50.00
845	cu. yd. Class "D" concrete	60.00	50.00
328,515	lb. reinforcing steel (bars)	.10	.10
4,961	lb. structural steel	.20	.30
16	cu. yd. cement rubble masonry	50.00	32.00
105	cu. yd. hand placed rock fill set in mortar	30.00	32.00
230	lin. ft. drilling grout holes	.50	1.50
135	cu. ft. pressure grouting	5.00	3.80
100	lin. ft. 4-in. cast iron soil pipe	1.50	3.00
110	lin. ft. single curb and gutter (Type "G")	3.00	1.60
210	lin. ft. road guard	3.00	2.50
Lump sum,	furnishing grouting equipment	500.00	180.00

California—San Mateo County—State—Superstructs.

J. H. Pomeroy & Co., Inc., San Francisco, were low before the Division of Highways at Sacramento, with a bid of $640,207 for the construction of superstructures for two overhead crossings over the tracks of the Southern Pacific Company main line and Harbor Belt Line, in the City of South San Francisco. The following unit bids were submitted:

(A) J. H. Pomeroy & Co. Inc.....$640,207
(B) Earl W. Heple 674,704
(C) A. Soda & Son..... 675,695
(D) Guy F. Atkinson Co..... 682,138
(E) George Pollock Co..... 694,348
(F) Carrico & Gautier 696,530
(G) Leo Epp $698,482
(H) Chas. L. Harney, Inc..... 698,909
(I) Peter Sorenson & H. J. Oser..... 699,757
(J) Carl N. Swenson Co., Inc..... 704,447
(K) M. & K. Corp. 739,914

(1) 1,962 cu. yd. Class "A" P.C.C.
(2) 3,703,000 lb. furnishing structural steel
(3) 3,703,000 lb. erecting structural steel
(4) 439,000 lb. furnishing bar reinforcing steel
(5) 439,000 lb. placing bar reinforcing steel
(6) 3,832 lin. ft. steel railing
(7) Lump sum, deck drainage system
(8) Lump sum, electrical conduit

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
(1)	48.00	42.50	32.00	58.30	50.00	37.00	45.00	44.50	48.50	43.00	51.00
(2)	.105	.11	.1250	.112	.11	.1125	.12	.135	.115	.12	.127
(3)	.0225	.032	.02	.023	.0325	.035	.026	.01	.03	.03	.028
(5)	.025	.016	.02	.02	.025	.02	.02	.025	.02	.0175	.017
(6)	7.30	7.00	6.00	7.00	6.00	7.00	7.00	7.50	7.50	6.60	7.50
(7)	$11,500	$6,000	$15,000	$7,100	$10,000	$16,745	$11,000	$11,000	$5,000	$5,415	$4,500
(8)	$1,500	$1,500	$2,865	$1,000	$2,654	$1,250	$1,000	$2,000	$1,000	$1,000	600.00

Irrigation . . .

Oklahoma—Jackson County—Bur. of Recl.—Laterals

Stigler Construction Co., Stigler, and Jack Durrett, Keota, were low before the Bureau of Reclamation at Altus, with a bid of $349,416 for the construction of earthwork and structures for Ozark laterals 15 to 35 and Altus laterals 13.2 to 21.0 and sublaterals, Altus Project. The contract was awarded to the low bidders. Unit bids are as follows:

(1) Stigler Construction Co. & J. Durrett $349,416
(2) Stamey Construction Co. 373,680
(3) James & Phelps Construction Co.....$408,946

		(1)	(2)	(3)
210,000	cu. yd. excavation for laterals	.40	.50	.36
50,000	sta. cu. yd. overhaul	.01	.05	.03
3,000	cu. yd. compacting embankments	.10	.20	.25
17,000	cu. yd. excavation for drainage channels and dikes	.40	.30	.45
18,000	cu. yd. excavation for structures	1.00	1.00	1.75
15,500	cu. yd. backfill	.40	.40	.32
9,000	cu. yd. compacting backfill	1.00	1.50	2.50
2,350	sq. yd. dry-rock paving	5.00	4.50	4.50
2,000	cu. yd. concrete in structures	70.00	80.00	92.00
3,000	bbl. furnishing and handling cement	4.00	3.25	4.10
155,000	lb. furnishing and placing reinforcement bars	.15	.12	.18
35	M.F.B.M. furnishing and erecting timber in structures	400.00	200.00	200.00
144	lin. ft. laying 18-in. diam. concrete pipe	2.00	1.00	1.50
2,872	lin. ft. laying 24-in. diam. concrete pipe	2.00	1.25	2.00
1,388	lin. ft. laying 30-in. diam. concrete pipe	3.00	1.50	3.00
772	lin. ft. laying 36-in. diam. concrete pipe	5.00	2.50	4.00
156	lin. ft. laying 48-in. diam. concrete pipe	5.00	4.00	6.50
48,700	lb. installing gates	.15	.15	.15
5,900	lb. installing miscellaneous metalwork	.25	.20	.20

Oregon—Jefferson County—Bur. of Recl.—Earthwork and Struct.

Adler Construction Co., Redmond, submitted the low bid of $219,355 to the Bureau of Reclamation, Bend, for the construction of earthwork and structures, Station 3010+50 to Station 3562+30, North Unit Main Canal, Deschutes Project. Work is located between 1 mi. and 10 mi. north of Madras. The following unit bids were submitted:

(1) Adler Construction Co.....$219,355
(2) W. C. Bauman Co..... 283,651
(3) K. L. Goulter & Co..... 336,268
(4) Morrison-Knudsen Co., Inc.....$359,115
(5) E. B. Bishop 408,535

		(1)	(2)	(3)	(4)	(5)
186,000	cu. yd. excavation, common, for canal	.27	.42	.49	.375	.66
10,000	cu. yd. excavation, rock, for canal	1.60	1.65	2.00	4.00	.66
46,000	cu. yd. excavation for core banks	.25	.37	.35	.375	.66
34,000	sta. cu. yd. overhaul	.05	.04	.05	.05	.015
12,000	cu. yd. compacting embankments	.30	.40	.35	.85	.15
12,000	cu. yd. excavation, common, for structures	1.00	1.30	1.50	2.25	1.50
100	cu. yd. excavation, rock, for structures	7.00	5.00	5.00	7.00	1.50
8,000	cu. yd. backfill	.40	.37	.50	.90	.75
5,000	cu. yd. compacting backfill	.90	1.05	3.00	4.75	1.10
1,700	sq. yd. dry-rock paving	3.00	3.70	5.00	4.50	6.00
650	cu. yd. riprap	2.80	3.00	4.00	5.50	1.50

(Continued on next page)

This Number 707 stands for Efficient Truck Service

● It's the muster of Mack branches and dealers —707 strong—a far-reaching network we've set up throughout the United States and Canada for sales and service on Mack trucks.

It includes 67 Mack direct-factory branches strategically located in main industrial and trading areas. Each is manned by factory-trained experts who are constantly kept informed of improved service methods. Each is equipped with specialized Mack service tools that assure time-saving, money-saving precision work. And each is stocked with genuine high-quality Mack parts—parts that fit better and wear longer.

In more than 600 other communities Mack dealers—selected and responsible leaders in their field—also stand ready to give fast, on-the-spot service to Mack owners.

This means that no matter where your Macks may roll—there's always a source of authorized service and factory-made parts within easy reach.

It didn't just happen that way. We planned this service network as carefully as we plan every nut and bolt in a Mack truck.

Macks are built to need less service than other trucks. Our organization is built to make that service easy to get.

Mack

since 1900, America's hardest-working truck

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

Trucks for every purpose

6019

1,600 cu. yd. concrete in structures	42.00	54.00	60.00	60.00	86.50
150,000 lb. furnishing and placing reinf. bars	.1025	.14	.165	.12	.17
150 sq. ft. elastic filler material in joints	2.00	1.00	2.00	1.15	1.50
50 lin. ft. placing rubber water stops in joints	1.00	1.00	2.00	1.35	3.00
124 M.B.M. timber in structures and railings	145.00	146.50	147.00	185.00	240.00
800 lin. ft. furn. and laying 18-in. diam. conc. pipe	3.40	3.50	3.50	4.60	5.00
50 lin. ft. furn. and laying 24-in. diam. conc. pipe	4.50	4.60	5.00	6.05	7.50
70 lin. ft. furn. and laying 30-in. diam. conc. pipe	6.50	6.50	10.00	9.40	11.00
100 lin. ft. furn. and laying 36-in. diam. conc. pipe	9.60	9.00	12.00	12.90	14.00
13,500 lb. installing gates	.10	.10	.40	.18	.20
12,000 lb. installing miscellaneous metalwork	.20	.15	.40	.40	.20

Highway and Street . . .

California—Alameda County—State—Grade

Johnson Western-American, Alameda, submitted the low bid of $897,185 to the Division of Highways at Sacramento, for 2.3 mi. of highway to be graded on Eastshore Freeway, between one mile north of South City Limits of Oakland and three-tenths mile south of High St. in Oakland. Unit bids are as follows:

(1) Johnson Western-American ..... $ 897,185
(2) San Francisco Bridge Co. 1,094,020
(3) Hydraulic Dredging Co. Ltd. $1,124,465

	(1)	(2)	(3)
12 cu. yd. remove concrete	20.00	27.50	25.00
Lump sum, clearing and grubbing	$2,500	$3,000	$2,500
360,000 cu. yd. roadway excavation	.49	.70	.55
860,000 cu. yd. hydraulic dredger fill	.69	.65	.80
1,600 cu. yd. ditch and channel excavation	2.00	5.00	2.00
1,800 cu. yd. struct. excav.	5.00	7.50	6.00
214,000 sta. yd. overhaul	.03	.10	.08
119 sta. finishing roadway	25.00	25.00	15.00
18 cu. yd. Class "A" P.C.C. (structs.)	60.00	135.00	120.00
210 cu. yd. Class "A" P.C.C. (slope paving)	30.00	50.00	120.00
11,000 tons light stone riprap	8.00	19.00	15.00
375 lin. ft. 24-in. R.C.P.	5.00	10.00	8.00
200 lin. ft. 54-in. R.C.P.	12.50	17.00	15.00
60 lin. ft. 18-in C.M.P. (16 ga.)	4.00	6.00	5.00
110 lin. ft. 48-in. C.M.P. (12 ga.)	12.00	20.00	18.00
400 lb. bar reinf. steel	.15	.20	.20
40 lin. ft. salv. exist. pipe culverts	2.50	8.00	7.00
0.55 mi. new prop. fence	$2,500	$3,000	$3,000
1 ea. automatic drainage gate	200.00	125.00	110.00

Arizona—Greenlee County—State—Base and Surf.

Orr & Orr Construction Co., Phoenix, was awarded a contract by the State Highway Department at Phoenix, with a bid of $373,235 for approx. 2.8 mi. of grading, draining, applying base material and road mixed bituminous surface, the work to begin about 3 mi. northwest of Clifton and extending toward Morenci. The following unit bids were submitted:

(1) Orr & Orr Construction Co. $373,235
(2) Bowen & McLaughlin 380,435
(3) San Eavier Construction Co. 436,978
(4) Winston Bros. Co. $480,957
(5) Western Contracting Corp. 567,782

	(1)	(2)	(3)	(4)	(5)
271,900 cu. yd. roadway excav. (unclass.)	.85	.84	.88	1.08	1.36
14,500 cu. yd. overbreakage	.6375	.63	.66	.81	1.02
8,300 cu. yd. slides	.425	.42	.44	.54	.68
305 cu. yd. drainage excav. (unclass.)	1.00	2.00	.75	2.50	10.00
2,415 lin. ft. crown ditches	.20	.40	.20	.60	1.90
604 cu. yd. structural excav. (unclass.)	3.00	2.50	3.50	3.00	6.00
258,930 sta. yd. overhaul	.02	.015	.025	.02	.03
6,370 cu. yd. mi. haul	.30	.25	.30	.30	.40
16,400 ton imported borrow	.50	.30	.90	.65	.70
18,350 ton selected material	.60	.60	1.10	.85	.90
12,920 ton aggregate base	1.00	1.05	1.75	1.50	1.20
12,600 cu. yd. stripping pits	.20	.25	.25	.35	.30
8,900 M. gal. sprinkling	1.50	2.80	3.00	3.00	3.50
2,605 hr. rolling	5.00	5.60	6.00	6.50	7.00
30 hr. mechanical tamping	4.50	6.00	5.00	20.00	7.00
322 cu. yd. Class "A" conc.	43.00	48.00	55.00	55.00	52.00
39,840 lb. reinf. steel (bars)	.10	.12	.13	.11	.11
394 lin. ft. 18-in. corr. metal pipe	3.75	3.00	3.00	3.20	2.60
428 lin. ft. 24-in. corr. metal pipe	5.00	4.10	4.50	5.00	5.00
404 lin. ft. 30-in. corr. metal pipe	6.00	5.50	6.00	6.00	7.30
158 lin. ft. 36-in. corr. metal pipe	8.50	7.50	9.00	8.50	11.80
468 lin. ft. salv. exist. corr. metal pipe	1.50	2.00	2.00	1.50	6.50
2,380 lin. ft. road guard	2.50	2.10	3.00	2.50	1.10
144 ea. guide posts	5.50	5.50	5.00	5.00	5.70
6,140 ton mineral aggregate	1.10	1.15	1.75	1.50	1.20
303 ton road oil (SC-2)	28.00	28.00	30.00	30.00	25.00
2.803 mi. processing road mix	$1,000	800.00	$1,200	900.00	$1,200
745 ton screenings (for seal coat)	5.50	5.00	5.50	5.00	2.55
100 ton emulsified asphalt	32.00	31.00	34.00	35.00	27.00
1,005 sq. yd. placing intersections	.50	.60	.75	1.00	1.00

Montana—Liberty County—State—Surf. and Oil

McLaughlin, Inc., Great Falls, submitted the low bid of $347,703 before the State Highway Commission, Helena, and was awarded the contract for 13.7 miles of grading, surfacing and oiling of the Shelby-Chester Highway. The work should be completed by Sept. 15, 1947. Unit bids were as follows:

(1) McLaughlin, Inc. $347,703
(2) Inland Construction Co. 351,962
(3) Kiely Construction Co. 356,060
(4) Peter Kiewit Sons Co. $356,144
(5) Albert Lalonde Co. 356,588
(6) S. J. Groves & Sons Co. 363,243

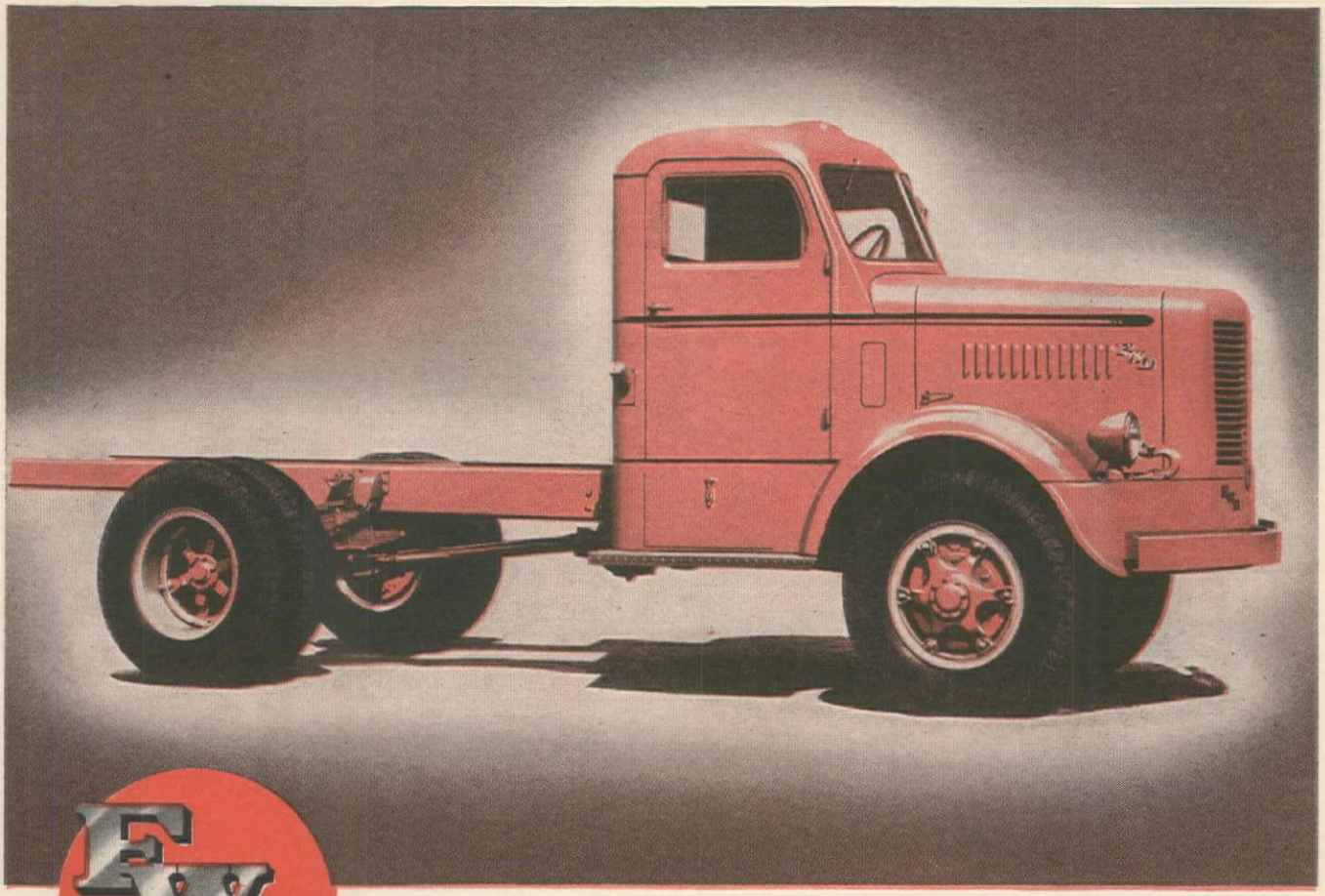
	(1)	(2)	(3)	(4)	(5)	(6)
117,169 cu. yd. unclass. excav. and borrow	.30	.30	.30	.36	.40	.54
608 cu. yd. culvert excavation	2.50	2.00	2.50	2.60	2.00	2.50
110,940 sta. yd. overhaul	.01	.02	.023	.02	.02	.02
42,272 ton Type A top coat surf., Gr. C	1.60	1.61	1.50	1.49	1.50	1.50
97,908 ton base coat surf., Gr. C-2	1.47	1.38	1.40	1.41	1.45	1.30
2,675 ton stockpile st. chps., Gr. B	6.00	3.40	8.00	6.00	5.00	6.00
4,900 cu. yd. binder	.05	.20	.01	.20	.25	.01
9,800 mi. yd. overhaul on binder	.05	.20	.01	.20	.15	.01
4,700 M. gal. watering	2.50	4.00	2.75	3.00	3.00	3.00
590 unit rolling embankment	6.00	6.50	6.75	7.00	8.00	8.00
620 unit rolling surface courses	6.00	9.00	7.00	7.00	6.00	6.00
273,196 gal. appl. SC-4 asph. road oil	.12	.13	.16	.12	.10	.12
13.745 mi. processing	900.00	$1,000	$1,000	$1,000	$1,200	900.00

