WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

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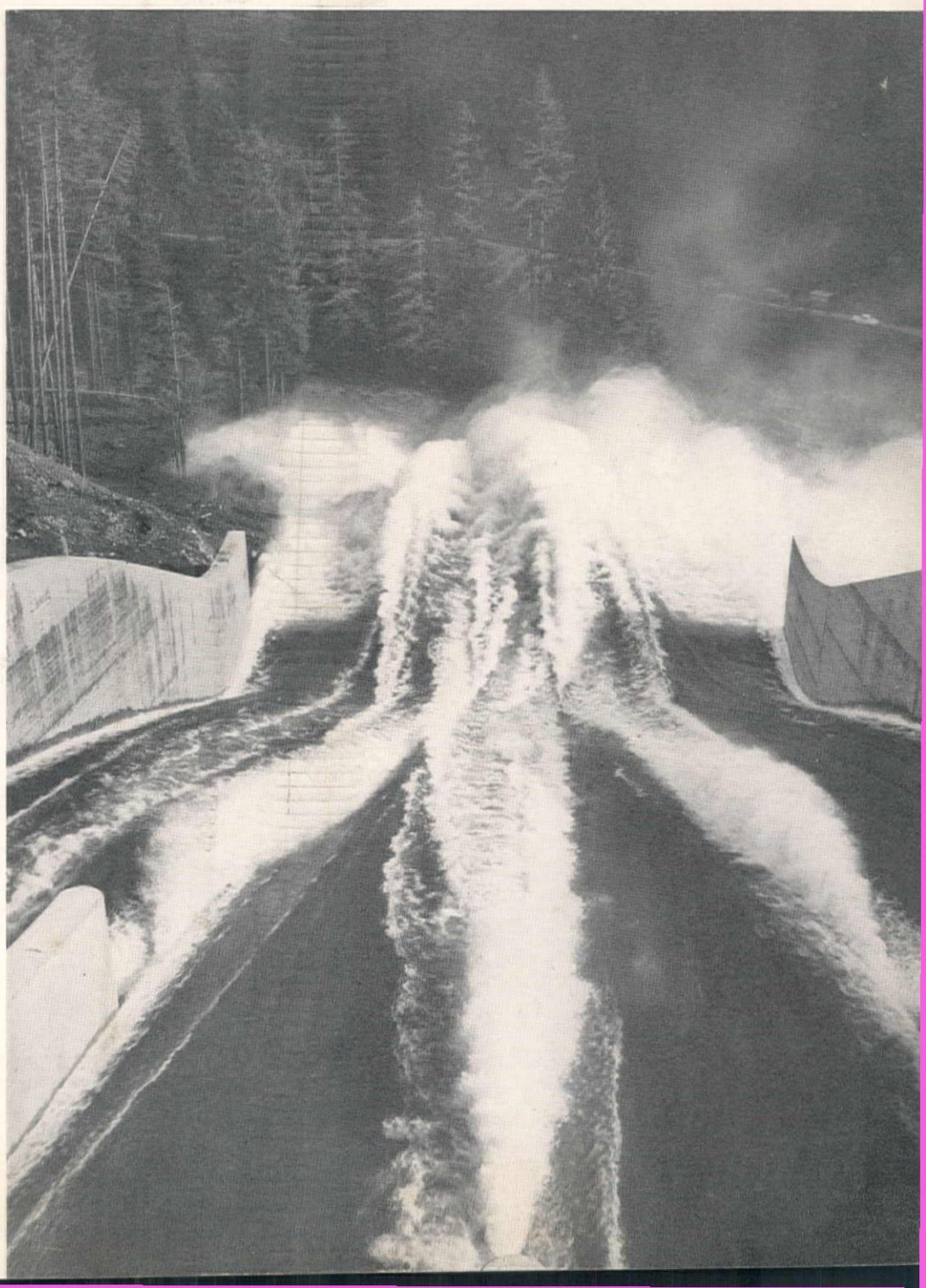
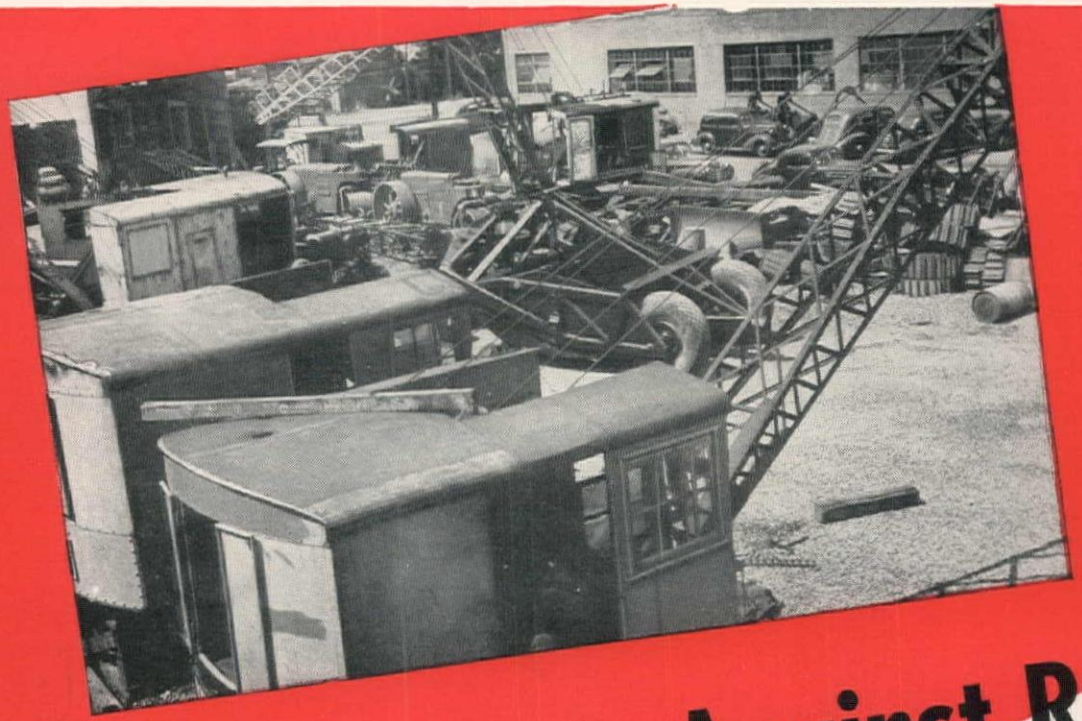
IN THIS ISSUE



FIRST WATER to pass over the spillway of Alder Dam, a unit of the Second Nisqually power project, built by the city of Tacoma, Wash. The trees shown in the path of the torrent were washed out in a few hours. The project began producing power Sept. 1.



3-Way Protection Against Rust

When you use the rustproof compound that . . .

1. Prevents rust formation on all exposed metal surfaces
2. Penetrates existing rust and stops further rusting
3. Loosens existing rust and makes it easy to remove

IN STORAGE or in use—equipment used by contractors, waterworks and sewage disposal plants needs the positive protection against destructive rust assured by *Texaco Rustproof Compound.* Because one application usually provides year-round protection, *Texaco Rustproof Compound* is very economical.

Texaco Rustproof Compound forms a soft, self-sealing film that remains completely waterproof and is highly resistant to chemicals and fumes under the severest conditions. It can be applied easily to most surfaces with a paint brush, or thinned down and sprayed to reach inaccessible parts. When necessary, it can be removed quickly with a kerosine-saturated rag.

Because of its proved effectiveness, *Texaco Rustproof Compound* is widely used throughout the construction field, as well as by leading railroads, in metal working plants, marine and refrigeration service, automotive, aviation and chemical industries, and, in general, wherever equipment is subject to corrosion.

Get *Texaco Rustproof Compound* today —available through more than 2300 Texaco distributing plants in the 48 States. Call the nearest one, or write: The Texas Company, 135 East 42nd Street, New York 17, N. Y.

FREE! This 36-page booklet tells *why Texaco Rustproof Compound* prevents rust, *where* and *how* to apply it, and how it can add extra years of life to your equipment. A single suggestion in this book may save you thousands of dollars. Write for your copy today.

TEXACO REG. T.M.

TEXACO Rustproof Compound

TUNE IN THE TEXACO STAR THEATRE WITH JAMES MELTON EVERY SUNDAY NIGHT—CBS

Jobs like this are

NORTHWEST PULLSHOVEL JOBS!

Here's a trench job that only a Pullshovel can handle. Note the minimum of destruction, the ability to work close to trees and poles, the ease of handling spoil!

Here's the machine to plan on for those future contracts for housing expansion, the extension of water and sewer lines and subdivision work.

When you buy a Northwest you are not putting your money in a one job machine! You have a trencher that can be quickly converted to a Shovel, Crane or Dragline for all classes of material handling and excavation and remember there are more Northwest Pullshovels in service than any other make.

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SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

If you have a Real Rock Shovel you'll never have to worry about output in dirt.

Northwest Sales Agents: ARNOLD MACHY CO., INC., 149 W. 2nd South St., Salt Lake City, Utah; BALZER MACHY. CO., 2136 S.E. Eighth Ave., Portland, Oregon; WILSON EQUIPMENT SUPPLY CO., 902 West 22nd St., Cheyenne, Wyoming;

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Increased Yardage *and* Lower Hauling Costs *on Off-the-Highway Jobs*

Whether it is coal hauling in Pennsylvania, dam construction in Idaho, or any job of moving earth and other materials, Euclids step up production and cut hauling costs. Because they are designed and built for the toughest jobs, Euclids have an unsurpassed range of usefulness and can handle all types of material on all lengths of haul at lower operating and maintenance costs. With their large payload capacity and speed on the haul road, this means savings in time and money — lower costs per ton or yard moved.

If you're using equipment that limits the type of work and lengths of haul you can handle economically, and can't take the tough jobs in stride, you will want to get complete information on Euclids. Literature and the recommendations of a hauling equipment specialist are available from your Euclid distributor or by writing direct, as you prefer.

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THE EUCLID ROAD MACHINERY CO.

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WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

Covering the Western Half of the National Construction Field

Contents for September, 1945

J. M. SERVER, JR.
Editor

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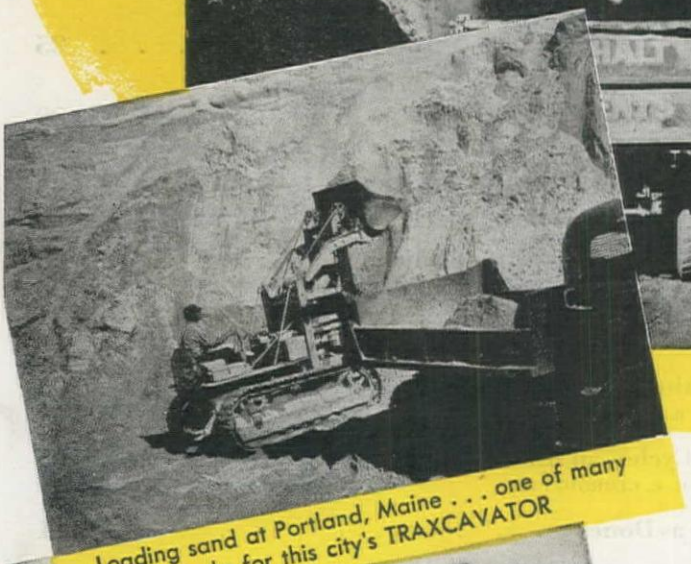
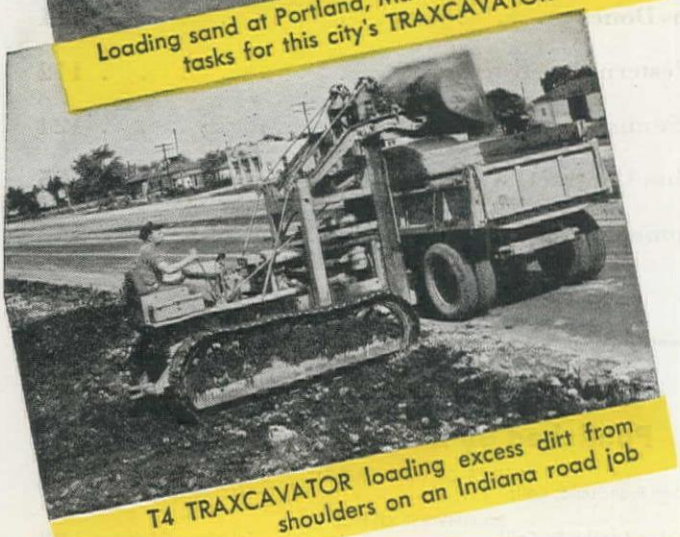
PLAN FOR BETTER EQUIPMENT, TOO!

Big 2½ yard T7 TRAXCAVATOR grading new street in San Francisco



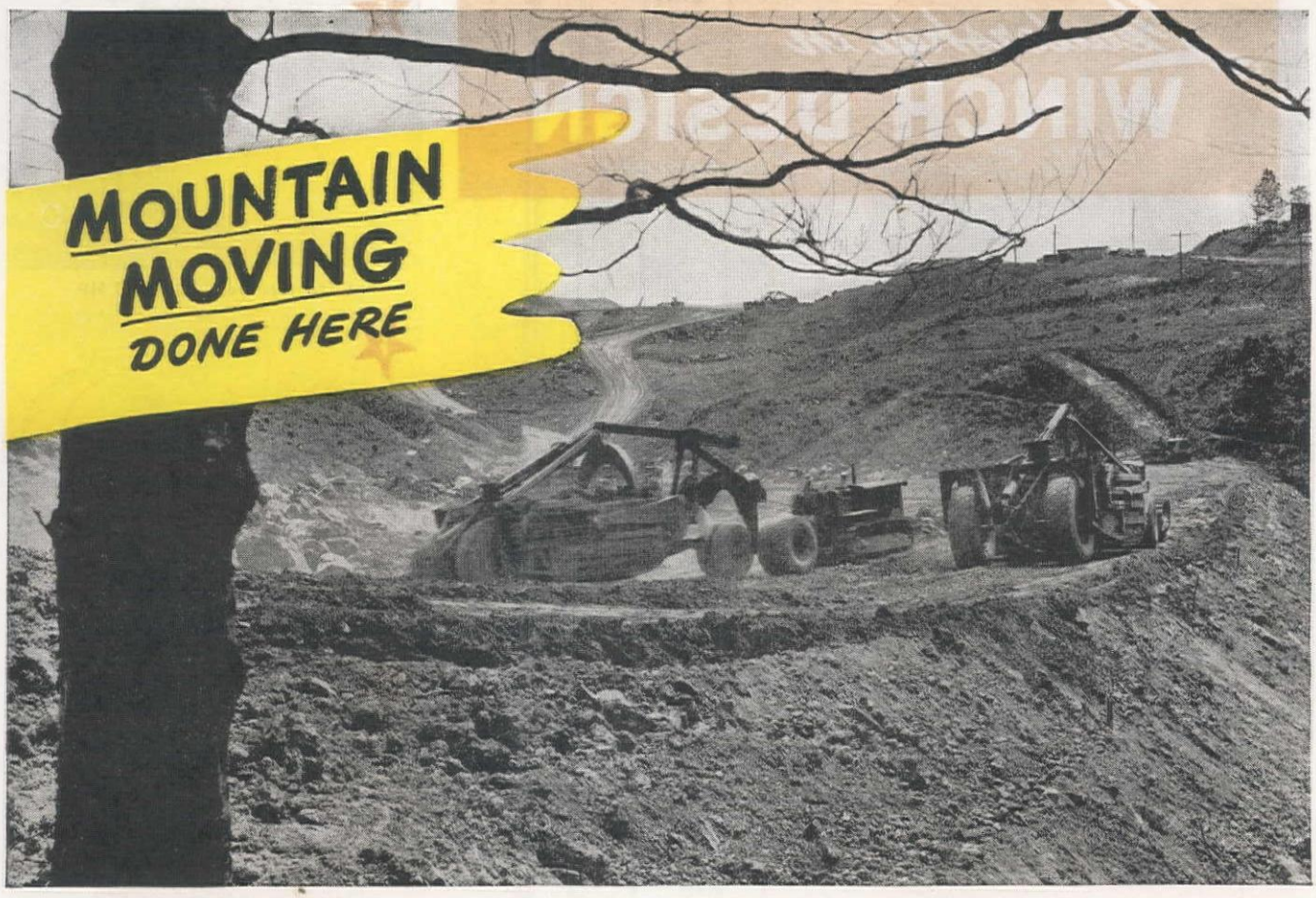
Loading sand at Portland, Maine . . . one of many tasks for this city's TRAXCAVATOR



T4 TRAXCAVATOR loading excess dirt from shoulders on an Indiana road job

WHEN the "go-ahead" signal is given, your well-planned construction projects will get off to a flying start if you have planned to "TRAXCAVATE" — for it's the modern earth-moving and material-handling method. TRAXCAVATORS, the dependable tractor excavators, combine in one machine the usefulness of a shovel, loader, scraper, bulldozer, anglegrader, etc. There's a size for every job and purpose. Your TRACKSON-"Caterpillar" dealer will be glad to give you the complete and revealing story, or write to the TRACKSON COMPANY, Dept. WC-95, Milwaukee 1, Wisconsin.

"Caterpillar" Diesel D8 Tractors pull scrapers on medium hauls in building the mountain-top Kanawha Airport



NEAR Charleston, West Virginia, heart of the Kanawha chemical and industrial empire, a remarkable airport is being built. There's no level ground in the region — nothing but rough sandstone hills and narrow, steep-sided valleys. But by slicing the tops off four adjacent mountains, and filling the valleys between, they're building a huge, modern airport with runways 6000 feet long!

Today some 60 "Caterpillar" Diesel Tractors—track-type and wheel—are busy moving these mountains. Husky D8's are slashing through earth and rock with their bulldozers and tumbling the hilltops into fills as deep as 230 feet.

On the medium hauls, the same sturdy track-type tractors are pulling 25-yard scrapers to the fill. And on the longer hauls of half a mile or more, where road-speed is important, "Caterpillar" Diesel DW10 Tractors, rolling on rubber, take the earth away in "Caterpillar" W10 Wagons. The whole mountain-moving operation is a graphic example of *zoned equipment*, effectively used on a contract totaling over 5,000,000 yards.

Also on this job, three "Caterpillar" Diesel Motor Graders are constructing haul roads and runways; and nine "Caterpillar" Diesel D13000 Engines are powering shovels and compressors.

The Harrison Construction Co., contractors on the airport, have had a great deal of experience with "Caterpillar" Diesels, moving more than 32,000,000 yards of earth in the past four years. Says L. S. Wescott, Asst. Chief Engineer: "On our jobs, temperatures have ranged from 110° in the shade to 40° below zero. Mud has been knee-deep and dust almost as thick. Completely equipped repair shops have been non-existent, and, in spite of these conditions, field-repaired 'Caterpillar' equipment has stayed on the job, working night and day."

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

Zone Your Equipment for Lowest Costs on Earth

1 *Track-type tractors, with bulldozers and rippers.*

2 *Track-type tractors for loading and pulling scrapers.*

3 *Wheel-type tractors for high-speed hauls*

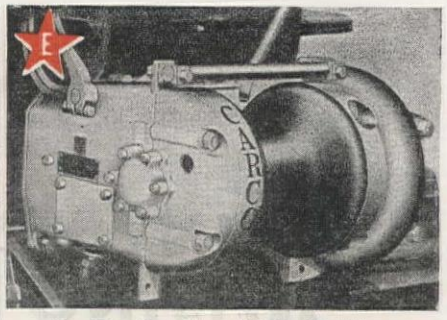
CATERPILLAR
REG. U.S. PAT. OFF.
DIESEL ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT

The discharged veteran wears this emblem. Remember his service and honor him.

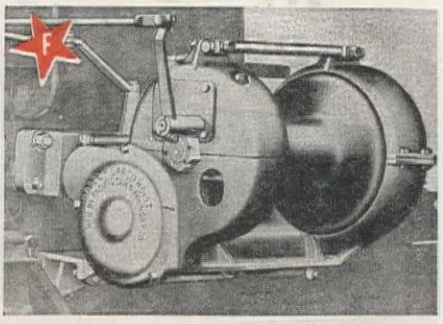
Leadership in WINCH DESIGN

"The Standard of Comparison"

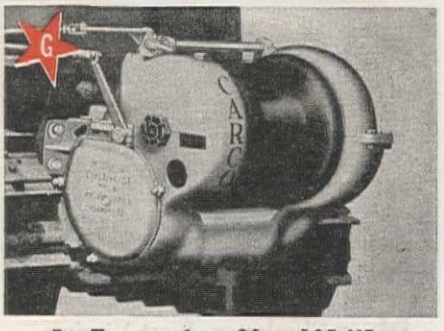
Double Drum Hoists for Tractors from 80 to 160 HP



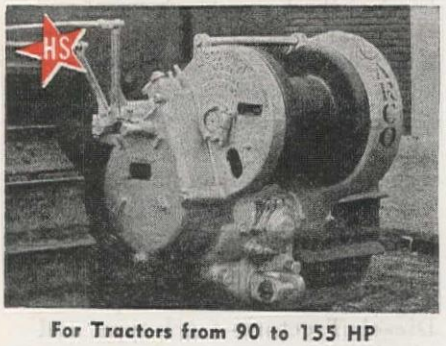
For Tractors from 30 to 50 HP



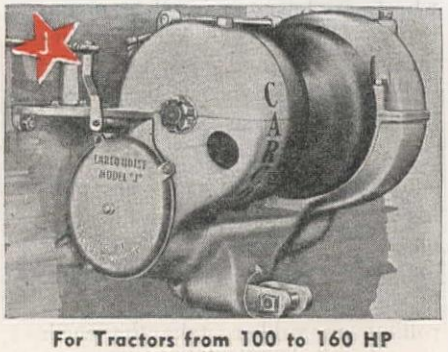
For Tractors from 50 to 75 HP



For Tractors from 80 to 105 HP



For Tractors from 90 to 155 HP



For Tractors from 100 to 160 HP

Sound design . . . proven stamina . . . quality materials and expert workmanship add up to superior service. These basic features of CARCO Winches, backed by years of world-wide use under the hardest conditions, have made them "The Standard of Comparison."

- ★ **Rigid cast Carcometal steel case.**
- ★ **Reversible — powered in and out.**
- ★ **All-gear transmission.**
- ★ **Oil and dust-tight case.**
- ★ **Ball and tapered roller bearings.**
- ★ **Interchangeable parts.**
- ★ **Self-energizing brake.**
- ★ **Safety cable ferrule lock.**
- ★ **Precision-cut gears.**
- ★ **Rugged construction throughout.**

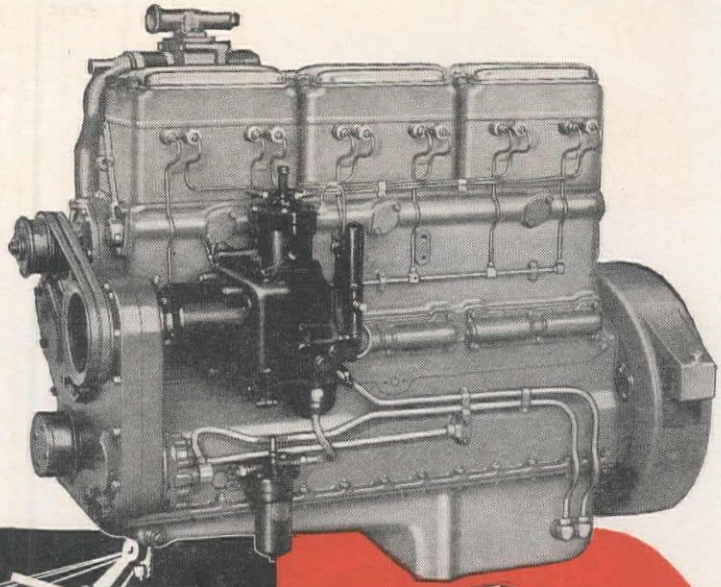
The investment made in a CARCO Winch will repay you many times over in the increased usefulness of your tractor. Install CARCO Winches on your present equipment and specify them for your new tractors.

PACIFIC CAR AND FOUNDRY COMPANY

CARCO

SEATTLE AND RENTON, WASHINGTON, U. S. A.

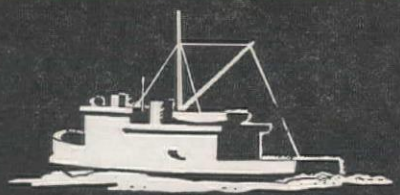
Jobs for PROVED POWER are jobs for CUMMINS DIESELS



More than 90% of all the long-line, franchise-operated, heavy-duty, diesel-driven trucks now operating in the 11 Western States are Cummins-powered.

Any list of the nation's major contractors is a list of Cummins Diesel owners. Their records prove that . . . "powered by Cummins is powered for profit."

On the rich Mesabi Iron Range, more than 80% of the rubber-tired earth and ore moving equipment is powered by Cummins Dependable Diesels.



Service facilities at some 40 salt water and fresh water ports . . . one more reason why so many commercial and pleasure craft are Cummins-powered.

In the vast Mid-Continent Area—the world's greatest oil producing region—Cummins Dependable Diesels power more drilling rigs than any other diesel.

In the Northwest Woods, no single make of diesel engine powers as many yarders, loaders and heavy-duty trucks as Cummins Dependable Diesels.

Some 130 leading builders of powered equipment now offer Cummins Diesels as standard or optional original power . . . *proof of proved performance!*

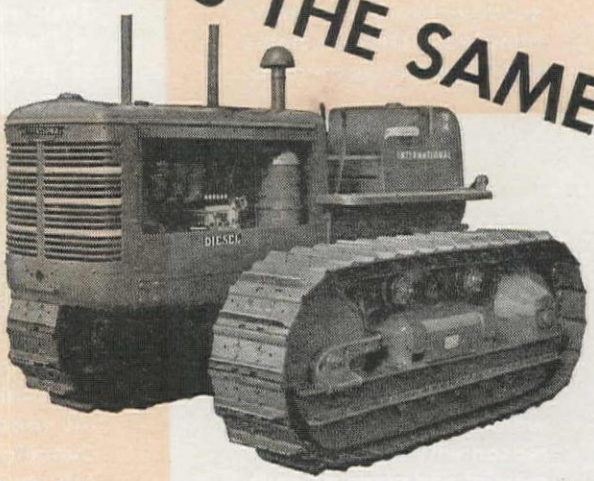
CUMMINS *Dependable* DIESELS

SINCE 1918...PIONEER OF PROFITABLE POWER THROUGH HIGH SPEED DIESELS

For every heavy-duty power application—automotive, portable, stationary and marine—a proved-on-the-job Cummins Dependable Diesel . . . 50 to 275 hp.

CUMMINS ENGINE CO., INC.
Columbus, Indiana

When a Bucyrus-Erie Bullgrader is mounted on an International TracTracTor, the all-important center of gravity does not change appreciably. There is no radical "balance-upset" to cause loss of power, excessive wear, or loss of the efficiency originally built into the tractor. Weight is properly distributed to give you full advantage of tractor power. Maintenance is low because digging loads are applied at the places designed to take them. All the speed, stability, and maneuverability of the bare tractor are still yours . . . No wonder a Bucyrus-Erie Bullgrader in action is a picture of smooth efficiency. The operator can handle it easily without nosing down, gouging, jerking, or stalling. It digs its blade in and sweeps through the cut with the fast action that turns out accurate grades and record outputs. Drive is smooth, easy on the tractor. The whole length of the tracks bears on the ground at all times for full tractive effort. Maximum power is concentrated



at the blade . . . Performance like that will economically solve plenty of dirt-moving problems for you. That's why it will pay you to get complete information on Bucyrus-Erie Bullgraders from your International TracTracTor Distributor. 25T45

See Your INTERNATIONAL TracTracTor Distributor

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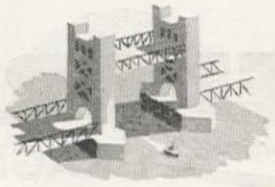
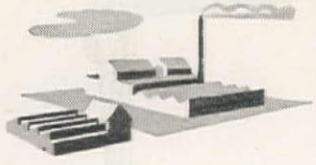
TRACTOR BUCYRUS ERIE EQUIPMENT TE-2

CONSOLIDATED STEEL PRESENTS...

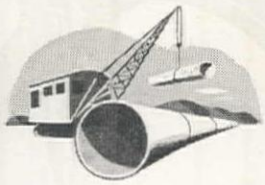
...seven ideas in steel—the kind of jobs Consolidated Steel is prepared to help you plan and build *now*.



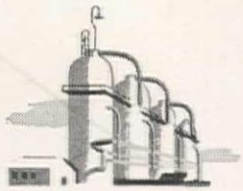
BRIDGES



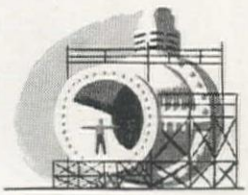
INDUSTRIAL BUILDINGS



PIPE LINES

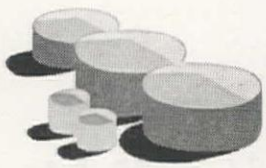


PETROLEUM EQUIPMENT



LARGE VALVES

TRANSMISSION TOWERS



TANKS

If your postwar plans call for precision steel fabrication, Consolidated Steel is ready to offer you swift, capable service. Address Consolidated Steel Corporation, 5700 South Eastern Avenue, Los Angeles 22, California. Other plants at Orange, Texas, and at Long Beach, Wilmington, and Newport Beach, California.

Largest Independent in the West

Consolidated Steel

FABRICATORS
ENGINEERS
CRAFTSMEN

DEPENDABLE

HENDRIX *Lightweight* DRAGLINE BUCKETS

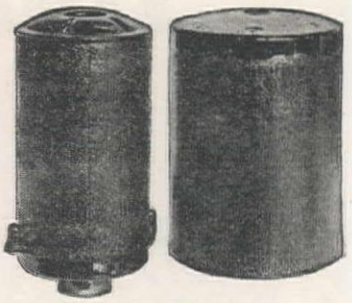
3/8 to 30 Cubic yds.

- ★ 20 to 40 per cent lighter than other buckets, type for type.
- ★ Manganese steel chains, fittings, and reversible tooth points.
- ★ Perfectly balanced—handles easier—fills faster dumps quicker, cleaner.
- ★ All welded construction—for greater strength and durability.
- ★ Gets full load pay material every trip—even in wet digging.
- ★ Available in three types—light, medium, and heavy duty.

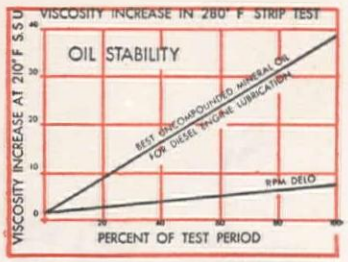
Write for descriptive Literature . . .
. . . or ask your dealer . . . today!

DESOTO FOUNDRY, INC. • MANSFIELD, LOUISIANA

How RPM DELO OIL stops filter clogging



Powerful Anti-Oxidant effects of compounding material in RPM DELO Oil are graphically illustrated by cleanliness of this filter after 500-hour test under heavy duty conditions. Inherent stability of selected base stocks in RPM DELO Oil, plus detergent compounds assure minimum engine deposits, prevention of many costly shutdowns.



This Is How uncompounded oil clogged a regular commercial filter element after only 204 hours in a test run. The shiny sludge deposit is the result of oxidation of oil, plus iron, silica and water. In actual use, a clogged filter can result in stopped-up oil passages and excessive crankcase sludge, necessitating expensive overhauls for cleaning.

Same Type Filter from the same engine, operated on RPM DELO Diesel engine lubricating oil looked like this after 1234 hours. There is little deposit, oil flow is unimpaired. RPM DELO Oil prevents filter clogging two ways: 1. By maintaining piston rings in free working condition. 2. By minimizing oxidation of oil itself.

How RPM DELO Oil resists oxidation far more effectively than other oils is shown in this chart. Results were based upon increase of viscosity during severe laboratory tests. Write Dept. T-X, Standard of California, San Francisco 20, Calif., for more technical information on RPM DELO Diesel Engine Lubricating Oil.

STANDARD OF CALIFORNIA

Standard Fuel and Lubricant Engineers are always at your service. They'll gladly give you expert help — make your maintenance job easier. Call your Standard Representative or write to Standard.

Job records prove TOURNAPULLS ability to

T. M. Page (right) bought four Super C Tournapulls during the fall of 1941 and his fifth in February, 1943. One of the first pair has now worked over 8300 hours, two others have passed 7000. Page, now working his Tournapull fleet on Clover Field Airport at Santa Monica, has used it on California airports at Victorville, March Field, Ontario and San Nichols; on railroad reconstruction at Del Mar, El Vira, Esperanza, Bakersfield, Stockton, Pittsburg and Needles-to-Topock; and on grading for Ammunition Depots at Bellemont, Ariz. and Seal Beach, Calif. Tournapull versatility for any dirt-moving job increases owner profits.

Cheney Wright Co., (left) took delivery of three Super C Tournapulls in October, 1941, bought two more in May, '42. Each of the five has run over 9000 hours, all are still using **original** drive tires as well as Scraper tires. They've licked such tough jobs as Willow Run Airport, Reynolds Airport at Jackson, Bishop Airport at Flint, Tri-City Airport at Freeland, and are at present moving dirt fast on the Quincy, Ill., Municipal Airport. Owners like Tournapull long life.

Harrison Construction Co. bought their first two Tournapulls in February, 1940, used these on a highway project near Johnstown, Pa. and the Alcoa Plant at Marysville, Tenn. Early in 1942 they took delivery of 7 Super C Tournapulls, used them on the Alcoa Plant job, Knoxville, Tenn., Airport and Clinton Engineer Works, Clinton, Tenn. In February, 1945, Harrison purchased four more Super C's with W210 Tournatrailers for the Charleston, W. Va. Airport. Their repeat orders tell what they think of the Tournapull's ability to move dirt at lowest net cost per yard.

McVaugh Haynes Co. purchased two "C" Tournapulls in April, 1941, four Super C's in October, 1941, six more Super C's in April, 1943, still own 10 Tournapulls. These units average up to 5000 hours each, have whipped a lot of high speed jobs like Baer Airfield at Fort Wayne, Ind., Brookley Airfield at Mobile, Ala., Pinto Island job for the Alabama Drydock and Ship Building Co., Vigo Ordnance Plant job at Terre Haute, Ind., Freeman Army Airfield, Seymour, Ind., contracts on the Alaskan Highway, Watson Lake Airport in Yukon Territory, and Dubuque Municipal Airport, Dubuque, Iowa. Again repeat orders tell the story.

JOB-PROVED
Over 3500 Built and Shipped

LE TOURNEAU
PEORIA, ILLINOIS • STOCKTON, CALIFORNIA

{lick tough jobs handle all types of dirtmoving deliver long-life economy

Hodgkiss & Douma (right) bought four of first Model C Tournapulls in June, 1940, have worked them some 6500 hours each on major Michigan jobs including airports at Kinross, Grayling, Willow Run, Pellston, Charlevoix and Hastings; road jobs at Trenary and Grayling; Dow Magnesium Plant construction at Ludington. They still ride on original tires, one unit having had a retread. They've licked as tough scraper dirt as Michigan has to offer, have handled hauls of all lengths to 3 miles one way. In all their travels they've never paid a freight bill, make all moves under own power via highway. Self-powered moves pay dividends.