(Continued on next page)

THE TRUCK WITH A

$56,000,000.00 ENDORSEMENT

THE FWD "H" SERIES



America's Foremost Heavy-Duty Truck

A truly great truck — the FWD "H" Series — a truck that in just six years has won the endorsement of motor truck users to a total of $56,000,000.00 in purchases — a truck that offers the advantages of a phenomenal record of $56,000,000.00 in manufacturing experience.

Rated at 20,000 lbs. gross, the FWD "H" Series represents the highest development of the four-wheel-drive principle, pioneered by FWD in 1910, and recognized all over the world for outstanding heavy-duty performance.

FWD safety and surety—the dependable pulling power and traction of four driving wheels — the ability to do more work at low-cost-per-ton-mile, and to move capacity loads to location, on or off the highway — these FWD four-wheel-drive advantages are vitally important in heavy-duty trucking operations. Wherever motor truck performance must be more than usually dependable—in highway or municipal service, in utility line construction and maintenance, in oil-field operations, in heavy hauling on or off the highway — FWD four-wheel-drive trucks render valuable service.

There is an FWD Distributor near you . . . see him for complete information.

THE FOUR WHEEL DRIVE AUTO CO.
CLINTONVILLE, WIS.
Canadian Factory: KITCHENER, ONTARIO
WORLD-WIDE SALES and SERVICE

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.

1,600	sq. yd. processing	.20	.40	.30	.45	1.00	.60
286	lin. ft. 15-in. reinf. conc. pipe culv.	3.50	3.70	3.25	3.25	3.00	3.65
320	lin. ft. 18-in. reinf. conc. pipe culv.	5.00	4.50	4.00	4.25	4.00	4.45
80	lin. ft. 24-in. reinf. conc. pipe culv.	6.00	6.30	6.50	6.00	6.00	8.00
136	lin. ft. 30-in. reinf. conc. pipe culv.	8.00	8.40	8.50	8.00	8.00	10.50
98	lin. ft. 36-in. reinf. conc. pipe culv.	11.00	12.00	11.50	12.00	10.00	12.50
120	lin. ft. 48-in. reinf. conc. pipe culv.	16.00	19.00	16.00	18.00	16.00	23.00
5,524	lbs. reinforcing steel	.12	.15	.14	.15	.15	.20
89.31	cu. yd. Class A concrete	57.00	75.00	60.00	62.00	60.00	75.00
2	ea. concrete project markers	20.00	20.00	20.00	25.00	20.00	25.00
73	ea. conc. station markers	6.00	6.50	7.00	10.00	5.00	10.00
100	ea. conc. r/w monuments	4.00	5.00	5.00	7.50	6.00	5.00
2,060	ton stockpiled gravel	1.60	1.90	1.30	1.35	1.50	1.50

Wyoming—Sweetwater County—State—Surf.

Peter Kiewit Sons Co., Sheridan, was awarded a $384,918 contract by the State Highway Commission, Cheyenne, for base course surfacing, plant mixed surface course and miscellaneous work on 15.6 mi. of the Granger Junction - Green River and Granger Junction - Kemmerer roads. The following unit bids were submitted:

(1) Peter Kiewit Sons Co. $384,918
(2) Taggart Construction Co. 407,384
(3) Northwest Engineering Co. $432,300
(4) J. H. & N. M. Monaghan 451,019

		(1)	(2)	(3)	(4)
112,200	ton crushed gravel base course (2-in. max.)	.60	.75	.70	.92
37,550	ton crushed gravel base course (1-in. max.)	.75	.90	.85	1.05
30,780	ton plant mixed surface course	2.90	3.00	3.55	3.40
2,000	ton stone chips	5.00	7.00	6.00	5.50
820,400	ton mi. haul of surfacing material	.09	.08	.09	.085
1,740	ton bituminous material (Gr. 120-150)	33.00	31.50	35.00	33.00
345	ton bituminous material for seal coat (Gr. 120-150)	36.00	33.00	38.00	37.00
850	ton base treatment MC-1	38.00	35.00	42.00	40.00
3,030	M. gal. watering (base)	2.00	3.50	3.00	2.90
1,270	hr. roller operation (base)	5.00	6.50	5.00	6.10
1.0	mi. old road obliteration	500.00	$1,000	350.00	850.00
2,500	cu. yd. excavation	.50	.65	.48	.55
2,500	cu. yd. sta. overhaul	.015	.015	.015	.015

Montana—Flathead County—Bur. of Recl.—Road Relocation

F. R. Hewitt Co., Spokane, Wash., was low to the Bureau of Reclamation at Hungry Horse Government Camp, for earthwork and structures for the relocation of forest service road, approx. 30 mi. northeast of Kalispell, Hungry Horse Reservoir, Hungry Horse Project. Hewitt bid $632,428 and was awarded the contract. Units bids are as follows:

(1) F. R. Hewitt Co. $632,428
(2) Goodfellow Bros., Inc. 636,525
(3) S. Birch & Sons, McLaughlin, Inc., F. & S. Contracting Co. 738,877
(4) Union Construction Co. $755,488
(5) Clifton & Applegate 770,110
(6) Peter Kiewit Sons Co. 815,879
(7) S. J. Groves & Sons Co. 816,779

		(1)	(2)	(3)	(4)	(5)	(6)	(7)
105	ac. clearing right-of-way	600.00	700.00	950.00	800.00	$1,200	$1,000	$1,000
428,000	cu. yd. excav., common, for roadway	.44	.50	.59	.48	.54	.60	.50
82,000	cu. yd. excav., rock, for roadway	1.35	1.50	1.65	1.25	1.40	1.60	1.50
200,000	sta. cu. yd. overhaul	.02	.05	.02	.05	.04	.03	.02
565	M. gal. watering	3.00	3.00	1.00	4.00	3.00	3.00	2.50
600	roller hr. rolling embankments	9.00	8.00	5.00	8.00	9.00	6.00	8.00
980	cu. yd. excav., common, for structures	2.50	5.00	3.00	4.00	3.50	5.00	2.50
1,100	cu. yd. excav., rock, for structures	3.50	8.00	7.00	10.00	5.00	15.00	4.00
2,000	cu. yd. backfill	1.00	.50	1.00	2.00	1.00	2.00	1.00
2,000	cu. yd. compacting backfill	2.50	.50	1.00	2.00	1.75	3.00	1.00
680	cu. yd. riprap	2.00	5.00	6.50	5.00	5.50	8.00	5.00
1,250	sq. yd. dry-rock paving	6.00	5.00	6.00	6.00	7.50	5.00	3.00
1,760	lin. ft. furn. and laying 12-in. C.M.P.	2.50	3.00	3.00	3.00	3.50	3.50	3.00
580	lin. ft. furn. and laying 24-in. C.M.P.	6.00	6.00	6.00	6.00	5.75	6.00	6.25
220	lin. ft. furn. and laying 36-in. C.M.P.	12.00	12.00	10.00	12.00	9.80	10.00	11.50
4,500	bbl. furn. and handling cement	6.00	6.00	5.50	6.50	5.00	8.00	10.00
535	cu. yd. concrete in bridges	54.00	50.00	60.00	70.00	70.00	50.00	62.00
2,585	cu. yd. conc. in gravity retaining walls	48.00	30.00	40.00	70.00	50.00	48.00	84.00
51,600	lb. furn. and placing reinf. bars	.12	.12	.12	.20	.18	.12	.10
860	lin. ft. half-round corr. metal spillways for 12-in. C.M.P.	3.00	4.00	3.00	2.00	4.50	3.00	3.30
302	lin. ft. half-round corr. metal spillways for 24-in. C.M.P.	4.50	6.00	5.00	3.00	5.50	5.00	5.80
72	M.B.M. furn. and erecting treated timber in bridges	300.00	250.00	310.00	250.00	325.00	450.00	300.00
8	M.B.M. furn. and erecting untreated timber in bridges	200.00	200.00	270.00	250.00	200.00	350.00	300.00
774	ea. furn. and setting guard posts	3.00	4.00	5.00	3.00	5.00	3.00	5.00
734	sta. finishing roadway	15.00	10.00	10.00	25.00	15.00	30.00	3.00

California—Fresno County—State—Grade and Pave.

Guy F. Atkinson Co., South San Francisco, submitted the low bid of $1,341,822 to the Division of Highways at Sacramento, for about 1.2 mi. to be graded, paved with P. C. C. pavement and plantmix surfacing on cement treated base and grade separation structures to be constructed between 400 ft. south of Fresno City Limits and San Benito Ave., on Broadway in Fresno. Unit bids follow:

(1) Guy F. Atkinson Co. $1,341,822
(2) Morrison-Knudsen Co., Inc. 1,452,644
(3) Bressi-Bevanda Constructors Inc. 1,533,563
(4) A. Teichert & Son, Inc. $1,582,724
(5) J. E. Haddock Ltd. 1,686,454

		(1)	(2)	(3)	(4)	(5)
1,275	cu. yd. removing concrete	2.50	7.00	3.25	6.00	6.00
2,000	cu. yd. removing pavement	2.50	3.00	2.75	3.00	5.35
Lump sum,	clearing and grubbing	$3,000	$20,000	$10,000	$10,000	$9,000
104,000	cu. yd. roadway excav.	.40	.50	.65	.72	.64
705,000	sta. yd. overhaul	.0075	.005	.005	.01	.01
62,000	sq. yd. compacting original ground	.06	.05	.07	.05	.06
3,750	cu. yd. struct. excav.	3.00	2.50	3.00	3.00	2.85
6,500	cu. yd. struct. excav. (overhead and overcrossing)	1.50	3.00	3.50	2.00	3.25
500	cu. yd. struct. backfill (overhead and overcrossing)	2.00	5.00	3.75	3.00	3.50
76,000	sq. yd. cultivation (preparatory landscape treatment)	.10	.04	.10	.03	.04
5,700	cu. yd. Imp. borrow	1.10	1.00	1.25	.95	1.00
Lump sum,	dev. water supply and furn. watering equipment	$3,000	$10,000	$2,500	$3,000	$6,000
5,800	M. gal. applying water	2.00	2.00	1.50	1.50	2.00
55	sta. finishing roadway	20.00	30.00	60.00	50.00	25.00
31,000	sq. yd. mixing and compacting (cem. tr. subgrade)	.28	.40	.35	.25	.35
3,100	bbls. Portland cement (cem. tr. subgr. and cem. tr. base)	3.50	4.00	3.60	3.50	4.00
6,500	tons mineral aggregate (cem. tr. base)	3.75	5.50	4.80	4.40	3.65
55	tons filter material (sumps)	4.00	10.00	6.00	5.00	4.00
1	ton liquid asphalt SC-2 (prime coat)	50.00	40.00	35.00	40.00	77.50
60	tons liquid asphalt SC-6 (dense graded P M.S.)	18.50	25.00	22.50	17.00	18.50
1,100	tons mineral aggregate (dense graded P.M.S.)	3.75	5.50	6.50	5.00	4.40

(Continued on next page)

Welded Construction Simplifies Face-Lifting Operation

By WILLIAM B. MILLER, C. E.,
Consulting Engineer for Walker & Weeks, Architects, Cleveland, Ohio

INTERESTING problems in the integration of structural iron work in two adjacent buildings were encountered in a remodeling job on the Williamson and Otis Buildings in Cleveland.

It was desired to extend a bank's quarters from the Williamson Building into the Otis Building, but this was complicated by the fact that the front of the Otis Building projected 4 inches over the building line. It was necessary to set back this front and apply a new front of terra cotta and granite to both buildings so that the architectural design would carry through.

The front of the Otis Building, being wall bearing, was supported at the second floor line by a box Warren type truss. In order to set the front back it was necessary to slice this truss in half in a longitudinal direction. The architectural design was so worked out that a girder beam could be erected below this truss and masonry walls carried up to support existing walls.

The first step was to install temporary shoring to carry the load of existing walls during alterations. Fig. 1 shows the welding of temporary needle beams to the bottom flange of the old truss. Welding was used to avoid any possible movement in the needle beams. Next, tubular struts were arc welded into the old truss at frequent intervals so that underpinning loads could be carried directly through the truss into the masonry wall above. Fig. 1 shows two of these tubular struts directly behind a gusset plate at a web intersection of the old truss.

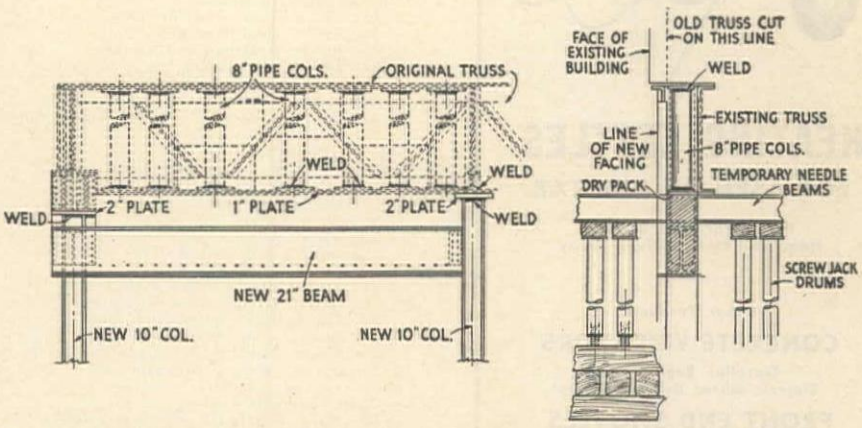


Fig. 2. Front view and cross-section showing alterations made in order to set wall back.

Fig. 2, a general sketch, shows the new 21-inch I-beam erected on new columns beneath the old truss to assume the wall-bearing load and support new masonry. Cross-section shows the tubular struts and the lines of the old and new facing. A masonry wall was then installed from the top of this beam and dry packed to the underside of the truss. The truss was then cut longitudinally and filled in with masonry between the tubular struts to complete the job. After building loads were properly transferred to new 21" beam (located below old truss), the shoring drums were removed and needle beams flame cut to clear new masonry.

The original columns of the Williamson Building, erected in the 1890's, were made by combining four Z-bars with exterior plates and interior lacing. Some of this lacing was strengthened during this remodeling with arc welding. To connect new beams into this type of column it was necessary to weld new plates between existing lacing of this column. At other points brackets were welded as shown in Fig. 3.

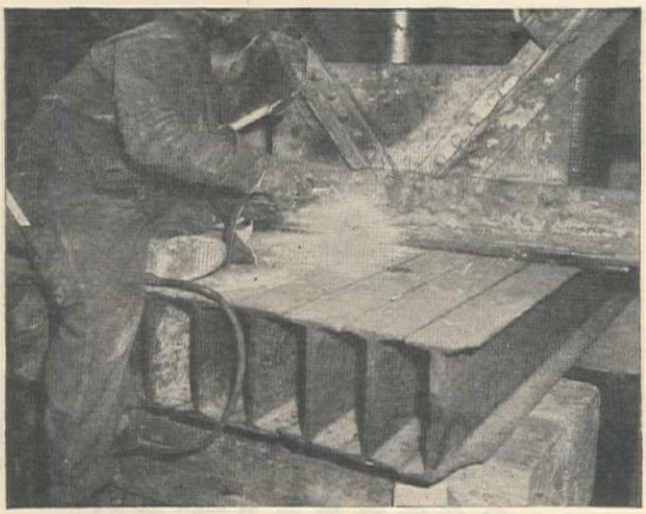


Fig. 1. Welding bottom of truss to needle beams acting as temporary support.

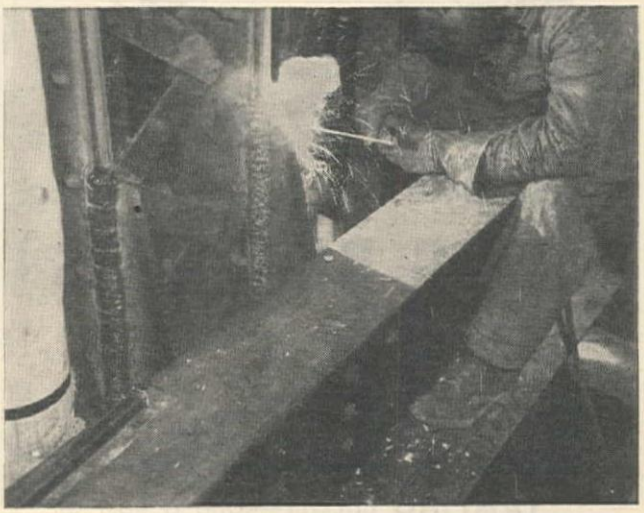


Fig. 3. Brackets from 21-inch I-beam are welded to existing column.

600 tons mineral aggregate (open graded P.M.S.)	3.85	5.50	5.50	5.50	4.60
180 tons pav. asph. (open graded P.M.S. and P.M.S. level course)	18.50	25.00	22.50	17.00	18.50
3,000 tons mineral aggregate (P.M.S. lev. course)	3.85	5.25	4.50	4.50	4.10
75 tons asph. emuls. (cur. seal, paint bdr. and seal coat)	30.00	60.00	32.00	45.00	45.00
7,000 cu. yd. P.C.C. (pavement)	12.50	13.00	14.00	15.00	15.00
4,800 each tie bolt assemblies	.60	.65	.60	.75	.60
11,000 cu. yd. Class "A" P.C.C. (struct.)	46.00	47.50	50.00	60.00	65.00
2,387,500 lb. furn. bar reinf. steel	.06	.05	.055	.06	.06
2,387,500 lb. placing bar reinf. steel	.02	.02	.0225	.02	.025
513,000 lb. furn. struct. steel	.12	.145	.135	.11	.12
513,000 lb. erecting struct. steel	.03	.03	.035	.04	.025
48,900 lb. misc. iron and steel	.38	.20	.25	.20	.355
Lump sum, inverted siphon	$7,500	$11,000	$8,500	$8,000	$10,800
152 lin. ft. 14-in. steel discharge pipe	8.00	20.00	14.00	9.50	12.00
162 lin. ft. steel handrail (2 rails)	8.50	8.00	7.60	8.50	8.95
77 lin. ft. steel handrail (3 rails)	12.00	13.00	11.00	12.00	12.75
3,319 lin. ft. steel railing	7.50	7.00	7.00	7.30	7.64
2 ea. handhole frames and covers	50.00	50.00	45.00	100.00	44.00
14 ea. drop inlet frames and covers	90.00	115.00	85.00	150.00	95.00
1,275 cu. yd. Class "A" P.C.C. (curbs, rolled gutters and sidewalks)	35.00	32.00	35.00	35.00	34.00
1,000 ea. curb dowels	.25	.30	.60	.50	.65
40 ea. right-of-way monuments	6.00	8.00	7.00	5.00	6.00
17 ea. center line monuments	8.00	8.00	7.00	7.00	7.50
25 ea. culvert markers	5.00	10.00	6.00	4.00	5.00
2,150 lin. ft. chain link fence	1.70	1.75	1.50	1.60	1.80
736 lin. ft. 12-in. R.C.P. (std. str.)	2.00	2.00	3.75	2.00	2.15
162 lin. ft. 15-in. R.C.P. (std. str.)	2.50	2.50	4.25	2.50	2.65
28 lin. ft. 24-in. R.C.P. (std. str.)	5.00	5.00	6.00	5.50	4.70
215 lin. ft. 4-in. vitrified clay pipe	.75	1.00	2.50	1.50	1.90
82 lin. ft. 6-in. vitrified clay pipe	1.00	1.50	3.50	1.50	2.15
461 lin. ft. 12-in. plain conc. pipe	1.25	1.50	2.50	1.30	1.30
594 lin. ft. 15-in. plain conc. pipe	1.50	1.75	3.25	1.60	1.70
1,356 lin. ft. 24-in. x 6⅜-in. part circle corr. metal culv. (8 ga.)	3.25	4.00	4.00	2.80	3.35
86 lin. ft. salv. existing pipe culv.	2.50	1.00	2.00	1.50	1.50
90 ea. red reflectors	3.00	3.00	2.50	5.00	2.50
Lump sum, engineer's office	$4,000	$4,000	$3,000	$5,000	$4,500
1,000 lin. ft. 1-in. galv. steel pipe (supply lines)	.60	1.00	.75	1.10	1.15
1,300 lin. ft. 1¼-in. galv. steel pipe (supply lines)	.75	1.10	1.00	1.20	1.70
900 lin. ft. 1½-in. galv. steel pipe (supply lines)	.85	1.30	1.25	1.50	1.85
2,500 lin. ft. 2-in. galv. steel pipe (supply lines)	1.05	1.45	1.50	3.50	2.00
1,400 lin. ft. 2½-in. galv. steel pipe (supply lines)	1.65	2.00	2.00	6.00	2.25
1,000 lin. ft. 3-in. galv. steel pipe (supply lines)	1.85	2.40	2.50	6.50	2.45
140 ea. control assemblies	25.00	22.00	18.00	70.00	21.50
11,000 lin. ft. ¾-in. galv. steel pipe (nozzle lines)	.40	.70	.65	.70	.65
12,600 lin. ft. 1-in. galv. steel pipe (nozzle lines)	.50	.90	.75	.80	.80
450 lin. ft. 1¼-in. galv. steel pipe (nozzle lines)	.60	1.00	1.00	1.00	.90
40 ea. sprinkler connections	12.00	7.00	15.00	10.00	20.00
Lump sum, drainage pumping equipment	$7,500	$7,800	$5,600	$9,000	$6,000
Lump sum, electrical system No. 1	$6,500	$5,500	$5,725	$6,000	$6,000
Lump sum, electrical system No. 2	$5,500	$4,700	$5,000	$5,000	$5,200
Lump sum, electrical system No. 3	$6,000	$6,000	$6,300	$6,500	$6,650
Lump sum, electrical system No. 4	$7,000	$6,300	$6,600	$6,800	$7,000
Lump sum, electrical lighting equip. (Monterey St. overhead)	$20,000	$20,000	$21,000	$20,000	$21,600
Lump sum, electrical equip. (California Ave. overcrossing)	$2,500	$2,400	$2,500	$2,500	$4,500
Lump sum, removing and reconstructing improvements	$98,700	$127,000	$165,000	$90,000	$130,000

There's a "Job-Rated" truck like this

...to fit YOUR job, save YOU money!

Take a good look at this truck! It's a "*Job-Rated*" truck—a truck built to FIT a specific hauling job.

This truck has "*Job-Rated*" power—the right one of seven great Dodge truck engines for pulling its load . . . dependably, and *economically.*

It has exactly the right clutch, transmission, springs, frame, rear axle—the right units throughout—for longer-lasting, more dependable service.

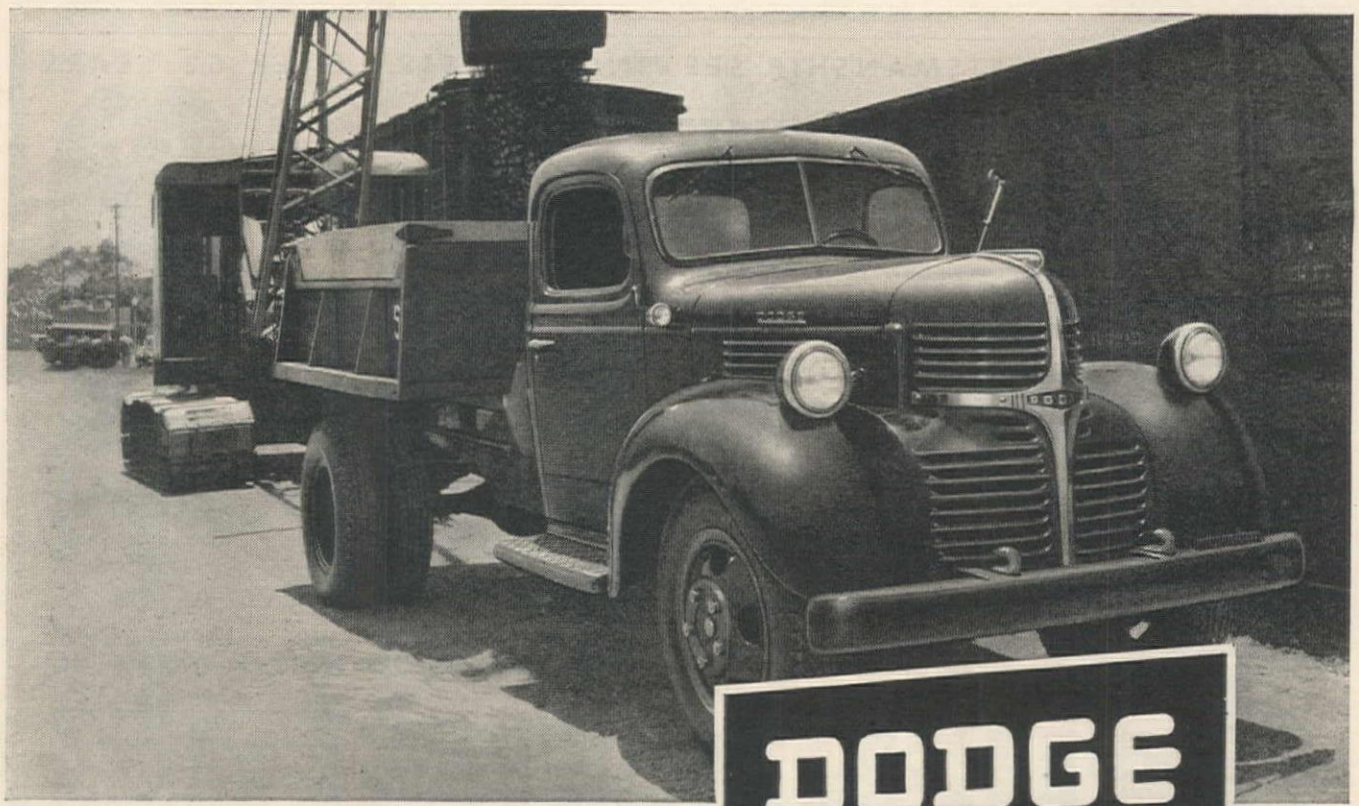
Such a truck performs better, enables its owner to give better service to his customers, lasts longer, and saves money.

There's a "*Job-Rated*" truck to fit YOUR job, too!

To get such a dependable and economical truck—simply explain your hauling problems in detail to your Dodge dealer. He will select the right Dodge "*Job-Rated*" truck for YOUR job.

★ ★ ★

Your Dodge dealer is interested in your continued satisfaction: *First,* by selling you a truck that fits your job; *Second,* by giving you dependable Dodge truck service; *Third,* by providing you with truck parts that are identical with original Dodge "*Job-Rated*" truck parts.



ONLY DODGE BUILDS "*Job-Rated*" TRUCKS

DODGE

Fit the Job . . . Last Longer !

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 $75,000 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 may be secured concerning employment conditions, wage rates, etc., by writing directly to the contractor. When available, the names of the supervisory personnel will be published in the "Supervising the Jobs" columns.

CONTRACTS AWARDED

Large Western Projects . . .

Guy F. Atkinson Co., San Francisco, Calif., and **Johnson, Drake & Piper**, New York, N. Y., are joint venturers in the $64,000,000 reconstruction program in Greece. $49,000,000 is to be used in the construction of highways and bridges, and $15,000,000 will be spent on railways. A party is at this time in Greece to survey the undertaking and prepare reports. This is the first contract to be awarded by the War Department, Washington, D. C., under the $300,000,000 foreign relief program.

T. E. Connolly, Inc., San Francisco, Calif., will construct the first 3,000-ft. section of 26-ft. wide and 21,054-ft. long horseshoe tunnel planned to carry water to the Cresta Plant from just above the mouth of Grizzly Creek on the North Fork of the Feather River, in Butte County, Calif. This $1,081,762 contract is the first to be awarded on the $61,800,000 project, the largest single hydroelectric development in the history of the Pacific Gas & Electric Co.

J. T. McDowell & Sons of Denver, Colo., were awarded a $566,693 contract by the Denver Board of Commissioners to rebuild and enlarge Basin No. 1 Capitol Hill Reservoir to permit the reinforced concrete reservoir to contain approximately 24,000,000 gals. of water.

James I. Barnes Construction Co., San Francisco, Calif., was awarded a $5,645,700 contract by the Veterans' Administration at Washington, D. C., for the construction of a steel and concrete, 7-story, basement and sub-basement, 250-bed veterans' hospital on a 2-acre site on N. Fresno St., near Clinton Ave., Fresno. Over $15,000,000 is expected to be spent on the hospital in the next 15 years by the addition of wings to the original units to include 1,500 beds, quarters for the staff, garage, powerhouse, etc.

Carl B. Warren, Pleasant Grove, Utah, was awarded a contract for the completion of the Jordan Narrows siphon, pumping plant, penstock, discharge pipes and wasteway. The work is located approximately 6 mi. northwest of Lehi in Utah. The Bureau of Reclamation, Provo, Utah, made the $549,299 award.

Guy F. Atkinson Co., South San Francisco, Calif., received $962,631 from the Division of Highways at Sacramento, Calif., for the construction of about 2.1 mi. of highway, stringer highway overcrossing, and concrete pedestrian overcrossing, betw. the north city limits of South San Francisco and .3 mi. south of Colma Creek in San Mateo County, Calif.

The Pacific Gas & Electric Co., San Francisco, Calif., is starting construction of a 41-mi. 110,000-volt transmission line to connect the power plant now under construction to the existing distribution network. The work is located near Bakersfield, Calif. The cost of the project is said to be $1,000,000.

Mead & Mount Construction Co., Denver, Colo., was awarded a $1,300,000 contract by the Rose Memorial Hospital Association of Denver for the construction of a brick, stone and masonry, T-shaped, 5-story hospital bldg. at 1050 S. Claremont Ave., Denver, Colo.

Morrison-Knudsen Co., Inc., Boise, Idaho, received a $668,938 contract from the Bureau of Reclamation at Denver, Colo., for

the construction of earthwork and structures, Wyoming Canal, Sta. 883+00 to Sta. 1606+00, Riverton Project. 450 calendar days are permitted for completion of the work which is located approximately 25 mi. northwest of Riverton, Wyo.

Swinerton & Walberg of San Francisco, Calif., will build a 700,000 sq. ft. automobile and truck assembly plant on Davis St. and Bay Farm Island, San Leandro, Calif. The Chrysler Corp., Detroit, Mich., awarded the contract. Total cost of construction is approximately $5,500,000.

General Construction Co., Portland, Ore., received $1,830,852 from the Commission of Public Docks of Portland, Ore., for the construction of a lumber storage and shipping dock and a dock struct. 1100 ft. on the harbor site and 600 ft. along the ship berth, on a 2.2 acre site, Terminal No. 1, Portland.

M. & K. Corp., of San Francisco, Calif., will build the $667,279 60-in. supply line from Colma to the Sunset reservoir, in San Francisco and San Mateo Counties, Calif. The City and County Public Utilities Commission, San Francisco, made the award.

The McCormack Construction Co. of Pendleton, Ore., was awarded a contract in the amount of $966,489 by the Oregon State Board of Control at Salem, for the construction of the 114-bed treatment hospital at Eastern Oregon State Hospital, Pendleton.

Highway and Street . . .

Arizona

YUMA CO.—**W. R. Skousen**, Box 71, Mesa—$139,211 base and surf. of 7.7 mi. of Yuma-Gila Bend Hwy., starting approx. 15 mi. east of Yuma and extending easterly—by State Highway Department, Phoenix.