LaClede-Christy Clay Products Co. have two Tournapull prime movers on 17-yard rear-dump Tournatrailers purchased in March, 1942, that have now worked 11,225 hours each. They handle rocky overburden from a 2-yard shovel at a pit near Wellsville, Mo., still give excellent service. Tournapull interchangeability to Carryall Scraper, Tournatrailer, Tournatruck or Tournacrane increases application range, insures owner earnings over their long lifetime.

Like these successful earthmovers, you, too, will find Tournapulls' long life and lowest net cost per yard the profitable answer to all your dirtmoving problems. For more information, see your LeTourneau distributor TODAY.

C29

TOURNAPULLS

Trade Mark Reg. U. S. Pat. Off.

Follow the Trend

to MOBILE shovels

mounted on big rubber, self-propelled chassis with one-man control, and Full Circle operation . . .

BYERS HALF YARD **TRAVELER**

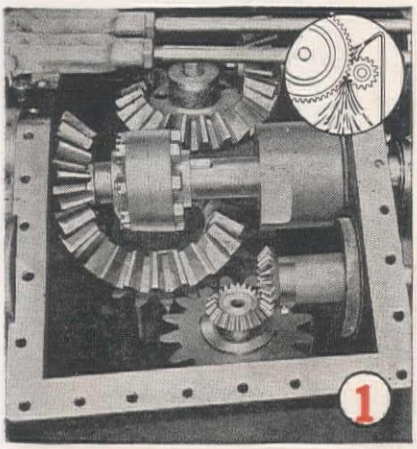
Byers shovels are distributed through:

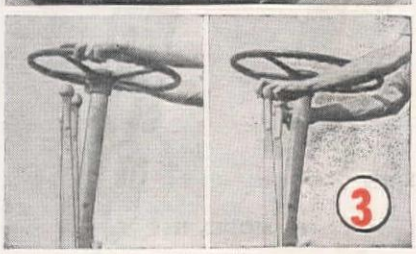
Edward R. Bacon Co., San Francisco
Nelson Equipment Co., Portland & Seattle Offices
Ray Corson Machinery Co., Denver
Willard Equipment, Ltd., Vancouver, B. C.

BYERS HALF YARD TRAVELER

Sets the Pace!

THE *Trend* IS TO OPERATING ADVANTAGES LIKE THESE!





1. Less Wear, Lower Maintenance Cost
Gears enclosed in oil-tight housings and lubricated by force-feed circulation. Gears submerged in oil.

2. One Man Control—Flexibility
All operations of traveling or operating are performed by *one man* located in operator's clear, wide visioned control cab.

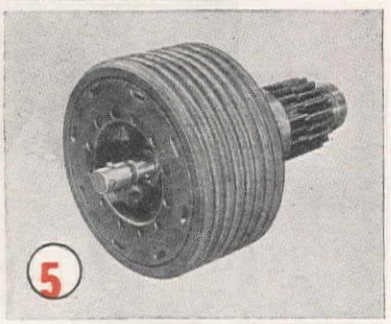
3. Convenient, Accessible Controls
All control levers and foot pedals conveniently grouped so one man can perform all operations easily without leaving his seat. Clutches controlled by finger-touch levers with air pressure . . . not by push, pull and grunt.

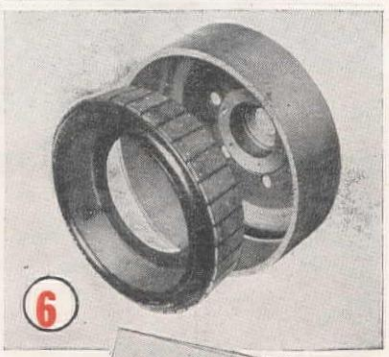
4. Improved Air Clutches
Here is cross section view of the "Traveler's" Airflex clutch used for hoist, swing, crowd, boom hoist and travel transmission. It is a masterpiece of simplicity, is engaged by inflating with air, is released by deflating.

5. Air Clutch Runs Cool
Airflex swing clutch shown here runs so cool, even in warmest weather, that operator can hold his bare hand on finned outer surface of clutch. This is proof of clutching efficiency, freedom from excessive wear.

Full 360° clutch contact with friction surface provides remarkably smooth starting, no jerks, no chattering. Airflex is trouble free because it eliminates adjustment and continual maintenance. There are no clutch adjustments to make *or that can be made.*

6. Airflex Eliminates Clutch Troubles
Efficiency of this clutch has been proved over many years in varied applications. It requires no maintenance because it has no toggles, no levers, no bell cranks, no connecting pins, no shifter collars, no springs to wear or get out of adjustment.





WRITE TODAY FOR THIS NEW ILLUSTRATED BOOKLET

THE BYERS MACHINE COMPANY

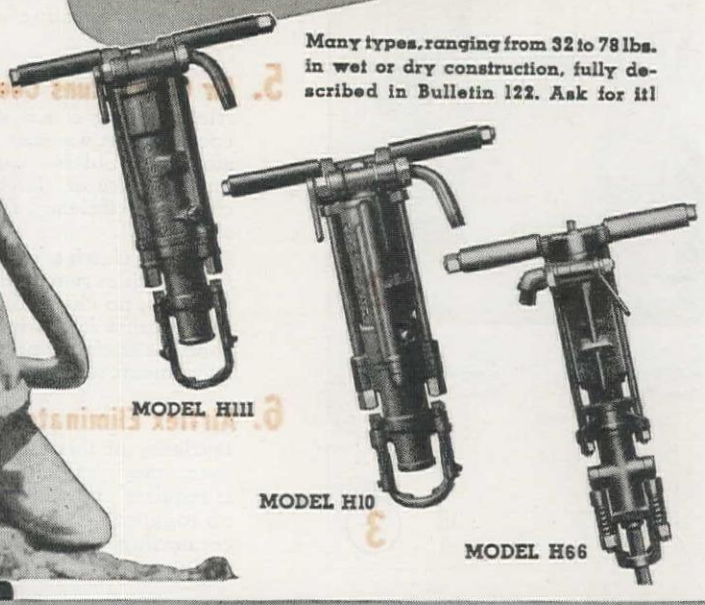
RAVENNA, OHIO

Distributors Throughout the World

12 reasons why CLEVELAND SINKERS are PREFERRED...

1. Drop forged construction insures super-strength.
2. End-seating valve (used on most models) improves with use, prevents greater air consumption with long wear.
3. Big oil reservoir holds enough for four hour's steady operation.
4. Lubrication of rifle nut and bar prolongs their life 50%.
5. Complete lubrication of all parts of the machine insures longer wear of all moving parts.
6. Chrome plated spacer wears 3 times longer, insures full cushion on front end, avoids piston and side rod breakage.
7. Large areas of face contact hold parts in line, minimize wear at joints.
8. Floating chuck clutch prevents binding of piston.
9. Well designed exhaust port prevents freezing.
10. Throttle detents fully enclosed and well oiled.
11. Four pawl rotation—rugged and reliable.
12. Goose neck swivel air connection.

Many types, ranging from 32 to 78 lbs. in wet or dry construction, fully described in Bulletin 122. Ask for it!



MODEL H111

MODEL H10

MODEL H66

CLEVELAND ROCK DRILL DIVISION

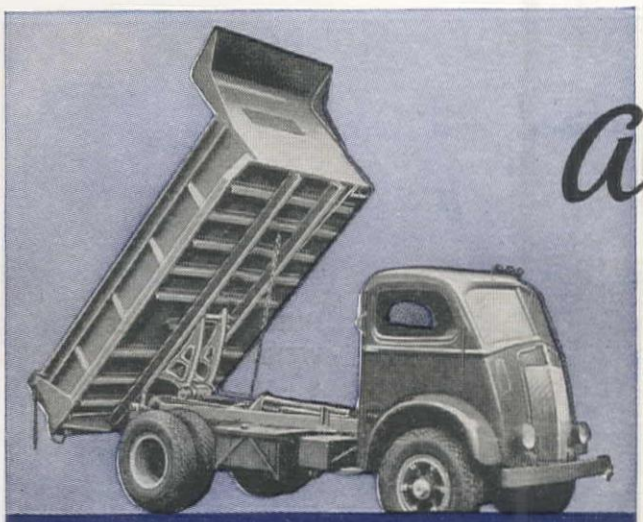
THE CLEVELAND PNEUMATIC TOOL COMPANY

CABLE ADDRESS: "ROCKDRILL" • CLEVELAND 5, OHIO

Leaders— in DRILLING EQUIPMENT

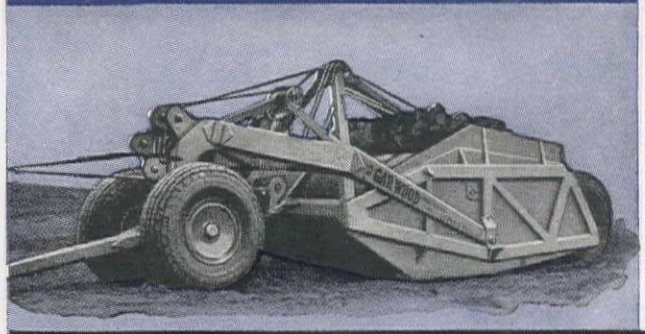
WESTERN BRANCHES: San Francisco, California, 582 Sixth Street; El Paso, Texas, 1225 Texas Street; Butte, Montana, 41 East Broadway; Salt Lake City, Utah, 65 W. Fourth South Street; Wallace, Idaho, 515 Bank Street; Los Angeles, California, 3817 Santa Fe Avenue.

DISTRIBUTORS: THE RIX COMPANY, INC., San Francisco 3, Calif.; NELSON EQUIPMENT CO., Portland, Oregon; LeROI-RIX MACHINERY CO., Los Angeles 11, Calif.; A. H. COX CO., INC., Seattle, Washington.



Model F8C Cam and Roller Hoist with Type W12 Body. Capacity 5 cu. yds.

One-way side dump body with dual hydraulic hoist. Automatic downfolding side.



Always Good!

NOW BETTER THAN EVER

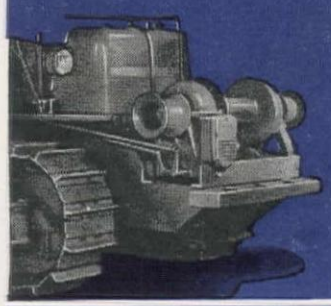
GAR WOOD

CONSTRUCTION EQUIPMENT

For nearly three decades Gar Wood inventive genius, advanced engineering and high quality manufacture provided the world's finest medium and heavy-duty construction equipment. Then came the period when Gar Wood bodies, hoists, winches, etc., were made for one customer—Uncle Sam. Notable mechanical improvements and even greater strength were engineered and built into these rugged units to give them a new high in performance and efficiency.

And now, with civilian production about to be resumed, Gar Wood will build still better construction equipment . . . with greater values, and longer life than ever before.

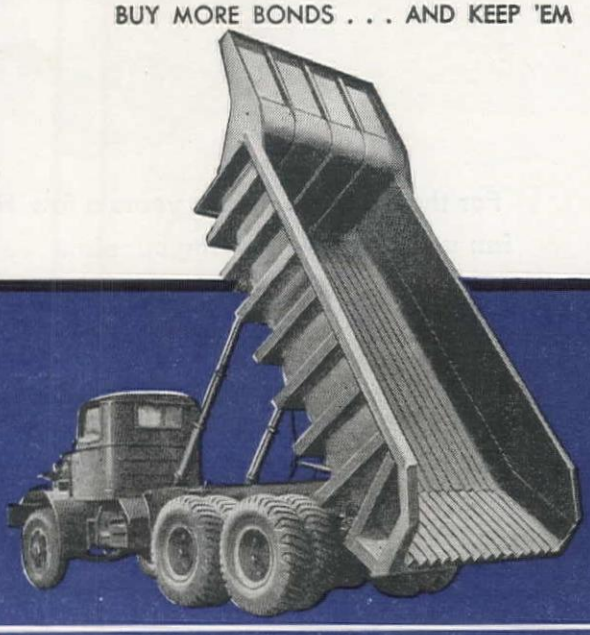
BUY MORE BONDS . . . AND KEEP 'EM



↑ 4-Wheel Cable Scraper—capacities 11, 15, 20 and 25 cu. yds. Rolling ejection. Accurate spreading.

← Tractor or utility winches.

Extra heavy duty type → X112 rock body with open or scoop-end. Hydraulic, twin telescope hoist Model T-4440.



GAR WOOD INDUSTRIES, INC.

DETROIT 11, MICH. WORLD'S LARGEST MANUFACTURER OF TRUCK AND TRAILER EQUIPMENT

HOISTS AND BODIES • WINCHES AND CRANES • TANKS • ROAD MACHINERY • HEATING EQUIPMENT • MOTOR BOATS

For the first time in four years a few Huber Rollers earmarked for "civilian use" are now leaving our plant . . . although our production facilities are still devoted for the most part to war work. These 1945 Hubers measure up in every respect to the pre-war Hubers still in service and to the wartime Hubers which helped knock out Germany and are now contributing to our successes in the Pacific. You'll find them long-lived, dependably powered, economical to operate and keep in service.

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

LEE & THATRO EQUIPMENT CO.
Los Angeles, Calif.

THE O. S. STAPLEY CO.
Phoenix, Arizona

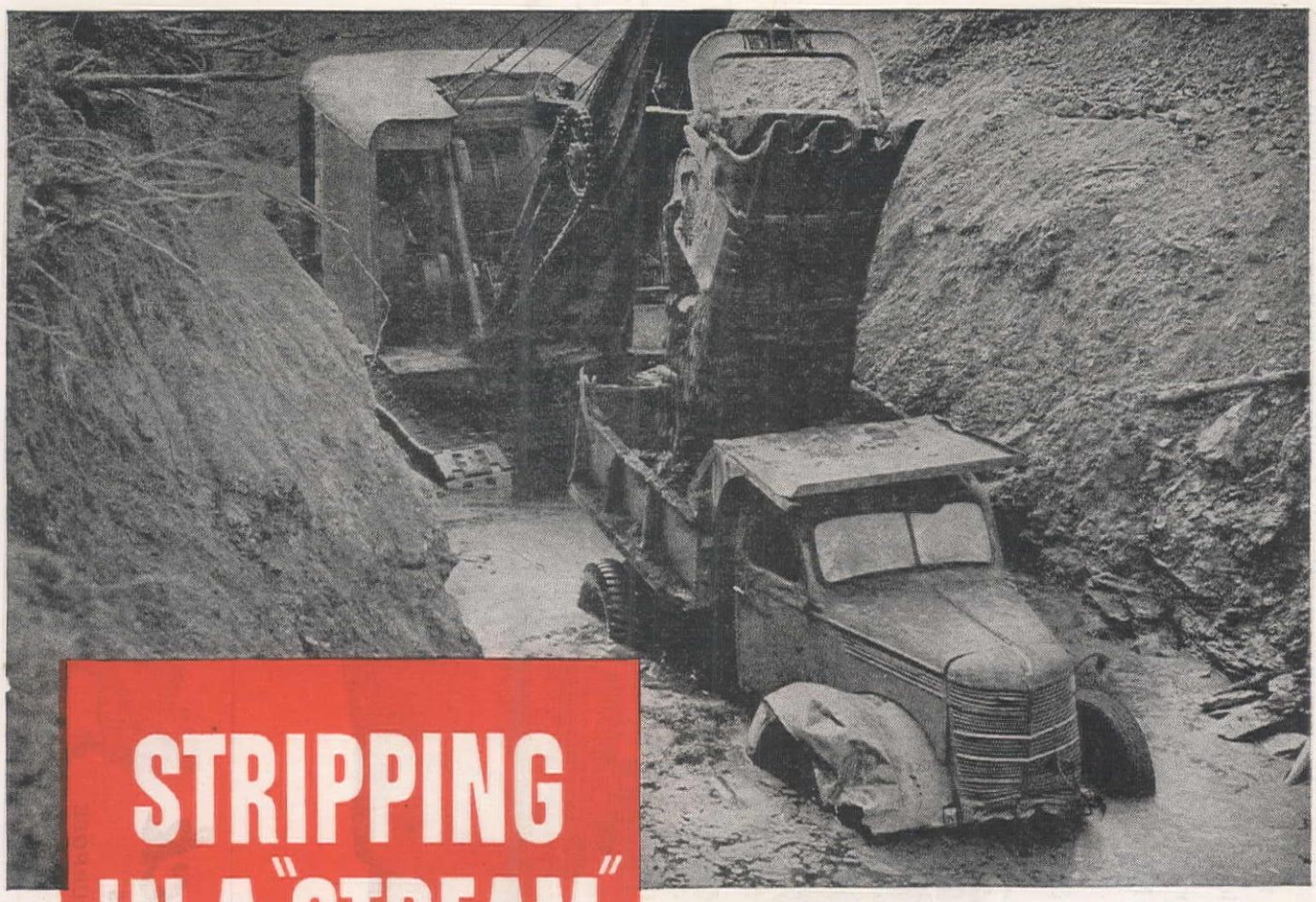
EDWARD F. HALE CO.
San Francisco, Calif.

THE MINE & SMELTER SUPPLY CO.
Denver, Colorado

CONTRACTORS' EQUIPMENT & SUPPLY CO.
Albuquerque, New Mexico

FEENAUGHTY MACHINERY CO.
Portland, Ore. • Boise, Idaho
Seattle, Wash. • Spokane, Wash.

THE C. H. JONES EQUIPMENT CO.
Salt Lake City, Utah

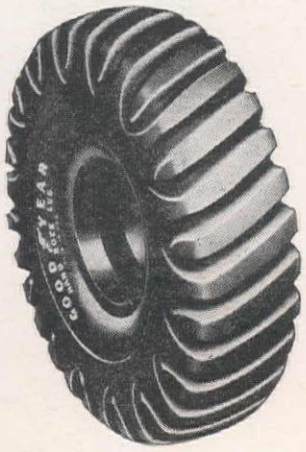


STRIPPING IN A "STREAM"

—but these tires keep loads moving!

HERE'S where work-tires take a daily bath and beating — and come back for more.

On the Wade and Richey Company's coal-stripping job in Alabama, seven trucks like the one above — all equipped with Goodyear Hard Rock Lug tires — haul away the coal. But a perverse creek nearby puts much of the area under several feet of water. So loads must be pulled through sticky mud and slime — often over submerged and murderous rocks, shale, sharp stones.



Yet these Goodyears — all veterans of many months of rough and rugged service at various ore and quarry operations before their transfer here — are delivering top-notch performance on this tire-killing job because they're built tough for tough going, have the stamina to take long punishment.

The other Goodyear off-the-road tires, too, are job-proved, high-hour performers — the great Sure-Grip with *open center* tread for drive wheels where traction counts most, and the time-proved All-Weather Earth Mover for drawn vehicles where easy rolling is a must.

And because these tough work tires consistently deliver lower costs-per-ton-mile, more and more contractors now buy Goodyears for their units. Chances are you will, too, once you get the story from men now using them.

Sure-Grip, All-Weather—T.M.'s The Goodyear T. & R. Co.

GOODYEAR

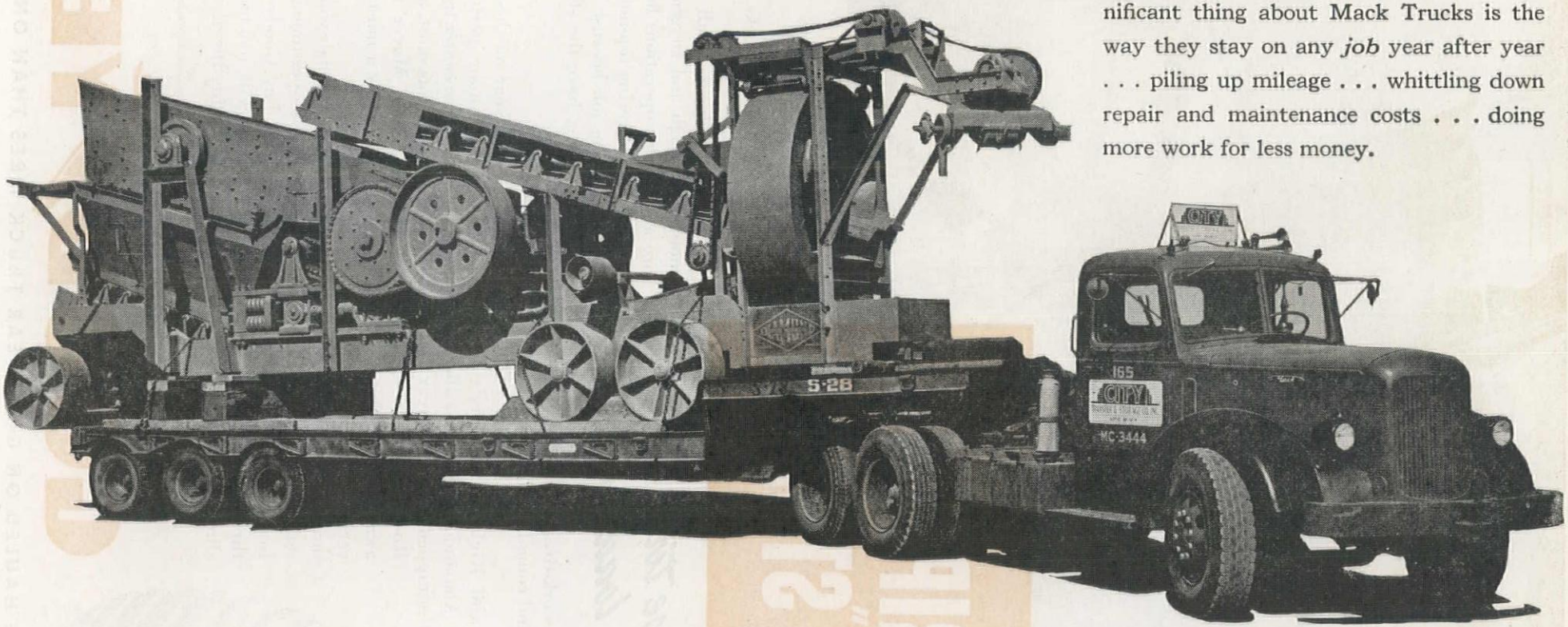
MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

It couldn't be done.. but a MACK DID IT!

It was a staggering assignment—moving a 38-ton rock crusher to Los Angeles from the U. S. Naval Station at Inyokern, California, *230 miles away*. Over the mountains and through the Mojave desert twisted the gruelling route.

The City Transfer & Storage Co. of Long Beach, California, solved the problem simply. They set the rock crusher on a 35-foot three-axle trailer and coupled the vast load to a Mack LJSW. And the long trek went off without a hitch.

Spectacular jobs such as this are not the only ones at which Macks excel. The significant thing about Mack Trucks is the way they stay on any *job* year after year . . . piling up mileage . . . whittling down repair and maintenance costs . . . doing more work for less money.



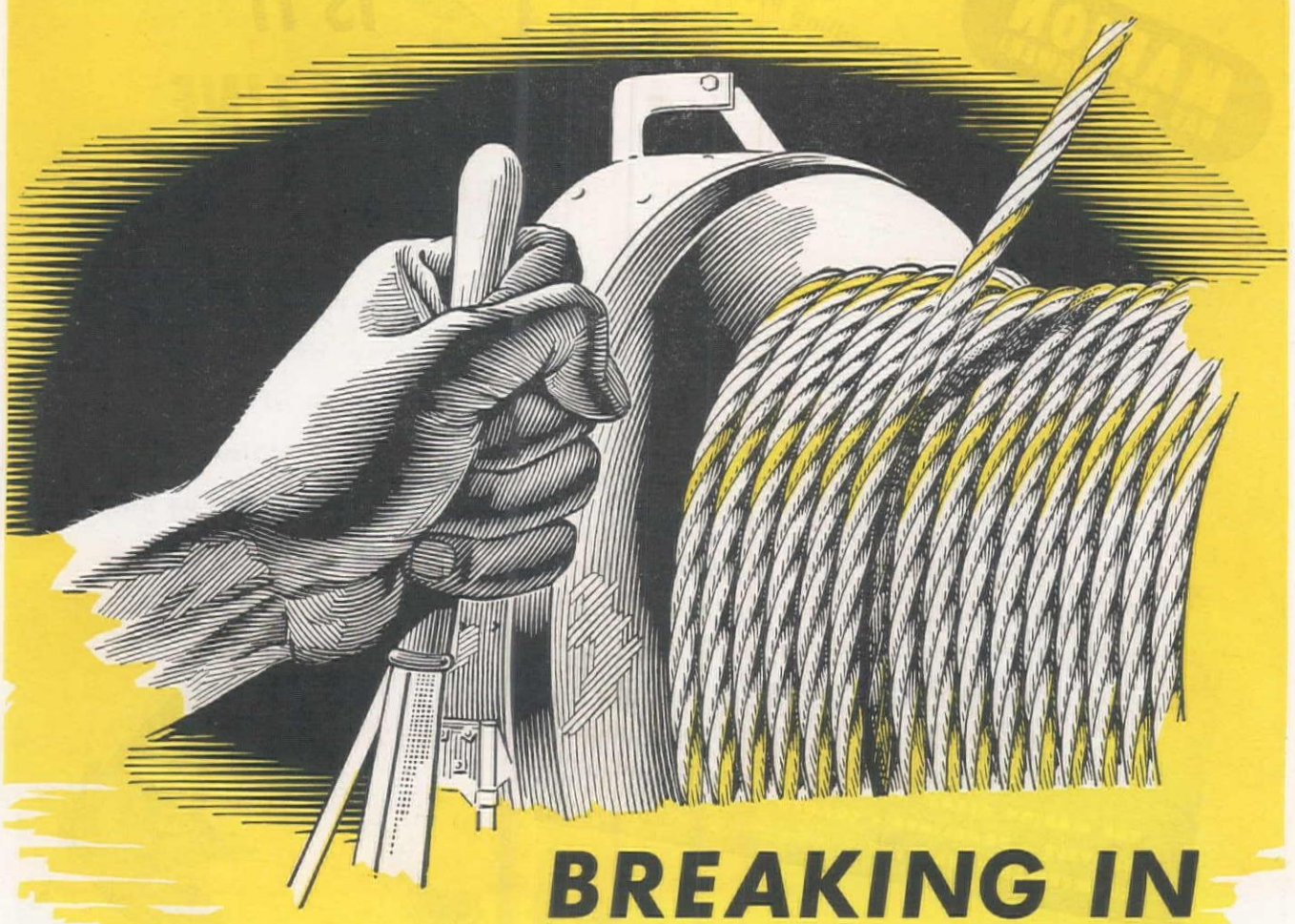
★ BUY THAT EXTRA WAR BOND TODAY ★

Mack-International Motor Truck Corporation—Los Angeles, Sacramento, San Francisco, Seattle, Portland, Salt Lake City.

Mack
TRUCKS
FOR EVERY PURPOSE
ONE TON TO FORTY-FIVE TONS

NEW Mack Trucks are available for essential civilian use. Ask for details.

Take the full load sooner!



BREAKING IN

the new line is a short job with *PREFORMED* YELLOW STRAND

Let's agree that "slow and easy" is a good rule for putting most equipment to work — *Preformed* Yellow Strand included. Proper adjustment between wire rope and other operating parts extends rope life.

But a prolonged slowdown for starting a new rope is expensive. And it's *unnecessary* with *Preformed* Yellow Strand, because the factory process that preshapes wires and strands is equivalent to a *preliminary break-in.*

When flexible *Preformed* Yellow Strand reaches you it is notably relieved of internal stresses. You save much of the time that would be spent trying to relax the stiffness of a corresponding unpreformed rope. After a short, gradual stepping up—to bed the strands firmly on the core—you can take the full load.

The same rope tractability aids production in other ways. *Preformed* Yellow Strand is installed quickly. It resists kinking... stays in the sheave grooves... curbs overwinding on the drum.

Specify *Preformed* Yellow Strand by name. Get all you should in wire rope performance and economy. Broderick & Bascom Rope Co., St. Louis 15, Mo. *Branches:* SEATTLE, Portland, New York, Chicago, Houston. *Factories:* SEATTLE, St. Louis, Peoria.

HAND BOOK FREE: "Industrial Wire Ropes" contains useful facts, tables, pictures. Write for your copy.

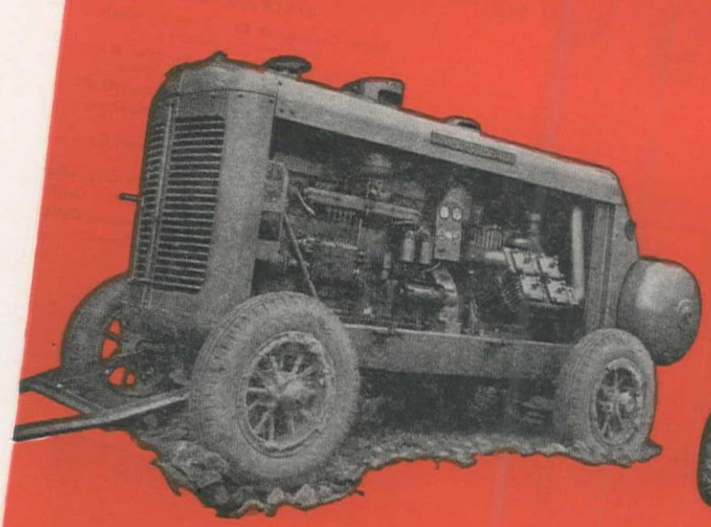
ARMY E NAVY

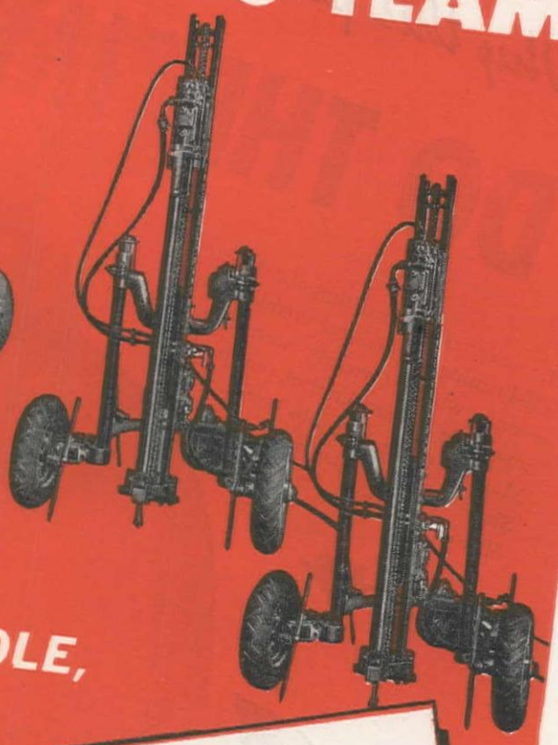
BRODERICK & BASCOM

Yellow Strand

***PREFORMED* WIRE ROPE**

HERE'S A WINNING TEAM





1350 FEET OF DRILL HOLE, EVERY SHIFT, PROVE IT

The combination of two FM-2 Wagon Drills and a K-500 Mobil-Air Compressor helped carve an airport out of solid rock in an unbelievably short time. The rock was of average hardness, yet this team drilled 75 holes every 8 hours—each hole being 18 feet deep.

This total of 1350 feet of drill hole per shift should give you a good idea of the lower drilling costs you can get by putting this team to work.

K-500 Advantages

The 2-stage, air-cooled K-500 Mobil-Air Compressor easily runs two FM-2 Wagon Drills. Equipped with our patented Drill-More Regulator, it provides up to 15% faster drilling and uses up to 40% less fuel to do an average drilling job. Other features are light weight, a convertible engine for operation on either gasoline or oil, a spring mounting and automotive steering.

FM-2 Advantages

The FM-2 Wagon Drill is extremely flexible. Holes can be drilled at any angle and set-up time is reduced. Drill steel feeding pressure from 0 to 1000 pounds is provided by a compact, sturdy air motor. The operator can easily select the right feed for any rock condition. Steel changing time is cut in half and drilling speeds are faster. The sturdy X-71WD Drill used on the FM-2 was developed especially for wagon-drill service. It hits a heavy hammer blow and has a unique follow-through characteristic which overcomes the inertia of long, heavy drill steel.

Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y.

COMPRESSORS · CONDENSERS · TURBO BLOWERS · CENTRIFUGAL PUMPS · ROCK DRILLS · AIR TOOLS · OIL AND GAS ENGINES

5-711

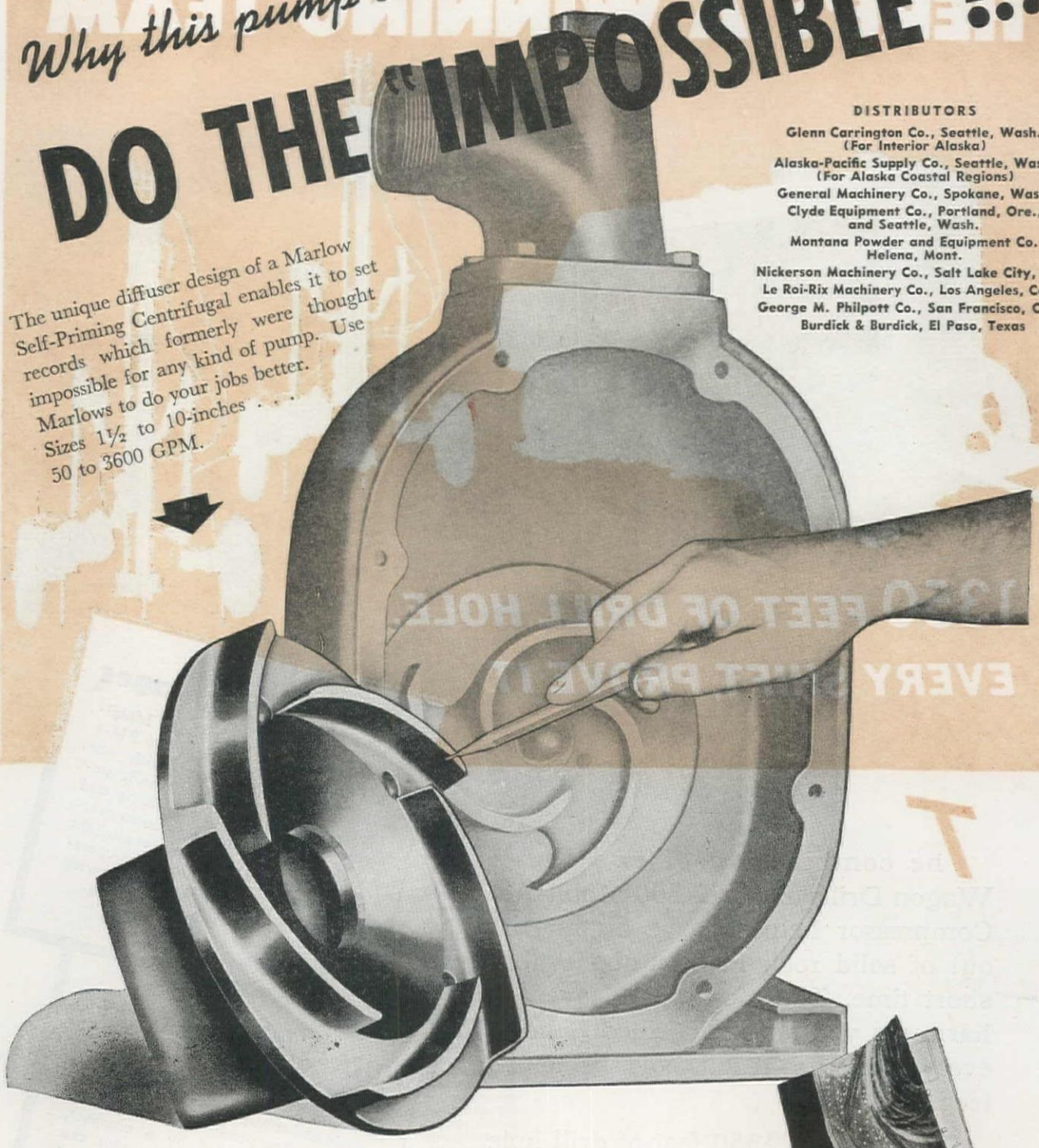
Why this pump can

DO THE "IMPOSSIBLE"!...