California

ALAMEDA CO.—**Heafey-Moore Co.**, 344 High St., Oakland—$213,922 for improvement of Park St., betw. Otis Dr. and the Estuary, Alameda—by City Council, Alameda. 8-8

ALAMEDA CO.—**Independent Construction Co.**, 46th Ave. and Clement St., Oakland—$107,110 to improve Webster St., betw. Santa Clara Ave. and Atlantic Ave., Alameda—by City Council, Alameda. 8-8

AMADOR CO.—**A. Teichert & Son**, Box 1113, Sacramento—$177,915 for 4.7 mi. grade, and surf. from Pine Grove to North fork of Mokelumne River—by Division of Highways, Sacramento. 8-8

LAKE CO.—**Morrison-Knudsen Co., Inc.**, 111 Sutter St., San Francisco—$111,182 for 5.1 mi. grade and seal coat, betw. Rt. 89 and Lower Lake—by Division of Highways, Sacramento. 8-15

LASSEN CO.—**Fredrickson & Watson Construction Co.**, 873 81st Ave., Oakland—$99,712 for 1.1 mi. grade and surf. at Baxter Creek, 3 mi. north of Janesville—by Division of Highways, Sacramento. 8-26

LASSEN CO.—**A. Teichert & Son, Inc.**, Box 1113, Sacramento—$283,421 for 17.6 mi. grade, base and surf., betw. Susanville and north side of Willow Creek Valley and joint Hwy. District No. 14—by Division of Highways, Sacramento. 8-1

LOS ANGELES CO.—**Griffith Co.**, 1060 S. Broadway, Los Angeles—$197,048 grade, pave Daly St., betw. Pasadena Ave. and N. Main St., Los Angeles—by City Council, Los Angeles. 8-1

PLACER CO.—**H. Earl Parker**, 12th & F Sts., Marysville—$142,869 for 11.9 mi. grade and bitum. surf. of county roads betw. Loomis and Auburn, and betw. Rt. No. 768 at Kisters Corner and Newcastle—by Division of Highways, Sacramento. 8-15

SOLANO CO.—**A. G. Raisch Co.**, 2048 Market St., San Francisco—$129,992 to widen 4th St., Maryland St. to Winchester St., Vallejo—by City Council, Vallejo. 8-12

Colorado

EAGLE CO.—**C. L. Hubner Co.**, 4000 York St., Denver—$250,903 for 3.6 mi. surf. betw. Dowd and Wolcott on State Hwy. No. 4—by State Highway Department, Denver. 8-1

EL PASO & LINCOLN COS.—**J. H. & N. M. Monaghan & Assoc.**, Rt. 1, Derby—$92,105 for 7.9 mi. gravel surf. on State Hwy. No. 94, betw. Yoder and Arroyo—by State Highway Department, Denver. 8-1

LAKE CO.—**R. L. Hanes & Assoc.**, Denver—$134,677 for 2.7 mi. gravel surf. on State Hwy. No. 82, betw. Twin Lakes and Granite—by State Highway Department, Denver. 8-1

PUEBLO & HUERFANO COS.—**Brown Construction Co.,** Pueblo—$335,154 for 4.4 mi. grade—by State Highway Department, Denver. 8-8

Idaho

FRANKLIN CO.—**H. A. Gardner,** Blackfoot—$164,522 for 6.3 mi. grade, drain and surf. of Mink Creek Rd., betw. Riverdale and Maple Grove—by Bureau of Highways, Boise. 8-22

Kansas

THOMAS CO.—**M. W. Watson,** Topeka—$142,536 for 8.5 mi. grade and subgrade modification—by State Highway Commission, Topeka. 8-1

Montana

GOLDEN VALLEY CO.—**Stanley H. Arkwright, Inc.,** Securities Bldg., Billings—$118,484 for 12.6 mi. surf. on Lavina South Rd.—by State Highway Commission, Helena. 8-1

SHERIDAN CO.—**Inland Construction Co.,** 3867 Leavenworth St., Omaha, Nebr.—$144,921 for 18.9 mi. grade, drain and surf. of Reserve-North Dakota Line Rd.—by State Highway Commission, Helena. 8-1

TETON CO.—**E. C. Powell,** 2626 4th Ave. N., Great Falls—$97,749 for 6.2 mi. grade, drain, surf. and oil of Choteau-Dutton Rd.—by State Highway Commission, Helena. 8-1

Nevada

ELKO CO.—**Dodge Construction Co.,** N. Main, Fallon—$449,784 for 10.1 mi. hwy. constr. from Wells to 10 mi. east—by Department of Highways, Carson City. 8-8

LINCOLN CO.—**Isbell Construction Co.,** Box 2351, Reno—$207,081 to constr. portion of state hwy. secondary system from Pioche to Ursine—by Department of Highways, Carson City. 8-15

New Mexico

CURRY & ROOSEVELT COS.—**Wheeler & Trotz,** Albuquerque—$149,614 to grade and surf. on State Hwy. No. 88, betw. Melrose and Floyd — by State Highway Department, Sant Fe. 8-19

DE BACA CO.—**Brown Contracting Co.,** Albuquerque—$137,144 to grade and pave on State Hwy. No. 20, betw. Ft. Sumner and Roswell—by State Highway Department, Santa Fe. 8-19

Oregon

LAKE CO.—**H. C. Hall Co.,** Tigard Bldg., Portland—$202,238 for 8.5 mi. grade, and surf. Mud Creek-Drake Creek section of Warner Secondary Hwy. — by State Highway Commission, Salem. 8-1

Utah

WASATCH CO.—**V. C. Mendenhall Co.,** Springville—$184,783 for 1.5 mi. bitum. surf. of U. S. Hwy. 40, betw. Strawberry Reservoir and Fruitland—by State Road Commission, Salt Lake City. 8-11

Washington

CHELAN & KING COS.—**John Havlik, Jr.,** Scappoose, Ore.—$175,305 for constr. of access roads from approx. 5 mi. southwest of Berne to about 1.5 mi. east of Scenic—by Bonneville Power Administration, Portland, Ore. 8-8

KITTITAS CO.—**Harrison Bros. Co.,** 225 Wakefield Dr., Tacoma—$102,955 for 2.3 mi. grade and resurf. of Secondary State Hwy. No. 2-E, Cle Elum to Roslyn—by Department of Highways, Olympia. 8-1

SKAGIT CO.—**C. V. Wilder Co.,** 2006 State St., Bellingham —$192,912 for 7.3 mi. grade and pave portions of State Hwys. No. 1 and 1-E, Mount Vernon North—by Department of Highways, Olympia. 8-12

YAKIMA CO.—**C. & E. Construction Co.,** Box 1531, Yakima —$119,697 for 10.4 mi. grade and surf. of county roads west and northwest of Yakima—by County Commission, Yakima. 8-8

Wyoming

CONVERSE CO.—**Blanchard Bros.,** Tramway Bldg., Denver—$136,581 for 9.1 mi. widen subgrade, surf. and oil treatment of Douglas - Glenrock Rd. — by State Highway Commission, Cheyenne. 8-1

LARAMIE CO.—**Inland Construction Co.,** 3867 Leavenworth St., Omaha, Nebr.—$102,988 for 16.4 mi. road mix oil treat. and stone chip seal coat on Pine Bluffs-Albin Rd.—by State Highway Commission, Cheyenne. 8-1

LINCOLN CO.—**Parson & Fife Construction Co.**, Box 563, Brigham City, Utah & **R. T. Johnson Construction Co.**, Brigham City, Utah—$278,730 for approx. 5 mi. grade, drain, base and surf. of Border-Kemmerer Rd. by Sange Junction-Randolph Rd.—by State Highway Commission, Cheyenne. 8-15

SHERIDAN & CAMPBELL COS.—**Big Horn Construction Co.**, Box 875, Sheridan—$273,310 for 16.7 mi. grade, surf. and oiling of Sheridan-Gillette Rd.—by State Highway Commission, Cheyenne. 8-1

Bridge . . .

California

ALAMEDA CO.—**J. H. Pomeroy & Co., Inc.**, 333 Montgomery St., San Francisco—$646,322 for superstruct. for overhead structure, Fruitvale Ave. over the Southern Pacific Co. tracks, Oakland—by Division of Highways, Sacramento. 8-15

KERN CO.—**Guy F. Atkinson Co.**, Orange & Railroad Aves., South San Francisco—$392,290 for two superstructs across Tehachapi Creek and two combined bridge and overhead structs. across Tehachapi Creek and Southern Pacific Co. tracks, betw. Keene and Tehachapi—by Division of Highways, Sacramento. 8-18

LOS ANGELES CO.—**Bent Construction Co.**, 5359 Valley Blvd., Los Angeles—$205,140 for steel girder bridge over Santa Clara River and So. Pacific Co. tracks, approx. 18 mi. east of Saugus—by Division of Highways, Sacramento. 8-8

SAN MATEO CO.—**Guy F. Atkinson Co.**, First & Railroad Aves., South San Francisco—$962,631 for 2.1 mi. hwy. constr., hwy. overcrossing and pedestrian overcrossing, betw. N. city limits, So. San Francisco and Colma Creek—by Division of Highways, Sacramento. 8-25

SAN MATEO CO.—**Carrico & Gautier**, 365 Ocean Ave., San Francisco—$989,150 for superstructs. and approaches for four overcrossings on Bayshore Hwy., betw. So. San Francisco and Burlingame—by Division of Highways, Sacramento. 8-15

SANTA BARBARA CO.—**Carl N. Swenson Co.**, 1095 Stockton Ave., San Jose—$527,522 superstruct. for overhead crossing, over Southern Pacific Co. tracks at Salsipuedes St., Santa Barbara—by Division of Highways, Sacramento. 8-26

SANTA CLARA CO.—**Dan Caputo**, 985 Delmas Ave., San Jose—$82,725 for reinf. conc. bridge over Guadalupe Creek and widen culvert over Canoas Creek — by County Commission, San Jose. 8-19

YOLO CO.—**Grant L. Miner**, 33 Encina Ave., Palo Alto—$74,466 to reconstr. reinf. conc. bridge over Cache Creek, approx. one mi. east of Esparto—by County Commission, Woodland. 8-6

Oregon

LANE CO.—**Lockyear & White, Inc.**, 4136 40th Ave., S. W., Seattle—$73,771 for three conc. and steel bridges on Fall Creek access rd. east of Eugene, in Willamette National Forest—by Public Roads Administration, Portland. 8-8

Utah

UTAH & SALT LAKE COS.—**W. W. Clyde & Co.**, Springville—$466,002 for 5.5 mi. surf. and constr. of conc. bridge, U. S. Hwys. 50, 89, and 91, Lehi and Draper—by State Road Commission, Salt Lake City.

Water Supply . . .

California

SAN FRANCISCO & SAN MATEO COS.—**M. & K. Corp.,** Financial Center Bldg., San Francisco—$667,279 for 60-in. Sunset supply line from Colma to Sunset Reservoir—by City and County Public Utilities Commission, San Francisco. 8-15

Colorado

DENVER CO.—**J. T. McDowell & Sons,** First Natl. Bk. Bldg., Denver—$566,693 to rebuild and enlarge Basin No. 1 Capitol Hill Reservoir, Denver—by County Commission, Denver. 8-15

Utah

UTAH CO.—**Carl B. Warren,** Pleasant Grove — $549,299 for Jordan Narrows pumping plant siphons, penstock, discharge pipes and wasteway, approx. 6 mi. northwest of Lehi—by Bureau of Reclamation, Provo. 8-26

Sewerage . . .

California

SAN JOAQUIN CO.—**Stockton Construction Co.,** Box 2087, Stockton—$192,635 for south trunk sewer line, Charter Way from South sewage treatment plant to Edison St., Edison St. from Charter Way to Scotts Ave., Stockton—by City Council, Stockton. 8-26

Colorado

LARIMER CO. — **City of Fort Collins** — $200,000 for sewage disposal plant to be constructed by force account, Fort Collins —by self. 8-26

Waterway . . .

California

CONTRA COSTA CO. — **American Dredging Co.,** 1419 Broadway, Oakland—$100,000 for dredging 3,500-ft. harbor channel, near Port Chicago—by R. S. Harris, Piedmont. 8-8

LOS ANGELES CO. — **Case-Connolly Co.,** 2051 East Del Amo Blvd., Compton—$149,886 for rock mole constr. at entrance to Outer Fish Harbor, Terminal Island, Los Angeles—by City Harbor Department, Los Angeles. 8-8

SAN FRANCISCO CO.—**Healy-Tibbitts Construction Co.,** 411 Brannan St., San Francisco—$79,050 for dredging of Islais Inner Channel, San Francisco—by Board of State Harbor Commissioners, San Francisco. 8-7

Oregon

MULTNOMAH CO.—**General Construction Co.,** 4850 N.W. Front St., Portland—$1,830,852 for dock and appurtenances, Terminal No. 1, Portland—by Commission of Public Docks, Portland. 8-18

Dam . . .

California

SAN MATEO CO.—**Metropolitan Construction Co.,** 111 New Montgomery St., San Francisco—$134,384 to replace stone dam aqueduct, San Mateo Dam No. 2—by Public Utilities Commission, San Francisco. 8-1

Irrigation . . .

Oregon

JEFFERSON CO.—**Adler Construction Co.,** Box 1067, Redmond—$219,355 for approx. 10.5 mi. constr. of last link of main canal of north unit of Deschutes project, north from Willow creek across Agency plains, near Madras—by Bureau of Reclamation, Bend. 8-13

Wyoming

FREMONT CO.—**Morrison-Knudsen Co., Inc.,** Box 450, Boise, Ida.—$668,938 for earthwk. and structs. Wyoming Canal, northwest of Riverton—by Bureau of Reclamation, Denver, Colo. 8-15

Tunnel . . .

California

BUTTE CO.—**T. E. Connolly, Inc.,** 461 Market St., San Francisco—$1,081,762 for 3,000-ft. section of horseshoe tunnel on North fork of Feather River—by Pacific Gas & Electric Co., San Francisco. 8-5

Power . . .

California

KERN CO.—**Pacific Gas & Electric Co.,** 245 Market St., San Francisco—$1,000,000 approx. for constr. of 41-mi., 110,000-volt transmission line near Bakersfield—by self. 8-1

KERN & SAN JOAQUIN COS.—**Pacific Gas & Electric Co.,** 245 Market St., San Francisco—transmission line from Tesla to the Midway steam plant near Buttonwillow—by self. 8-1

Idaho

NEZ PERCE CO.—**Thompson & Parker,** Bremerton—$118,247 for 270 mi. of electric power poles, etc., near Lewiston—by Clearwater Valley Light & Power Association, Lewiston. 8-22

Building . . .

Arizona

MARICOPA CO.—**Del E. Webb Construction Co.,** 5101 San Fernando Rd., Los Angeles, Calif.—$219,900 for two-story, conc. and brick constr. school bldg. on 18th St. near Roosevelt St., Phoenix—by City School District No. 1, Phoenix. 8-8

MOHAVE CO.—**John H. Bohannan,** 444 Ocampo Drive, Pacific Palisades, Calif.—$104,400 for 20 prefabricated dwellings at Davis Government Camp, west of Kingman—by Bureau of Reclamation, Davis Dam, Nev. 8-12

California

ALAMEDA CO.—**Risdon & Sons,** 5977 Majestic Ave., Oakland—$175,000 for drive in theater at Foothill Blvd. and Sybil Ave., near Hayward—by Golden State Theater & Realty Corp., San Francisco. 8-6

ALAMEDA CO.—**Swinerton & Walberg,** 225 Bush St., San Francisco—$5,500,000 approx. cost of truck and auto assembly plant, Davis St. and Bay Farm Island, San Leandro—by Chrysler Corp., Detroit. 8-1

FRESNO CO.—**James I. Barnes Construction Co.,** Russ Bldg., San Francisco—$5,645,700 for Veterans' Hospital, Fresno—by War Department, Washington, D. C. 8-12

FRESNO CO.—**L. H. Hansen & Sons,** Box 1784, Fresno—$183,220 for firehouse, First and Iowa Sts., Fresno—by City Council, Fresno. 8-5

HUMBOLDT CO.—**Mercer-Fraser Co.,** 2nd & Commercial Sts., Eureka—$100,000 for reinf. conc. manufacturing bldg., Arcata—by California Fabricators, San Rafael. 8-7

KERN CO.—**Hermann Co.,** 417 S. Hill St., Los Angeles—$350,000 for one-story office bldg., Kern Island Rd., near Bakersfield—by Richfield Oil Co., Los Angeles. 8-20

KINGS CO.—**R. H. Hougham,** 1420 Kanweah St., Hanford—$270,000 for telephone exchange bldg., Hanford—by Pacific Telephone & Telegraph Co., San Francisco. 8-14

LOS ANGELES CO.—**H. G. Larson,** 3252 Euclid Ave., Lynwood, & **Manderbach Construction Co.,** 1937 Victory Blvd., Glendale—$192,639 for frame and stucco, 2-story rectory, 2-story school and 2-story convent in Lynwood—by Roman Catholic Archbishop, Los Angeles. 8-22

LOS ANGELES CO.—**Lindgren & Swinerton Inc.,** Standard Oil Bldg., San Francisco—$210,000 for 4-story and basement addition to telephone bldg., 3233 W. Vernon Ave., Leimert Park—by Pacific Telephone & Telegraph Co., Los Angeles. 8-19

LOS ANGELES CO.—**C. L. Peck,** 816 W. 5th St., Los Angeles—$650,000 for conc. church bldg. and social hall, Wilshire Blvd. and Warner St., Los Angeles—by Westwood Community Methodist Church, Los Angeles. 8-22