The unique diffuser design of a Marlow Self-Priming Centrifugal enables it to set records which formerly were thought impossible for any kind of pump. Use Marlows to do your jobs better. Sizes 1½ to 10-inches . . . 50 to 3600 GPM.

DISTRIBUTORS

Glenn Carrington Co., Seattle, Wash. (For Interior Alaska)
Alaska-Pacific Supply Co., Seattle, Wash. (For Alaska Coastal Regions)
General Machinery Co., Spokane, Wash.
Clyde Equipment Co., Portland, Ore., and Seattle, Wash.
Montana Powder and Equipment Co. Helena, Mont.
Nickerson Machinery Co., Salt Lake City, Utah
Le Roi-Rix Machinery Co., Los Angeles, Calif.
George M. Philpott Co., San Francisco, Calif.
Burdick & Burdick, El Paso, Texas



A Marlow Self-Priming Centrifugal differs from all other pumps. Regular centrifugals cannot prime themselves at all—therefore are unsuitable for many tasks. Ordinary self-priming centrifugals can prime themselves—but do so by means of auxiliary vacuum pumps, by-pass valves or other recirculation mechanisms. These devices consume power and reduce pumping efficiency.

A Marlow contains no such device. Instead, it primes itself by the action of the water within the stationary diffuser which surrounds the pump impeller. This diffuser serves a dual purpose—it exhausts air or vapor during priming and it converts the water flow into pressure head at top efficiency when pumping. Send for Marlow literature.

MARLOW PUMPS • RIDGEWOOD, NEW JERSEY

ENGINEERED BY MARLOW

Build Better Roads to SEE AMERICA!

Cedarapids

Built by IOWA

The beauty and grandeur of America's scenic wonderlands will beckon travelers soon again when America is once more "a nation on wheels". Many more miles of smooth, all-weather black-top roads will be built, providing both employment and enjoyment for millions of Americans.

Contractors who look ahead, plan ahead, will be the ones who get the bigger, more profitable road contracts. The owner of a Cedarapids Hot or Cold Mix Asphalt Plant is completely prepared to bid on any bituminous job that comes along. Flexible, easy to set up or knock down, these asphalt plants are sure and simple in operation. Grading and proportioning are accurate beyond the tolerance of the most rigid highway department specifications and outstanding performance is attained through the efficient coordination of all parts. Properly balanced, the feeder, driers, elevators, screening, batching and mixing units all work together in close harmony for fast, smooth and accurate production. Let your Iowa dealer tell you more about these profit-making asphalt plants.

BATCH TYPES OR CONTINUOUS MIX TYPES—all sizes are available.

THE IOWA LINE
of Material Handling Equipment

distributed by

HOWARD-COOPER CORP.
Seattle, Washington, and Portland, Eugene, and Medford, Oregon

HALL-PERRY MACHINERY CORP.
Butte, Great Falls, Missoula, and Billings, Montana

INTERMOUNTAIN EQUIPMENT CO.
Boise and Pocatello, Idaho, and Spokane, Washington

WORTHAM MACHINERY CO.
Cheyenne, Wyoming

LUND MACHINERY CO.
Salt Lake City, Utah

BROWN-BEVIS EQUIPMENT CO.
Los Angeles, California

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Denver, Colorado

EDWARD F. HALE CO.
San Francisco, California

ARIZONA-CEDAR RAPIDS CO.
Phoenix, Arizona

R. L. HARRISON CO., INC.
Albuquerque, New Mexico

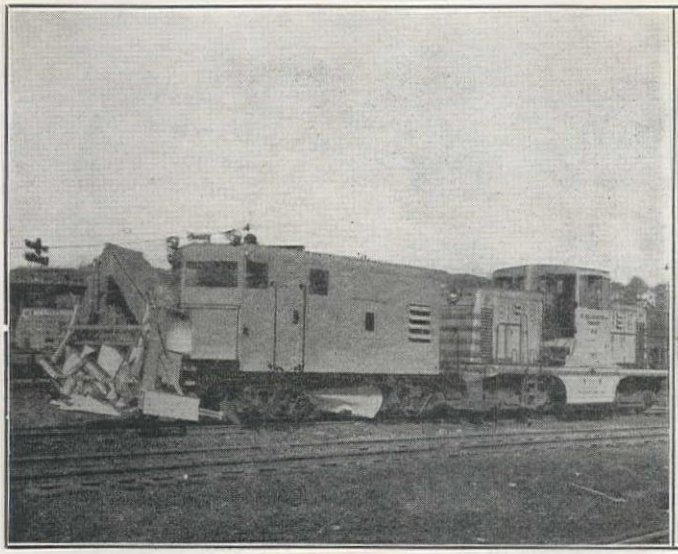
SIERRA MACHINERY CO.
Reno, Nevada

IOWA MANUFACTURING CO.
Cedar Rapids, Iowa

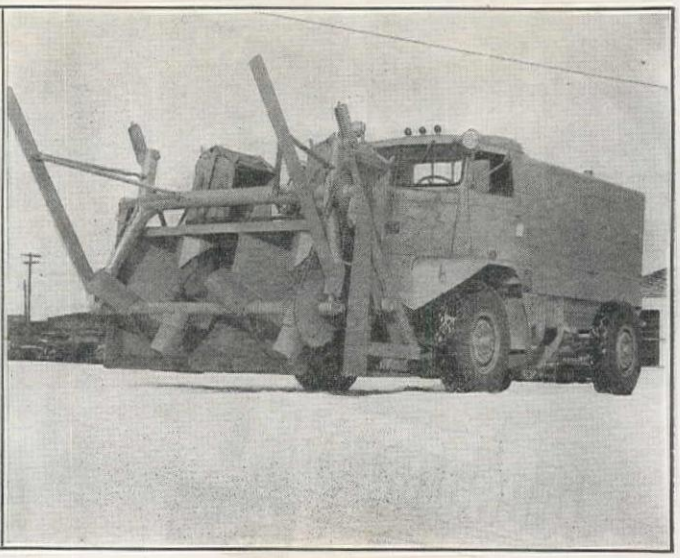
MASTER OF SNOW AND ICE

BROS ROTARIES BY THE HUNDREDS were used by the Army to keep military roads and airports open when demands of strategy called for undelayed advances in both Europe and America.

THE NAVY USED BROS ROTARIES to keep the airports open so that the heavy demands of flight transportation could be met daily without needless and costly delays or interruptions.



RAILROADS USED BROS ROTARIES to keep their main lines open and to remove the ice hazard in open stations and in congested switch yards. A loading chute permits side-loading into cars.



CITIES, COUNTIES AND STATES used Bros Rotaries to keep the streets and highways open for the Nation's traffic. Wm. Bros Boiler & Manufacturing Company, Minneapolis 14, Minnesota.

Give us your Snow Problems—we'll give you the answer

BROS

FABRICATORS OF STEEL • BOILERS • STOKERS • TANKS • ROAD EQUIPMENT

"...have used nothing else for 10 years"

FROM LOUISIANA

EDWARD SWAN; General Manager
Walter P. Villere, General Contractor
New Orleans, Louisiana

One of a series of testimonial letters received from all parts of the United States

"...our company uses in the construction business one of the largest draglines in the South, a Walking Monagan, capable of handling 10 cubic yards of dirt at a time.

...machine which is now working on an emergency levee building job on the Mississippi River at Baton Rouge, is powered by a Fairbanks Diesel motor.

...as you know, a Diesel motor operates faster, and under increased pressure of heat, ordinary oils form carbons and plug up piston rings...power and compression are cut to an alarming extent.

...ten years ago Macmillan Ring-Free Motor Oil was recommended as a solution to the problem of keeping machine in prime working order...we have used nothing else since.

...having been around machinery all my life, have yet to see any other motor oil accomplish in both Diesel and gasoline motors what Macmillan Ring-Free can do."

Excerpts of letter from– Edmund Swan

Other equipment operated by Villere Company: two P. H. Shovels, 1¼ yard capacity with Waukesha motors; four 1½-Ton Ford Trucks, one 1½-Ton International, one 1-Ton Diamond T; 1940 Imperial Chrysler, 1942 Oldsmobile, 1936 Chrysler, 1941 Plymouth. On Macmillan Ring-Free, of course!

MACMILLAN RING-FREE MOTOR OIL

Operators of all types of equipment report lower-cost, more efficient performance with Macmillan Ring-Free Motor Oil. Find out how it can help lick your toughest lubrication problems...Phone or write the nearest Macmillan office.

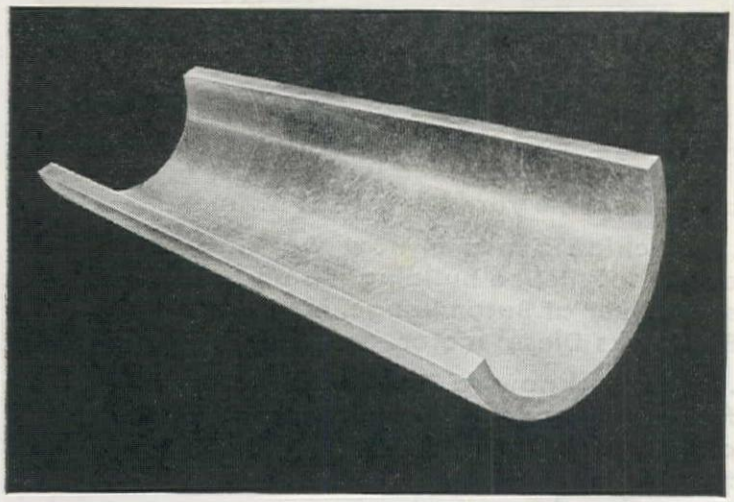
MACMILLAN PETROLEUM CORPORATION

50 W. 50th Street, New York 20 • 624 So. Michigan Avenue, Chicago 5 • 530 W. Sixth Street, Los Angeles 14 •

You save on all 3 counts!

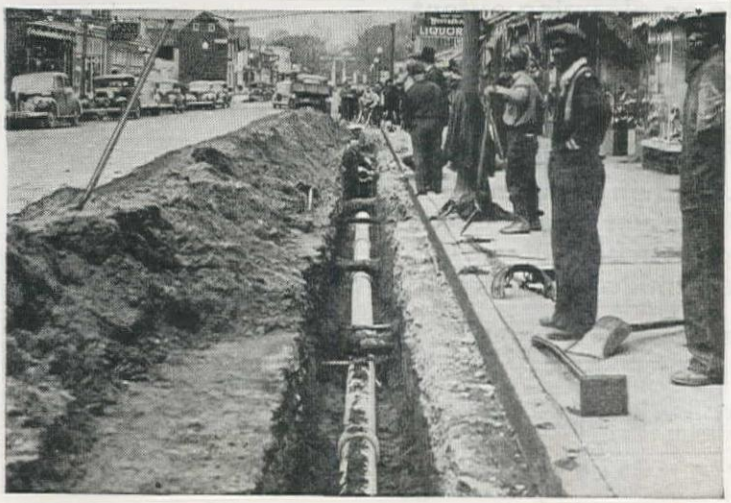
low installation costs

In every phase of pipe installation—including handling and assembly—you save with Transite! You save because this light weight pipe requires smaller installation crews . . . needs no mechanical handling equipment except for the larger sizes. Rapid assembly is assured with the Simplex Coupling.



low operating costs

Because of Transite's asbestos-cement composition, its initial high delivery capacity (C-140) can never be reduced by tuberculation. Pumping costs stay low. This advantage often permits use of smaller diameter pipe . . . and ends problems arising from progressive reduction of carrying capacity due to tuberculation.



low maintenance costs

In modern water systems, Transite Pipe provides another important money-saving advantage—low maintenance. Even in highly aggressive soils, it stubbornly resists corrosion. And because Transite cannot tuberculate, the need for periodic cleaning is eliminated—another appreciable maintenance saving.

Booklet TR-11A gives all the facts. Write Johns-Manville, 22 East 40th Street, New York 16, N. Y.

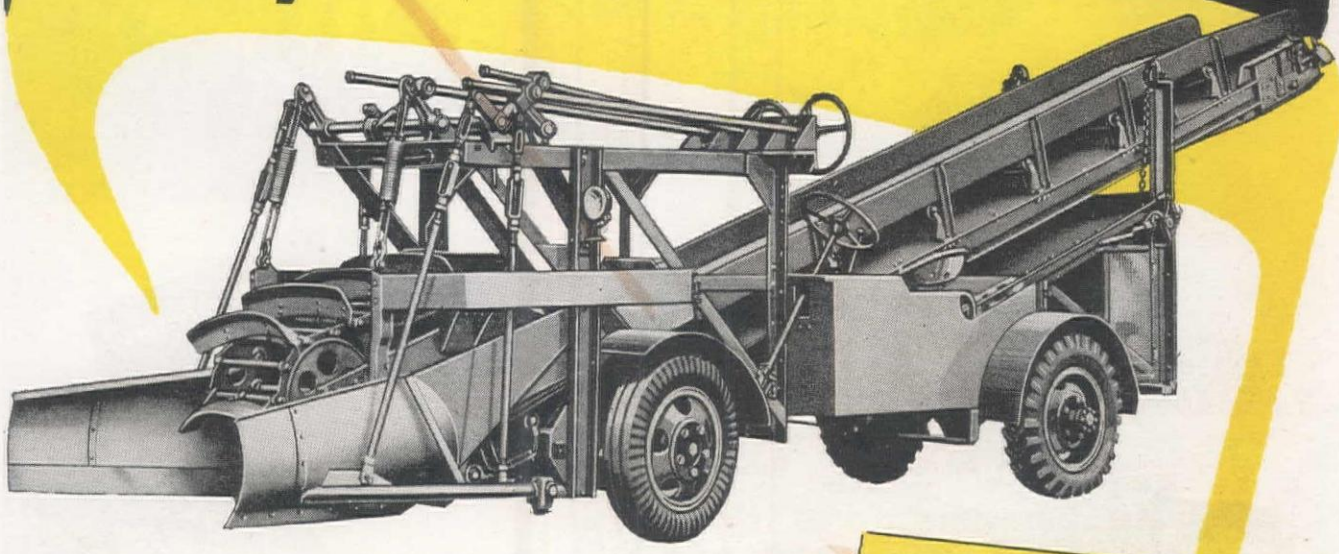
Johns-Manville

TRANSITE PIPE
for efficient, economical water transportation

HIGHWAY ENGINEERS ACCLAIM MANY *War-Time* USES OF

★

Athey FORCE-FEED LOADER



Here's What They're Saying

"Just the tool we've wanted."

"Speeds every one of our loading jobs."

"There's nothing else like it."

"Simplifies our highway maintenance problems."

"It's a lifesaver these busy war days."

"Keeps our roads better maintained than ever before."

Busy highway departments are turning away from hand and other obsolete, costly loading methods . . . finding the modern, Athey Force-Feed Loader a versatile piece of equipment for many wartime maintenance jobs.

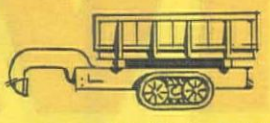
Operating as a companion tool with your "Caterpillar" Motor Grader, the Athey Force-Feed Loader is a self-propelled, one-man operated outfit designed to help solve your manpower problems and speed the removal and salvage of surplus material on highway maintenance and construction.

You'll find the Athey Force-Feed Loader an economical, fast, clean tool for handling surplus material in ditch cleaning, road widening and straightening, slope trimming, road grading, building and relocating ditches, salvaging topsoil, and loading oil mix.

Investigate the Athey Force-Feed Loader for your highway maintenance work. See your Athey-"Caterpillar" dealer today, or write direct to Athey Truss Wheel Co., 5631 West 65th Street, Chicago 38, Illinois.

Athey

FORCE-FEED LOADER



FORGED-TRAK TRAILERS

MOBILOADERS

DEPENDABLE LOADING & HAULING EQUIPMENT

heavy duty air power

all you want where you want it!

PRODUCTS
Portable Compressors
Stationary Compressors
Rock Drills
Wagon Drills
Core Drills
Portable Hoists
Spaders
Paving Breakers
Trench Diggers
Sheeting Drivers
and other
Pneumatic Tools

When you want dependable air power and plenty of it in those "hard-to-get-at" places you'll appreciate the "wallop" that's packed into a Sullivan heavy duty, two-stage portable air compressor. The Diesel-powered compressor shown, Model 365 which delivers 365 C.F.M. actual free air, provides the efficiency of two-staging, the economy of heavy duty operation and the mobility of smaller Sullivan portables.

Typical of Sullivan compressors are their built-in dependability and ruggedness . . . which help to finish your job on time.

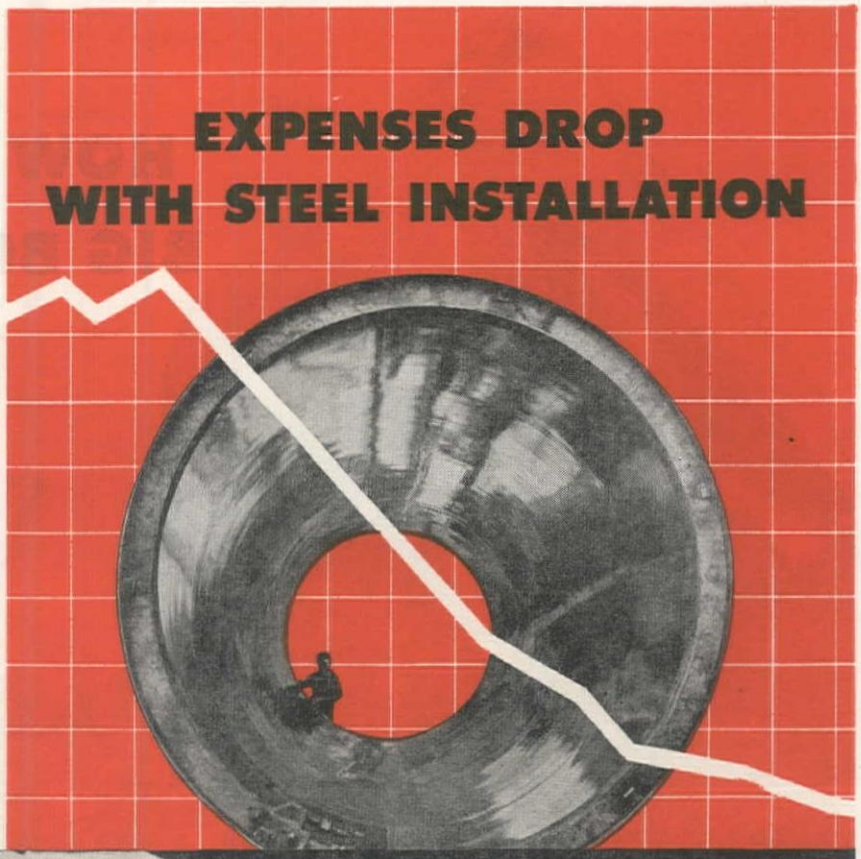
Consult your nearest distributor or branch office.

Sullivan Machinery Company, Executive Offices: Michigan City, Indiana. In Canada: Sullivan Machinery Company, Ltd., Dundas, Ont.

SULLIVAN

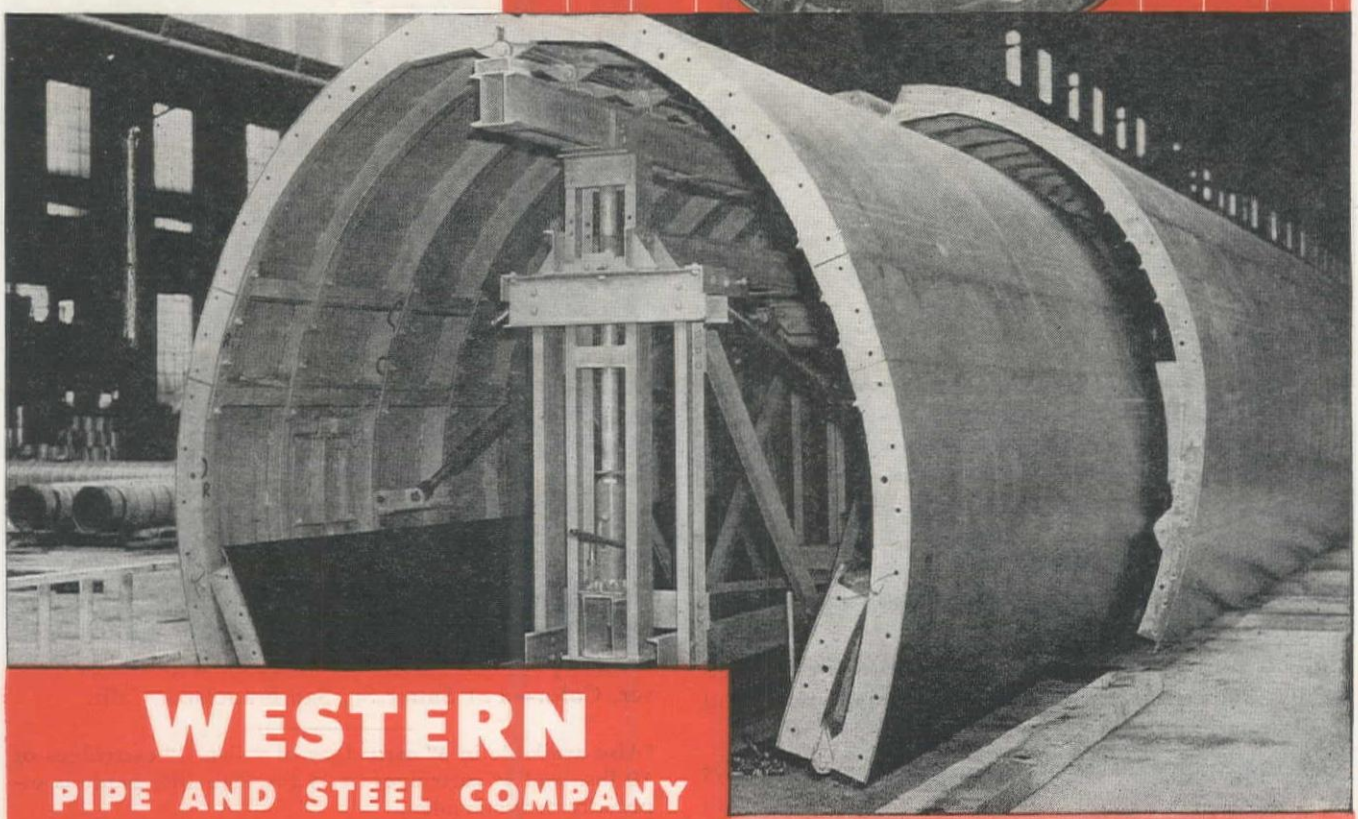
OFFICES Birmingham • Boston • Butte • Chicago • Claremont • Dallas • Denver • Duluth • El Paso • Huntington • Knoxville • Los Angeles • Middlesboro • New York • Pittsburgh • Portland • Salt Lake City • San Francisco • Scranton • Seattle • St. Louis • Washington, D. C.

EXPENSES DROP WITH STEEL INSTALLATION



● Because there is only one installation cost, and because upkeep is at a minimum, steel makes the ideal installation for sewers, culverts, water towers, water mains, penstocks, tanks, boilers, as well as pipe for oil, gas and water.

Western Pipe and Steel Company has full facilities to build and fabricate the job from start to finish. Our highly specialized personnel can furnish you with vital construction data if you are planning a job that calls for steel. A letter or phone call is all that is necessary.



WESTERN
PIPE AND STEEL COMPANY OF CALIFORNIA

Fabricators and Erectors

5717 Santa Fe Avenue
Box 2015, Terminal Annex
Los Angeles 54, California

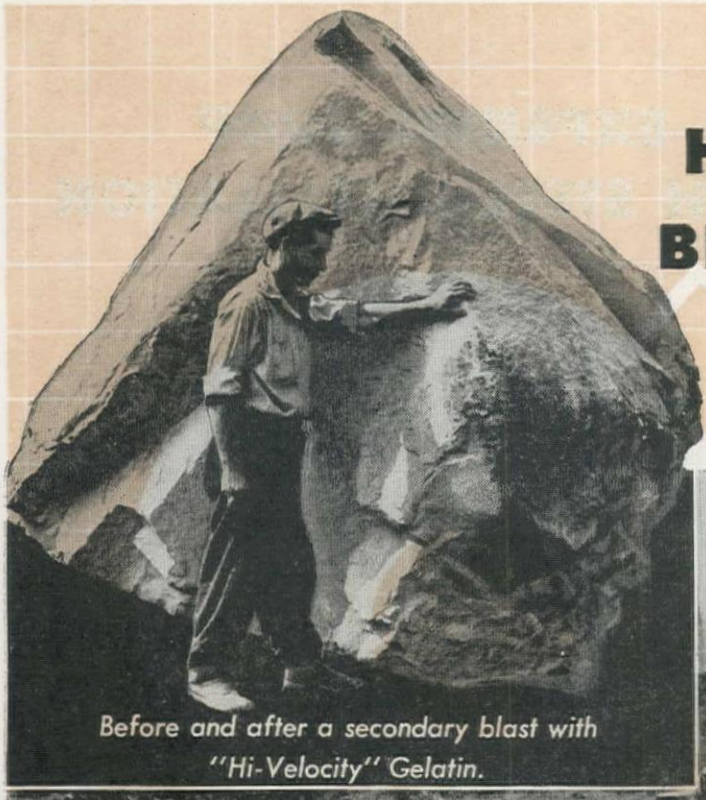
200 Bush Street
San Francisco 6
California

WESTERN BUILT PRODUCTS INCLUDE:

Absorbers	Gas Cleaners	Refinery Equipment
Agitators	Gas Separators	Tanks
Boilers	Pipe	Bolted
Casings	Oil	Riveted
Oil and Water	Gas and Water	Welded
Culverts	Penstocks, Steel	Walkways
		Structural

PLANTS AND OFFICES: FRESNO, BAKERSFIELD, TAFT, CALIFORNIA AND PHOENIX, ARIZONA

HOW TO BREAK UP BIG BOULDERS...*easily*



Before and after a secondary blast with "Hi-Velocity" Gelatin.

"HI-VELOCITY" GELATIN simplifies the job

For economical secondary blasting . . . turn to Du Pont "Hi-Velocity" Gelatin.

This powerful high-velocity dynamite does the job easily and quickly. It saves time, manpower and equipment.

"Hi-Velocity" saves money, too, because it always detonates at its maximum velocity and, as a result, saves from ⅓ to ½ of the amount of explosives generally required for this type of work. Its tremendous shattering power eliminates the need of confining the charge with mud . . . completely breaks up big boulders.

Charges of "Hi-Velocity" are easily measured. 1¾" x 8" sticks weigh a pound each.* Cutting or slicing raw dynamite is unnecessary.

Try Du Pont "Hi-Velocity" Gelatin for simplified secondary blasting. Compare results with those you have been getting. E. I. du Pont de Nemours & Co. (Inc.), Hoge Bldg., Seattle, Wash.—Old National Bank Bldg., Spokane, Wash.—Midland Savings Bldg., Denver, Colo.—111 Sutter St., San Francisco, Calif.

*Also available in 3" cartridges of 5 lbs., 4" cartridges of 10 lbs., and 5" cartridges of 25 lbs. The 40% grade is especially recommended.

DU PONT

REG. U. S. PAT. OFF.

DU PONT

EXPLOSIVES

BLASTING SUPPLIES AND ACCESSORIES

ENGINEERED AND BUILT BY AUTOCAR

A limited quantity of new, heavy-duty Autocar Trucks is now being built by Government authorization. A fortunate few haulers of essential loads can buy them. Maybe you can qualify.

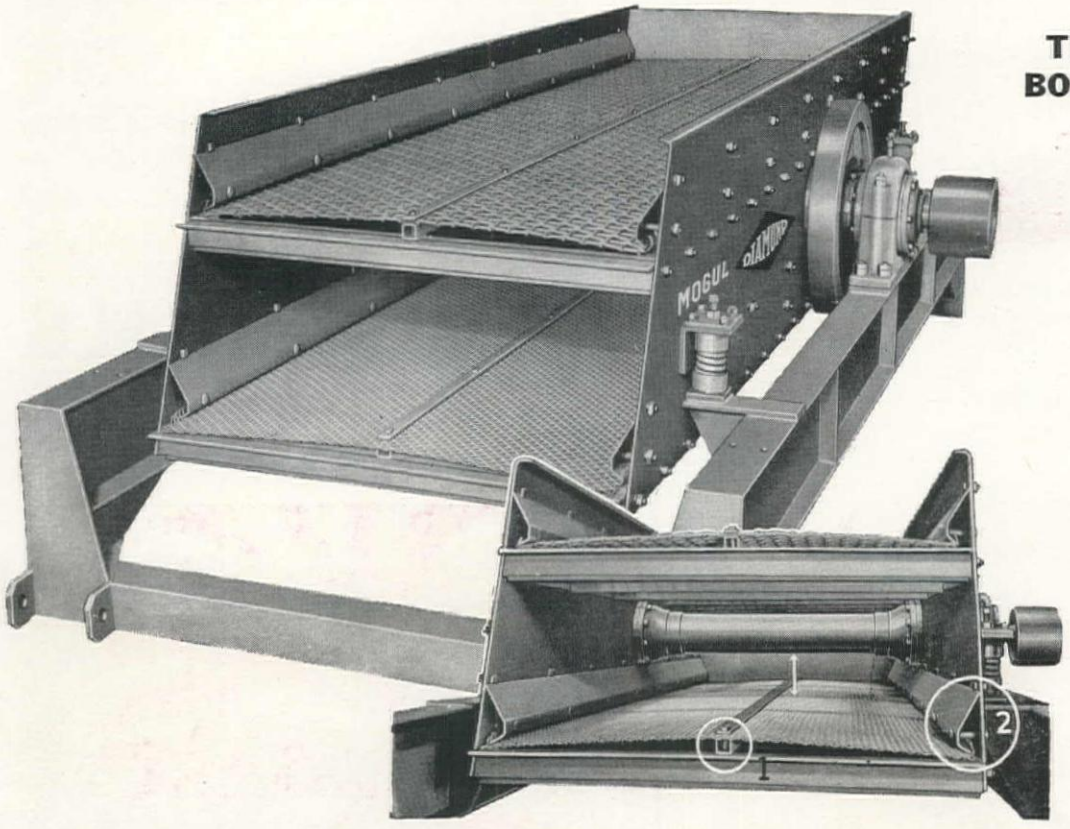
Hauling gasoline from plants to stations—5400 gallons at a time—is heavy-duty hauling. Heavy-duty trucks, superbly engineered and precision-built *for the job,* can do it more economically and profitably. Autocar Trucks, in short . . . famous for long life; unparalleled for dependable performance; designed and built *by Autocar* for heavy-duty hauling; owned and operated by such national leaders as Standard Oil Company of California. . . . Autocar Trucks cost more *because they're worth more.* Buy Autocars *by Autocar!* Follow the leaders, for they know the way.

AUTOCAR TRUCKS

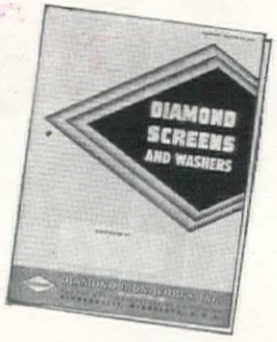
Engineered FOR HEAVY DUTY

Manufactured in Ardmore, Pa. • Serviced by Factory Branches and Distributors from Coast to Coast

YOU CAN'T CHOKE A DIAMOND VIBRATOR!



THIS NEW FREE BOOK TELLS WHY



It tells you the many reasons for the acknowledged superiority of the DIAMOND vibrator, and it tells you more. It illustrates and describes DIAMOND scalping and combination scalping and scrubbing screens, and DIAMOND drag washers. Send to us, or ask your DIAMOND dealer for a copy of Bulletin D-45-V.

Look at the illustration above. Study it. Note the free space between decks, even with the shaft housing, as denoted by the white arrow. This gives the material the room it needs. The marvelously balanced *forward* action of the screen keeps the material moving from the feed end to the open end. Figure 1 shows how the screen on each deck is raised in the center to force the material to spread towards the sides. Users will invariably tell you that they consistently "get more material through their DIAMOND vibrators" which means greater capacity, important savings in time, and consequent savings in operating costs.

Figure 2 shows the DIAMOND method of screen locking. Here, the curved side plate holds the turned edge of the screen, and tightening bolts pulling straight out draw the screen taut without the constant cutting action so often found with other methods. This means considerably less screen replacement. Bulletin D-45-V fully illustrates and describes these and other important features. Ask for it.

ASK YOUR DIAMOND DEALER ABOUT THE NEW "DUAL-ACTION" CRUSHER

Get the facts about this startling new development in crushing. A primary (jaw) and finishing (roll) crusher in ONE UNIT! About half the weight, equal or greater capacity, dependable uniformity of product — these and other features make "DUAL-ACTION" the outstanding development in crushing in the past thirty years. Ask for Bulletin D-45-M which gives all the facts and information on the use of the "DUAL-ACTION" for replacement on your present used plant bringing its weight well within minimum load limits anywhere on any highway. Other dependable DIAMOND products are:

Jaw and roll crushers . . . Conveyors, screens . . . Bucket elevators . . . Feeders, hoppers, bins . . . Portable, ROTOR-LIFT plants . . . Complete quarry plants.

DIAMOND DEALERS

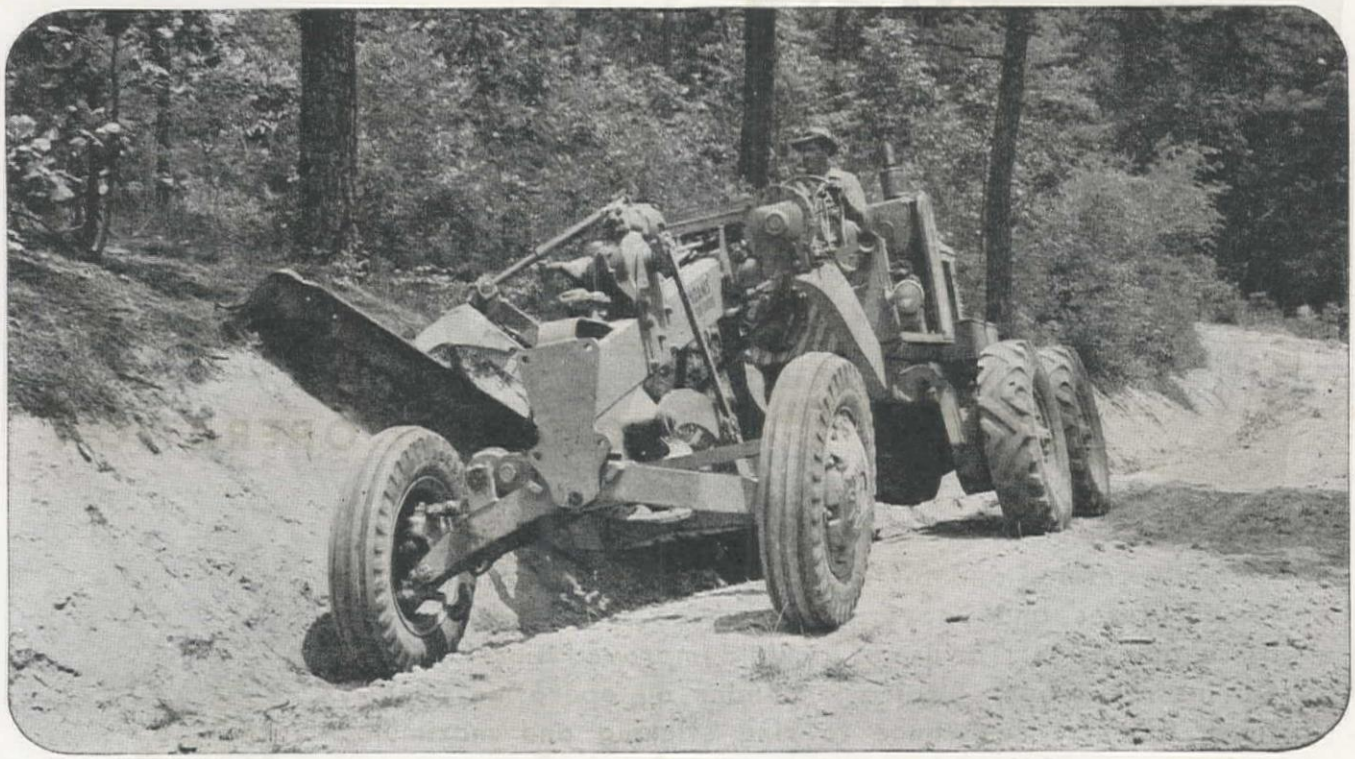
Oakland	SOULÈ EQUIP. CO.
Los Angeles	GARLINGHOUSE BROS.
Seattle	A. H. COX & CO.
Portland	LOGGERS & CONTRACT'S MACH. CO.
Boise and Spokane	WESTERN EQUIP. CO.
Salt Lake City	C. H. JONES EQUIP. CO.
Phoenix	O. S. STAPLEY CO.
Albuquerque	CONTRACTORS' EQUIP. & SUP. CO.

DIAMOND

DIAMOND IRON WORKS, INC.

AND THE MAHR MANUFACTURING CO. DIVISION

1818 SECOND STREET NORTH MINNEAPOLIS 11, MINNESOTA



...YOU GET THEM ALL IN ADAMS!

★Judged by any standards you like—power plant, engineering design, construction—Adams Motor Graders are unsurpassed in the three fundamental respects which, more than any others, determine efficient, profitable operation . . . *abundant power, long-life dependability, operating economy.*

Take the husky International Diesel engines used in Adams Graders—they're *long* on power and dependability, *low* on fuel consumption! . . . Most heavy-duty Adams Graders—even on the toughest jobs—operate on two gallons or less of low-priced Diesel fuel per hour.

Structurally, Adams Motor Graders have the rugged strength and rigidity to withstand hard usage. Add to this Adams' in-built adjustments for taking up wear at all critical control points, and you have a combination of dependability and economy that guarantees long years of efficient, low-cost operation.

See your nearby Adams dealer for full details and the other advantages of Adams machines.

LOCAL ADAMS DEALERS

ALASKA
Glenn Carrington & Co., Fairbanks

ARIZONA
O. S. Stapley Company, Phoenix

CALIFORNIA
Lee & Thatro Equip. Co., Los Angeles
Sutton Trac. & Equip. Co., Sacramento
J. G. Bastain, Redding
Valley Equipment Co., San Jose, San Francisco
Brown Tractor Co., Fresno
Thompson-Sage, Inc., Stockton
Farmers Mercantile Co., Salinas
Stevenson Farm Equip. Co., Santa Rosa
Stanislaus Impl. & Hdwe. Co., Modesto
Exeter Mercantile Co., Visalia
Gallagher Tractor & Impl. Co., Merced

COLORADO
McKelvy Machinery Co., Denver

IDAHO
Intermountain Equipment Co., Boise, Pocatello

MONTANA
Industrial Equip. Co., Billings, Missoula

NEVADA
Brown Motors, Reno

NEW MEXICO
Hardin & Coggins, Albuquerque

OREGON
Howard-Cooper Corp., Portland, Eugene

UTAH
The Lang Company, Salt Lake City

WASHINGTON
Howard-Cooper Corp., Seattle
Intermountain Equip. Co., Spokane

WYOMING
Industrial Equip. Co., Billings, Mont.
The Lang Co., Salt Lake City, Utah

J. D. ADAMS MANUFACTURING CO.
INDIANAPOLIS, INDIANA

Adams

ROAD-BUILDING AND EARTH-MOVING EQUIPMENT

RICHFIELD IMPROVED DIESEL MOTOR OIL

ADDS LIFE *and* ECONOMY TO DIESEL OPERATION

Richfield *Improved* Diesel Motor Oil is a superior lubricant specially refined and fortified to stand up under the high temperatures and heavy duty service characteristic of Diesel operation. The use of Richield *Improved* Diesel Engine Oil insures proper lubrication under all operating conditions, extreme resistance to ring sticking and maximum maintenance of the compression seal.

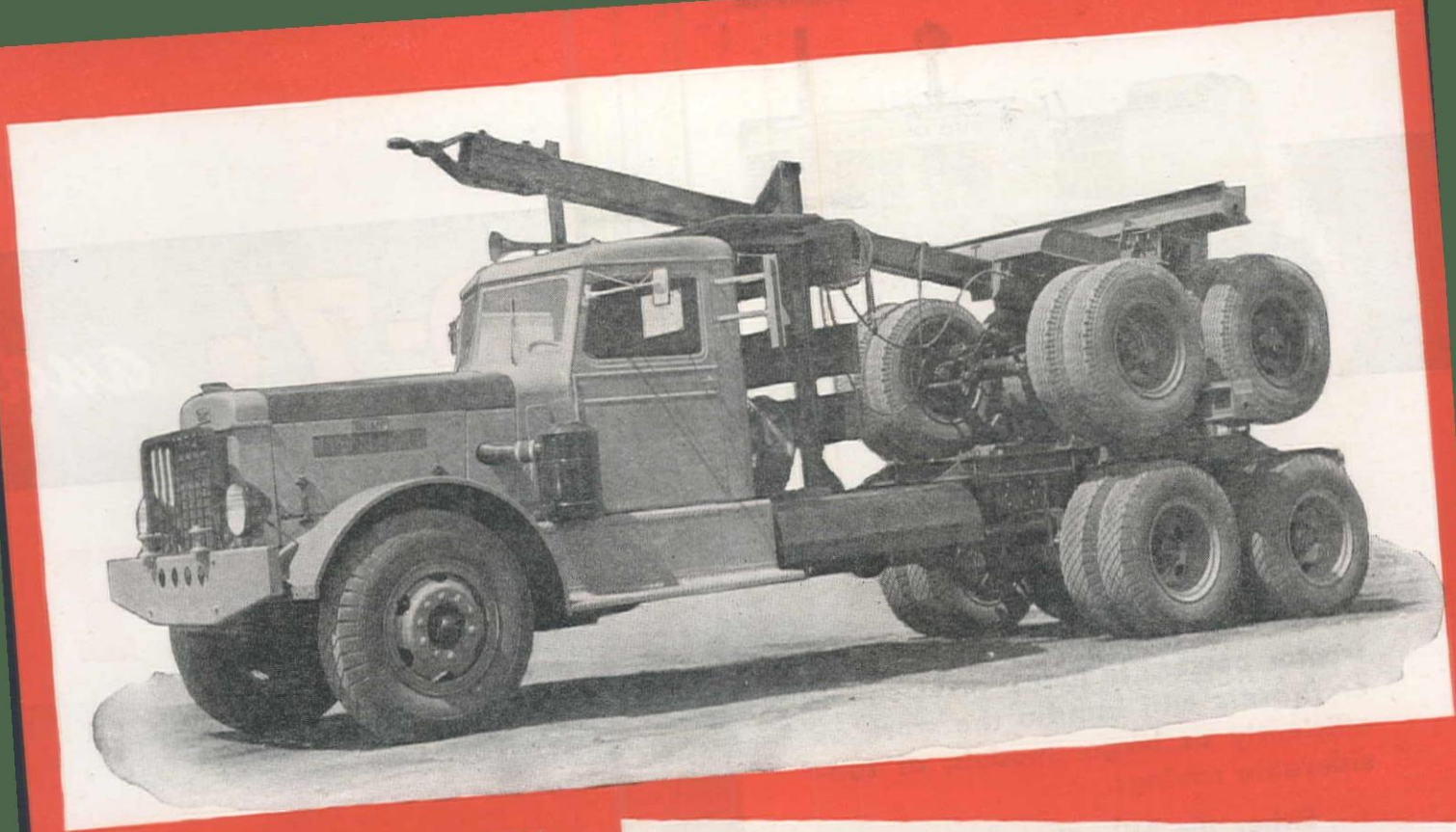
SELECTED STOCKS PLUS SCIENTIFIC COMPOUNDING WITH ADDITIVES GIVE RICHFIELD ***IMPROVED*** DIESEL MOTOR OIL ALL OF THE DESIRABLE CHARACTERISTICS WHICH ADD TO ENGINE LIFE AND FUEL ECONOMY—

- Safe and instant starting — quick flowing
- High film strength and adhesiveness
- Cleaner rings, liners, pistons and valves
- Anti-foam additive stops foaming
- Anti-corrosion additive for longer bearing life
- Better piston seal adds fuel and oil economy

AVAILABLE IN SAE GRADES 10, 20, 30 AND 40

INDUSTRIAL LUBRICANTS FOR ALL PURPOSES

RICHFIELD

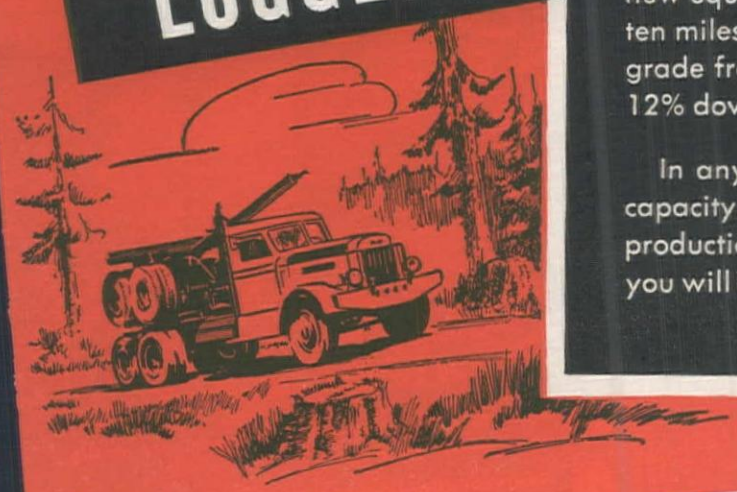


WM. T. HESS Buys 6 PETERBILT LOGGERS

When William T. Hess buys logging trucks and trailers, he does so with a background of long experience. He has been hauling logs continuously since 1920. Last year he hauled 83,000,000 ft. board measurement for the Pacific Lumber Company and the Hammond Lumber Company, over private roads in Humboldt County, California. His 1945 schedule calls for 110,000,000 feet.

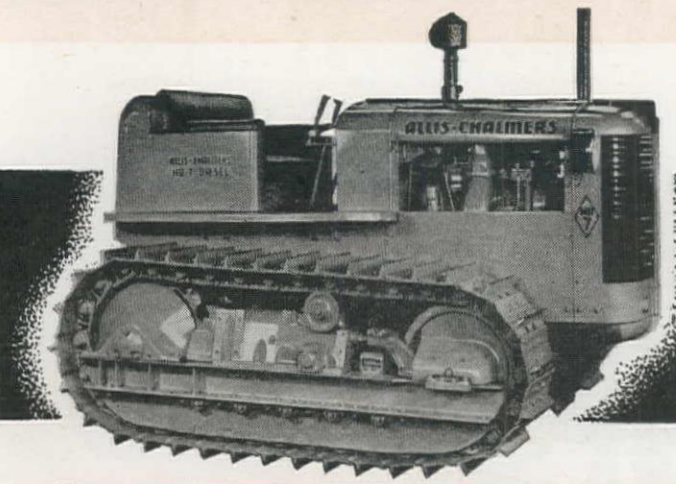
Working 12 months each year in the wettest section of California, hauling logs so large and heavy that they would have to be cut into short, uneconomical lengths if hauled on any but the largest equipment, it is very evident why he selected PETERBILT LOGGERS with their powerful dual drives, and powered by Diesels. With his new equipment, Hess averages 6 round trips per day of ten miles each. The road contour involves a 6% adverse grade from the woods to the top of the ridge and then 12% down to the railhead.

In any heavy duty service where you need power, capacity, traction—far in excess of that provided by production model trucks—that's the kind of a job where you will want PETERBILT Dual Drives.



Peterbilt Motors Company

107th AVENUE AND MacARTHUR BOULEVARD · OAKLAND · CALIFORNIA

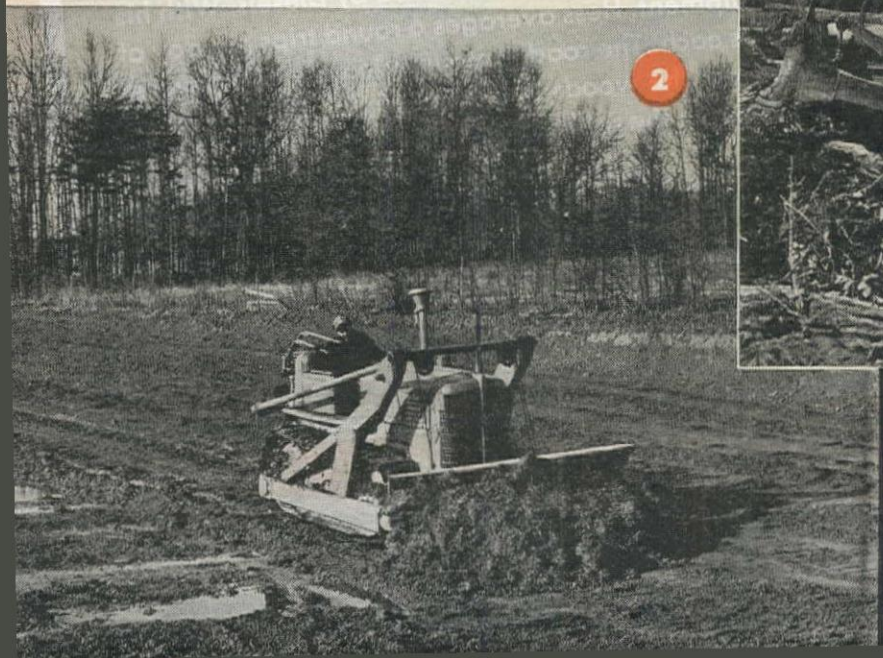


HD-7's and MEAN ECONOMY

Size up the job, then apply the right tractor power. In many cases smaller Diesels will handle the work as efficiently as larger models, at considerable savings.

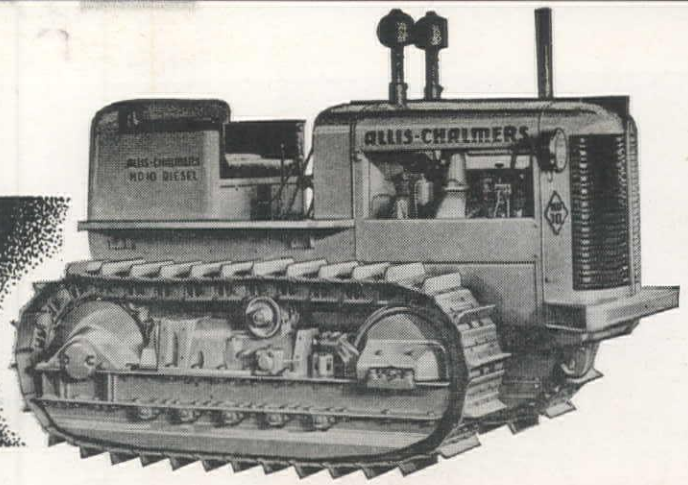
Either the Allis-Chalmers HD-7 or HD-10 may be used for bulldozing, pulling graders, clearing or moving heavy machinery, depending on conditions . . . also with suitable 2- or 4-wheel scrapers or for pushing larger scrapers.

Use power to fit the job. Get your money's worth from your tractors. A well-balanced line of HD-7's, HD-10's and HD-14's is the answer to lower cost construction. Let your Allis-Chalmers dealer help you power your job *right!*



1. Medium capacity 4-wheel scrapers are easily handled by the HD-10.
2. Plenty of digging power — HD-7 handled all grading on this cut.
3. Big stumps and trees are quickly cleared with the HD-7.
4. Here is economy. Work both ends of your HD-7.

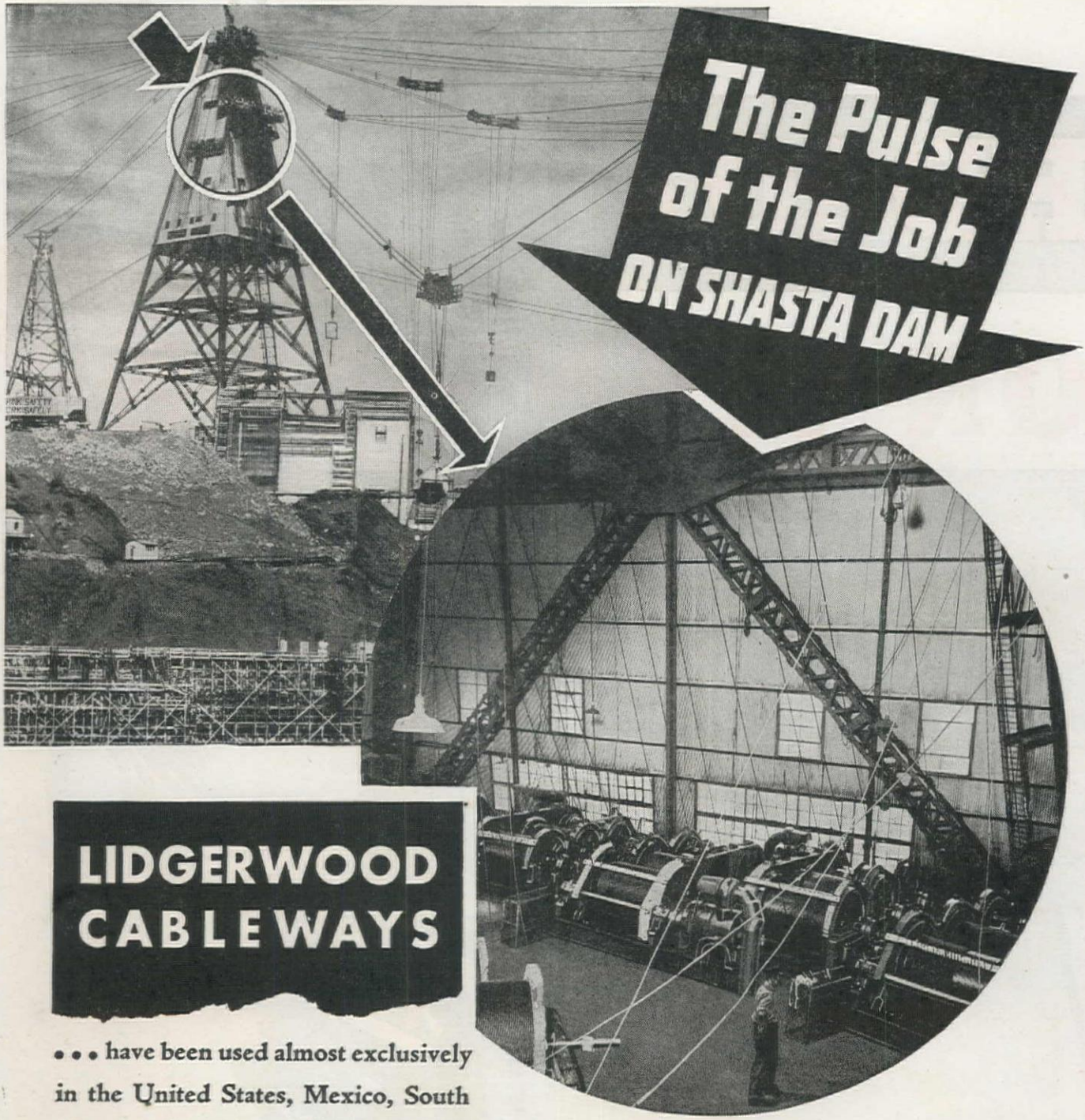
HD-10's



ON MANY JOBS

ALLIS-CHALMERS

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



The Pulse of the Job ON SHASTA DAM

LIDGERWOOD CABLEWAYS

• • • have been used almost exclusively in the United States, Mexico, South America, Spain and throughout the world, during the past half of a century in the construction of major irrigation and hydro-electric power dams, viaducts and bridges, filtration and sewage disposal plants, placing large volumes of concrete and handling forms and other materials of construction.

HIGH SPEED • EFFICIENT • DEPENDABLE

Built in capacities 5 TO 150 TONS with clear spans up to 2900 FEET.

★

Send for your copy of Cableway Bulletin C-111

LIDGERWOOD
ESTABLISHED 1873
Manufacturing Company
MAIN OFFICE AND WORKS • ELIZABETH 8, NEW JERSEY
EXPORT OFFICE, 50 CHURCH STREET, NEW YORK 7, N. Y.
CABLE ADDRESS—BROSITES

Represented in California by Industrial Equipment Co., Emeryville, California

PMCO

America's Most Complete Line of Material Handling Buckets

All purpose-

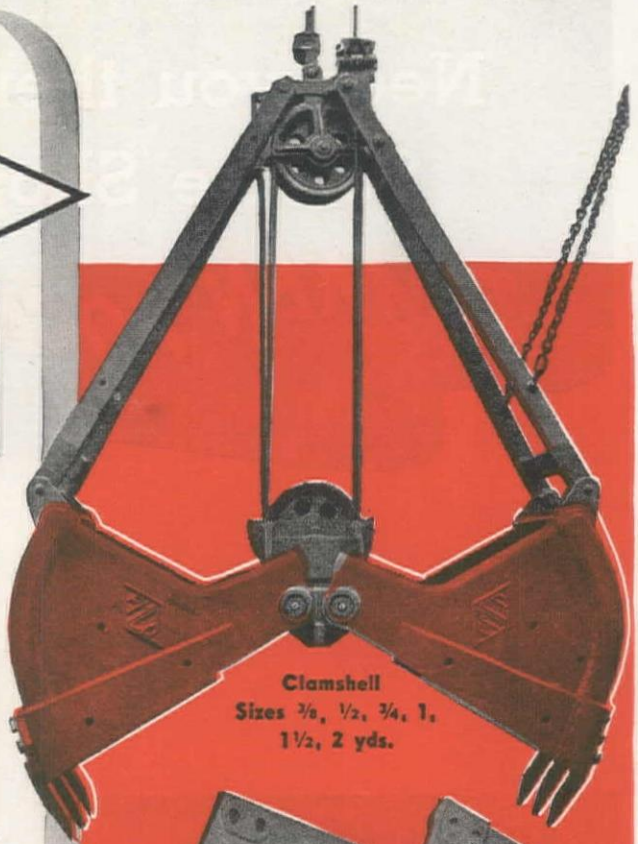
- **SHOVEL**
- **PULLSHOVEL**
- **DRAGLINE**
- **CLAMSHELL**

● FRONTS, BOTTOMS, SCOOPS and TEETH shown in red on buckets are 14% manganese steel developing tensile strength up to 120,000 p.s.i. This high percentage manganese steel gives tough, rugged strength for hard service and allows wide set corner teeth for easy entrance in digging. Volume production methods enable us to build a better bucket with amazing economies in manufacturing.

On the ½ yd. and ¾ yd. Shovel, Pullshovel, and Dragline Buckets, all teeth are interchangeable — a great advantage to operators.

Experience Counts

See your shovel man or equipment dealer about PMCO Buckets and Dippers.



Clamshell
Sizes ⅜, ½, ¾, 1, 1½, 2 yds.

Pullshovel
Sizes ⅜, ½ and ¾ yd.

Dragline
Sizes ⅜, ½, ¾, 1, 1½, 2, 2½ yds.

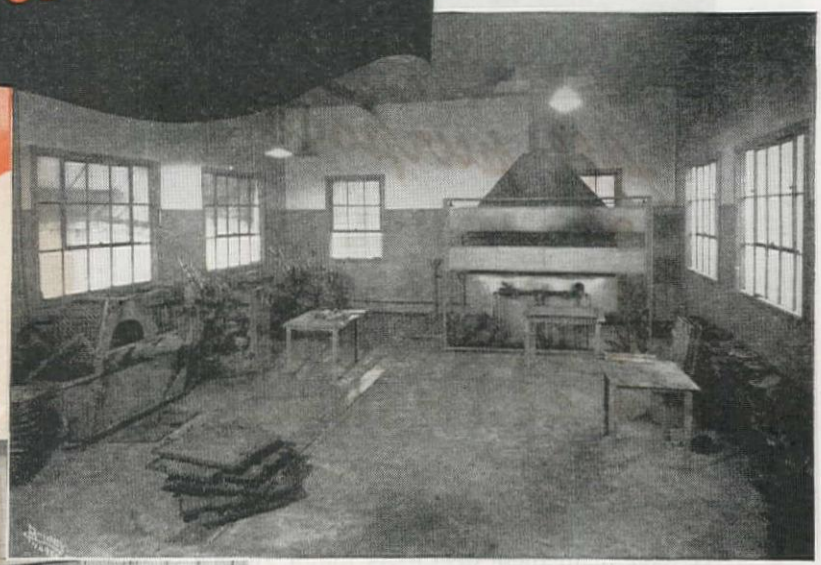
Shovel
Sizes ⅜ to 18 yds.

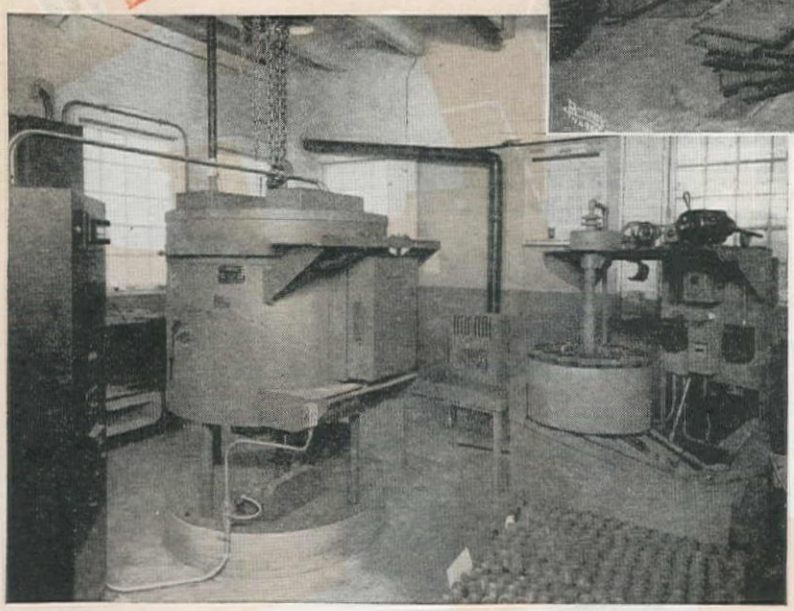
"Quality Since 1880"

PETTIBONE MULLIKEN CORP. CHICAGO 51, U. S. A.

WE OPERATE THE LARGEST AND MOST COMPLETE MANGANESE STEEL FOUNDRY IN THE UNITED STATES.

Near you there is a Service Shop for TIMKEN ROCK BITS





One of the important reasons for the widespread uses of Timken Rock Bits in the mining, quarrying and construction industries is the availability of prompt and economical service for converting hollow drill steels for use with Timken Rock Bits.

Located at 80 strategic centers throughout the country are modern well-equipped independently operated service shops, such as the one illustrated here. Most of these shops are also able to recondition used Timken Rock Bits for additional drilling—thus decreasing your drilling costs.

If your operations do not justify the maintenance of such a shop you may still enjoy the advantages of Timken Rock Bits by utilizing the services of the shop operator in your immediate locality. Write us for his name and address.

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
ROCK BITS

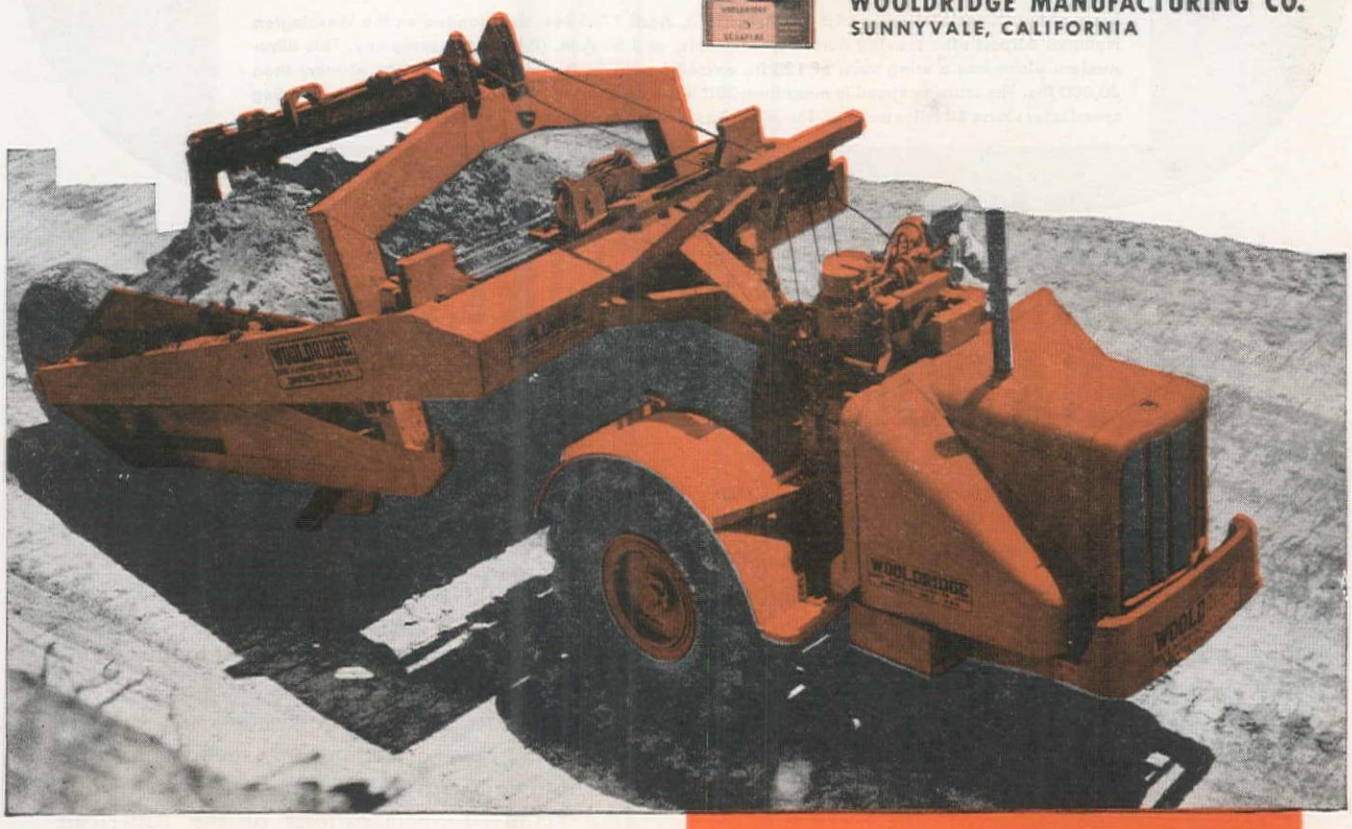
THE TIMKEN ROLLER BEARING COMPANY, CANTON 6, OHIO

NO DANGER OF "JACKNIFING!"

As there are no steering clutches to "fight" nor individual brakes to "humor" or grab, the true directional steering of a Wooldridge Terra-Cobra eliminates any chance for *"Jacknifing"* to occur with resultant costly accidents, damage and down-time. Power is maintained on both wheels simultaneously. The front drive wheels both turn under power with their respective speeds automatically governed by differential gears in exactly the same manner as heavy duty trucks. Operators are able to maintain higher hourly yardage averages as fatigue is reduced to a minimum. Get the full facts today.

Send for Bulletin TA-425

WOOLDRIDGE MANUFACTURING CO.
SUNNYVALE, CALIFORNIA



WOOLDRIDGE TERRA COBRA

SELF-PROPELLED EARTHMOVERS

View of the "Constellation" at 1:54 P.M. (E.W.T.), April 17, 1944, as it landed on the Washington National Airport after leaving Burbank, California, at 3:56 A.M. (P.W.T.) the same day. This ultra-modern plane has a wing span of 123 ft., overall length 95 ft., and a gross weight of more than 80,000 lbs. The cruising speed is more than 300 miles an hour at 19,000 ft. altitude, and the landing speed is less than 80 miles an hour. The plane has four independent fuel systems. (*Photo by Del Ankers.*)

CONCRETE PIPE LINES DRAIN THE NATION'S MAJOR AIRPORTS

When the TWA's 57-passenger Lockheed "Constellation" arrived at the Washington National Airport, Washington, D. C., April 17, 1944, after a record flight of 2,400 miles from Burbank, California, in 6 hours 57 minutes, it landed on runways safely designed and drained with concrete pipe. More than 64,000 ft. of concrete sewer pipe and reinforced concrete sewer and culvert pipe was required to build drains parallel to and under runways of the Washington National Airport.

Concrete pipe and reinforced concrete pipe ranging in diameter from 6 to 108 in. has been required to build drains, culverts, and sewers for most major airports of this country because of these advantages:

1. Maximum strength when properly bedded and back-filled;

2. Maximum hydraulic capacity;

3. Long life expectancy;

4. Furnished locally at reasonable cost by our members. List mailed on request.

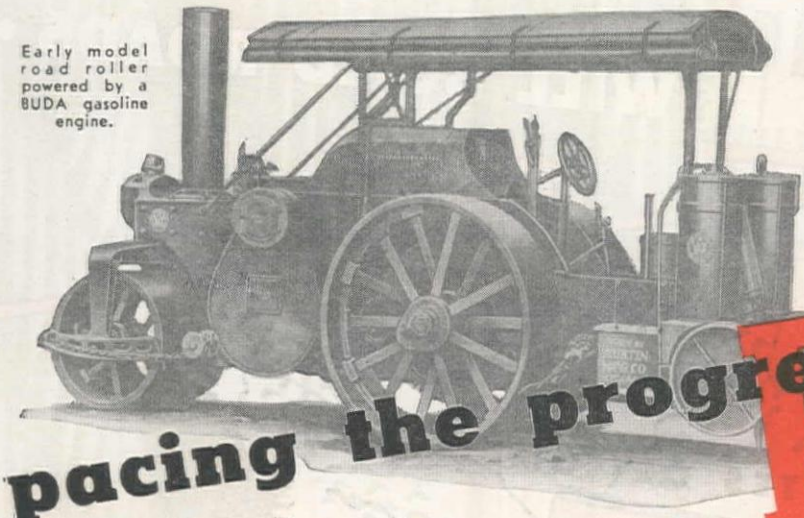
When you design drainage systems for airports now and in the postwar period, specify concrete pipe complying with the tests and other provisions of the Standard Specifications of the American Society for Testing Materials and the American Association of State Highway Officials.