LOS ANGELES CO.—**Sievers Construction Co.,** 936 Belmont Ave., Bellflower—$151,498 for one-story, frame and stucco, 6-classroom and kindergarten school bldg., Rosehedge Dr., Whittier—by City School District, Whittier. 8-8

MONTEREY CO.—**Pacific Builders,** 312 E. Alisal St., Salinas—$600,000 for frame and reinf. conc. department store bldg., S. Main St., Salinas—by Sears-Roebuck Co., Salinas. 8-20

NAPA CO.—**M & K Corp.,** Financial Center Bldg., San Francisco—$900,000 for 2-story, reinf. conc. telephone exchange bldg., Clay and Randolph Sts., Napa—by Pacific Telephone & Telegraph Co., San Francisco. 8-20

PLACER CO.—**George S. Latin,** Alta Vista Dr., Grass Valley—$200,000 for motel, to include 16 housing units and recreation facilities, Emigrant Gap—by C. E. Widing, Dutch Flat. 8-28

SAN FRANCISCO CO.—**Carrico & Gau-**

tier, 365 Ocean Ave., San Francisco — $375,867 for two, reinf. conc. and metal livestock barns, Geneva Ave. and Rio Verde, San Francisco—by Division of Agriculture, San Francisco. 8-4

SAN FRANCISCO CO.—**Central California Construction Co.,** 116 Erie St., San Francisco—$156,658 for church house adjacent to temple at California and Webster Sts., San Francisco — by Congregation Sherith Israel, San Francisco. 8-20

SANTA CLARA CO.—**O. A. Anderson,** 398 Menker Ave., San Jose—$176,090 for two steel frame and rustic siding school bldgs. at Pollid and Allendale Rds. and at Moorpark Ave., Campbell — by City Union Elementary School District, Campbell. 8-12

SANTA CLARA CO.—**E. A. Hathaway & Co.,** 1275 Glen Eyrie Ave., San Jose—$101,144 for two grade school bldgs., Broadway and Ramona Ave., San Jose—by City Unified School District, San Jose. 8-21

SANTA CLARA CO.—**Earl W. Heple,** 494 Delmas St., San Jose—$123,000 for frame, stucco and corr. metal office and salesroom bldg., Polhemus St. and Stockton Ave., San Jose—byTay-Holbrook, Inc., San Francisco. 8-4

STANISLAUS CO.—**Fisher & McNulty,** Fulton-Fresno Bldg., Fresno—$155,000 for telephone exchange bldg., Turlock — by Pacific Telephone & Telegraph Co., San Francisco. 8-14

Colorado

ARAPAHOE CO.—**Melwin Construction Co., Inc.,** 747 Santa Fe Dr., Denver—$125-270 for one-story, 10 classroom, masonry constr. grade school bldg., Stanford and Lincoln Sts.—by County School District No. 1, Englewood. 8-12

DENVER CO.—**A. A. & E. B. Jones,** 682 Wyandot, Denver—$638,416 for brick and conc. produce, bakery, grocery and meat bldg. additions at 43rd and Wyncoop and 41st St. and Brighton Blvd., Denver—by Union Pacific Railroad Co., Denver. 8-5

DENVER CO. — **Mead & Mount Construction Co.,** Denver National Bldg., Denver—$1,300,000 for hospital bldg., 1050 S. Claremont Ave., Denver—Rose Memorial Hospital Association, Denver. 8-14

Idaho

BANNOCK CO.—**C. H. Elle,** Box 1010, Pocatello—$188,000 for 3-story, brick Masonic Temple, Pocatello — by Masonic Order, Pocatello. 8-15

Nevada

CLARK CO.—**Superior Construction Co.,** Box 1551, Las Vegas—$250,000 for 23-unit grade school bldg., 10th St. and Franklin Ave., Las Vegas—by City Union School District, Las Vegas. 8-11

New Mexico

OTERO CO.—**Robert E. McKee,** 1918 Texas Ave., El Paso—$482,222 for 30 dwellings, permanent type, at Air Field, Alamogordo—by Corps of Engineers, Albuquerque. 8-4

SANTA FE CO.—**Robert E. McKee,** 1908 Texas Ave., El Paso, Tex.—$201,000 for incinerator bldg., garages, service station, etc., Los Alamos — by Atomic Energy Committee, Santa Fe. 8-28

Oregon

MARION CO. — **Sound Construction & Engineering Co.,** 1403 W. 45th St., Seattle,

Wash. — $1,099,121 for ward bldg. and nurses' home, State Hospital, Salem—by Oregon State Board of Control, Salem. 8-26

UMATILLA CO. — **McCormack Construction Co.,** Pendleton—$966,489 for 114-bed treatment hospital, Pendleton — by State Board of Control, Salem. 8-7

YAMHILL CO.—**Viesko & Post,** 1440 S. 13th St., Salem—$328,909 for grade school bldg., McMinnville—by City School District, McMinnville. 8-14

Utah

SALT LAKE CO.—**Paul Paulsen Construction Co.,** 1425 Jefferson St., Salt Lake City—$100,000 for Central Train Control Tower, Salt Lake train yards—by Union Pacific Railroad Co., Salt Lake City. 8-15

UNITAH CO. — **Dorland Construction Co.,** Dooly Bldg., Salt Lake City—$195,000 for Utah Field House of Natural History at Vernal—by Division of Architecture, Salt Lake City. 8-1

Washington

CHELAN CO. — **Atherton Construction Co.,** Terminal Sales Bldg., Wenatchee—$358,969 for reinf. conc., three-story, 100-bed hospital wing addition, Deaconess Hospital, Wenatchee—by Hospital Board of Trustees, Wenatchee. 8-5

KING CO.—**Strand & Sons,** 801 Roy St., Seattle—$1,500,000 for reinf. conc., stone faced, 5-story and 3-story wing administration bldg., university campus, Seattle—by Board of Regents of University of Washington, Seattle. 8-5

WHATCOM CO.—**Paul N. Odegard,** 2417 Hewitt Ave., Everett—$194,850 for three prefab. rigid frame utility warehouse bldgs., Naval Reserve Armory, Bellingham—by Bureau of Yards & Docks, Washington, D. C. 8-8

Canada

BRITISH COLUMBIA—**Victoria Housing Ltd.,** 853 Comorant St., Victoria—$200,000 to erect 50 wartime homes, Oaklands district—by Government Wartime Housing Agency, Victoria. 8-15

Miscellaneous . . .

California

MOHAVE CO. — **General Electric Co.,** Denver, Colo.—$957,766 for Schedules 1, 2 and 4 under Spec. 1820 to furn. electrical equipment for Davis switchyard, Davis Dam Project, Ariz.-Nev.—by Bureau of Reclamation, Denver. 8-29

ALAMEDA CO.—**Mangrum-Holbrook & Elkus,** Fell and Gough Sts., San Francisco—$188,354 to constr. and install lab. furniture for chemistry bldg., university campus, Berkeley—by Board of Regents, University of California, Berkeley. 8-4

SACRAMENTO CO.—**McGillivray Construction Co.,** Box 873, Sacramento—$109,586 for grade, curbs, gutters, sewers, etc., Meadow Lane Park, Sacramento—by City Council, Sacramento. 8-20

SAN BERNARDINO CO.—**Pacific Coast Engineering Co.,** Drawer E, Alameda—$871,700 for 20-in. floating cutter type hydraulic suction dredge complete with appurtenances, for Colorado River front work and Levee System Project, Arizona-California-Nevada. Work is located near Needles—by Bureau of Reclamation, Denver, Colo. 8-1

TULARE CO.—**Paul Spencer Construction Co.,** 832 W. 5th St., Los Angeles—$153,498 to convert bldgs. and constr. roads, sewer and water systems, etc. at Government Camp, Lindsay—by Bureau of Reclamation, Friant. 8-1

Montana

YELLOWSTONE CO.—**Jones & Laughlin Supply Co.,** Tulsa, Okla. — $8,500,000 total cost of constr. of oil refinery, Billings—by Continental Oil Co., Billings. 8-29

Nevada

WASHOE CO.—**Isbell Construction Co.,** Box 2351, Reno—$117,344 for curbs and gutters, sidewalks and paving portions of Reno—by City Council, Reno. 8-22

Washington

CHELAN & KING COS.—**McPhail Engineering Co.,** Tacoma—$180,000 for approx. 3 mi. clearing right-of-way for portion of Grand Coulee-Snohomish 230-kv. transmission line betw. Berne and Scenic—by Bonneville Power Administration, Portland, Ore. 8-8

MASON & THURSTON COS. — **Benison & Stone Co.,** Salem, Ore.—$138,200 to clear right-of-way on 19 mi. section of Olympia-Shelton power line—by Bonneville Power Administration, Portland, Ore. 8-5

Foreign

GREECE—**Guy F. Atkinson Co.,** Box 593, South San Francisco, Calif. — $64,000,000 for reconstruction work in Greece — by War Department, Washington, D. C. 8-25

TRADE WINDS

News of Men Who Sell to the Construction West

CALIFORNIA

New headquarters for the CLAY BRICK MANUFACTURERS' ASSOCIATION OF NORTHERN CALIFORNIA are at Room 216 Sharon Building, 55 New Montgomery St., San Francisco, it was announced recently. **George E. Solnar, Jr.,** is association manager.

☆ ☆ ☆

A. M. Kuehmsted, SANTA FE TANK AND TOWER COMPANY chief engineer in the Los Angeles area for the past 12 years, has assumed new duties at the New York branch. He will take over district management of cooling towers, air cooled units, and wood tanks at Santa Fe's New York office, 400 Madison Ave.

☆ ☆ ☆

A regional office in San Francisco was established in August by AIR CARGO, INC., Washington, D. C. **J. P. Houghton,** an experienced airline executive and former officer in the Army Air Forces, is in charge of the territory, comprising the entire area of the United States west of the Mississippi River. Address of the regional office is 421 Powell St.

☆ ☆ ☆

Miles V. McDonald is the recently appointed general sales representative of PACIFIC RUBBER COMPANY, Oakland, Calif., according to **Harry A. Wright,** vice-president and sales manager. McDonald, who makes his headquarters at the Oakland, Calif., factory, has been associated with UNITED STATES RUBBER COMPANY in San Francisco. During the war he was manager of tire sales to the government for that company.

☆ ☆ ☆

SOULE EQUIPMENT COMPANY, Oakland, Calif., has been appointed a distributor in northern California for the full line of SCHRAMM Compressors and will provide both sales and rental service, according to **H. L. Stilley,** general manager.

☆ ☆ ☆

J. E. Masquelier, office representative at San Francisco for LIMA LOCOMOTIVE WORKS, INC., SHOVEL AND CRANE DIVISION, has returned from a visit to the Lima plant and offices at Lima, O. While there he attended an instruction and training course recently inaugurated by the Lima firm for all field personnel.

☆ ☆ ☆

Sale of the BITUMINOUS PRODUCTS & APPLICATION CO., San Francisco, by **O. G. Quarre** to **W. E. Peters** and **J. R. Lewis** was announced. Peters was formerly contract department superintendent for Wailes-Dove-Hermiston Corp., while Lewis was Northern California sales engineer for the same company.

☆ ☆ ☆

New San Francisco offices were recently opened by manufacturers of MOBILIFT fork lift truck used in warehouses and factories. Branch manager is **R. M. (Dick) Lewis,** who previously sold Mobilift trucks for the Star Machinery Co., Seattle, Wash. Home office of the company is located in Portland, Ore., with branches in Chicago, Ill., Atlanta, Ga., and Long Island City, N. Y.

☆ ☆ ☆

Consolidation of manufacturing and engineering facilities of the MUSTO-KEENAN CO., Los Angeles and San Francisco, with the BEVIL COMPANY was recently announced. The consolidation will expedite manufacture of Bevil diamond-abrasive cutting tools, including cutting wheels for all types of tile, granite, marble, etc. Musto-Keenan will be exclusive sales agents for the tools.

☆ ☆ ☆

Two new men are on the West Coast sales force of the DETROIT DIESEL ENGINE DIVISION, GENERAL MOTORS CORP., Detroit, Mich., according to announcement by **V. C. Genn,** general sales manager. **Lauren H. Wells** is now sales engineer for the northern West Coast zone and will direct industrial, marine and petroleum distributors sales in Washington, Oregon and the northern part of Idaho. Wells has been with the company since 1937. **Victor Hansen** will serve the southern West Coast in a similar capacity, with distributors in California, Arizona and eastern Nevada coming under his jurisdiction. His headquarters will be at Oakland, Calif. The appointments were made to fill vacancies left by **Murrison C. Wright**


PACIFIC
SUPER STEEL
PREFORMED
WIRE ROPE
PACIFIC WIRE ROPE COMPANY
LOS ANGELES 21, CALIF., U.S.A. BRANCHES:
SAN FRANCISCO HOUSTON PORTLAND

and **James R. Williams,** who took over the Northern California distributorship franchise for the sale of General Motors Series 71 marine and industrial diesel engines.

☆ ☆ ☆

An AMERICAN LUMBER AND TREATING CO. wood-preserving plant at Weed, Calif., was recently sold to the LONG-BELL LUMBER CO., it was announced by **J. F. Linthicum,** Chicago, American president. Besides a plant now under construction in Everett, Wash., American Lumber and Treating owns and operates plants at Port Newark, N. J., Baltimore, Md., Florence, S. C., Gainsville, Fla., Crossett and Fordyce, Ark., Shreveport, La., Wilmington, Calif., and Wauna, Ore.

☆ ☆ ☆

Wendell J. Farischon is the newly appointed news editor of the CATERPILLAR TRACTOR CO.'s News Service, succeeding **Jerry Reichart,** who is now associated with CUTTER LABORATORIES, Berkeley, Calif. Farischon has a background of 13 years of newspaper experience, prior to the war in which he served for 3½ years in Mechanized Cavalry, with combat experience in the European theater.

☆ ☆ ☆

PACIFIC NORTHWEST

HOWARD-COOPER CORP. has been announced as new distributor in Oregon and western Washington for AMERICAN TRACTOR EQUIPMENT CORP., Oakland, Calif., for 2- and 4-wheel scrapers for use with wheel and track type tractors. ATECO sales and service will be available through Howard-Cooper Corporation's headquarters in Portland and its branches at Seattle, Albany, Eugene, Roseburg, Central Point and Klamath Falls.

☆ ☆ ☆

OREGON TRACTOR & EQUIPMENT CO. has moved into a new building ten blocks north of its old location in Portland. The new structure is 50 by 60 ft., one-story, reinforced concrete, with mezzanine show room. **Art Simonson** heads the company.

☆ ☆ ☆

HYSTER SALES CO. has been established in Portland by the parent manufacturing company to be exclusive distributor of Hyster Lift and Straddle trucks and Karry Kranes. **J. W. Givans** has been appointed manager of the sales company with **C. S. Chastain** as parts manager and **Eugene Pogue** as office manager.

☆ ☆ ☆

Andy Anderson, a well known figure in truck tire sales and service in the Northwest, has joined the staff of the GENERAL TIRE CO. in Seattle, where he is specializing in the sale of heavy duty tires.

☆ ☆ ☆

Fred D. Romanowsky has been appointed Northwest representative for the PACIFIC RUBBER CO. of Oakland. Romanowsky, who was formerly with the Sieberling Rubber Co. in Akron, Ohio, will make his headquarters in Portland, where Pacific is establishing new offices.

☆ ☆ ☆

BOW LAKE EQUIPMENT CO., INC. recently formed equipment distributing organization with headquarters midway between Seattle and Tacoma, is headed by **Conrad Creim,** as president. Prior to the war, Creim was a construction equipment sales representative for Brown-Bevis Machinery Co. of Los Angeles. The sales staff, in addition to Creim, includes **Scott Simonstad,** well known equipment sales representative in the Seattle area.

☆ ☆ ☆

PITTSBURGH TESTING LABORATORY has established a branch in Seattle with equipment for chemical testing and physical testing of materials. **Mark R. Rosumny,** electro-chemical engineer, has been transferred from the company's Chicago office to take charge of the Seattle branch.

☆ ☆ ☆

LOGGERS & CONTRACTORS MACHINERY CO., Oregon equipment distributor with headquarters in Portland, is planning to construct a new building at Eugene to house its offices and service operation. The new building will be a one-story, reinforced concrete structure that will provide a 70 by 120-ft. showroom and parts division, and a 90 by 110-ft. shop.

☆ ☆ ☆

TITAN METAL PRODUCTS CORP., western Washington distributors for the Stran Steel Quonset building manufactured by the Great Lakes Steel Corp., has completed the erection of a Quonset building for its own headquarters at 3626 Airport Way, Seattle. Officers of Titan Metal Products Corp. include **John E. Foigle,** president; **Burwell C. Derry; Robert Levoff** and **Henry Levoff. W. B. Peterson** is general manager.

Establishment of an eastern manufacturing plant at Danville, Ill., was recently revealed by the ELECTRIC STEEL FOUNDRY, Portland, Ore., producers of ESCO dragline buckets and dippers. The new plant is now producing ESCO buckets for coal stripping, construction work and excavating machine manufacturers. It is under the supervision of **Vincent J. Shanahan.**

☆ ☆ ☆

Craig Carroll, formerly vice-president and general manager of Jackson Implement Co. at Portland, has announced the formation of a new firm to design and manufacture heavy equipment and parts. CRAIG CARROLL CO. will have offices at 1704 S.E. 22nd Ave.

☆ ☆ ☆

AMONG THE MANUFACTURERS

Alois Cibulka, doctor of engineering, has joined the staff of INDUSTRIAL REPRESENTATIVES, INC., as consulting engineer, president **Robert D. Rice** announced. IRI is planning and supervising construction of buildings using the systems of reinforcing timber with steel or aluminum generally known as RST and ART; systems originated and patented by Cibulka.

☆ ☆ ☆

E. A. Buxton succeeds **E. P. Corey** as chairman of the Committee on Steel Pipe Research of the AMERICAN IRON AND STEEL INSTITUTE. Corey, who served as chairman of the Committee from its inception in 1942, has retired after 52 years in the steel pipe industry. Buxton is sales manager, pipe and tubes, for the BETHLEHEM STEEL CO.

☆ ☆ ☆

Consolidated net sales for the UNITED STATES PLYWOOD CORPORATION for the fiscal year ended April 30, 1947, were $43,616,109 as compared with $27,083,286, it was stated in the company's annual report. Consolidated profits before taxes on income were $9,100,302 and after provision for such taxes and dividends on preferred stock, amounted to $5,195,100, or $3.71 per share on each of the 1,401,528 shares of common stock outstanding.

☆ ☆ ☆

Royce A. Hill is new field sales engineer for the DETROIT DIESEL ENGINE DIVISION, GENERAL MOTORS CORPORATION, Detroit, Mich., for the northern section of the division's Dallas, Tex., region. In his new assignment, Hill will be responsible for all industrial and petroleum distributors' sales activities for the territory including Oklahoma, northern Texas and northern New Mexico. He fills a vacancy left by **Fred L. Manton,** who has taken the position of sales manager with the DIESEL POWER COMPANY, distributors for General Motors Series 71 engines in Oklahoma.

☆ ☆ ☆

M. Seth Babcock, treasurer-manager of BAY CITY SHOVELS, INC., Bay City, Mich., died July 29, 1947.

☆ ☆ ☆

New personnel assignments in the distribution division of the CUMMINS ENGINE CO., INC., Columbus, Ind., as announced by **L. W. Beck,** general sales manager, include the appointment of **S. J. Coffey** as manager of regions. Former manager of Cummins Diesel Sales Corporation of Illinois, in his new capacity he

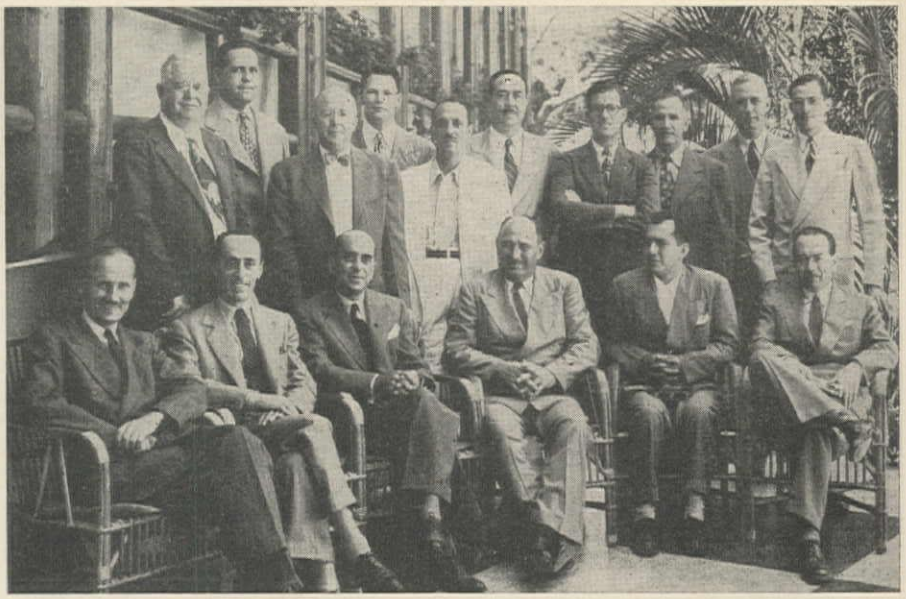
will work directly under the general sales manager. **Byron A. Duling,** a Cummins employee since 1936, is new manager of engine distribution with headquarters at Columbus, while **Raymond Boll** has been appointed assistant manager of the Cleveland region. The appointment of **W. C. Phillips** as assistant manager of the southeastern region was also announced by Beck. He will assist regional manager **C. A. Buxton.**

☆ ☆ ☆

Many new graduate engineers who have recently completed post-graduate courses at the Brown School of Instrumentation at Philadelphia were assigned to the branch and regional offices of the BROWN INSTRUMENT CO., it was announced by **William H. Steinkamp,** field sales manager for the Brown division of MINNEAPOLIS-HONEYWELL REGULATOR COMPANY. New appointees include: **Edgar Andrews,** Atlanta; **Nilsson S. Bassett,** Boston; **R. J. Bierman** and **Clarence W. Swanson,** Minneapolis; **Edward J. Bryne,** Houston; **Warren H. Erftenbeck,** Buffalo; **David J. Fair,** Dallas; **William R. Hamaker,** Detroit; **Charles F. Hintz,** Chicago; **Lawrence W. King,** New York; **Donald W. Larcen,** Milwaukee; **John F. Smith,** Tulsa, Okla., and **Andrew H. Albee,** Cleveland, O.

☆ ☆ ☆

The Permanent Construction Company of Chicago was awarded contract for construction of INTERNATIONAL HARVESTER COMPANY's new motor truck sales and service branch in Milwaukee, Wisc. Construction of the $350,000 building will begin immediately and, when finished, it will contain 43,000 sq. ft. of space.



Executives of La PLANT-CHOATE MANUFACTURING CO., INC., with Latin-American dealers and representatives in attendance at Caracas, for one of the first such sales conferences held by an American construction machinery manufacturer.

One of the first Latin-American sales and service conferences ever to be conducted by an American construction equipment manufacturer was held when key sales personnel of LaPLANT-CHOATE MANUFACTURING CO., Cedar Rapids, Iowa, met the Latin-American dealers in Caracas, Venezuela. The company was represented by **E. R. Galvin,** executive vice-president and general sales manager; **S. L. Myers,** vice-president and export sales manager; **G. E. Hall,** sales engineer, and **Frank Belousek,** district representative. Representatives of LaPlant-Choate dealers from Panama, Puerto Rico, Brazil, Chile, Argentina, Peru, Colombia and Netherland West Indies attended.

Showing of movies, slide films, quiz sessions, and a visit to the plant of the National Highway Department of Venezuela at Caracas were included in the program. Over 200 ac. of the plant are under concrete, and

much of the area is covered with modern shops and offices.

☆ ☆ ☆

MACK TRUCKS, INC. reports for the quarter ended June 30, 1947, net sales of $34,481,304, a net profit of $2,039,576, equal to $3.41 a share on 597,335 shares of common stock, after provisions of $1,346,000 for Federal income taxes. For the six months ended June 30, 1947, net sales were $58,506,143, net profit of $3,420,335, equal to $5.72 share after provision of $2,303,000 for Federal income taxes.

☆ ☆ ☆

Sales of the DOW CHEMICAL CO. reached the all time high of $130,426,838 during the fiscal year ended May 31, it was revealed in the company's 50th annual report to the stockholders. This was 28 per cent above sales the previous year and approximately 4½ per cent above the wartime peak of $124,570,200 set during the fiscal year 1944-45. Consolidated net earnings equivalent to $9.22 per share on 1,248,706 shares of common stock were shown after deducting $1,215,476 paid during the year in preferred stock dividends.

☆ ☆ ☆

E. Wayne Haley is the recently-appointed director of sales for the SOUTHERN ALKALI CORPORATION, it was announced by **W. I. Galliher,** executive sales manager for the COLUMBIA CHEMICAL DIVISION of PITTSBURGH PLATE GLASS COMPANY and the Southern Alkali Corp. Southern Alkali is a subsidiary of the Pittsburgh firm. Associated with the company since 1935, Haley has served as assistant director of sales for the past 12 years. He succeeds **Eli Winkler** who continues with the firm in the capacity of sales consultant.

☆ ☆ ☆

Retirement of **George J. Stanley** as vice-president and general sales manager of the ALUMINUM COMPANY OF AMERICA was effected July 1. Stanley, who has served Alcoa for more than 42 years in both sales and engineering capacities, will continue as a director of the company. He came to the Pittsburgh Reduction Co., as Aluminum Company of America was then known, at the Boston sales office in 1905. He had been general sales manager since 1928, vice-president since 1931, and a director since 1939.

☆ ☆ ☆

Australian distributors and INTERNATIONAL HARVESTER EXPORT CO. officials were recently entertained by THE FRANK G. HOUGH CO. at the Libertyville, Ill. factory and general offices. Headed by **G. H. Bacon,** International Harvester Co.'s Australian general sales manager, the men visited the company to study Hough line of equipment. **C. E. Killebrew,** sales manager for the Hough Co., conducted a tour of the factory and explained the phases of production and assembly.

☆ ☆ ☆

Max M. Kipfer, vice-president and works manager of ALUMINUM SEAL CO., is the new company general manager, according to recent announcement by **John E. Sharp,** president. The company is a wholly-owned subsidiary of ALUMINUM COMPANY OF AMERICA, Pittsburgh, Pa. Kipfer, who has been affiliated with the Aluminum Seal Company for 23 years, will reside in Richmond, Ind., as soon as new headquarters are established there.

Appointment of **Laird A. Hanson** as supervisor of parts and service merchandising for the INTERNATIONAL HARVESTER COMPANY motor truck division was announced by **W. K. Perkins,** manager of sales. Hanson, former manager of the Wichita, Kans., motor truck branch, began his Harvester service as an advertising man at Topeka, Kans. He replaces **M. D. Dean,** who has been appointed manager of the Wichita truck branch.

☆ ☆ ☆

Robert B. Coons of the AMERICAN POTASH & CHEMICAL CORP. was appointed to the post of vice-president, according to announcement by **Peter Colefax,** company president. Coons, formerly senior partner with Coons, Milton and Co., San Francisco securities firm, joined American Potash last year as assistant to the president.

☆ ☆ ☆

An extra dividend of $1 in addition to the fourth-quarter regular dividend of 25 cents on each of the 600,000 outstanding shares of common stock was declared by the MASONITE CORPORATION, Chicago, Ill. This brings total dividend payments for the company's current fiscal year, which ended Aug. 31, to $2 a share.

☆ ☆ ☆

Roger G. Delong is the new manager, with **W. B. Gibson** as sales manager of the Hydraulic Division of the TWIN DISC CLUTCH CO., Racine, Wisc. Delong has been serving as both acting manager and sales manager of the Rockford, Ill., division, while Gibson has been assistant manager of the eastern territory.

☆ ☆ ☆

Charles R. Boreham is the new parts and service manager for THE FRANK G. HOUGH CO., Libertyville, Ill., manufacturers of road building and material handling equipment. He has been with the company for the past two years, working in assembly, production control, shipping and receiving.

☆ ☆ ☆

Harry W. Hobson, veteran of 44 years' service and assistant director of sales in the explosives department of the E. I. DU PONT DE NEMOURS & CO., died a few weeks before his retirement.

☆ ☆ ☆

Consolidated net sales of the UNITED STATES PLYWOOD CORP. for the fiscal year ended April 30, 1947, were $43,616,109, as compared with $27,083,286 for the previous year. Net profits for the year, including its equity in undistributed earnings of companies not consolidated, amounted to $5,940,000, equal after preferred dividends to $4.10 per share on the 1,401,528 common shares outstanding. This compared with $1,598,000 for the preceding fiscal year or $1.06 a share on the same number of common shares.

☆ ☆ ☆

Appointment of **Kirby Walker,** formerly chief engineer of the AMERICAN GAS MACHINE CO., to the position of chief engineer of CONSOLIDATED INDUSTRIES, INC., Lafayette, Ind., was announced. Walker joined the American Radiator Co. in the early 1930's, in charge

of development programs covering combustion, controls, and heating systems. A licensed professional engineer, he is a member of the American Society of Heating and Ventilating Engineers.

☆ ☆ ☆

An 80 per cent increase in production of pillow blocks at peak operation is anticipated with completion of new plant facilities at Hornell, N. Y., by SKF INDUSTRIES, INC. Production in the new plant includes two new types of ball bearing unit pillow blocks, it was announced by **William L. Batt,** company president.

☆ ☆ ☆

Edgar B. Creigh, recently retired as manager of the UNITED STATES PLYWOOD CORPORATION's Brooklyn, N. Y., sales warehouse, has been nominated for election as an additional director of the firm. Creigh, who has been with the company since its inception and has the longest service of any employee, will return to the corporation's headquarters in an advisory capacity following an extended vacation.

☆ ☆ ☆

Appointment of **F. G. Hoyt** as general manager of the Woven Wire Fabrics Division, JOHN A. ROEBLING'S SONS COMPANY, Trenton, N. J., was announced recently. Hoyt, who is widely experienced in the aggregate wire screen and allied fields is to coordinate the recently-announced program of modernization and expansion of production facilities in that division. He will be assisted by **J. Fennell Berger,** assistant manager of sales, and **F. Clifford Peet,** superintendent of production.

☆ ☆ ☆

Farmall Works is planning an addition to its present manufacturing space, **L. M. Gildea,** works manager of INTERNATIONAL HARVESTER's Rock Island tractor plant, announced recently. The steel and brick addition, 330 ft. by 220 ft., will add 72,600 sq. ft. of space to Farmall Works' productive area, and will be an extension of the present manufacturing building.

☆ ☆ ☆

Robert L. Hutchison is the newly appointed general superintendent for PITTSBURGH PLATE GLASS COMPANY's Columbia Chemical Division and the SOUTHERN ALKALI CORPORATION, **E. T. Asplundh,** vice president in charge of the firm's chemical division announced recently. Hutchison who joined the firm in 1925, has served as superintendent of the Columbia Chemical Division's alkali producing plant at Barberton, O. during the past seven years. His new headquarters will be in Pittsburgh, Pa.

☆ ☆ ☆

Appointment of **L. A. Weom** as manager of FAIRBANKS, MORSE & CO., Chicago, Ill. in the Pump Division was announced recently by **R. H. Morse, Jr.,** vice president and general sales manager. Weom, who has been with the company since 1929, replace **Arnold Brown,** who has resigned. He was promoted to manager of the Pump and Electric department of the St. Paul branch in 1936, prior to which time he was a company field engineer traveling the territory of South Dakota and western Minnesota. He has been with the company all the time since 1929 with exception of three and one-half years spent as an officer in the United States Navy during the recent world war.

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.

New "Moto-Scraper"

Manufacturer: LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa.

Equipment: First of a new line of rubber tired tractors.

Features claimed: A modern high speed tractor-scraper combination consisting of a two-wheeled rubber tired tractor joined to a 17.5 yd. scraper by a pedestal hitch assembly to form a single integral self-propelled unit, the "Moto-Scraper" is designed for digging, loading, transporting and spreading earth. Tractor has a 225 hp.

Diesel engine, four speeds forward and one in reverse, with top travel speed of 18 m.p.h. at 1800 engine rpm. Scraper is a positive forced ejection type, operated by air actuated cable power control unit, mounted on rear of tractor. Steering of unit is accomplished by two double acting hydraulic jacks which are positively controlled by an LPC Fluid Power Unit mounted on front of tractor.

Concrete Block Fork

Manufacturer: Schmidgall Mfg. Co., Peoria, Ill.

Equipment: Completely automatic concrete block fork.

Features claimed: Prongs of the heavy duty automatic mechanism are steel plate individually bolted to lower part of the protecting structure and easily removed. The Model 33 will handle standard 4-in., 6-in., and 8-in. and 12-in. blocks whether

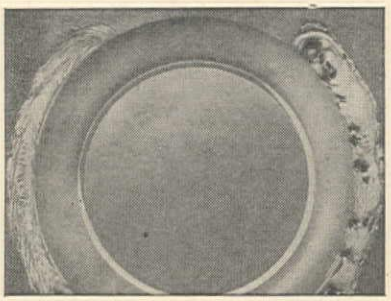
made of Waylite, cinder or concrete process. Capacity is limited only by capacity of the lift truck on which it is used. Prongs are self-cleaning and will not become clogged with dust or particles. When loading railroad cars 95 per cent of the car can be loaded with a lift truck equipped with this fork; the other 5 per cent having to be piled by hand due to variation of car width.

Improved Electrode

Manufacturer: Air Reduction Sales Company, New York, N. Y.

Equipment: New Improved Airco No. 312 electrode.

Features claimed: An all-position, mild steel electrode designed to produce weld metal possessing not only mechanical properties but low hydrogen content, the present equipment is much improved over the first model which appeared two years ago, it is claimed. Features include the fact that it can now be used on AC and DC reverse polarity current, and that preheating of the electrode is no longer required. Uses for the improved Airco 312 are welding high sulphur, free machining steels; welding hardenable steels where no pre-



heat is used; welding cold rolled steels which normally exhibit excessive porosity when welded with conventional electrodes, and many others.