CALIFORNIA ASSOCIATED CONCRETE PIPE MANUFACTURERS

P. O. BOX 152 — FRESNO 7, CALIF.

BUDA experience

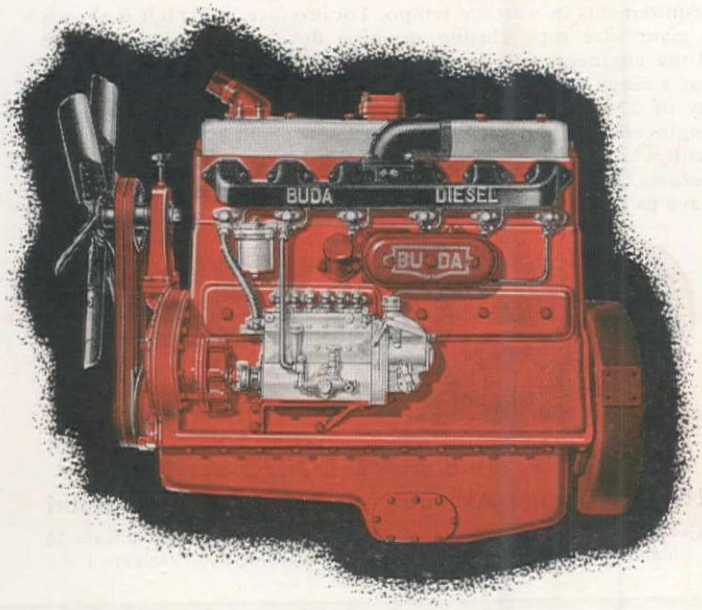
since 1881



Early model road roller powered by a BUDA gasoline engine.

pacing the progress of Power

Over 64 years of manufacturing experience and 35 years in the engine business is back of every engine BUDA design. Maximum power and economy are the result — and are as much ingredients of the finished product as the skill behind each accurately made part. Send for literature on BUDA engines — the most dependable power available for your job.



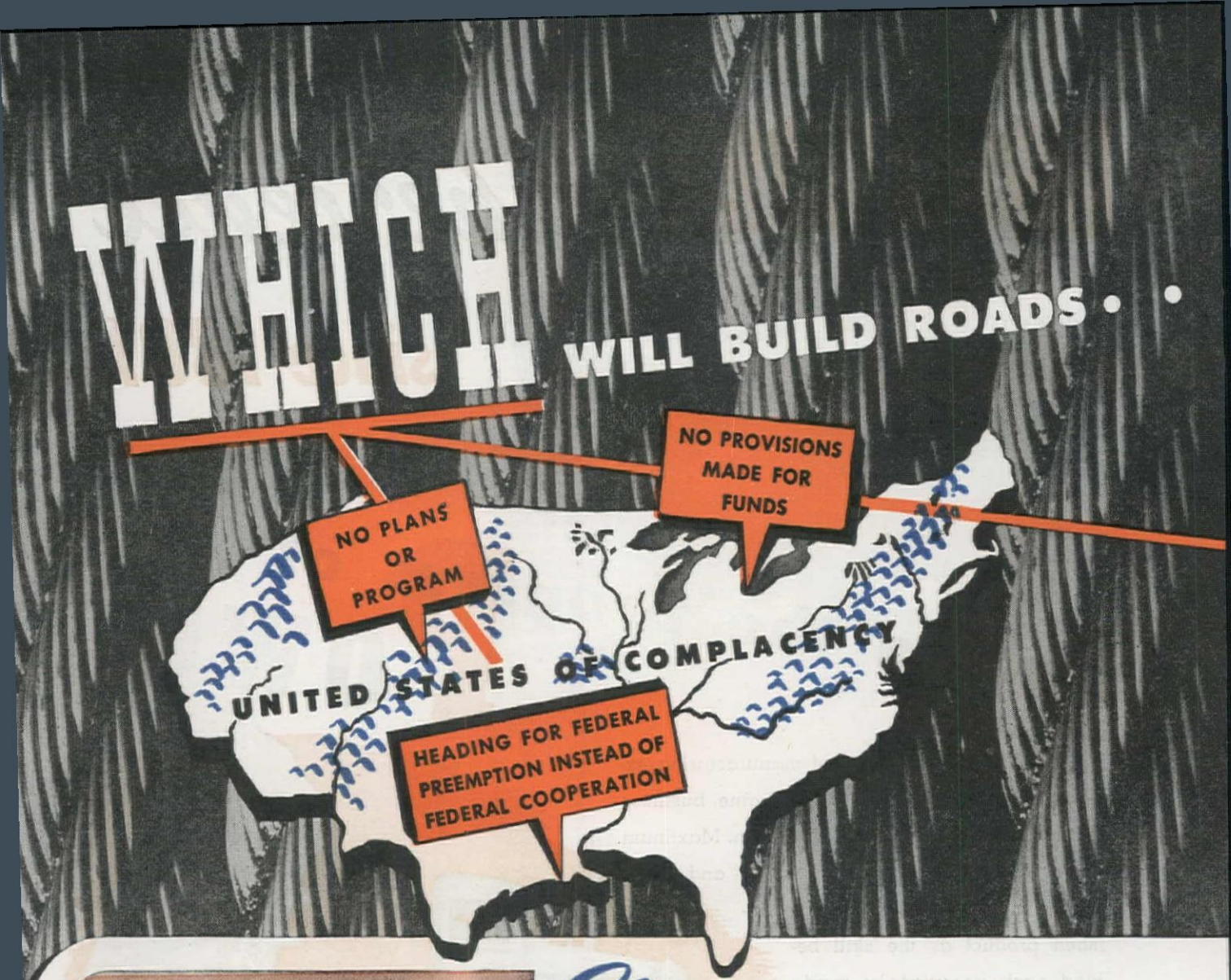
BUDA Jacks

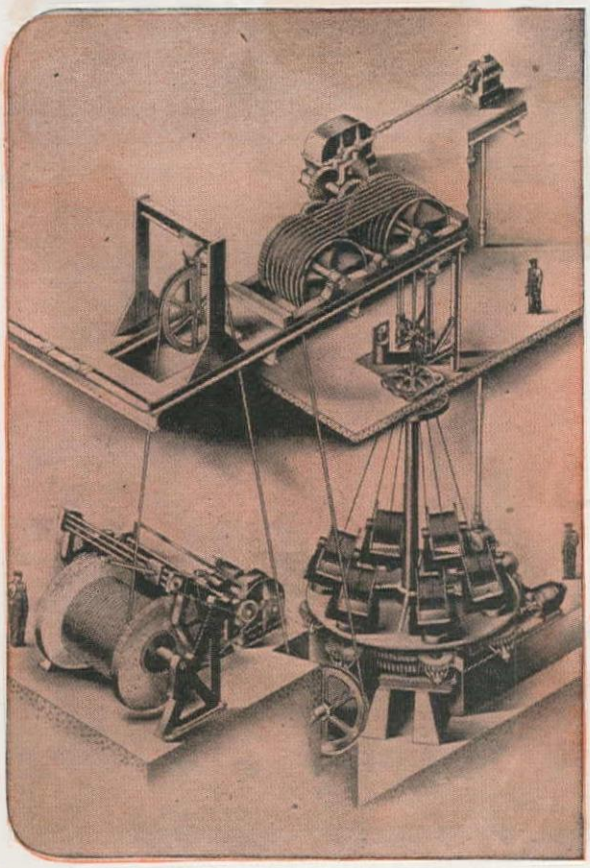
BUDA Nozzle Testers

BUDA

15424 Commercial Ave.
HARVEY (Chicago Suburb) **ILLINOIS**

WHICH WILL BUILD ROADS . . .





New War-Borne Techniques Will Make America's Competitive System of Private Enterprise More Efficient Than Ever Before!

Although geared largely to war production, the Union Wire Rope organization is prepared to shift overnight to fill home-front requirements in wartime tempo. For instance, at the left is shown a giant wire rope closing machine developed by Union Wire Rope engineers in the war emergency. It is three stories high, has a range of ¾ inch to 4 inch wire rope and a maximum capacity of 27 tons of wire rope in one continuous length. Union engineers have devised many other new facilities and techniques with which to serve private enterprise more efficiently than ever before. Our war work has been such that our craftsmen will not have to relearn their skills.

union *Wire Rope*

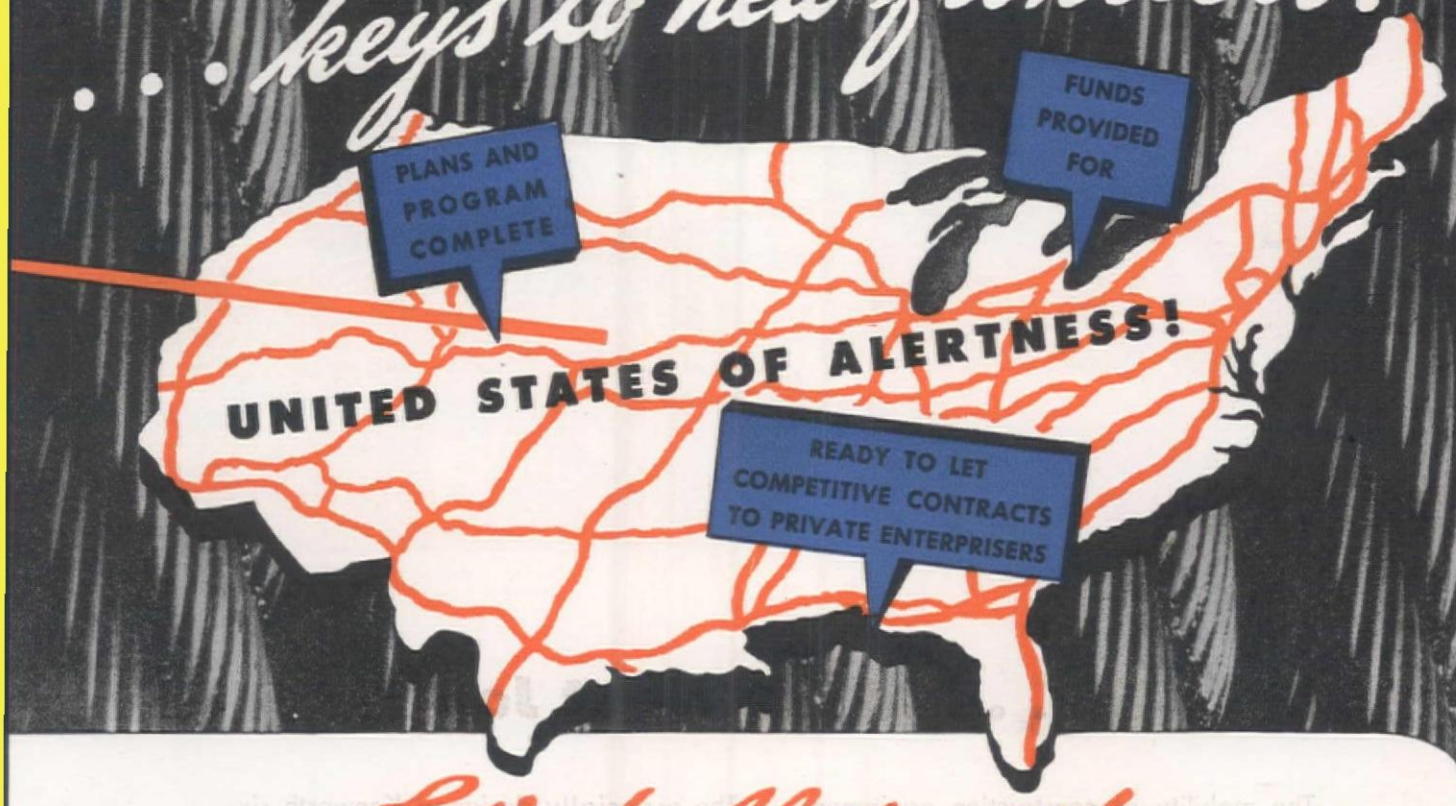
UNION WIRE ROPE CORPORATION

2146 Manchester Avenue Kansas City 3, Missouri

Tulsa 3 Houston 11 Chicago 6 Salt Lake City 13 New Orleans 16
Monahans, Tex. Portland 10, Ore. Ashland, Ky. Atlanta 1

• STREETS • AIRPORTS • FLOOD CONTROLS

. . . keys to new frontiers?



Let's pull together

FOR THIS KIND OF AN AMERICA

Americans have called upon their national leaders for a far-reaching highway system, a network of airports, and a long-studied program of flood control and land conservation. Why? Because they are the keys that will open new frontiers and because they are among the few proper and fertile fields for the investment of public funds.

Our leaders in Congress have responded by approving our largest highway and flood control programs and doubtless will respond with an airport program.

But, the approved programs are not being pushed to final*ization* in many states. The National Highway Program, for example, is based upon state responsibility for plans by State Highway officials and funds by State Legislatures. No citizen can afford to let this sound program go by default. If there is a lag in your theatre of operations, make it your concern. Send the coupon for "The Road Ahead", published by the American Road Builders' Association, and "Put Your Town on the Air Map", published by the Personal Aircraft Council of the Aeronautical Chamber of Commerce of America.

UNION WIRE ROPE CORPORATION, 2146 Manchester Ave., Kansas City 3, Mo.

☐ Send a Free copy of book entitled "The Road Ahead"
☐ Send a Free copy of book entitled "Put Your Town on the Air Map"

*Name*_____

Firm _____

*Address*_____ *City*_____ *Zone*___ *State*_____

D-45

Let's Go . . . to the Next Job

The mobility of construction equipment is of great importance to contractors—especially now when the supply of machinery is limited and many of the jobs to be done are of military value. No time is lost through building a loading platform or ramp when the unit illustrated here has completed an excavation job. The shovel digs a hole. The especially designed Kenworth six-wheel diesel truck backs the low-bed Fruehauf trailer into the hole. The big shovel loads itself, and the powerful truck pulls away—off for the next job. Thus does Kenworth engineering, which has long served the West in many transportation fields, help to solve yet another specialized problem.

KENWORTH

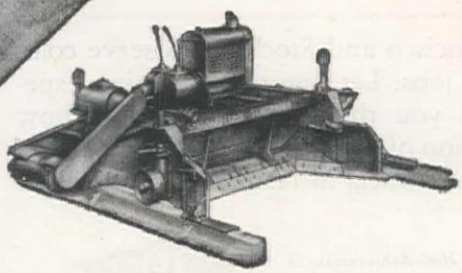
Builds for Victory—Plans for Peace

TRUCKS ★ BUSES ★ TRAILERS ★ FIRETRUCKS

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

12,000

LINEAL FEET OF FINISHED 25 FOOT SUBGRADE IN 8 HOURS



THAT'S A BROAD CLAIM TO MAKE!

But it's based on fact—an actual job record of the STANDARD-LEWIS Subgrader on four 25-foot runways that had to be built in a hurry. In this speedy operation, the STANDARD-LEWIS Subgrader bailed material at the rate of 8 yards per minute and produced a finely finished and accurate subgrade from side form to side form.

FEATURES

1-Quickly adjustable to variable digging depths. 2-Cuts in either direction without turning. 3-Works around curves without binding and tows sideways through narrow places. 4-Digs right up to the side forms, eliminating hand cleaning. 5-Simple lever adjustment for spoiling at either side.

OTHER STANDARD PRODUCTS

ASPHALT PLANTS • BATCHING PLANTS • ASPHALT FINISHERS • CONCRETE FINISHERS • LOADERS ROLLERS • POWER BROOMS

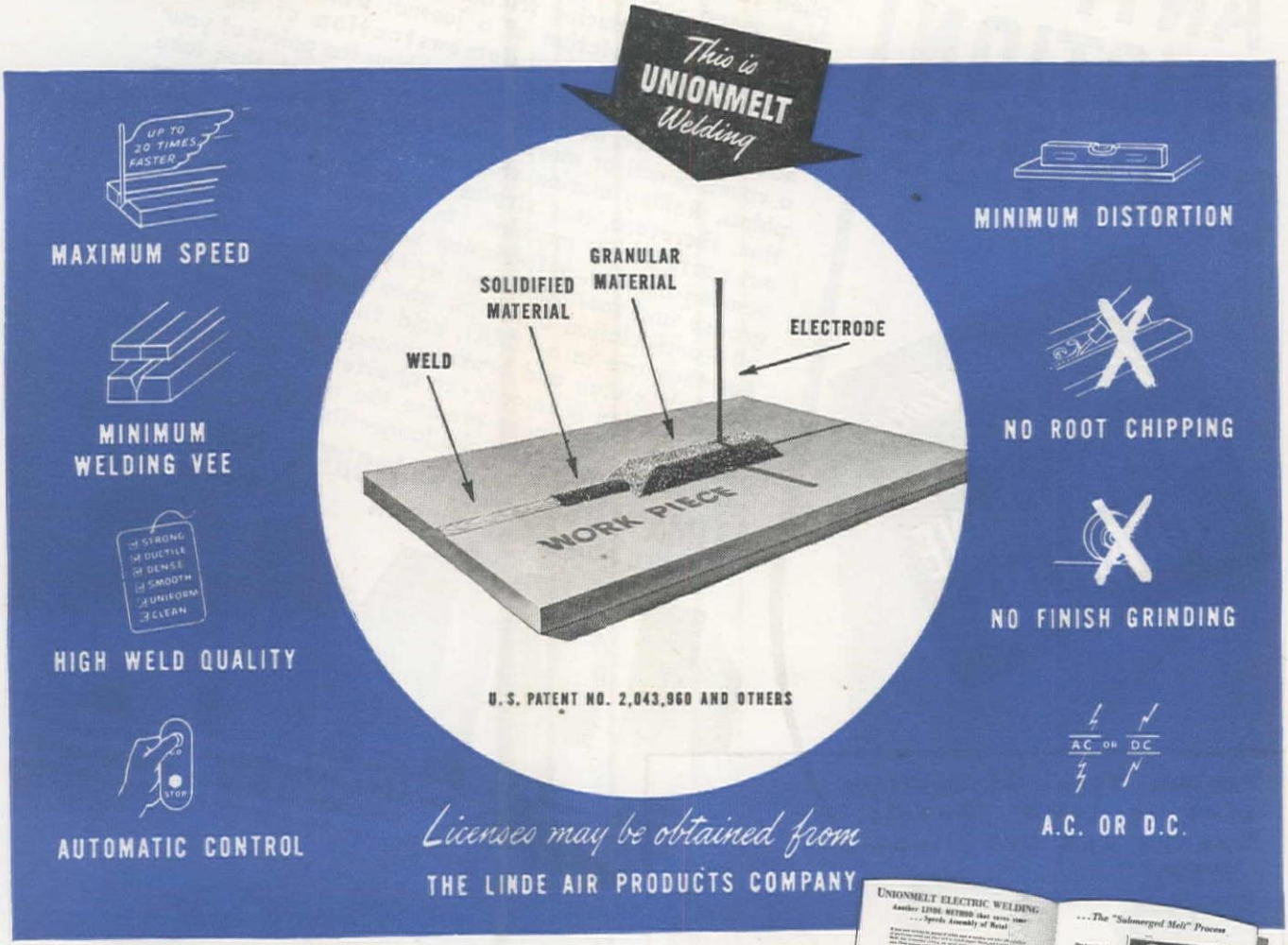
GET THE WHOLE STORY— SEND FOR THIS BULLETIN

STANDARD STEEL CORPORATION

General Offices and Plant: 5001 South Boyle Avenue
Los Angeles 11, California
Distributors Throughout United States and Canada

These are the advantages of Automatic UNIONMELT Electric Welding

A PROCESS OF WELDING ELECTRICALLY BENEATH A MINERAL MELT



Hundreds of manufacturers are now benefiting by the advantages of UNIONMELT Welding. It gives them top quality welds at speeds that are greater than with any other similarly applicable process.

If your work includes the joining of carbon steel, of stainless, and other alloy steels, or of non-ferrous metals and alloys such as nickel, copper, Monel, and Everdur, it is quite likely that UNIONMELT Welding can speed production, raise quality, and lower your costs.

Anyone who wishes to use this patented invention may do so under our standard license agreement. License fees are low and are based upon extent of use. Complete engineering assistance is available to licensees.

For additional information send for the folder *"Report No. 6 on the Use of Linde Methods in Mass Production"*—or ask a Linde representative to help you determine where you can use the UNIONMELT process advantageously.

MARITIME "M" AWARD FOR OUTSTANDING PRODUCTION ACHIEVEMENT

THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation

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

In Canada: Dominion Oxygen Company, Limited, Toronto

The word "Unionmelt" is a registered trade-mark of The Linde Air Products Company.

★ BUY UNITED STATES WAR BONDS AND STAMPS ★

ANTI-FRICTION BEARINGS

A good feature to have in a SHOVEL CRANE or DRAGLINE!

To get the full advantage of anti-friction bearings in a shovel, crane or dragline, the bearings must be applied to every important bearing point, not only on high speed shafts. Anti-friction bearings are the modern means of reducing friction. They transfer the sliding rubbing friction of a journal bearing into a rolling friction. A good demonstration of the difference may be had by first rubbing the palms of your hands together, noticing how warm they get, then take a round pencil or marble, and rolling it between the palms. Rolling motion starts easier than the sliding motion, therefore, less strains are imposed upon the various parts of the machine. In addition to effecting less bearing friction, anti-friction bearings also save oil, grease and fuel consumed by the engine, and that's not all -- anti-friction bearings, when applied to the drums (as they are in a LIMA), hold the drums concentric to their clutch and brake, consequently the clutch and brake action is smooth-no chattering and grabbing. Remember, the more precise the machine the better the performance and the longer its life.

LIMA LOCOMOTIVE WORKS, INCORPORATED
SHOVEL AND CRANE DIVISION LIMA, OHIO, U. S. A.

Various Types of Bearings used in LIMA Shovels, Cranes and Draglines

LIMA

The LIMA DIAMOND --- For 75 Years an Emblem of Quality Workmanship

SHOVELS • CRANES • DRAGLINES

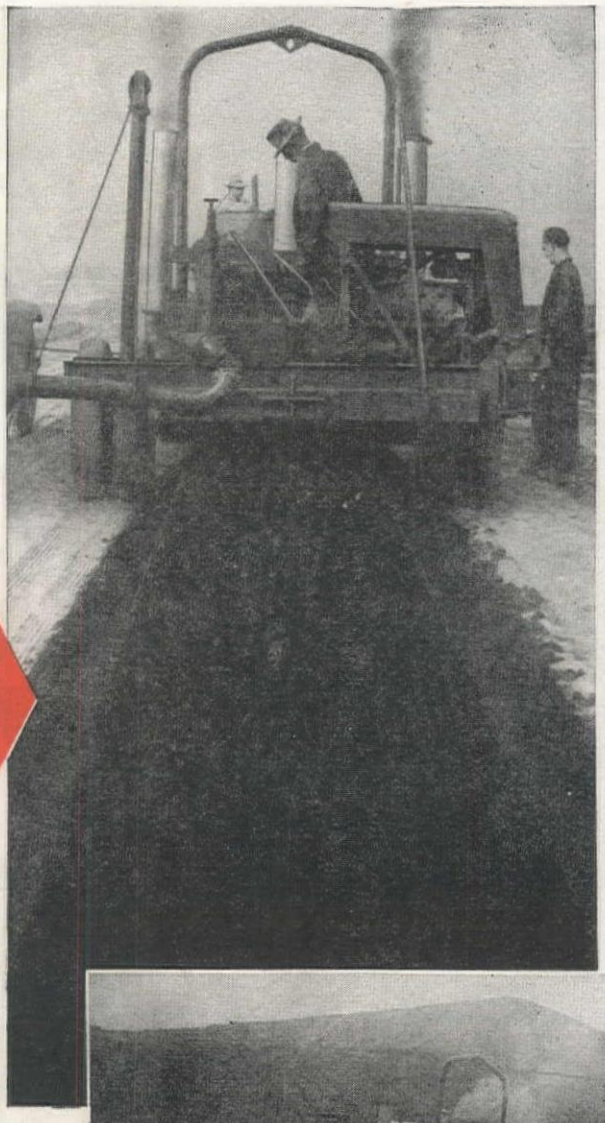
A type and size for every job

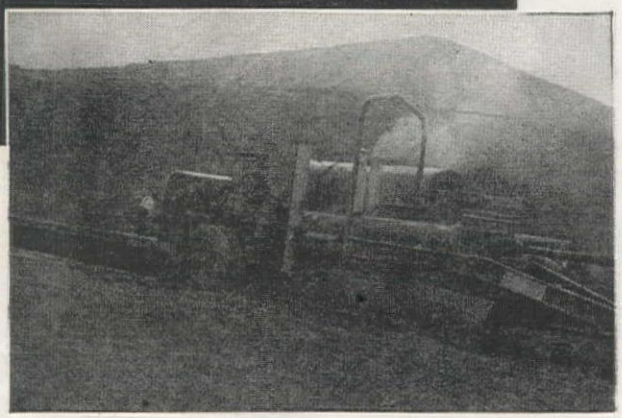
CAPACITIES
SHOVELS, ¾ Yd. to 5 Yds.
CRANES, 13 Tons to 100 Tons
DRAGLINES, Variable

Our Seattle Office, 1932 First Avenue South; Feenaughty Machinery Co., 112 S. E. Belmont St., Portland; and their Boise address, 600 Front St.; Garfield and Co., 1232 Hearst Bldg., San Francisco; Smith Booth Usher Co., 2001 Santa Fe Ave., Los Angeles; Held & McCoy Machinery Co., 3201 Brighton Blvd., Denver; Smith Booth Usher Co., 1756 Grand Ave., Phoenix; Steffeck Equipment Co., Main and Cutter Streets, Helena, Montana; Willard Equipment Ltd., 860 Beach Ave., Vancouver, British Columbia, Canada; Western Machinery Co., P. O. Box 2196 (748 W. 8th St.), Salt Lake City, Utah; Contractors' Equipment and Supply Co., Springer Bldg., P. O. Box 456, Albuquerque, N. M.; Wells Alaska Motors, Fairbanks, Alaska, and Modern Machinery Co., Inc., N. 2417 Division St., Spokane, Wash.

Are You Bidding This Kind of Work?

ROAD MIX SURFACING
MIX-IN-PLACE ASPHALT BASE
SOIL CEMENT BASE
FLEXIBLE BASE
ANY TYPE OF STABILIZED BASE





If You Are, You Need a WOOD ROADMIXER

Here's why: (1) Your cost per square yard or cost per ton is less than when using any other method.

(2) It produces as much as 250 tons per hour of ready-to-spread mix.

(3) It needs only a tractor and supply truck as auxiliary equipment, both of which can be used for other work when Roadmixer is not in use.

(4) Two men can handle average job.

(5) It costs less to own, operate and maintain than any similar equipment on the market.

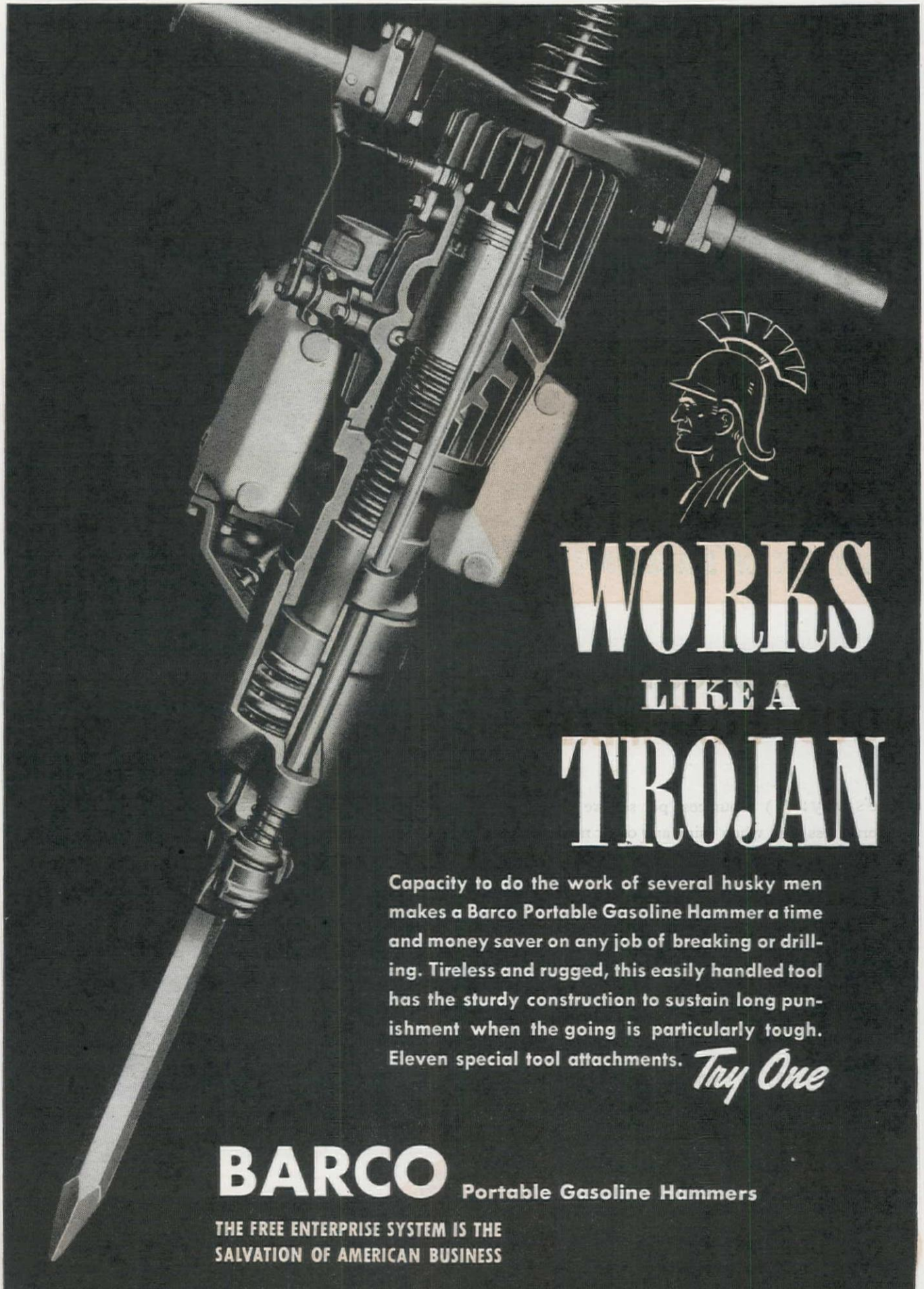
(6) It has a 12-year record of successful, economical, long-life construction throughout the world.

Wood Roadmixers are now available without priority. See your nearest distributor or write direct for literature and prices.

ROADBUILDING EQUIPMENT

WOOD MANUFACTURING CO.

816 WEST FIFTH ST. LOS ANGELES 13, CALIF.



WORKS LIKE A TROJAN

Capacity to do the work of several husky men makes a Barco Portable Gasoline Hammer a time and money saver on any job of breaking or drilling. Tireless and rugged, this easily handled tool has the sturdy construction to sustain long punishment when the going is particularly tough. Eleven special tool attachments. *Try One*

BARCO Portable Gasoline Hammers

THE FREE ENTERPRISE SYSTEM IS THE SALVATION OF AMERICAN BUSINESS

BARCO MANUFACTURING COMPANY, NOT INC., 1819 Winnemac Ave., Chicago 40, Ill. • In Canada: The Holden Co., Ltd., Montreal, Can.

"Boom Guard" Shock Absorber

UNTWISTS ROCK HANDLING STRESSES

YOU CAN'T JAR THE 605 BOOM!

Because the Koehring "Boom-Guard" Shock Absorber takes the jar out of rock shock loading. Heavy coil springs ride out twisting strains of "sweeping up," cushion bending strains when the dipper hits a tough spot in the cut, absorb all the stresses that injure unprotected booms or dipper sticks.

WHY A SHOCK ABSORBER?

Why a shock absorber on a boom that's already plenty strong? Because there may be times, particularly in rock, when even the toughest boom takes it on the chin. That's why it's smart to buy the Koehring 605 with the boom that's shock absorber protected.

BOOM REMAINS RIGID!

Because the Koehring 605 "Boom-Guard" Shock Absorber is correctly spring-loaded, you sacrifice not a bit of the rigidity you want for perfect control. No spring, no bounce, no sway, but full protection when you need it.

KOEHRING COMPANY • MILWAUKEE 10, WIS.

KOEHRING

605

ASK FOR YOUR 605 CATALOG TODAY

ARMY E NAVY

KOEHRING K HEAVY DUTY

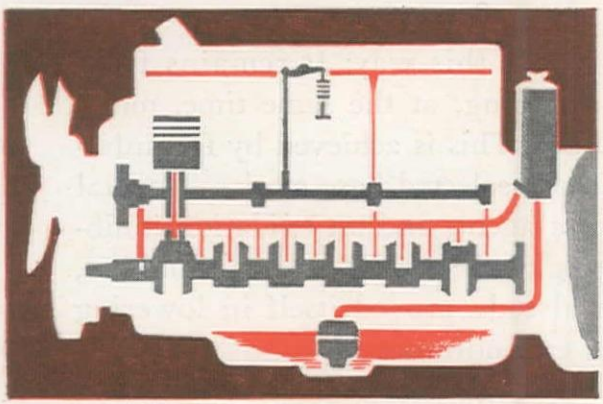
HEAVY-DUTY CONSTRUCTION EQUIPMENT

UNACAL REDUCES THE CAUSE OF CARBON

1. Many truck operators find that engine trouble is the biggest profit-eater in their business, and that carbon is the usual cause of this trouble. Less carbon would mean more profits.

2. Since almost all carbon in engines comes from the lubricating oil, it is to your advantage to use the motor oil that forms the least carbon and sludge.

3. And that means use Unacal Truck-Bus Oil . . for it is a wholly-distilled, solvent-refined, 100% pure paraffin base motor oil with carbon-forming elements reduced to the minimum.



4. Unacal Truck-Bus Oil is a balanced blend which provides adequate lubrication at high temperatures and yet is fluid enough for easy starting at low temperatures.

5. It is so tough and stable that it gives the utmost lubrication and protection under the most severe operating conditions. You'll find the oil and the price are right for fleet or single unit operations.

Reduce the cause of carbon and get better engine performance with Unacal Truck-Bus Oil. Your local Union Oil representative will promptly deliver a supply.

Unacal TRUCK-BUS OIL

UNION 76

Another **UNION OIL** *Success-Tested Product*

Affiliate Member, Associated Contractors of America

Prevents Gear-Metal Deterioration!

Provides Greater Oiliness!

Inhibits Oxidation!

VEEDOL SUPER FILM LUBRICANT "A"

If you are a contractor with high speed highway or job equipment, here are some facts you should know about Veedol Super Film Lubricant "A". This additive oil is the latest development of Tide Water Associated Automotive Laboratories, and is designed for lubricating both final drive worm gears and transmissions of your heavy duty dump trucks, cement trucks, ready-mixers, and utility haulers.