Hydraulic Jacks and Jennys

Manufacturer: Templeton, Kenly & Co., Chicago, Ill.

Equipment: Complete line of simplex hydraulic jacks and jennys.

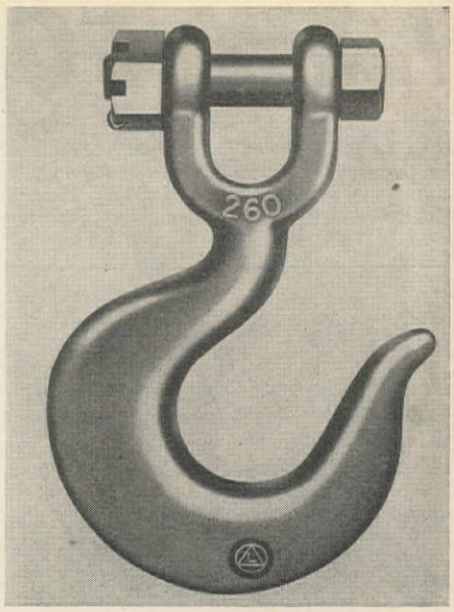
Features claimed: Drop forged steel cap, steel screw with clean machine cut threads, a heavy section steel ram carefully machined, high pressure packing seals, and a long stroke pump are but a few of the features claimed for the heavy-duty hydraulic jacks. Guaranteed as to materials and workmanship and to lift their rated capacity, each jack is tested for 50 per cent overload. Pressure-tested malleable iron is used in the top nut and base of the machines, while neoprene pressure packing that resists oil deterioration and wear is used in all high pressure seals.

Clevis Hook

Manufacturer: Thomas Laughlin Co., Portland, Me.

Equipment: New clevis hook.

Features claimed: Utilizing a bolt, slotted nut and cotter pin for fastening, it is easy to attach the hook and switch from one job to another, yet meet all safety requirements. No welding, machining or



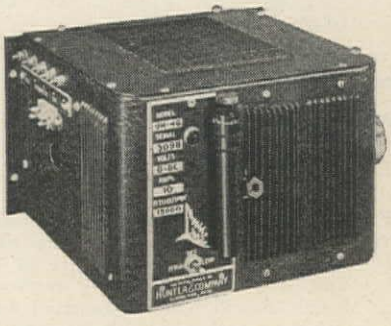
threading is necessary to attach this latest addition to a complete line of drop-forged wire rope and chain fittings. The clevis hook can be supplied with the Laughlin safety latch, or with reversed jaw, on special order. Four hook sizes are 1½, 2, 3 and 5 tons, and all parts, including bolts, are of drop-forged, heat-treated steel.

Automatic Heater

Manufacturer: Hunter and Company, Cleveland, O.

Equipment: Automatic gasoline burning heater.

Features claimed: This compact 7 in. x 10 in. x 10 in. gasoline burning heater, for heating and ventilation of truck cabs and small busses, operates independently of the



engine. Fresh air is supplied by an air inlet tube running from heater to radiator grill. Installed exactly as a hot water heater, the new heater can be equipped to operate while the engine is not running, making it ideal for engine preheating as well as overnight storage in cold weather.

Paving Breaker

Manufacturer: Rock Bit Sales & Service Co., Philadelphia, Pa.

Equipment: Rockbit Detachable Moil Point.

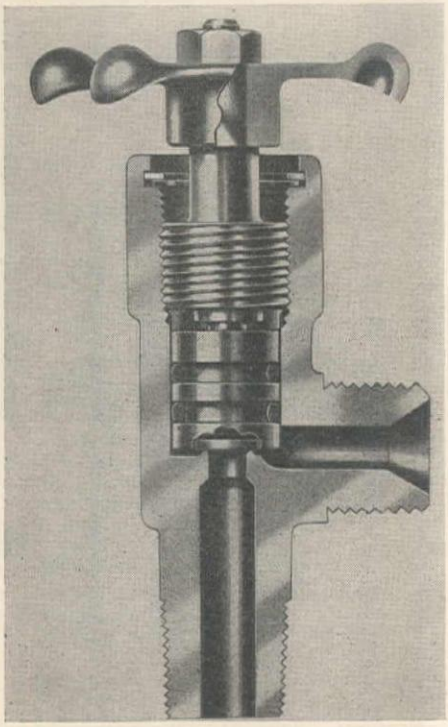
Features claimed: Forged of two different types of steel instead of the usual one, the Rockbit tool utilizes "tough" steel in the shank for long life, while the point is made of "hard" steel for cutting ability. It is claimed that 32 sq. yd. of concrete can be broken by the tool without one regrind. When the point wears out it can be detached and a new point placed on the same shank, thus eliminating the need of many tools.

Safe Stem Valve

Manufacturer: Security Valve Co., Los Angeles, Calif.

Equipment: New packless stem valve.

Features claimed: An entirely new and safe design for oxygen and acetylene cylinders, the SE-CO packless stem valve will not freeze in either open or closed position, it is claimed. Brass retaining washer, held



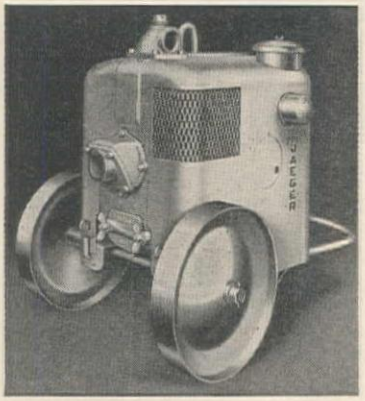
in place by a Waldes snap ring, stops upward motion of the spindle at the wide-open position. Since the retaining washer is free to rotate, there is no possibility of the spindle becoming wedged in the open position. In closed position, downward motion of the spindle is halted both by the valve's Neoprene seat and a metal-to-metal contact.

Self-priming Centrifugal Pump

Manufacturer: Jaeger Machine Co.

Equipment: Jaeger self-priming centrifugal pumps.

Features claimed: Overall housings are used on the new Jaeger pumps which pro-



tect the engine as well as pump from weather and dirt. Water is kept from sparkplugs, carburetor and crankcase, thus insuring quick starting and more efficient operation. Side panels give instant access to all operating controls. "Inherent" priming is combined with "jet" priming—two

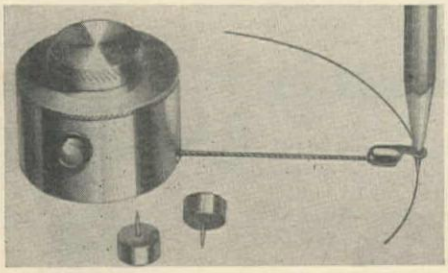
independent actions which operate simultaneously. Other features are replaceable liners or seal rings, Jaeger patented "Lubri-Seal" which is accessible for inspection, self-cleaning shell design and open-type impellers which are adjustable for wear.

Vest-Pocket Size Compass

Manufacturer: Stewart-Jackson Instrument Co., Inc., Los Angeles, Calif.

Equipment: Vest-pocket size Flex-A-Beam compass.

Features claimed: Consisting of a stretch-proof linen line on an aluminum



encased reel, the Flex-A-Beam is claimed to also draw ellipses, spirals, and arches as well as circles. Three special push-pins are furnished which serve as center points for the compass. A releasing button permits the line to be drawn out to whatever radius is desired. It is claimed that the linen line will hold true to any desired length.

Roller Pipe Supports

Manufacturer: Unistrut Products Co., Chicago, Ill.

Equipment: Unistrut roller pipe supports.

Features claimed: One-inch to 12-in. pipe can be supported on the same roller assembly having only the axles vary in length, which greatly reduces the problem of stocking and supplying parts for roller pipe supports to accommodate many different sizes of pipe. Mounted on framing members, it eliminates the necessity for conventional screw adjustments also.

Compressor

Manufacturer: Le Roi Company, Milwaukee, Wis.

Equipment: The "85" Airmaster compressor.

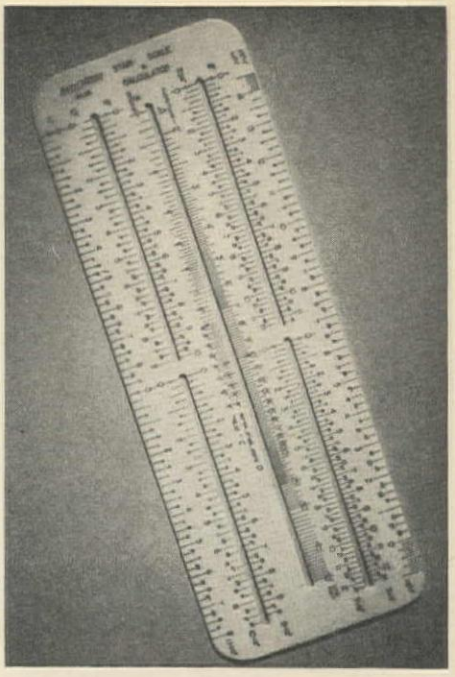
Features claimed: Replaceable cylinder-sleeves, precision bearings, pressure lubrication and magneto ignition are but a few features claimed of the Model D201 valve-in-head engine which powers the compressor. Compressor itself, built integrally into the engine block, is liquid cooled with pressure lubrication, replaceable cylinder sleeves, and precision bearings. It is regulated by the patented Econotrol controlling compressor operation automatically according to the demand for air. Electric starting and electric hourmeter are supplied as standard equipment.

Multiple Calculator

Manufacturer: Rapidesign, Inc., Glendale, Calif.

Equipment: New stair-scale and multiple calculator.

Features claimed: Specifically designed for the field of architecture, the device combines 10 scales for accurately spacing stair risers and treads, rafters, studs, joists,



etc., without lifting or sliding the instrument from the drawing. An architect's scale and quick calculator is also provided. Scales are calibrated ⅜ in., ¼ in., and ½ in. to one foot.

Flexarc Welder

Manufacturer: Westinghouse Electric Corp., Pittsburgh, Pa.

Equipment: Lightweight engine-driven welder.

Features claimed: Designated "The

Ranger," the Flexarc lightweight engine-driven 200 ampere welder comes with accessories ready to weld, including work and electrode leads, helmet, electrode holder, and a supply of electrodes and a wire scratch brush. The DC welder can be

towed anywhere a jeep can take it. Welding current is adjusted over a wide range from 30 amperes at 20 volts to 250 amperes at 30 volts. Intermediate values of current are obtained by rheostat control.

New AC Arc Welders

Manufacturer: Harnischfeger Corporation, Milwaukee, Wis.

Equipment: New line of AC arc welders.

Features claimed: Designed and built by P&H, all models are supplied with P&H "Dial-lectric" control, thus eliminating

New P & H Model TI-150 AC Welder with "Dial-lectric" current control

need for moving coils or cores, worm gears, sprockets and chain or lever adjustments. Without cranks or plug-in stations, current selection is made by turning a single dial which requires but a three-quarter turn to cover the full welding range of the machine.

Heavy Duty Lift Truck

Manufacturer: Mixermobile Manufacturers, Portland, Ore.

Equipment: New type lift truck.

Features claimed: A hydraulic lift that will handle 6,000 lb. to a height of 8 ft., or 4,000 lb. to 11 ft., yet collapse completely into the truck body like the bellows of a

NEW POWER METHODS MAKE GOLD MINING EASIER, MORE PROFITABLE

UP-TO-DATE power equipment is being used by the French Gulch Dredging Co., San Francisco to mine gold from a riverbed near Fort Jones, Calif. To build a dam 450 ft. across the riverbed, a trench was dug down to bed rock. The trench was then filled with top soil by a Bucyrus-Erie 8-10-yd. wheel scraper, shown being pulled by an International Diesel crawler tractor. Top soil will make a water tight seal to hold water.

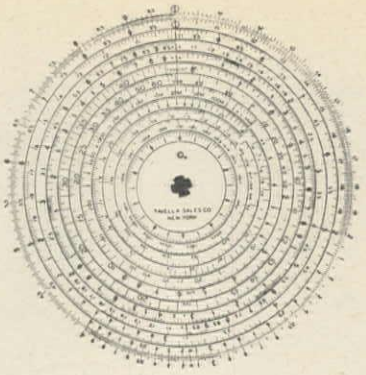
camera is the principal feature on this new model. The Wagnermobile Lift weighs 7,425 lb. with fork and boom, and incorporates hydraulic control 100 per cent. Attachments include forks to handle pallets, lumber, etc., "scoop" type buckets in both ½-yd. and ¾-yd. capacities. An enclosed cab is available, but not standard equipment for this model.

Slide Rule

Manufacturer: Tavella Sales Co., New York, N. Y.

Equipment: "Dualog" slide rule.

Features claimed: Adapted for carrying in a brief case or for desk use, the Dualog is a scientifically designed computing instrument for rapid solution of problems involving multiplication, division, proportion, trigonometric functions, logarithms, exponential equations, square and cube roots and powers. The log scales provide means for the direct extraction of any root or power of numbers. Operation is easily learned, and the arrangement of the calibrations and numerals on the 12 scales permit rapid and easy reading.



Mobile Drilling Rig

Manufacturer: Roscoe Moss Co., Los Angeles, Calif.

Equipment: Mobile well drilling rig.

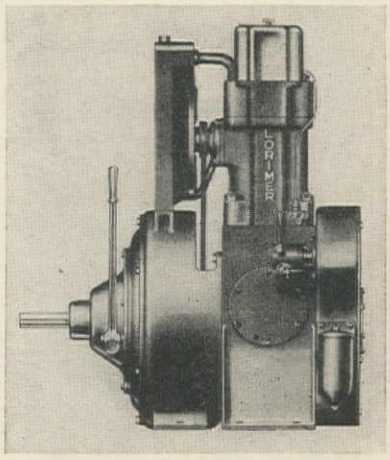
Features claimed: Powered by a 113-hp. General Motors Diesel engine, the new rig is capable of drilling a 24-in. hole down to depths of 1,500 ft. Several such outfits are owned and used by the manufacturer for deep water well drilling in Southern California and Arizona.

Stationary Diesel Engine

Manufacturer: Lorimer Diesel Engine Co., Oakland, Calif.

Equipment: Single-cylinder stationary Diesel engine.

Features claimed: The "Sturdy Scot," a vertical 4-cycle full Diesel, has a bore of 5¾ in. and a 7½-in. stroke. Horsepower is 10 at 600 r.p.m., 12 at 720, and 14 at 800. Simple, rugged design and slow-speed



operation are main features. Standard equipment includes governor, lube pump, fuel and lube filters, tools and instruction manual. Optional equipment includes power take-off clutch, heavy-duty radiator, water pump, fuel transfer pump, electric or air starting equipment, or impulse magneto for manual-gas starting.

Testing Screen

Manufacturer: Gilson Screen Co., Mercer, Pa.

Equipment: New mechanical testing screen.

Features claimed: Designed for efficient sizing of test samples of crushed stone, gravel, slag and similar materials, the mechanical tester provides a rapid and practical testing method. Gilson Testing Screen handles up to one cu. ft. of sample, making from two to seven separations simultaneously. Very fine materials can also be handled efficiently. Concrete research is another good use for the screen which may also have a sand attachment, if desired. The machine's rigid electric welded outer frame, enclosing the vibrating unit, counterbalances vibration so that operation is smooth and quiet. Vibrating unit has a

number of interlocking spacers supporting and separating the screen trays. Equal clearance between trays permits a clear view of the operation and independent removal of each tray. Six trays are held in vibrating position. When fewer separations are required, one or two of the trays may be left out.

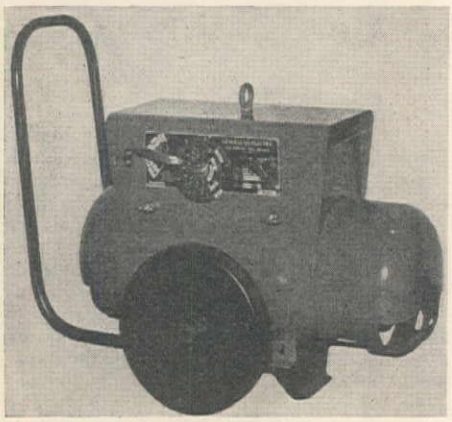
Arc Welding Machine

Manufacturer: General Electric Co., Schenectady, N. Y.

Distributor: Victor Equipment Co., San Francisco, Calif.

Equipment: Model WD-40, arc welding machine.

Features claimed: Made in standard NEMA ratings and 200, 300, or 400-amp. capacities, the new GE model WD-40 has been reduced 50 per cent in weight and over-all size for better handling and easier storage. Operating speed of the new model is 3500 r.p.m., and control panel is modernized. Panel is instantly and easily adjusted to electrode size and proper ampere range.



Station Outlet Valves

Manufacturer: Air Reduction Sales Co., New York, N. Y.

Equipment: New ½-in. station outlet valves.

Features claimed: A compact combined shut-off and check valve for use on drops or risers of a piping system, the new valve is a diaphragm type, therefore has no stuffing box. The new outlet valve eliminates necessity of installing a separate shut-off valve and check valve as it serves a double purpose. As a shut-off valve it permits repairs or alterations to be made on equipment downstream from the valve without disturbing other stations on the line; as a check valve, it allows flow of gas in only one direction and will close tightly should a disturbance at the torch cause a back pressure to travel as far as the valve. Other features claimed are compact, simple construction, body, bonnet and handwheel of brass forgings, ease of dismantling and reassembling.

Diesel-Electric Locomotive Crane

Manufacturer: American Hoist and Derrick Co., St. Paul, Minn.

Equipment: New Dieselectric locomotive crane.

Features claimed: Electric power is used to travel this crane along the rails while diesel power operates the turntable and load lifting mechanism. The American Dieselectric may be used with grab bucket, grapple, magnet, or car switching. Electric power from the traction generator, used to energize the magnet, is another feature, as is fluid starting and traveling.

Low Temperature Steel Electrode

Manufacturer: Eutectic Welding Alloys Corp., New York, N. Y.

Equipment: New "Low Temperature" steel electrodes.

Features claimed: EutecTrodes 66 AC and 660 DC, for arc welding steel at low base metal heat, are flux-coated and produce a smooth, high tensile, crack-resistant weld, it is claimed. For welding low carbon steel to high carbon, EutecTrode 66 can be used. A universal rod for all types of steel, it eliminates the necessity for determining the base metal before welding.

Portable Electric Megaphone

Manufacturer: Phil-Mar Manufacturing Corp., Chicago, Ill.

Equipment: Porta-Voice, a new portable electric megaphone.

Features claimed: Consisting of two units: a megaphone which amplifies and projects the voice and a battery case which serves as the power speaker, the new megaphone is claimed to project the normal speaking voice up to a distance of one-half mile. Megaphone is a permanent magnet double re-entrant type speaker, with dynamic microphone and two-stage amplifier built into speaker housing. Unit is equipped with a pistol-grip handle, and a switch which operates only when held down and automatically cuts off when released. Horn is 12 in. long with 10-in. diameter bell opening. Microphone and amplifier are shock-mounted to withstand rough usage. Complete outfit weighs only 13½ lb.

Concrete House Forms

Manufacturer: Irvington Form & Tank Corp., Irvington, N. Y.

Equipment: Atlas speed forms.

Features claimed: About one and a half houses a day can be poured with this set of forms, it is claimed by the company. Forms, distributed for rent or sale, are supplied in complete sets for pouring an entire house, including exterior walls, interior walls and roof. Forms are of steel, made up of units simple to assemble with wedge bolts and clips. Studding is not required for support of the wall, making big savings in labor to erect, strip and move, as well as in material. Inserts, sleeves and outlets are easily accommodated and both the wall and slab forms make a construction of uniform thickness, free from grain marks or knot holes.

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.

CATERPILLAR EARTHMOVERS—**Caterpillar Tractor Co.**, Peoria, Ill., has issued a new 16-page booklet, "Earthmoving Calls for Caterpillar," in which it explains what its equipment and auxiliary units can do in big and small earth-moving operations. Diesel track-type and wheel-type tractors with appropriate trailed units, bulldozers and scrapers, Diesel motor graders, Diesel engines and electric sets are fully illustrated, pictured in active job scenes as prime movers or as power sources for other equipment. Applications of Diesel equipment and power for dam, airport and housing construction are discussed, as well as many other functions.

AUTOMOBILE FACTS AND FIGURES—**Automobile Manufacturers Association**, Detroit, Mich., has released an 80-page booklet, the 27th edition of Automobile Facts and Figures, and the first issued since the end of the war. Statistics on the average life of a motor car, accidents, automobile production, number of people employed in the automotive industry, and many others form an interesting edition, complete with numerous tables and charts as illustrations.

P & H MODEL 1055—**The Harnischfeger Corporation**, Milwaukee, Wis., has issued a 40-page pamphlet on their new Model 1055. Illustrations of the machine in action, together with detailed pictures of various parts of the equipment, are combined with text on the machines, which are easily converted for four types of service.

WELDING AND CUTTING EQUIPMENT—**Victor Equipment Co.**, San Francisco, Calif., shows in their latest brochure their entire range of welding and cutting equipment with detailed copy on each. Handsome photographs in color illustrate the text, which shows the many and varied uses for the tools, as well as their advantages. Models, numbers, and equipment prices are also listed.

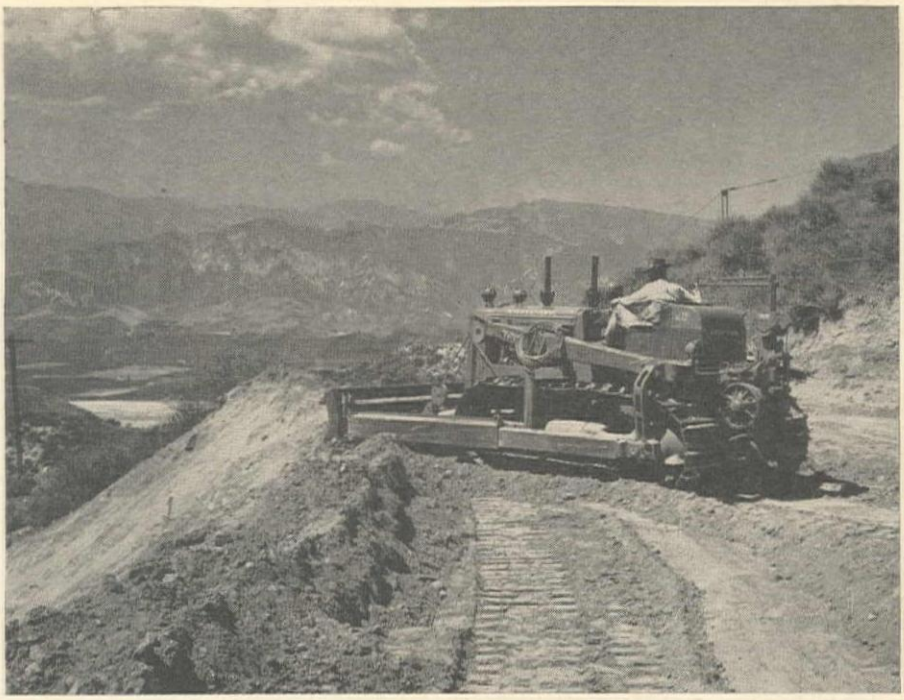
ATLAS SPEED FORMS—**Irvington Tank & Form Corporation**, Irvington, N. Y., has published two pieces of literature describing the variety and advantages of Atlas labor-saving Speed Forms. Available in tunnel, sewer, or column forms, as well as many others and foundation wall forms, they may be rented as well as sold. Forms for walls and floors are described in detail as to finish, layout service, paint, oiling and moving. Low cost is another advantage discussed.

BREIDERT AIR-X-HAUSTER—**G. C. Breidert Co.**, Los Angeles, cites advantages gained by applying aerodynamic principles to ventilator design in a new brochure. Illustrated in two colors, it tells of Air-X-Hauster results in wind tunnel tests and in actual use on all types of installations.

LOS ANGELES SERVICE PLANT—**Joseph T. Ryerson & Son, Inc.**, Chicago, Ill., have put out a 12-page booklet describing their new plant at Los Angeles. Steel service facilities, stocks and personnel are thoroughly described. The twelfth unit in the Ryerson nation-wide group, the Los Angeles plant opened for business in October, 1946.

TANDEM ROLLER—**Shaw Sales & Service**, Los Angeles, has released a new 6-page, 2-color folder describing the Wheeler 3- to 4-ton Tandem roller. The relatively new, job-tested roller is pictured and described in the folder. Simple and

DRILLING LOCATIONS for new oil wells in Ventura County, Calif., require much earthmoving. In accompanying picture may be seen an International Diesel crawler tractor with Bucyrus-Erie cable dozer on a rig-site job for Ward & Reed, dirt moving contractors of Santa Paula. It was working on the Torrey lease of the Union Oil Co.



efficient operation are among the features stressed, as well as the single lever clutch and shift which alone will move the machine forward or backward. A one-lever steering control to maneuver the machine by a hydraulic steering lever or an easy operating hand wheel is also provided. Better vision of the working area is provided by an unobstructed right-hand view.

MONOLITHIC CONSTRUCTION— **R. G. LeTourneau, Inc.,** Longview, Tex., recently released an 8-page brochure, RT-126. The folder, complete with many illustrations, portrays the new and modern way to build homes faster and more economically by the Tournalayer method. Freedom of design, speed of erection, lower cost per sq. ft., superior construction and world-wide distribution are some of the advantages listed. A complete description of how the Tournalayer operates and produces various combinations of basic, monolithic units in order to provide any size or style of home is also given. Numerous architectural renderings illustrate the unlimited freedom of architectural treatment.

CONTROLLED AIR — **Dewey and Almy Chemical Co.,** Cambridge, Mass., have published a bulletin on Darex Air Entraining Agent in concrete. Illustrated profusely, it tells the importance of the fifth ingredient in concrete — "controlled air." Increased durability, workability, reduced segregation and bleeding all are listed as contributing to the economic advantage of concrete users. Distribution of tiny air bubbles throughout the concrete act as ball bearings serving to lubricate or plasticize the concrete with the result that a substantial reduction in water can be made with no loss in slump and with an actual improvement in workability.

HEAVY DUTY TRUCKS — **Four Wheel Drive Auto Company,** Clintonville, Wis., has published a bulletin on FWDM 6x6 heavy duty trucks. Bulk cement haulers, heavy equipment haulers, oil field roust-abouts, oil well servicers, 6 x 6 transporters and others are described and illustrated, with drawings of details of engine and parts accompanying the text. The power-proportioning differention, 20 per

cent in front and 80 per cent in the rear, is also diagrammed and explained.

SOCKETYPE CABLE TERMINALS —**Macwhyte Wire Rope Company,** Kenosha, Wis., has issued a bulletin on their Socketype Cable Terminals, formerly made by Paulsen & Nardon, Inc., Los Angeles. Pamphlet describes the terminals, which consist of an alloy steel cadmium plated eye or fork type fitting, plus a stainless steel sleeve for swaging to cable (wire rope). They are available loose or attached to the rope in a complete cable assembly to specification length.

FOREST LAWS AND PRACTICE—**The Joint Committee on Forest Conservation of the West Coast Lumbermen's Association,** Portland, Ore., released pocket manuals on forest laws and practice for the Douglas-fir region of Oregon and Washington. The easy-to-understand booklets contain state laws on conservation and protection requirements in logging camps, including state forestry laws and amendments passed by the legislatures of Oregon and Washington this spring. The booklets are separate for each state because of some variation between the forestry laws of the two Douglas-fir states.

CATERPILLAR ANGLING BLADE BULLDOZER—**Caterpillar Tractor Co.,** Peoria, Ill., has issued a pamphlet on basic specifications and production features of the new cable controlled angling blade bulldozers, outlining the structural advantages of the No. 8A and No. 7A, designed for use with Caterpillar Diesel D8 and D7 track-type tractors. It also emphasizes and illustrates, with model and cutaway views, blade C-frame, brace, sheave, and push cup construction and angling, tilting and lifting adjustments possible.

FIFTY YEARS—Progress of the **Dow Chemical Co.,** Midlands, Mich., is recorded in this handsomely-illustrated booklet. A chronicle of the company since its inception in 1897, it is an interesting history of a great American corporation. Achievements of Herbert H. Dow, the founder of the concern, and Willard H. Dow, his son and present president, as well as many others who had a hand in the enormous growth of the company are told in an interesting manner.

DROP FORGED HARDWARE—**The Thomas Laughlin Co.,** Portland, Me., has put marine and industrial hardware data in a newly revised catalog, book No. 140. In addition to presenting detailed working characteristics of each product to remove guesswork in selecting the proper fitting, tables and charts which make the catalog a valuable reference book are included. Many products which round out the regular Laughlin line are also listed.

INCO WELDING MATERIALS — **International Nickel Company,** New York City, has published a new 16-page booklet on the materials required for the metal-arc, oxy-acetylene and submerged melt welding of nickel and the high nickel alloys. It also lists such general information as the type of welding rods to use, recommended amperages for electric-arc welding, and the proper flux to select for gas welding and brazing.

CENTER HOLE HYDRAULIC PULLERS — **Templeton, Kenly & Co.,** Chicago, Ill., has released a booklet describing the Simplex Jenny Center Hole Hydraulic Puller. A jack with a center hole, it accelerates pulling of wheels, gears, keys, propellers, pistons, valve seats, wrist pins, bushings, cylinder liners, shafts, boiler tubes, pipe and ship stern tubes. Illustrations and diagrams show the Simplex-Jenny in use as well as the various parts, together with a complete description of both.

OPPORTUNITY SECTION

FOR SALE

1—Model Ru LeTourneau Carryall, double bucket, 22 c.y. struck capacity with 8—18:00 x 24 tires, Serial No. S5951ROO. Good condition. Price $7700.00.

2—LaPlante-Choate hydraulic angledozers, for Caterpillar D8 Tractors, new. Price $2100.00 each.

1—Sterling Dump truck, 8 c.y. body, 12-ton capacity, chain drive. Serial No. S15512. Rebuilt Cummins engine, 6—12:00 x 24 tires. Price $4500.

1—LeTourneau Model J12 Scraper, 10 c.y. capacity, Serial No. J2312J12. Price $2500.00.

1—Ingersoll-Rand 315 cfm compressor, steel wheel mounted. Serial No. 40T6278, with rebuilt Cummins engine. Price $5300.00.

1—Hesselman engine, Model WBFH, Serial No. 394871. Price $1200.00.

Located at Spring Canyon Dam site, near Fort Collins, Colorado
Phone Fort Collins 1527

Hinman Bros. Const. Co.
Fort Collins, Colorado

For Sale . . . New and Used
Diesel Engines and Generator Units
All Sizes — Available for Immediate Delivery

Send Us Your Inquiries

DULIEN STEEL PRODUCTS, Inc.
of Washington
9265 E. MARGINAL WAY · LANDER 6000 · SEATTLE 8, WASH.

FOR SALE

1—WHITE TRUCK CHASSIS
Model 1580; Butane Powered; 13:00 x 24 Front Tires, 14:00 x 24 Dual Rear Tires
Price $2500

1—INDUSTRIAL BROWN HOIST STEAM LOCOMOTIVE CRANE
50-foot Boom
Price $2000

AMERICAN PIPE AND CONSTRUCTION CO.
P. O. Box 3428, Terminal Annex
Los Angeles 54, California

WANTED

Sales manager to represent manufacturer of roadbuilding equipment

★

Must know the application of road oils, cut-back asphalts, emulsions and soil cement on base stabilization and road-mix jobs by modern methods. Sales experience required. Must be willing to travel. Good salary and good future for the right man. Give complete details in letter to

BOX 620
NORTH HOLLYWOOD
CALIFORNIA

6000 KW. RECTIFIER STATION COMPLETE

For Sale—

6000 Kilowatt Rectifier Station Complete.

13,800 volts primary to 600/700 volts Direct Current.

If interested please write to Box 1020, Western Construction News, 503 Market Street, San Francisco, California.

***Waterproof With* FORMULA NO. 640**

A clear liquid which penetrates 1" or more into concrete, brick, stucco, etc., seals—holds 1250 lbs. per sq. ft. hydrostatic pressure. Cuts costs: Applies quickly—no mixing—no cleanup—no furring—no membranes. Write for technical data—free sample.

HAYNES PRODUCTS CO., OMAHA 3, NEBR.

FOR SALE

One 10 Ton White Diesel Truck and One 50 Ton Fruehauf "Low Boy" Trailer.

Both new in October, 1946. Truck has 150 hp. Cummins diesel engine, 1100 x 24 tires, tandem drive. This truck and trailer in A1 shape. Price $15,000.00.

Will consider D8 tractor or LP or FP LeTourneau scraper in trade.

Elmer D'aane
1022 Blvd. St., Sturgis, South Dakota

FOR SALE

One ½ yd. Byers Crane
Model 65
with 2-section boom
A-1 condition
$7500.

ROSEBURG LUMBER CO.
ROSEBURG, OREGON

ATTENTION: "CONTRACTORS"

FOR RENT

HEAVY DUTY CONSTRUCTION EQUIPMENT

1—Northwest Power Shovel, Model 70, 1¾ Cu. Yd. Capacity, powered by Murphy Diesel Engine. (Available about Oct. 1st.) This machine is in good condition.

3—***NEW***, D8 Caterpillar Tractors, with Dozers and Double Drum Power Control Units.

1—Each, D7 and D6 Caterpillar Tractors, with Dozers and Double Drum Power Control Units. These machines are in good condition.

4—8 and 14 Cu. Yd. Capacity, CARRYALLS. Good condition.

We, also, have Portable AIR COMPRESSORS from 160 to 365 CFM, powered by Gasoline and Diesel engines. Good condition.

For prompt service and further information, please address:

R AND L EQUIPMENT COMPANY

RENO, NEVADA **P. O. Box 2482** **RENO 2-2885**

INDEX TO ADVERTISERS
★ IN THIS ISSUE ★