Super Film "A" works this way: It remains fluid throughout its life, retaining, at the same time, maximum protective qualities. This is achieved by formulating three additives into a selected base stock—a metal de-activator, an oiliness agent, and an oxidation inhibitor. By thus prolonging the life of expensive assemblies, Super Film "A" has already proved itself in lowering year-round operating expenditures.

Your nearby Associated Representative can give you full details on usage, quantities, and cost. Phone today.

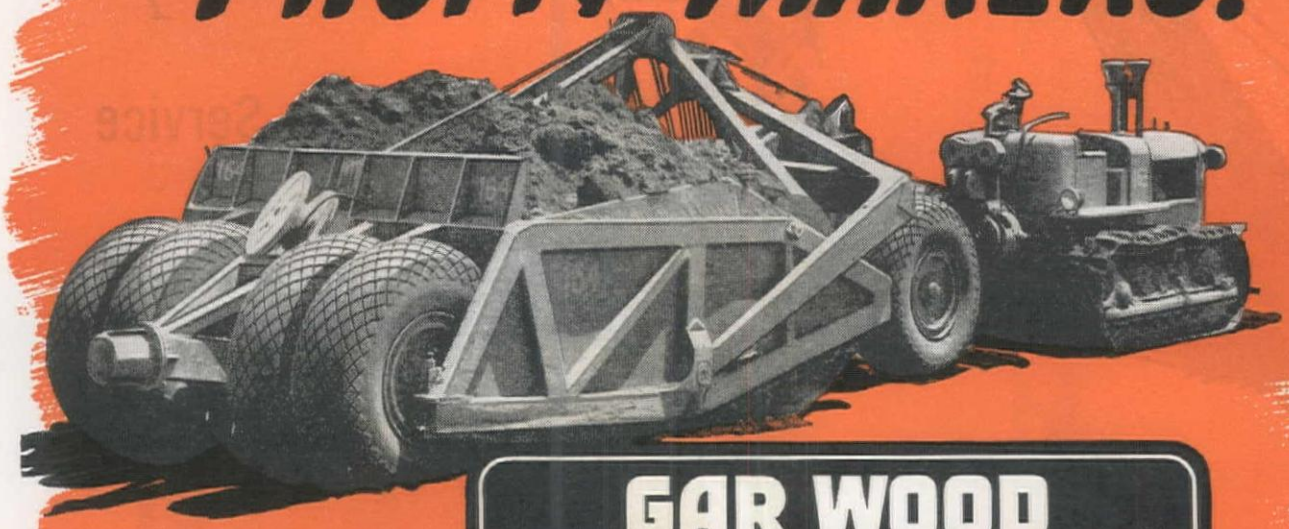
TIDE WATER ASSOCIATED OIL COMPANY

LET'S GET ASSOCIATED

SPECIALIZED LUBRICANTS FOR EVERY INDUSTRIAL PURPOSE

20th YEAR Associated Football Sportcasts
Get Free Schedules at All Associated Dealers

PROFIT MAKERS!



GAR WOOD ROAD MACHINERY

WITH ALLIS-CHALMERS DIESEL POWER

Whether it's the fast, high capacity Gar Wood Cable Scraper shown above or any other unit in the complete line of Gar Wood Road Machinery, you can be sure it is a consistent profit maker.

The profit earning ability of Gar Wood equipment has been proved by the best of all tests—actual on-the-job performance. In fact, such performance tests are the basis for a very large proportion of Gar Wood orders. For these orders are *repeat* orders from fleet users whose cost sheets show that Gar Wood Road Machinery cuts earth moving costs to a minimum—makes possible maximum profits on job after job.

Get your share of profits in the big construction program that's just ahead. Order Gar Wood Road Machinery now from your Allis-Chalmers dealer.

SPECIFY GAR WOOD FOR OUTSTANDING PERFORMANCE

Heavy Duty Rippers | Cable Dozecasters | 2-Wheel Hydraulic Scrapers | 4-Wheel Hydraulic Scrapers | Hydraulic Bulldozers

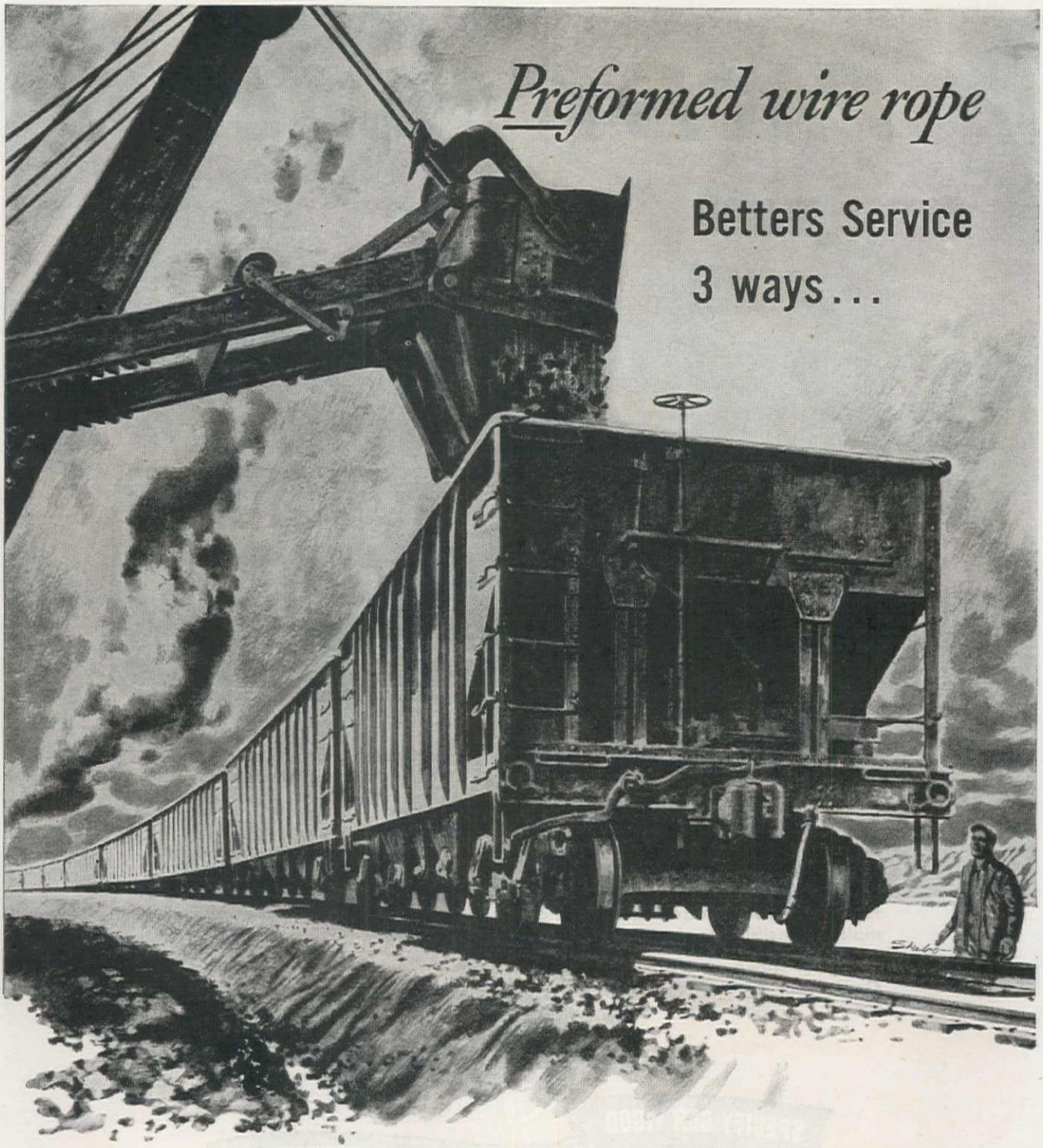
GW ROAD MACHINERY is Sold Through ALLIS-CHALMERS Dealers Everywhere

ROAD MACHINERY DIVISION

GAR WOOD INDUSTRIES, Inc.

DETROIT 11, MICHIGAN

OTHER PRODUCTS OF GAR WOOD INDUSTRIES INCLUDE HOISTS AND BODIES • WINCHES AND CRANES • TANKS • HEATING EQUIPMENT • MOTOR BOATS



RAILROADS own and operate thousands of pieces of heavy-duty equipment for which Preformed wire rope provides the muscle. Thus, Preformed is found on power shovels, cranes, derricks, hoists, winches—on car pullers, car retarders, dumpers—on loaders, unloaders, slings.

Railroads—like other industries—choose Preformed because it is *economical*, *safe*, and *saves wear* on equipment.

Its *economy* comes from longer life, due chiefly to lack of internal stress. It is *safer* for workmen because its wires lie flat when cut or broken, and because preforming relaxes wire rope and makes it flexible . . . It *saves wear* on expensive equipment because it reduces rotation on sheaves and spools evenly on drums.

Executives in *all* industries recognize the better service offered by Preformed.

ASK YOUR OWN SUPPLIER FOR PREFORMED WIRE ROPE

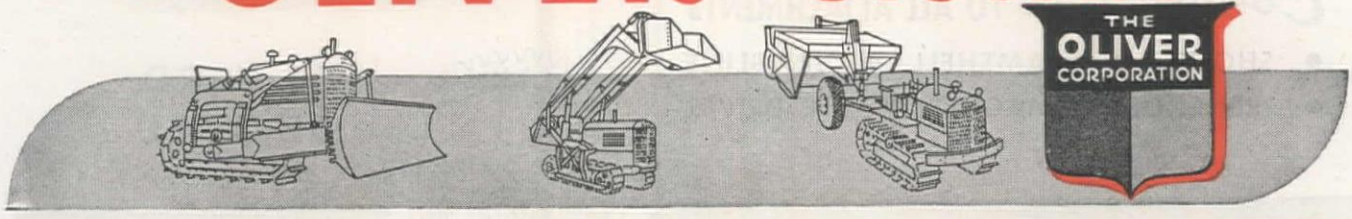
• Combine the sure-footed power of an Oliver "Cletrac" crawler tractor with the versatility of a Sargent overhead shovel and you get a one man construction crew that really speeds job progress.

You get maximum traction to crowd backwards into the pile and get a full dipper every time . . . to speed forward and discharge fast . . . even in the muddiest going.

This "one man gang" speeds loading out trucks . . . stripping loam or overburden . . . handling snow removal . . . digging foundations . . . tearing up and loading out old cobblestone or black top street surfaces . . . or on any job that calls for a speedy, powerful tractor shovel. And in a very few minutes a cable operated bulldozer or angledozer can be attached for grading or spreading operations. It's an all purpose unit . . . tractor, loader, angledozer, or tractor shovel.

For complete information on the "one man gang" that can help step up the pace of your jobs, see your Oliver "Cletrac" dealer. Substantial numbers are now being released for essential use. Your dealer will gladly assist you in making application. **The OLIVER Corporation,** 19300 Euclid Avenue, Cleveland, Ohio.

OLIVER - Cletrac



State of California: Gustafson Tractor Co., Eureka; Mechanical Farm Equipment Dist., Inc., San Jose; Comber & Mindach, Modesto; Nelson Equipment Co., Los Angeles; Tractor & Equipment Co., San Leandro; Flood Equipment Co., Sacramento; Hamsher Tractor Co., Stockton; W. J. Yandle, Santa Rosa. State of Washington: Burrows Motor Co., Yakima; Inland Truck & Diesel Co., Spokane; Pacific Hoist & Derrick Co., Seattle; Melcher-Ray Machinery Co., Walla Walla. State of Oregon: Loggers & Contractors Machinery Co., Portland and Eugene. State of Idaho: Idaho Cletrac Sales Co., Lewiston; The Sawtooth Company, Boise. Western Montana: Western Construction Equipment Company, Billings. British Columbia: A. R. Williams Machinery Co., Vancouver.

UNIT 1020

for the TOUGH *jobs*

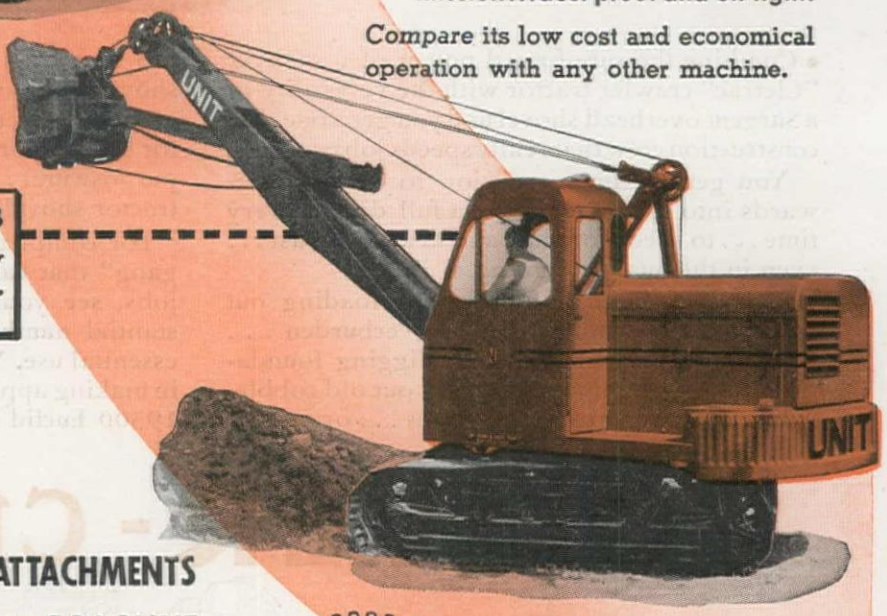
10 TON CRANE

Consider these exclusive features *not* found in any other comparable crane or shovel:

- New style full vision cab.
- Gasoline engine mounted in straight line with main machinery.
- Drop-forged alloy steel gears and splined shafts.
- Automatic traction brakes . . . no manual control required.
- One-piece cast gear case, simple in design and built as carefully as the finest automotive transmission . . . dust proof and oil tight.

Compare its low cost and economical operation with any other machine.

FULL VISION CAB
Complete 360 degree visibility at all times. Promotes safety. Increases job efficiency.



Convertible **TO ALL ATTACHMENTS**

- SHOVEL • CLAMSHELL • DRAGLINE
- TRENCHOE • MAGNET • PILE DRIVER

¾ YARD SHOVEL

UNIT CRANE & SHOVEL CORP. **MILWAUKEE 14, WISCONSIN, U.S.A.**

A 4848-1P-C

Ready NOW to cut your handling costs . . . . .

The NEW MODEL U
Full-Revolving HANDI-CRANE

• With traveling speeds to 15 m. p. h. and lifting capacity to 8,000 lbs., the Model U Handi-Crane offers versatility, working range and mobility unmatched by any other type of unit.

Loading or unloading cars, stockpiling materials, placing machinery, handling scrap . . . virtually *any* job of lifting or transporting materials . . . offers an opportunity for saving time and money with a HANDI-CRANE. A copy of the new Model U Bulletin is yours for the asking . . . write for it *today!*

Hydraulic topping provides safe, smooth and accurate boom control independent of swing and hoist operation.

Rugged, wide-tread front axle provides unsurpassed stability in traveling with loads, plus easier steering.

INDUSTRIAL EQUIPMENT COMPANY

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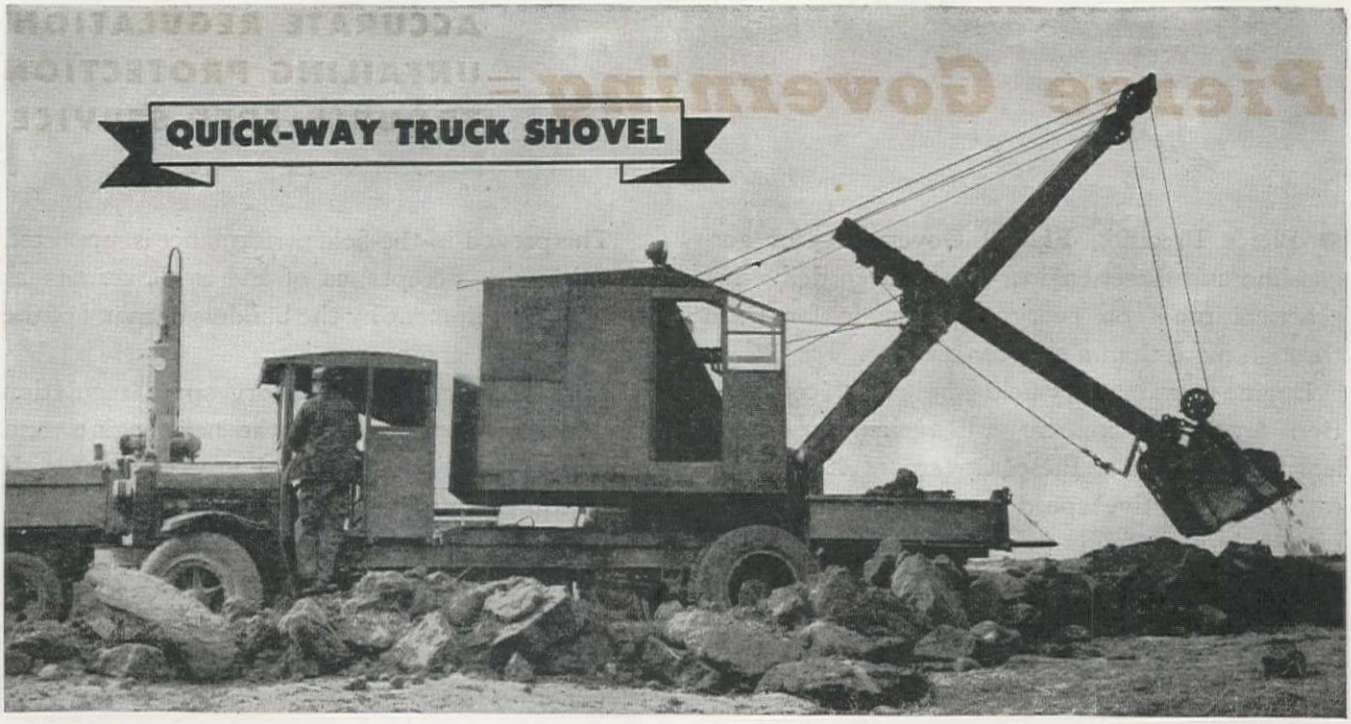


DO A VARIETY OF JOBS WITH A *Single* PIECE OF EQUIPMENT

The most versatile piece of excavating and construction equipment on the market. Goes anywhere a truck will go, at road speed. Works on soft ground where heavy equipment bogs down. Operates efficiently, under adverse conditions, where big machines cannot go. Requires no time for loadings when ready to move to the next job.

There's no limit to the number of jobs that can be done with a Quick-Way Truck Shovel. Custom built attachments make possible quick conversion of shovel into dragline, trench hoe, orange peel, clamshell, crane or pile driver in less than two hours, right on the job.

Get better profits from small jobs. Do them with a Quick-Way Truck Shovel, the shovel that does a variety of jobs better, because of these outstanding features:

1. MOBILITY PLUS SPEED.
2. BALANCED FOR SHOVEL OPERATION WITHOUT COUNTER WEIGHT OR OUTRIGGERS.
3. QUICK CONVERSION OF SHOVEL TO ANY ATTACHMENT.
4. ACCESSIBILITY TO AND INTERCHANGEABILITY OF PARTS.
5. HEAVY DUTY ENGINE FOR SHOVEL OPERATING POWER. STANDARD TRUCK ENGINE FOR SPEEDY TRAVEL TO THE JOB.
6. TOUGH STEEL CONSTRUCTION FOR DURABILITY.
7. SIMPLICITY OF DESIGN.

The "QUICK-WAY" is the best way to do MORE jobs for Greater Profits

WRITE FOR COMPLETE INFORMATION

SALES REPRESENTATIVES
George L. Meffley & Co.
820 UNIVERSITY BLDG., DENVER 2, COLO.

QUICK-WAY
TRUCK SHOVEL CO. DENVER 1, COLO., U. S. A.

FWD TRUCK-POWER IS ENGINEERED FOR ALL-SEASON USEFULNESS

FWDs are never out-of-season in highway service. Engineered specifically as Road Maintainers, they have a far greater work-range than ordinary trucks. Throughout all seasons, these multi-purpose highway units perform scores of jobs, many of them beyond the line of duty to which trucks dependent on "conventional drive" are limited. The same FWD Road Maintainer that is so effective in spring road conditioning and construction, also does every highway job that calls for truck power throughout summer and fall . . . takes care of more road mileage, faster, safer, with less drain on highway funds. And when winter sets in, the same FWD is on the job clearing snow — fast and at low cost. That's why rugged, reliable FWDs outnumber all other four-wheel-drive trucks better than 4 to 1 in all-season duty for over 800 counties, and thousands of townships and municipalities. Write for bulletin.

THE ONE TRUCK FOR ALL SEASONS

- **FALL** —Road patrolling; snow fence hauling.
- **WINTER** —Snow clearing.
- **SPRING** —Road conditioning and construction.
- **SUMMER** —Earth-moving; material hauling.

THE FOUR-WHEEL DRIVE AUTO CO.
Clintonville, Wisconsin
Canadian Factory: KITCHENER, ONTARIO

FWD TRUCKS

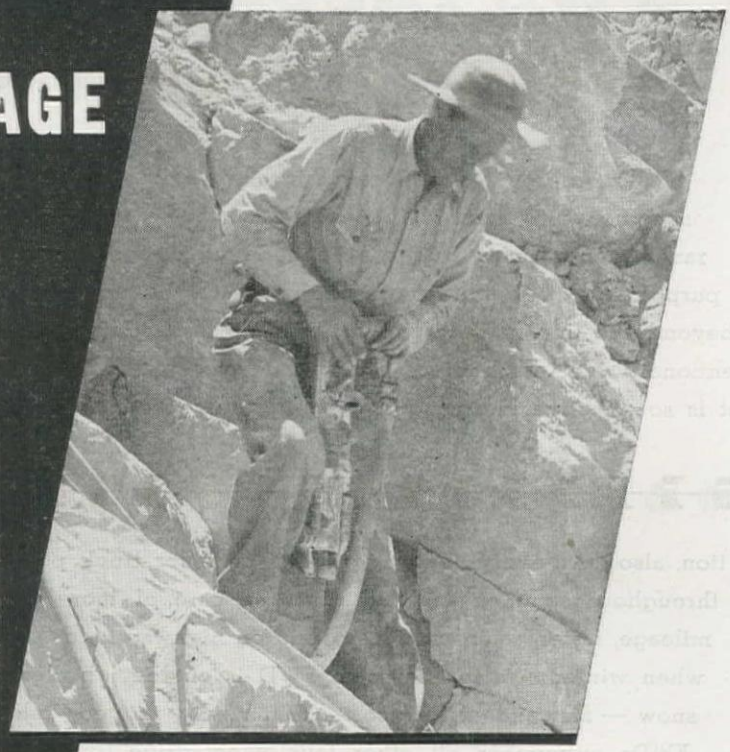
THE ORIGINAL EXCLUSIVE BUILDERS OF FOUR-WHEEL-DRIVE TRUCKS

FWD Model SU Truck equipped with underbody maintenance blade as recently purchased by city of Muskegon, Michigan.

FWD Model SU

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 Truck & 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. Ninth South, Salt Lake City; WASHINGTON—Feenaughty Machinery Co., 1028 Sixth Avenue South, Seattle 2, Glenn Carrington & Co., 91 Columbia Street, Seattle, and Feenaughty Machinery Co., 715 North Division Street, Spokane; WYOMING—Wortham Machinery Co., 517 West Seventeenth Street, Cheyenne; ALASKA—Glenn Carrington & Co., Nome, Fairbanks, Anchorage.

SPEED *the* FOOTAGE WITH *Thor* ROCK DRILLS



No. 75
SINKER ROCK DRILL

A general purpose, medium weight machine—one of three of a series in the 56-pound class—for shaft sinking, quarrying, road building and general construction work. Designed for deep, down-hole drilling with powerful rotation, powerful hammer action and powerful hole-blowing . . . for either wet or dry operation. Light and heavy duty drills also available in the complete Thor line.

Tough, on-the-job experience proves the capacity of Thor Rock Drills to drive *more holes per man per shift* . . . they easily out-drill everything on the job in all types of underground and surface hard-rock operations. And, that's not all—along with extra drilling speed, Thor Rock Drills provide low air consumption, minimum vibration, and maximum economy in maintenance.

Extra powerful rotation prevents stalling even in heavy, sticky formations . . . full air power behind the piston gives maximum penetrating and rotating power. Thor *air economy* turns every foot of air into power that, in combination with powerful rotation, assures exceptional hole-cleaning ability and steps up the rate of penetration. *Thor drills are tops for fast, low-cost drilling.*

WHAT THOR "MEASURED AIR" ECONOMY MEANS TO YOU . . .

Balanced Power—only a precisely measured amount of air is allowed behind the piston.

Smooth Performance—every stroke is powered by the same measured quantity of air.

Air Economy—every ounce of air provides a full measure of power for peak efficiency.

Low Maintenance Cost—there are no separate parts of the patented Thor valve to wear out or lose.

For more detailed information about the powerful, easy-operating Thor Rock Drills and other mining and contractors' tools, write for Catalog 42-A.

INDEPENDENT PNEUMATIC TOOL COMPANY
600 W. Jackson Blvd., Chicago 6, Illinois
New York — Los Angeles

OTHER THOR TOOLS FOR MINING AND CONSTRUCTION

Thor PORTABLE *Electric & Pneumatic* TOOLS
Branches in Principal Cities


• TWO REASONS WITH
BUT A SINGLE THOUGHT
The reasons WHY your burners prefer Victor cutting torches are the reasons WHY you will like them too—they work better—faster—more economically. AND they stay on the job longer.
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SAN FRANCISCO 7, CALIFORNIA
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NAVY

DIRT *IS* CHEAP

Perhaps that's one good reason why it was so long ignored as a primary source of materials for hard surfaced roads. There was no profit in it.

But now, the very cheapness of dirt—*native-in-place materials*—is being capitalized by new developments which make it possible to process them and produce stabilized all-weather roads at lower costs than ever before.

To make the highway dollar go furthest, all the necessary operations of processing and controlling "mixed-in-place" materials must be done in the most efficient manner. To this end P&H has developed a machine that combines the 8 basic requirements in a *single pass* — and at a good rate of speed.

The P&H *Single Pass* STABILIZER, capable of handling all types of commercial admixtures, opens a new era in low cost building of base courses, light traffic roads, streets, airport runways, etc. If you contemplate work of this nature, write us now for complete information.

P&H

SINGLE PASS
STABILIZERS

4490 W. National Avenue
Milwaukee, Wisconsin

HARNISCHFEGER
CORPORATION

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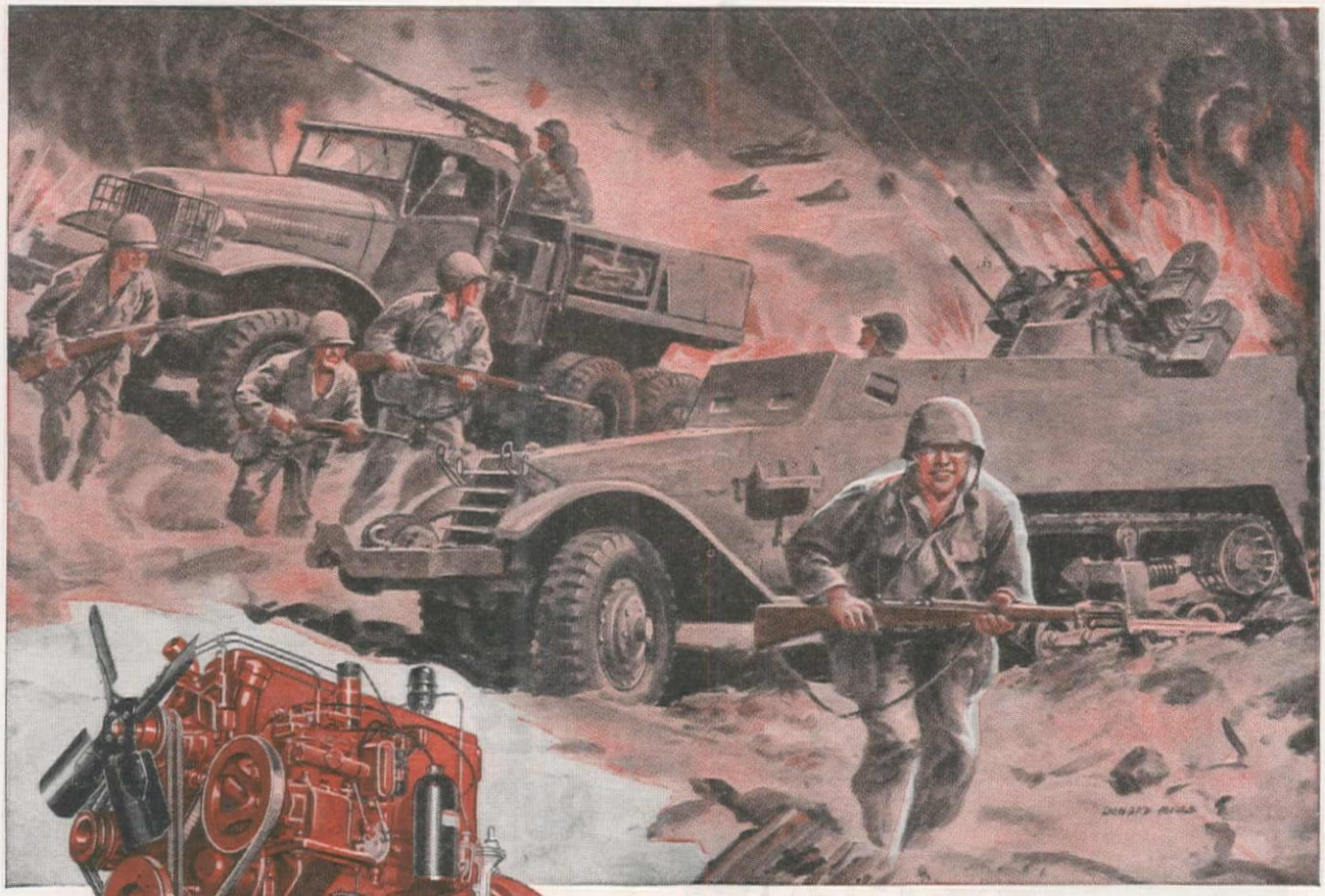
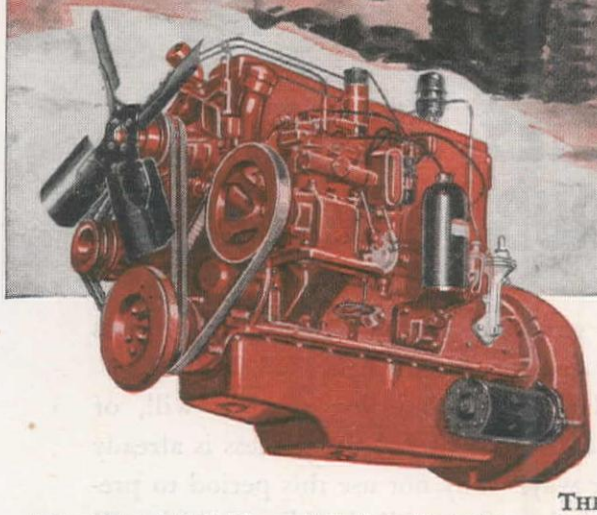




International Red Diamond Engine. Heavy-duty power for heavy-duty work. Ample power and capacity—surprising economy. Proved in actual combat warfare, now available for civilian service.

OUT OF THIS WAR —the Red Diamond Engine

THE rugged requirements of warfare on every battlefront have inspired the engineering genius of American industry.

Out of this war has come, for example, the *new International Red Diamond Engine.*

Tens of thousands of International Military Trucks and Half-Tracks—powered by this new International Red Diamond Engine—have set new transportation and combat records in wartime service.

Many of these mighty Red Diamond Engines have already gone into International Heavy-Duty Trucks for essential civilian use. The men who operate them will vouch for the stamina and economy of adequate power for any job.

When new trucks roll out in volume on America's highways, look to International for even greater economy, even greater dependability. And remember—for ten years before the war *more heavy-duty Internationals were sold than any other make.* Backed then, as now, by the *world's largest company-owned truck service organization.*

The new Red Diamond Engine powers International Models K-8, KS-8, KR-11, and KS-11.

INTERNATIONAL HARVESTER COMPANY
180 N. Michigan Ave. Chicago 1, Illinois

International Truck Branches at Portland, Tacoma, Seattle, Spokane. International Truck Dealers throughout the Pacific Northwest.

NEW TRUCKS: The government has authorized the manufacture of a limited quantity of light, medium and heavy-duty International Trucks for essential civilian hauling.

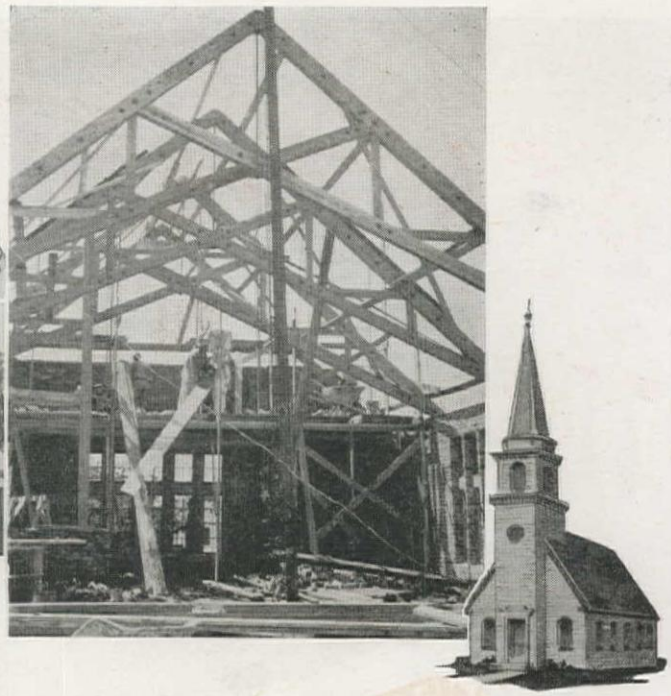
SERVICE: Many operators will have to wait for trucks. Maintenance of existing vehicles is just as important today as before V-E Day. Therefore—be sure your trucks get top care and service at International Truck Dealers and Branches.

INTERNATIONAL HARVESTER

Buy More War Bonds and Keep Them

INTERNATIONAL

INTERNATIONAL *Trucks*



Needed...! SCORES OF NEW PUBLIC BUILDINGS

DESIGN THEM IN TIMBER . . . with TECO connectors

IN ALMOST every community America's pent-up construction requirements extend far beyond places for people to live . . .

Because of the vast number of the units involved, *residential* construction overshadows other types in discussions of post-War building . . . BUT ONLY IN DISCUSSIONS.

Practically every town needs a new place of *worship,* new places to *play,* and various other structures for public assembly . . . this is, or can be, BUSINESS FOR YOU.

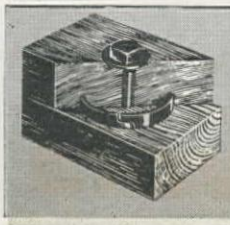
Relaxation of building controls will, of course, be gradual, but the process is already under way. Why not use this period to prepare designs for public buildings which will place you out in front when the signals are green?

If you design in timber with TECO CONNECTORS, your plans will have a *cost and time advantage.* Use this developing situation now. Get ahead of the "push" later by examining the local market and planning with the aid of TECO'S service.

HOW? . . . send for "Typical Lumber Designs". There is no obligation . . . use the coupon below.

Timber Engineering Co., Inc. of Washington, D.C.

Monadnock Building, 681 Market Street, San Francisco • Telephone Garfield 6296



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QUALITY LUBRICANTS ADD TO YOUR TRUCK'S LIFE . . . CUT "DOWN-TIME" . . . SAVE REPAIR BILLS

One thing that the war years taught us — the cars and trucks that are regularly serviced with quality lubricants are the ones that last. Long after what was formerly considered their "normal life span," they kept on delivering trouble-free service.

Shell Super Chassis Lubricant is one of the high quality lubricants which have helped keep America's equipment on the road, saved repair bills and out-of-service time.

Specially developed by Shell for general chassis lubrication, it has the stick-to-the-job quality that protects shackles, king pins, steering connections and other vital parts against wear. Super Chassis Lubricant is highly water repellent . . . maintains a tough lubricating film under severe conditions . . . spreads readily without excessive dripping.

Build your own preventive maintenance program around this Shellengineered chassis lubricant. Fill out your needs with other Shell quality lubricants — Golden Shell Motor Oil, Shell Super Gear Lubricant EP, Shell Transmission Oil, Shell Wheel Bearing Grease. Whatever you need in lubricants you can get from Shell Oil Company, *Incorporated*.

SHELL SUPER CHASSIS LUBRICANT

SHELL

Shellengineered for the job

Now UP TO 2000 hp!

STANDARD 2000-HP TRI/CLAD MOTORS NOW AVAILABLE

THEY GIVE EXTRA PROTECTION 3 ways

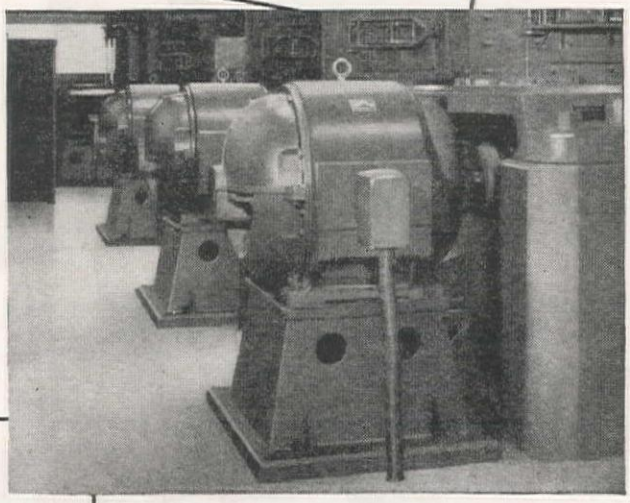
1 **Extra protection from physical damage**—Cast-iron construction. Upper portion completely enclosed. Streamline, cast-iron end shields. Corrosion-resisting finish.

2 **Extra protection from electrical breakdown**—Windings of Formex* wire, strongly bonded with oil- and moisture-resistant synthetic resins, stand up under abrasion or "heat-shock."

3 **Extra protection from operating wear and tear**—Sleeve or ball bearings, in dust-tight housings. Sleeve-bearing design is a further refinement of well-proved Tri-Clad bearing proportions, with cast-in "air seal" to further insure oil tightness of the housing.

The triple-protected construction that has made General Electric's Tri-Clad motor so popular in the small and intermediate sizes has now been extended to motors of 2000-hp capacity. On your *big* drives, these new Tri-Clad motors will meet severe conditions with greater assurance than ever of dependable service and long life.

The Tri-Clad motor, in its wide range of types and sizes, is industry's most popular integral-hp motor. Chances are there's a standard Tri-Clad to meet your requirements "on the nose." For information on G.E.'s complete line of Tri-Clad motors, ask for Bulletin GEA-3580. *General Electric Company, Schenectady 5, N. Y.*



Three of the new, large Tri-Clad motors, each rated 200 hp, 1200 rpm, driving coal pulverizers in a Southern steam-electric plant

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

HERE'S TODAY'S WIDER RANGE OF STANDARD SIZES	
TRI/CLAD Type K	—1 hp to 2000 hp at 1800 rpm
TRI/CLAD Type KG (High starting torque, low starting current)	—5 hp to 200 hp at 1800 rpm
TRI/CLAD Type KR (High starting torque, high slip)	—Available to 100 hp in speeds required for high-slip, flywheel drive (punch press, etc.)

Buy all the BONDS you can—*and keep all you buy*

GENERAL ELECTRIC

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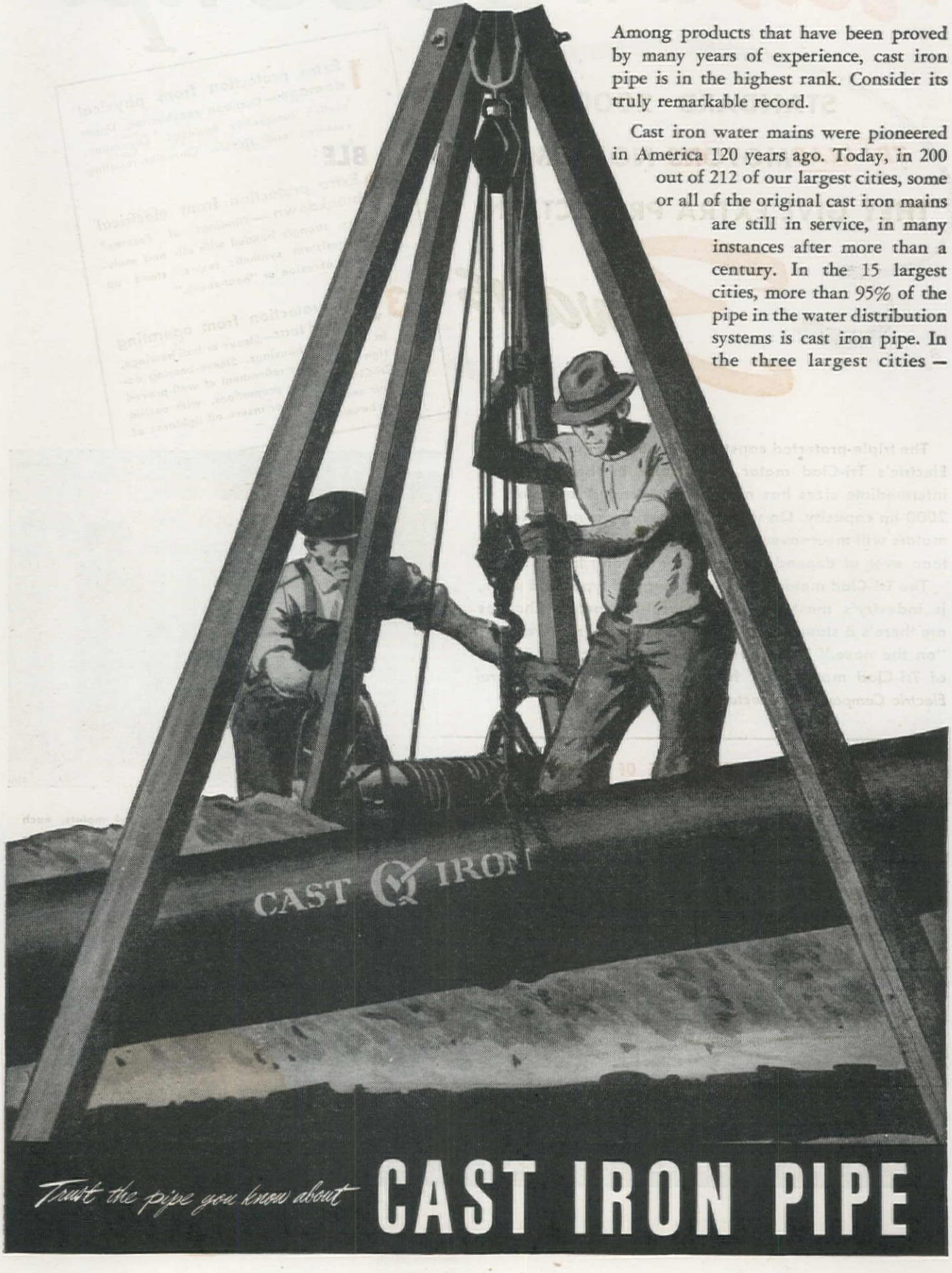
TRI/CLAD MOTORS

Lay it with Confidence



Among products that have been proved by many years of experience, cast iron pipe is in the highest rank. Consider its truly remarkable record.

Cast iron water mains were pioneered in America 120 years ago. Today, in 200 out of 212 of our largest cities, some or all of the original cast iron mains are still in service, in many instances after more than a century. In the 15 largest cities, more than 95% of the pipe in the water distribution systems is cast iron pipe. In the three largest cities —

Trust the pipe you know about **CAST IRON PIPE**

Based on Experience

New York, Chicago, Philadelphia—the ratios are respectively, 97%, 99% and 98%. Thus it is evident that top-flight engineers *continue* to endorse the judgment of four generations of water works men.

Confidence, based on experience, is doubly important in the case of pipe to be installed underground for distribution mains. They represent the major investment in a water supply system. So we say *—trust the pipe you know about.*

Cast Iron Pipe Research Association, Thomas F. Wolfe, Research Engineer, Peoples Gas Building, Chicago 3, Ill.

THE 10 REQUIREMENTS FOR UNDERGROUND MAINS UNDER NORMAL CONDITIONS

LONG LIFE: In evaluating bids, the useful life of cast iron pipe is figured at 100 years minimum.

CARRYING CAPACITY: The carrying capacity of standard tar-coated cast iron pipe remains practically unimpaired for centuries. For the certain areas where tuberculating water is encountered, cement-lined cast iron pipe is available. Under such conditions, no other material offers the combined long life and sustained carrying capacity of cement-lined cast iron pipe.

TIGHT JOINTS: For *ordinary* pressures, cast iron bell-and-spigot pipe—for *high* pressures, cast iron mechanical joint pipe—are known to be leak-proof.

TENSILE STRENGTH: When tested under hydrostatic pressure to destruction, the ultimate tensile strength of cast iron pipe is a minimum of 11,000 p.s.i. for pit cast pipe and a minimum of 18,000 p.s.i. for cast iron pipe made by other methods.

BEAM STRENGTH: Under beam stress tests, 10 ft. span, standard 6" cast iron pipe sustains a load of 15,000 pounds and bends approximately one inch before breaking.

TOUGHNESS: Under hydrostatic pressure and the impact of a 50 lb. hammer, standard 6" cast iron pipe does not crack until the hammer is dropped four feet.

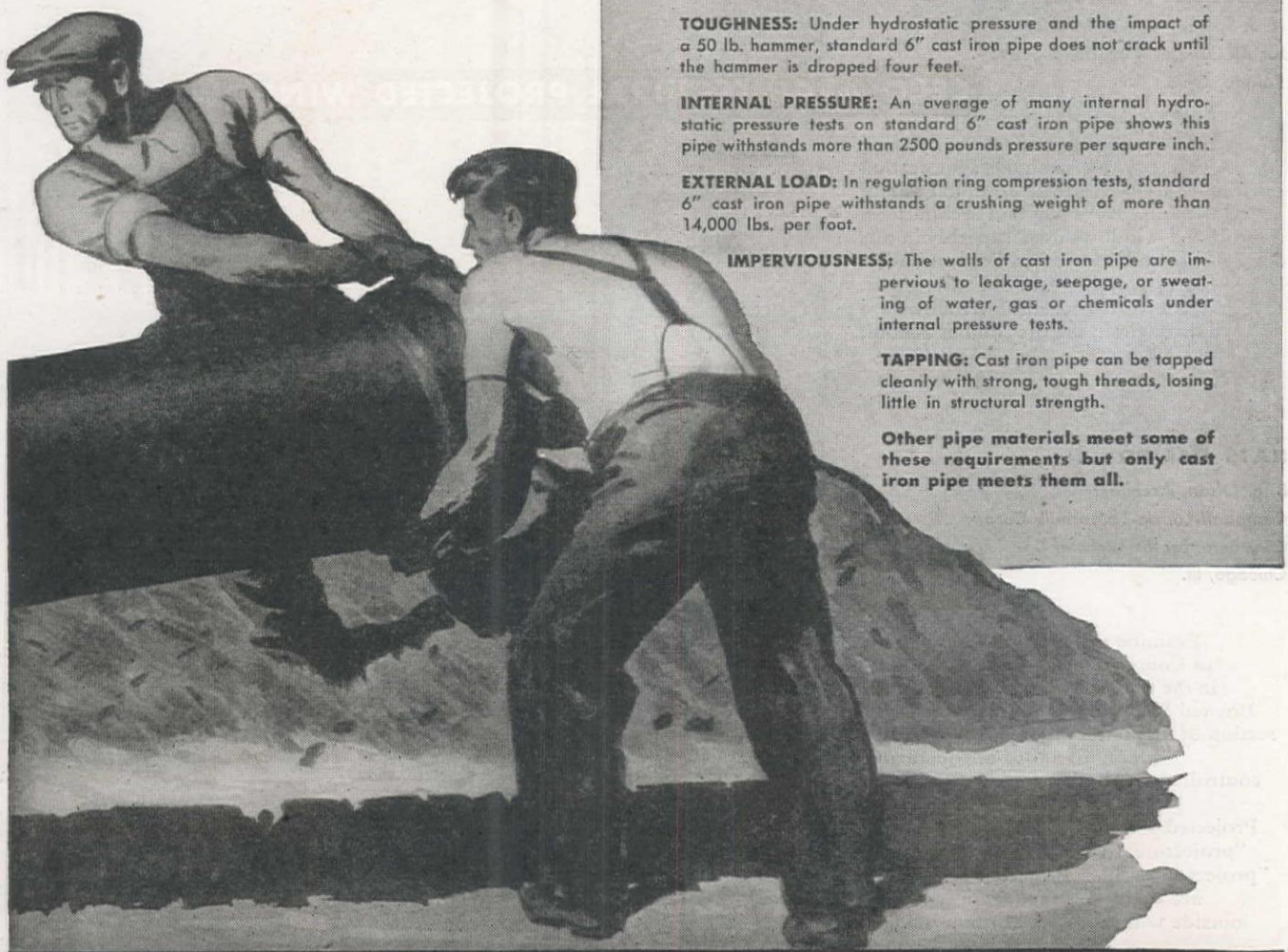
INTERNAL PRESSURE: An average of many internal hydrostatic pressure tests on standard 6" cast iron pipe shows this pipe withstands more than 2500 pounds pressure per square inch.

EXTERNAL LOAD: In regulation ring compression tests, standard 6" cast iron pipe withstands a crushing weight of more than 14,000 lbs. per foot.

IMPERVIOUSNESS: The walls of cast iron pipe are impervious to leakage, seepage, or sweating of water, gas or chemicals under internal pressure tests.

TAPPING: Cast iron pipe can be tapped cleanly with strong, tough threads, losing little in structural strength.

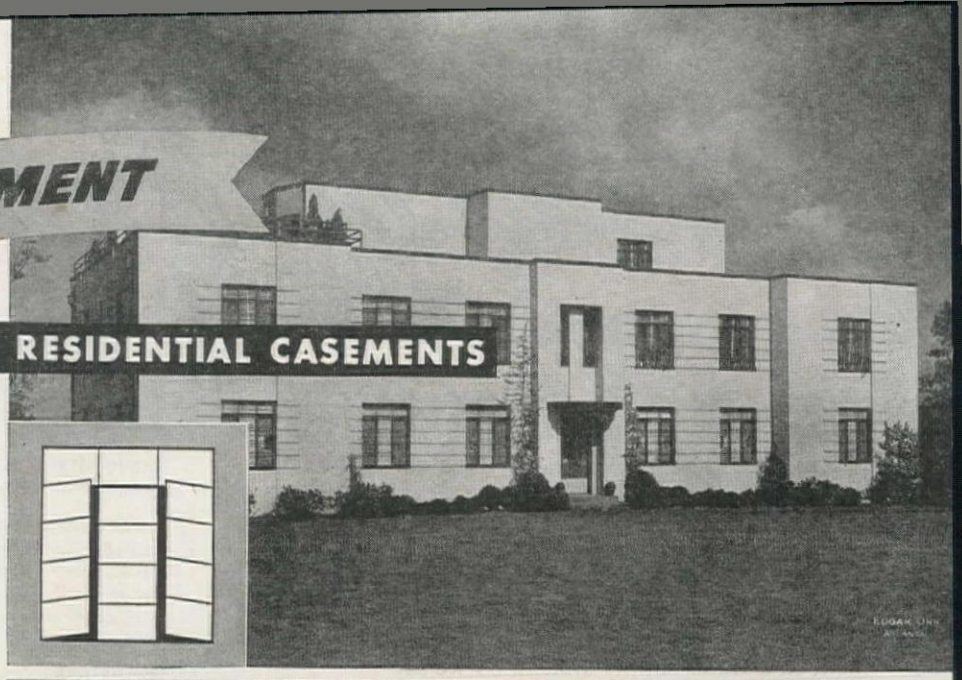
Other pipe materials meet some of these requirements but only cast iron pipe meets them all.



SERVES FOR CENTURIES

Tax Saver No. 1

HATS OFF DEPARTMENT



CECO RESIDENTIAL CASEMENTS

HATS OFF TO...

A. Thomas Bradburg, Architect
C. R. Justi, Contractor
for 4 family apartment Atlanta, Georgia

This unusual treatment of a four family apartment stresses the importance of the windows to the modern design. A fine example as applied to a multiple family unit. In this interesting Atlanta apartment Ceco residential steel casements are used throughout.

CECO ARCHITECTURAL PROJECTED WINDOWS

HATS OFF TO...

Edwin M. McGee
Department of Architecture
Toledo Board of Education
H. J. Spieker Co., Contractor
for McComber Vocational School
Toledo, Ohio

A well designed school building using the maximum fenestration without sacrifice to the traditional school design. Here you find architectural projected windows used superbly in this design which calls for control of ventilation so essential to school construction. Ceco Architectural Windows are used throughout the McComber School.

CECO COMMERCIAL PROJECTED WINDOWS

HATS OFF TO...

B. F. Olson, Architect
Campbell-Lourie-Lautermilk Corp.
Contractor for the Webster Co.
Chicago, Ill.

Examine the effective combination of Commercial Projected Windows in the office portion and Horizontal Pivoted Windows in the manufacturing section of this modern Webster Company plant. To afford adequate and controlled ventilation for office workers Mr. Olson specified Commercial Projected Windows with two-light-high "project-out" vents and one-light-high "project-in" vents. Projected ventilators are easily screened from inside or outside with Ceco metal-frame screen.

CECO STEEL PRODUCTS CORPORATION
MANUFACTURING DIVISION
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Concrete Engineering Division, Sheet Steel and Wire Division, Highway Products Division

NGINEERING MAKES THE BIG DIFFERENCE IN CECO CONSTRUCTION PRODUCTS

SERVICE BY THE TON

CHEVROLET TRUCKS for 1945

CHEVROLET

Your truck is an important part of your service. The loads that it hauls keep you in business. Your trucking jobs demand equipment that will serve you satisfactorily and economically.

Low first cost, low operating cost and low maintenance cost are the main factors in successful truck operation.

Chevrolet trucks, with their built-in values, are the most economical to buy, to operate and to maintain. They are built for tough truck work. They are built to last longer. They will serve your business for thousands of ton-miles. For these reasons, truck users bought more Chevrolet trucks than any other make in seven of the last nine prewar years.

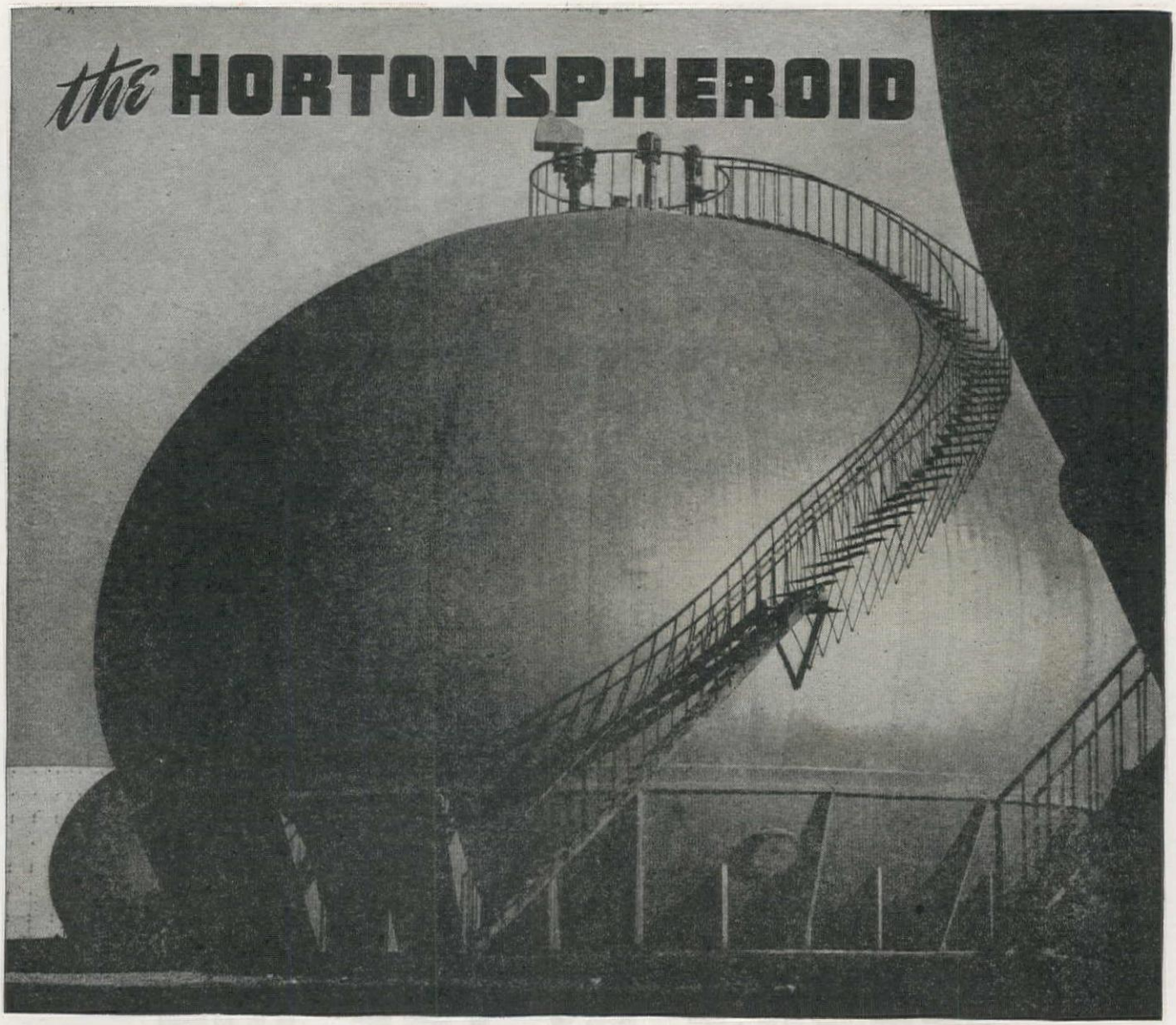
Your Chevrolet dealer can supply the right truck for your trade. He can increase the payload capacity, if you desire, by the installation of auxiliary axles, springs, bodies or trailers.

Buy only as much truck as you need. Buy a Chevrolet truck. It's payload, not chassis weight, that pays profits.

1 OUT OF EVERY 3 TRUCKS IS A CHEVROLET

Keep on Buying War Bonds

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



. . . your best bet for storing volatile liquids ranging in volatility from motor gasoline to natural gasoline.

THE HORTONSPHEROID is used to store volatile liquids under pressure. It eliminates costly evaporation due to breathing, boiling, and filling.

The operation of the Hortonspheroid is simple. It is usually designed to operate at a higher pressure than the maximum vapor pressure of the product being stored, and is equipped with relief vents set to open at this pressure. Hence, instead of allowing the air vapor mixture above the liquid in the tank to escape, pressure is built up inside of the tank. No evaporation loss can take place as long as this pressure does not exceed the setting of the relief vents.

Smooth type Hortonspheroids are available in capacities from 2,500 to 40,000 bbls. for 5 to 35 lbs. per sq. in. pressure. Noded Hortonspheroids are built in capacities of 20,000 to 120,000 bbls. for pressures of 2½ to 20 lbs. per sq. in.

Here's proof of the HORTONSPHEROID'S Efficiency. Motor gasoline, stored in a 50,000 bbl. Hortonspheroid, operating at 2½ lbs. per sq. in. pressure will suffer an evaporation loss of 50 bbls. during each complete filling, but the day-to-day breathing loss is eliminated entirely. With the same product stored in a gas-tight, fixed roof under the same conditions there will be a loss of 100 bbls. during a complete filling and an annual breathing loss of 1,300 bbls.

CHICAGO BRIDGE & IRON COMPANY

CHICAGO • HOUSTON • NEW YORK
SAN FRANCISCO • BIRMINGHAM

CLEVELAND • TULSA • LOS ANGELES
PHILADELPHIA • WASHINGTON

Plants at BIRMINGHAM, CHICAGO, and GREENVILLE, PENNSYLVANIA

WESTERN CONSTRUCTION NEWS
WITH WHICH IS CONSOLIDATED WESTERN HIGHWAYS BUILDER
September, 1945 Vol. 20, No. 9

The War Is Over

PEACE CAME suddenly and unexpectedly the other day, and in the midst of the resulting confusion, a few observations might be made.

First, peace came about primarily as the result of the atom bomb, developed by American scientific genius, and built in the world's greatest plants.

Some Americans were shocked to learn that our forces would engage in the most horrible indiscriminate bombing of civilians ever known, having been taught that only Germans or Japs would sink to such levels of depravity. However, if it's going to be done, no doubt it's better to "dish it out" than to "take it." The most serious repercussion comes from the fact that our internationalist statesmen will probably give the secret to all the world, thereby hastening the day when we, with them, will be utterly blown from the face of the earth.

Second, in San Francisco, after a few hours of genuinely happy celebration, the unbridled flow of liquor turned a joyous occasion into a disgraceful riot, resulting in twelve deaths, 1,059 reported injuries, and untold thousands of dollars of property damage. Noticeable was the fact that the principal participants were young sailors without campaign bars. Those who had seen action overseas were generally onlookers.

Third, peace finds many private and public construction agencies unprepared to meet the employment sag. This has been freely predicted by *Western Construction News* and other journals. We do not say "I told you so," but rather, "Let's put on all steam, but immediately." Applause to those highway departments and other agencies who have a big backlog of work **ready to contract.**

Further, we have not talked to anyone who sees less than a great and glowing postwar future for the West, not only in construction, but in every phase of industry, commerce, and life. "It's a natural!" Construction for the next few years should surpass all peacetime records.

Lastly, for inconsistency and humor, we mention the standard 60-word termination telegram received by this magazine from Chicago, terminating one three-dollar subscription for an army group.

Fair Employment Practice?

CONGRESS HAS BEEN considering the appropriation for the so-called Fair Employment Practices Commission, which guarantees to everyone, regardless of race, color or religion, equal opportunity in employment and working conditions.

It is a measure earnestly supported by the Administration, and has some good arguments in its favor. Truly, no group of citizens should be favored over any other.

It is particularly hard to understand, then, the action of the Federal Civil Service Commisson, a part of the same administration, in announcing a few days ago that from now on, employment in the bureaus and departments of the government would be limited to returning veterans. This is so far removed from the principles of the Fair Employment Practices Act, as to be a complete reversal.

The Civil Service system has two principal objectives. First, it is to assure the employee an opportunity to use his best efforts to the public benefit, without fear of political interference, and secondly, it is to make sure that positions in government are filled by the most capable and suitable persons available. This second objective is not being fairly met if they dogmatically rule out a large proportion of the country's population from consideration in selecting government employees. Desirous as everyone is of giving every possible advantage to the boys returning from the wars, it is nevertheless true that there conceivably could be jobs for which no service man is qualified, or for which the only available veterans are much less well prepared and qualified than some civilian.

By no stretch of the imagination is this editorial meant to imply that veterans should not be entitled to fit back into government jobs from which they were taken into the armed forces, or some reasonable preference should not be given them in new employment. This preference has usually been represented by a 5 or 10 per cent gratuitous credit on examination grades, and we feel this should continue. But we strenuously object to a ruling by which all non-veterans, qualified or not, are dictatorially and completely denied even the right to take a competitive examination for the job. Let the sponsors of Fair Employment Practices consider this again!!

A Well-Grounded Movement

PRAISE WITHOUT END for the activities of the group recently organized in the Northwest known as the Pacific Northwest Development Association. Although first conceived by the progressive contractors of the area and organized with money contributed by them, they have wisely given over direction and control of the organization to a board of directors composed of industrialists, agriculturists, representatives of labor, the press, transportation, and every other phase of activity.

Further, the organization is not devoted to any single objective, but to development of better and more prosperous living for all the citizens of the Columbia River Basin. It is not organized solely to promote construction work, for instance, or expansion of mining, or sale of farm produce. It proposes a well-rounded program of increased activity for every type of business, recognizing that free enterprise, properly encouraged, can be counted on to produce the most salutary benefits from the natural resources of the area, and the greatest prosperity for the citizens.

It is inevitable that such a program will soon run head-on into the totalitarian schemes of certain "pinks" in the government who would divide the nation into a few federally-operated regional authorities, one of which is proposed for the Columbia basin. The Association will, of course, be obliged to direct its mightiest efforts against such proposals if it is honestly to carry out the objectives set for it. We believe it will fearlessly defend the traditional American scheme of life.

The one sad note in the picture is the fact that the organization is limted in geographical coverage to one section of the great Western Empire. The need for an organization with the scope and vision of the Pacific Northwest Development Association to fight the battles of the WHOLE WEST impartially and without other personal interest than the gain which accrues to each individual and each local community as the whole prospers, is so acute as to be almost oppressive. Not local sections, but the entire region will stand or fall, and all Western communities should be battling unitedly.

Praise, indeed, for the aggressive Northwest movement—Hope that a similar united movement will soon be forthcoming for the whole West.

does double duty

99-M LOADER

Reduces Investment in Equipment ...Handles a Variety of Jobs

• COMBINING, in one machine, the ability to grade and load, the "99-M" Loader is deservedly popular with both contractors and highway departments.

In the upper picture, the Loader is picking up a windrow of sod "pulled" from the ditch, and, at the same time, stripping sod from the shoulder.

In the lower illustration, the Loader is performing one of the many small jobs of shallow excavation where neither shovels nor scrapers will operate efficiently or economically.

Your nearby A-W Distributor will be glad to tell you all about this "Double-Duty" machine.

AUSTIN-WESTERN COMPANY • AURORA, ILLINOIS, U. S. A.

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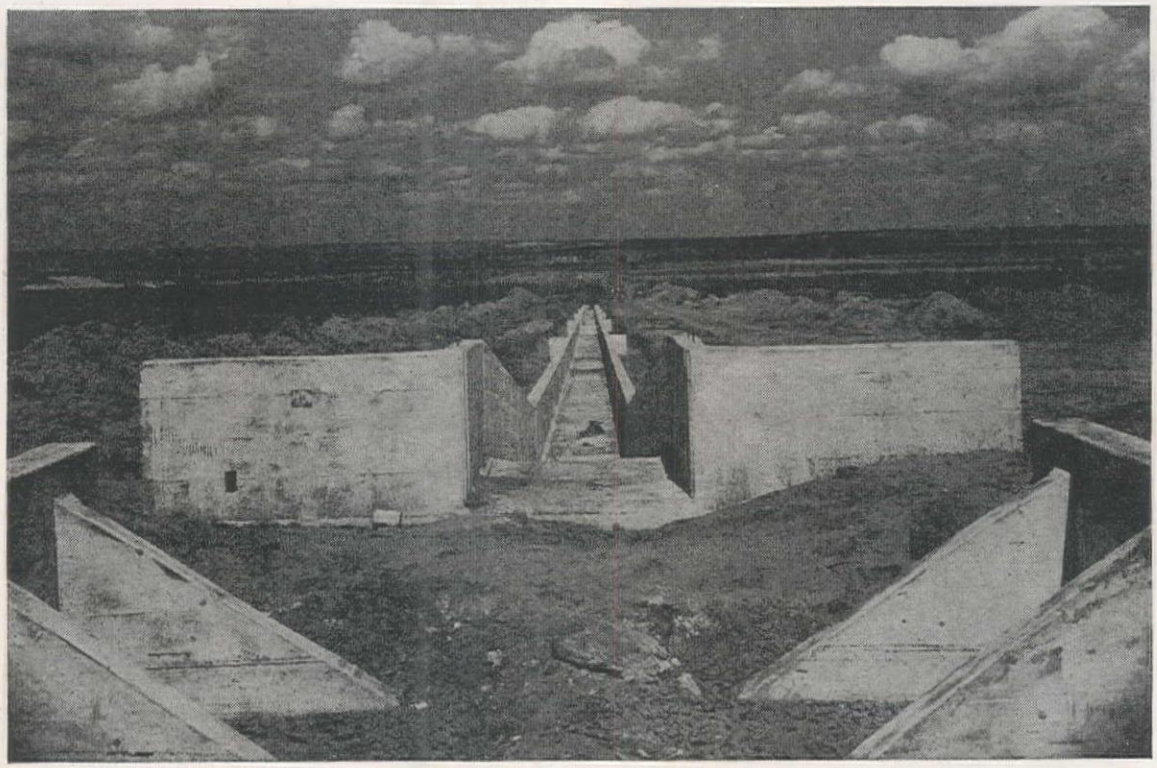
OREGON—COLUMBIA EQUIPMENT COMPANY . . . . . Portland 14
UTAH—WESTERN MACHINERY COMPANY . . . . . Salt Lake City 13
WASHINGTON—COLUMBIA EQUIPMENT COMPANY . . . . . Seattle
WYOMING—WILSON EQUIPMENT AND SUPPLY CO. . . . . Cheyenne



A LIBERTY LATERAL on the Tucumcari project. The long concrete construction is necessary to drop the water from the main canal, at the base of the mesa paralleling the S. Canadian River, without erosion to the fertile valley lands.

Water for New Mexico Desert

Tucumcari Project of the Bureau of Reclamation utilizes an extensive series of siphons, tunnels and ditches to convey water impounded by Conchas Dam on the South Canadian River to irrigate over 45,000 acres of farm land in the Arch Hurley Conservancy District

By HAROLD W. MUTCH
Construction Engineer, Bureau of Reclamation
Tucumcari, N. Mex.

"I'M AMAZED at the ingenuity of the construction of the siphons and tunnels on this great project." These were the words of Senor Jose Pons, Manager of the Bureau of Irrigation of Ecuador, when he flew from South America in June to visit the Tucumcari Irrigation Project, now under construction by the Bureau of Reclamation at Tucumcari, New Mexico.

The Tucumcari project, when completed, will irrigate 45,000 ac. of farm land in Quay County. This acreage is included in the Arch Hurley Conservancy District, which totals approximately 90,000 ac. The land is practically all in private ownership, tracts ranging in size from a few acres to more than a thousand.

Engineering design for the project was done by the Bureau of Reclamation, and supervision of construction by the same agency.

Source of water

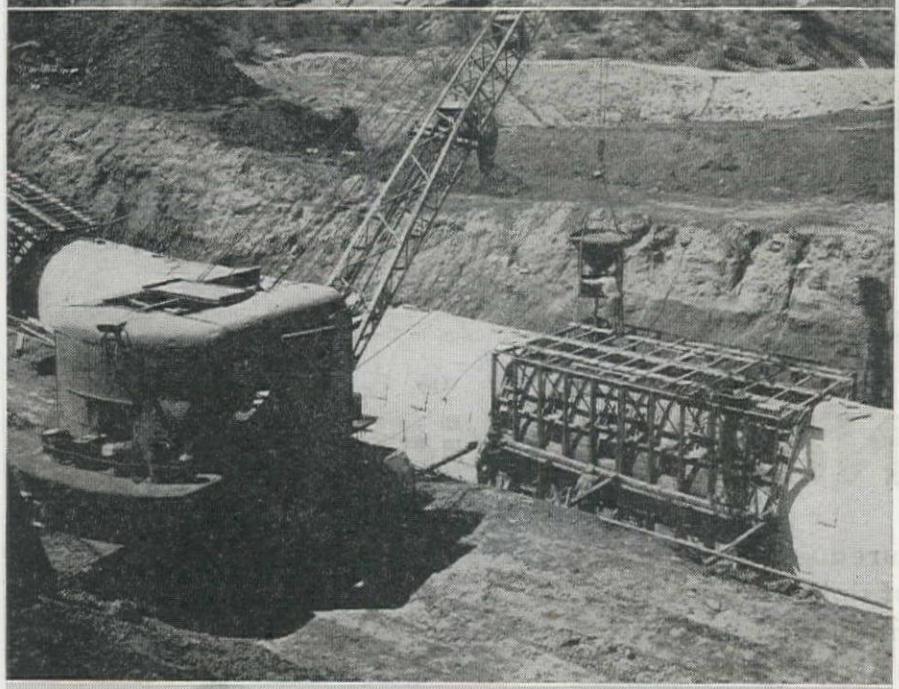
The source of supply for the irrigation project is the impounding of the flood waters of the South Canadian river by Conchas Dam, constructed by the Corps of Engineers. Work on the dam started in 1935 and it was completed in 1939. It is located immediately downstream from the junction of the Conchas and South Canadian rivers and is a straight gravity concrete dam, having a crest length of 1,250 ft. and a height of 235 ft. above foundation. Construction problems encountered in its erection were discussed in the May, 1938, and February, 1940, issues of the *Western Construction News*.

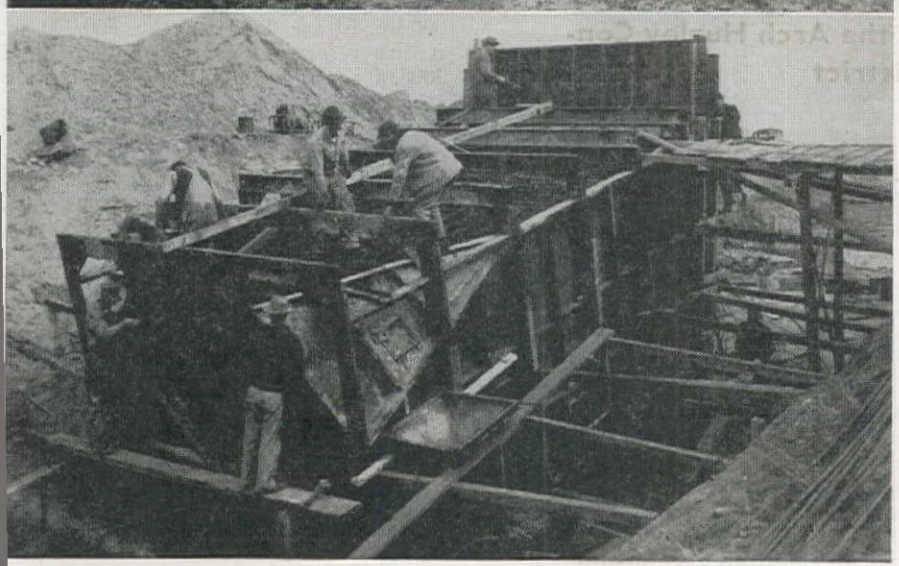
The Conchas reservoir has a storage capacity of 600,000 ac. ft., of which 100,000 ac. ft. are dead storage, 200,000 ac. ft. are reserved for flood control, and 300,000 ac. ft. are available for irrigation storage.

Construction of the irrigation phases of the program were begun by the Bureau in 1940. This work includes five tunnels, having a total length of 5.7 mi., 30 siphons, with a total length of 3.8 mi., and about 75 mi. of main canals. At the present time drilling operations on the last of the five tunnels is nearing completion, and when this tunnel is holed through the major construction work on the canal will have been completed.

Start of work

The first contracts, awarded in 1940, were for (1) the upper 134,000 ft. of canal and structures, to Utah Construction Co. and Griffith Co., San Francisco, Calif., $562,027; (2) the first three tunnels, to Jahn-Bressi-Bevanda Constructors, Inc., Los Angeles, Calif., $1,309,582; (3) processing of aggregates for the first 38 mi. of tunnel, to Brown &





TRANSIT MIXER loading concrete into a bucket alongside Siphon No. 17 on Conchas Canal, top. Pouring concrete in one of the thirty siphons that form part of the canal system, center. Forming a round to square transition for one of the siphons, bottom.

Root, Inc., Austin, Tex., $74,400; and (4) the outlet works for the canal, to Henry Shore, Grand Junction, Colo., $23,600. In addition some canal sections and structures were built by WPA forces in the early stages of the project.

A contract was awarded in 1942 to Bressi-Bevanda Constructors, Inc., for Tunnel No. 4, but they had scarcely gotten their camp established when the War Production Board ordered cessation of all construction activities on reclamation projects.

The canal follows generally eastward from the dam along the base of the mesa bordering the South Canadian river on the south, until it reaches the San Miguel-Quay county line, which is also the boundary line of the Arch Hurley Conservancy District. At this point the canal turns southward, skirting the watershed of Pajarito creek, and passing through the southwesterly corner of the city of Tucumcari.

Tunnel construction

One unusual phase of the tunnel construction is that Tunnel No. 5 will pass directly under the southern portion of the city of Tucumcari. This has been done to avoid depreciation of select residential property, and also as a safety measure. This tunnel is being constructed by Morrison-Knudsen Co., of Boise, Ida., and is the last tunneling on the project. On July 3, the 3,052-ft. bore was over half completted. Tunnel No. 4 was completed by Bressi-Bevanda after construction work was reopened by WPB in April, 1944.

The tunnels are of lined horseshoe section, driven to a 13-ft. diameter and concreted to a finished diameter of 11.6 ft. Standard tunneling methods have been employed throughout, using steel H-beam supports and 3-in. timber lagging. In the completed tunnels of the project an average of 34 ft. of excavation was completed each day by working around the clock. Tunnel No. 4 is the longest on the project, and work on its 7,087-ft. length included 17,000 cu. yd. of rock, open-cut and portal excavation; 39,360 cu. yd. of tunnel excavation; 9,410 cu. yd. of concrete; 604,000 lb. of permanent steel tunnel supports and 320,000 bd. ft. of permanent tunnel timbering. Although originally slated for completion in 750 calendar days, the final contract negotiation called for completion in 300 calendar days in order to facilitate the early delivery of water to the project.

The lining in the first four generally was placed by pumpcrete in 100-ft. sections, but in the M-K contract for Tunnel No. 5, since the cover is not heavy, concrete is placed by gravity through holes cut in the roof from ground surface. In all cases steel slip forms were used for the interior surface.

Earthwork

The earthwork performed on the Tucumcari project as of June 30, 1945, amounted to 7,452,000 cu. yd. of excavation. Of this total there were approximately a million and a half cubic yards of rock excavation.

The length of the 30 siphons constructed in Conchas Canal exceeds 12,500 ft. and they are capable of delivering over 300,000 gal. of water per minute. In following generally along the base of the towering mesa, numerous natural drainage channels are crossed by the canal and the need for protection at these points resulted in the designing of siphons. The siphons on the Tucumcari project cost approximately $93 per lin. ft. with 24 man-hours of labor. One siphon on the project rates among the largest and longest structures of this type ever built by the Bureau of Reclamation. The length of this particular siphon is 4,680 ft. The project siphons have concrete walls varying in thickness from 12 to 14 in., depending upon the hydrostatic head and the amount of reinforcement steel required in the various sections.

Siphon construction

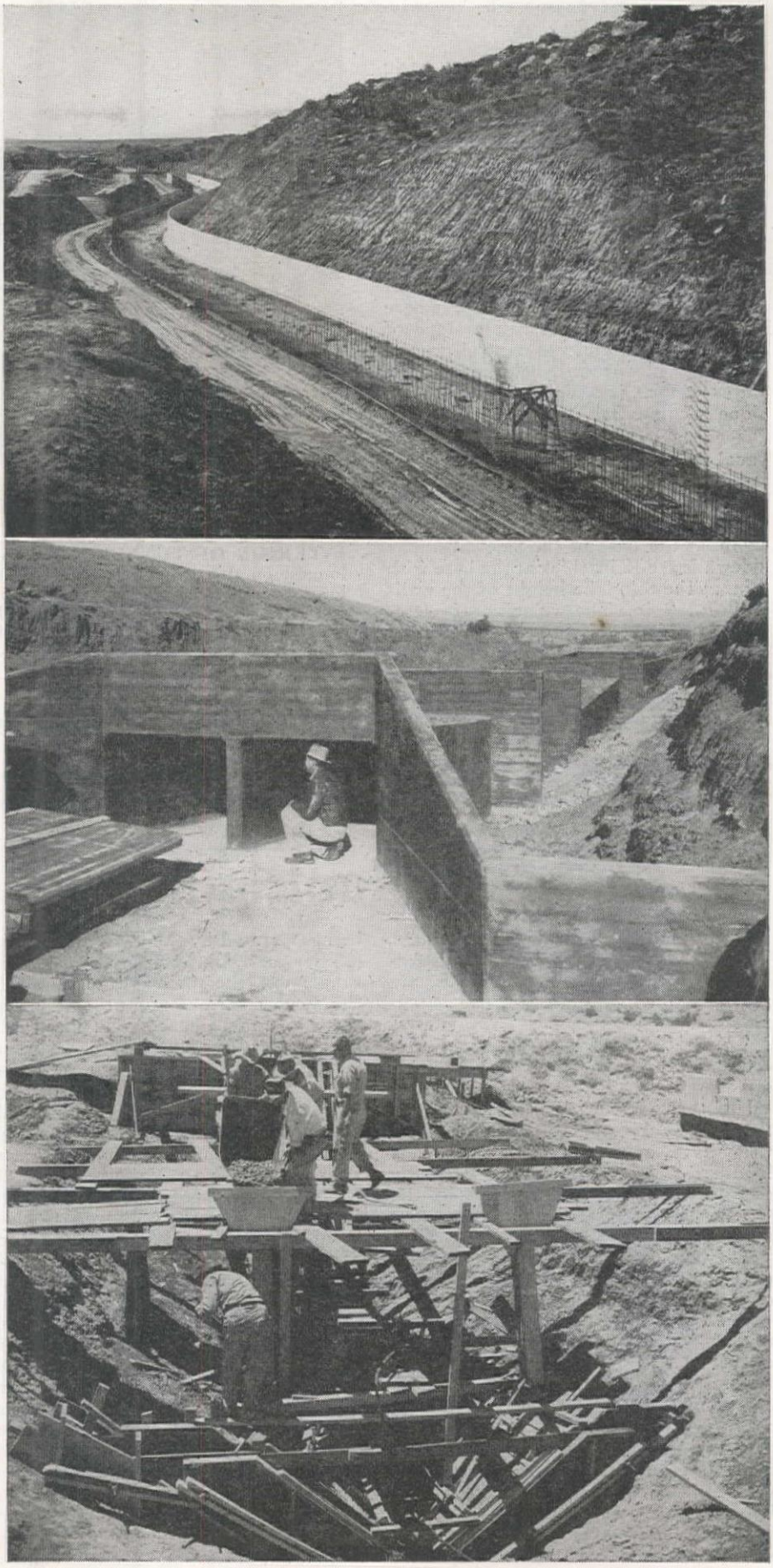
A typical example of the ingenuity displayed in overcoming construction problems of the siphons by the supervisory personnel of the Bureau of Reclamation, and later used by the contractors, was the building of a gasoline, motor-powered reinforcement steel bender to form the hoop reinforcement bars used in the concrete of the siphon barrels. The reinforcement steel hoops used were of 1¼-in. square bars, and by using the power bender, these heavy bars are bent to the required shape with a minimum of effort. The power bender was built from odds and ends found about the project shops of the Bureau and a surplus powered car-puller winch.

Construction practice generally does not recommend horizontal construction joints in siphon structures, so it was necessary to devise forms which would allow the siphon barrel to be placed in sections 25 ft. long as a monolithic pour of concrete. In addition, the forms had to be easily movable yet strong enough to stand repeated use. The forms that were successfully used consisted of an inside barrel form of metal and an outside barrel form of lumber. The inside barrel forms were collapsible and were extended to permit a pour of concrete 25 ft. long at one time. They were supported on a built-up steel truss 60 ft. long which made it possible to place two adjacent sections of siphon barrel before moving the supporting truss ahead. The members of the supporting truss act as tracks upon which the wheels of a carriage, attached to the barrel form, could roll. This arrangement permittted the reinforcement steel used in the barrel to be placed and securely fastened before the inside form was pulled into position.

The outside forms were assembled in sections rigidly braced and were made in a size that could easily be moved and quickly bolted into position in readiness for the succeeding pouring of concrete.

Open cut canals

The open-cut excavation of Conchas Canal made necessary the use of heavy equipment. Many of the through cuts exceeded 50 ft. in depth and consisted to a large extent of sandstone and sandy



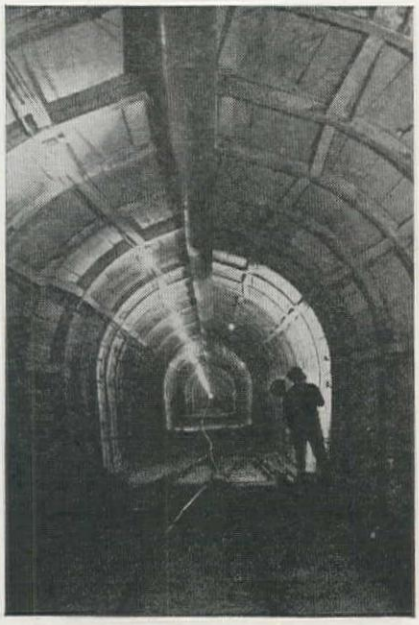
A BENCH FLUME constructed in a through cut along the Conchas Canal which will carry irrigation water for a distance of 75 mi. from Conchas Dam to Tucumcari, top. Intake of a double barreled culvert which will divert storm waters under the canal, center. Pouring concrete for the Bend Lateral drop near its junction with the canal.

loam to adobe type subsoil. A newly-developed auger-type drill was employed in the drilling and blasting operations. In most cases where this drill was used, the holes were augered to the canal depth through the overburden and the underlying sandstone and shale formations. This equipment proved very efficient.

The canals have a bottom width of 24 ft. and side slope of 1½:1. The surface of the levees is 16 ft. wide, and 13 ft. above the floor of the ditch. The design water depth is 8.65 ft. Outside slope of the levees is also 1½:1, except where the intersection of the inside slope of the lower bank and the natural ground surface is 4 ft. or more below maximum water surface, in which case the outside slope becomes 2:1.

Two concrete bench flumes in the canal were constructed, the longest being 1,697 lin. ft. The flume section is 20 ft. wide on the bottom with a thickness varying from 8 in. at the center line to 12 in. at the base of the sidewalls. The sidewalls are 12 in. thick at the base with 8 in. at the top. The height of the walls is 9 ft., 9 in. The velocity of water through this bench flume section is 4.15 cu. ft. per sec. Steel mats were placed both in the side walls and in the floor of the structure.

Recently awarded contracts, now under construction, include structures and earthwork on two different sections of the system, one to Clyde W. Wood, Inc., Los Angeles, Calif., $686,248, and the other to J. A. Terteling & Sons, Boise, Ida., for $563,441. Contract for Tunnel No. 5 was awarded to Morrison-Knudsen Co., Inc., Boise, Ida., in the amount of $588,270. Lock-Joint Pipe Co., Denver, Colo., holds the contract to furnish concrete pipe used in culverts and other project construction, and J. G. Shotwell, Tacoma, Wash., in preparing concrete aggregates for all the remainder of the project. Lym Engineering Co. of Salt Lake City, Utah, has started work on a contract valued at $130,041 for construction of laterals and sub-laterals for furnishing water to the first 4,500 ac. of the project. The first water was delivered Sept. 1.



INTERIOR OF TUNNEL No. 4, the longest on the project. It is 7,087 ft. long and includes 17,000 cu. yd. of rock and open-cut excavation. Standard H-beam sections are backed with 3-in. lagging to support weaker rock.

Organization

The design of the project was carried out by the Bureau of Reclamation, Harry W. Bashore, Commissioner, and Wesley Nelson, Regional Director, stationed in Amarillo, Texas. Harold W. Mutch is project engineer.

B. (Woody) Williams, formerly a superintendent for Morrison-Knudsen, has sub-contracted from that company, the driving of Tunnel No. 5, and Robert Test is his tunnel foreman. Emmett R. Steeples is general superintendent for the M-K operations on the project.

L. J. Montgomery is superintendent on the operations of J. A. Terteling & Sons.

Auxiliary Airports Available For Lease to Municipalities

MORE THAN 200 airports in 41 states, now leased by the Civil Aeronautics Administration as intermediate fields, are available to communities for use as municipal airports.

Any state, county or municipal government can take over any of these fields so located as to be convenient and useful to them, if they will agree to continue the field in operation in such a way that it is always available for emergency landings along the airways. Originally established as emergency fields by the CAA, these sites are essential airways facilities.

The CAA has no objection to the city or town contracting with commercial operators for operation of the fields.

The fields were developed and maintained by the Federal Airways Service of the CAA beginning in 1927, and were located along the airways to serve as emergency havens for the short range and the then less reliable aircraft. At the peak, the CAA maintained 900 small fields, but with the improvement of aircraft those which were considered no longer necessary were discontinued.

Most of these fields have turf runways; a few have paved runways and none is equipped for fueling planes. Physical conditions of these emergency fields vary with locations and there is no standard formula for their leasing by could-be operators.

A small number of fields already are being operated by the CAA and municipalities on a joint basis. Under this arrangement, the town is responsible for the airport surface and other facilities, the CAA for the beacon and other lighting. Western communities participating in this plan include: Ardmore, Okla.; Battle Mountain, Nev.; Chadron, Neb.; Ft. Collins, Colo.; Kelso and Toledo, Wash.; Kingsville, San Benito and Sulphur Springs, Tex.; Medicine Bow and Wheatland, Wyo.; Valley City, N. D.

The fields situated near other Western communities are: Ashford, Cochise, Deep Lake, Holbrook, Maine, Red Rock, Salome, Seligman, Tonopah, and Winona, Ariz.; Auburn, Bagdad, Blue Canyon, Delta, Desert Center, Dunsmuir, Newhall, Silver Lake, Trona, Truckee, and Williams, Calif.; Akron, Alvin, and Lamar, Colo.; Dubois, Idahome, Kellogg, Malad, Mountain Home, and Strevell, Idaho; Big Timber, Custer, Dell, Dillon, Drummond, Forsyth, Geyser, Lavina, Livingston, Mildred, St. Xavier, Superior, Townsend, and Whitehall, Mont.; Big Spring, Brainard, Hayes Center, Overton, and Sydney, Nebr.; Buffalo Valley, Fernley, Gabbs Valley, Humboldt, Mormon Mesa, Ventosa, Wells, and Winnemucca, Nev.; Acomita, Anton Chico, Columbus, Cuervo, El Morro, Engle, Hachita, Mt. Riley, Otto, and Rodeo, New Mex.; Ashley, Dawson, Glen Ullin, Golva, Pembina, and Washburn, N. Dak.; Claremore, Dill, Guthrie, and Stroud, Okla.; Arlington, Beaver Marsh, Cow Creek, Myrtle Creek, and Roseburg, Ore.; Miller and Philip, S. Dak.; Adrian, Arlie, Austwell, Delaware Springs, Dryden, Harpersville, Hudspeth, Pampa, Parker, Pawnee, Salt Flat, San Marcos, Temple, Twitty, Vernon, Westbrook, and Yoakum, Tex.; Enterprise, Fairfield, Grantsville, Knolls, Lucin, Milford, and Promontory Point, Utah; Easton, Harrington, Lacrosse, and Toledo, Wash.; Buffalo, Douglas, Ft. Bridger, Kemmerer, Knight, Pine Bluffs, Sinclair, Sussex, and Wamsutter, Wyo.

San Francisco Electric Net Being Expanded by P. G. & E.

PACIFIC GAS and Electric Company is now engaged in spending $1,500,000 within the city limits of San Francisco, Calif., for the purpose of improving its distribution system and to provide for its 1945-1946 winter load.

Power is generated by the company in 52 hydraulic electric generating stations situated in various points in the Sierra Nevada, and at four steam generators located within the city. The hydroelectric power is received at the Martin and Bayshore substations, whence it is distributed in low voltage overhead and underground lines throughout the city. The work now under way includes enlargement of the Martin substation, construction of three new substations, installation of additional underground cables and other work. The work at the Martin station will cost about $500,000.

Treasure Island—
Water Line Is Hung on Bay Bridge

Increasing demands for water at the Naval Station on Yerba Buena and Treasure Islands required the installation of a new pipe line and pumping plant on the San Francisco-Oakland Bay Bridge capable of supplying the station with an ultimate 3½ million gallons daily

By RICHARD R. KENNEDY
Associate Engineer, Clyde C. Kennedy
San Francisco, Calif.

AN ADDITIONAL WATER supply has been provided for the Naval Stations at Treasure Island and Yerba Buena Island in San Francisco Bay by a supply main from the East Bay Municipal Utilities District to the Treasure Island reservoir on Yerba Buena Island. The project involved the construction of 14,000 ft. of line from the connection in Oakland to the East Bay system, along the causeway to the end of the San Francisco-Oakland Bay Bridge and 10,000 ft. of line installed on the bridge structure, together with a pumping plant and control circuit.

Historical

When Treasure Island was made and preparations were carried forward for the Golden Gate Exposition, a fresh water supply was provided by service over the suspension portion of the bridge from San Francisco. Basic design for this bridge service line was prepared by the San Francisco Water Department and the detailed plans and specifications completed by the U. S. Army Engineers. This supply adequately provided for the fresh water requirements of the exposition and of the government activities on Yerba Buena Island. It consisted of a 10-in. steel line with 8-in. expansion bends at the suspension towers and anchorage pier, with water supplied by a pumping plant installed in the base of Pier W-2 on the San Francisco waterfront.

After the Navy took over Treasure Island and programmed the development to become one of the major personnel centers on the Pacific Coast, it was soon apparent that the existing water supply was not sufficient to meet the requirements. Investigation of the problem of providing additional water supply was made by the Public Works Office of the 12th Naval District to determine whether it would be better to increase the capacity of the existing service from San Francisco, or to provide an independent supply from the East Bay area. It was determined that an independent supply from the system of the East Bay Municipal Utilities District would provide the required fresh water service capacity with less construction difficulties and in the shorter period of time.

PLAN OF WATER SUPPLY pipe line which originates in Emeryville, follows the approach causeway to the bridge and is then suspended from truss members along the north side of the truck deck to island.

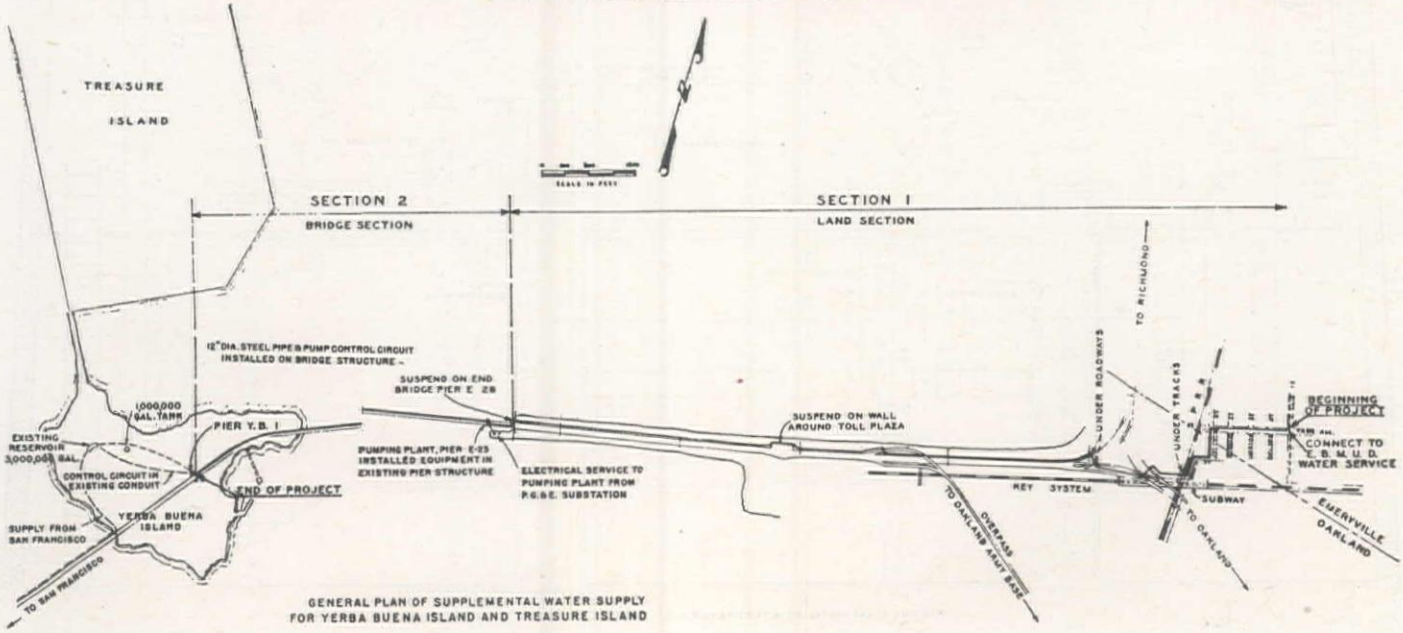
Design

The project as outlined for construction after preliminary investigation involved a service connection to the District's 30-in. low-level main at Hollis and Park streets in Emeryville and the construction of a pipe line through the cities of Emeryville and Oakland to the approach causeway and along the causeway of the San Francisco-Oakland Bay Bridge to a pumping plant at the end of the bridge structure. From the pumping plant the pipe line would be carried along the bridge structure to Yerba Buena Island and on the island to a connection with the Treasure Island reservoir.

It was determined that the original capacity of the supplemental supply should be 2½ Mgd. with the pipe line of such size that by increasing the pumping capacity the delivery could be increased to 3½ Mgd.

The static water level at the point of service on the East Bay system is approximately 200 ft. The maximum water surface of the Treasure Island reservoir into which this supply was to discharge is 263 feet. It was therefore necessary that a pumping station be installed in the line to provide for the difference in elevation and the friction losses in the line.

The agreement between the government and the California Toll Bridge Authority for the construction of the bridge allowed the government to in-



GENERAL PLAN OF SUPPLEMENTAL WATER SUPPLY FOR YERBA BUENA ISLAND AND TREASURE ISLAND

stall a pipe line on the bridge of not greater than 12-in. diameter. This limitation indicated that the pumping plant should be located as near to the beginning of the 12-in. line as possible to reduce the total pressure head necessary to pump the required capacity through this section of the pipe line.

The bridge authorities granted to the Navy the use of the lower portion of Pier E-23 for a pumping station. Pier E-23 is at the east end of the steel structure. The space in the pier was originally constructed for a transformer vault, but had never been used. The space consisted of two floors approximately five feet wide by sixty feet long. This space was very restricted for a pumping installation of the required capacity, but the difficulty of constructing a pumping plant on an independent foundation in this locality indicated the desirability of utilizing this space if at all practicable.

A design was developed which proved feasible for both construction and operation, utilizing vertical turbine type pumps operating in pressure suction well. Specifications covering the original pumping units provided that they should be capable of having additional impellers and bowls installed on the shaft which would increase the capacity to the required ultimate delivery under the increased pressure conditions. The original pump installation provided two identical units, each of which would provide the required 2½ Mgd. capacity. The future addition of turbine bowls to each pump with larger horse power motors would enable them to operate in parallel to meet the requirements of 3½ Mgd.

The land section of the pipe line was designed to provide the ultimate capacity with a pressure drop of approximately 40 ft. The pumping units are thus operating under a positive head on the suction side from the East Bay supply line at all times.

The land section of the line is 14-in. diameter steel pipe with cement mortar lining and coating. The pipe line supported on the bridge structure from the pumping plant to the Yerba Buena Island Pier YB-1 is of 12-in. cement mortar lined steel.

The operation of the pumping plant was made semi-automatic by means of a water level transmitter installed in the Treasure Island reservoir on Yerba Buena Island with an indicator at the pump station. This indicator is provided with contacts which start the pumps at predetermined water height. Provision was also made in this control circuit for emergency starting of the pumps at the Bay Bridge fire house on Yerba Buena Island to provide pump pressure for the hydrant outlets installed along the bridge section of the pipe line.

Construction

With the rapid completion of personnel facilities at Treasure Island and Yerba Buena Island it was apparent that additional water supply would be required as soon as possible. To facilitate speed in construction, the work on the entire project was divided into two equipment contracts, two construction contracts, and a change order to an existing contract on Yerba Buena Island.

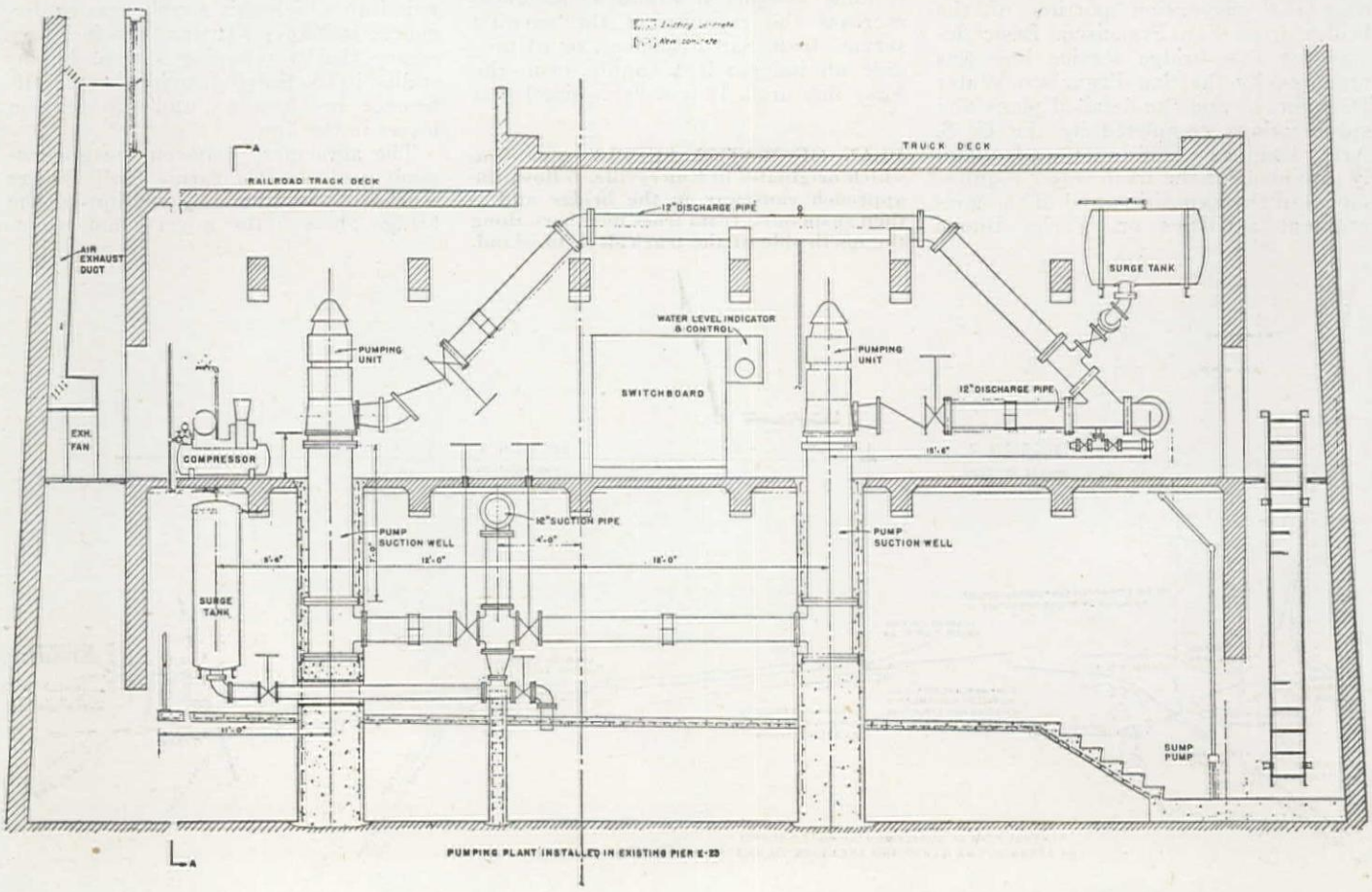
The first construction contract covered the land section of the pipe line extending from the service connection to the end of the bridge structure. This section was installed under contract by Miller and Stoutenburg of Hawthorne, Nev. It involved the installation of approximately 14,000 ft. of the 14-in. steel cylinder concrete lined and concrete covered pipe, which was manufactured by the American Pipe and Construction Co. The pipe had a bell and spigot joint with a rubber gasket ring.

The section laid on brackets around the administration annex and toll plaza building has the bell and spigot joint with flanges just back from the joint, which were bolted across the joint to provide a tie against lateral thrust, and obviating the installation of any anchorage points. This allowed the pipe to be laid directly on the pile supported building foundation and on brackets dowelled to the foundation walls.

The land section of the pipe line included crossing the Southern Pacific Railroad and the north and south bound East Shore Highway through culverts which were jacked under the track and roadway areas. The pipe was laid with a cover of five to seven feet in the street areas of Emeryville and Oakland and a cover of approximately three feet on the north side of the causeway fill parallel to the bridge approach roadway.

Steel cylinder pipe was delivered in 24-ft. lengths. Special pieces were fabricated for the angle points and exact lengths with the tie flanges were fabricated for the section around the toll plaza and at the end of the bridge. The

LONGITUDINAL section showing vertical turbine pumps installed in a 50x60-ft. vault originally intended for transformers. Either pump will deliver 2½ M.g.d.



simplified bell and spigot joint and long lengths enabled the contractor to lay the straight lengths at considerable speed.

Separate equipment contracts were made by the Navy for the delivery of the two pumping units and the pump control switchboard so that these units would be ready for installation by the bridge section pipe contractor. The two turbine pump units were supplied by Fairbanks-Morse Co. The electrical switchboard for the pump motor controls was furnished by Westinghouse.

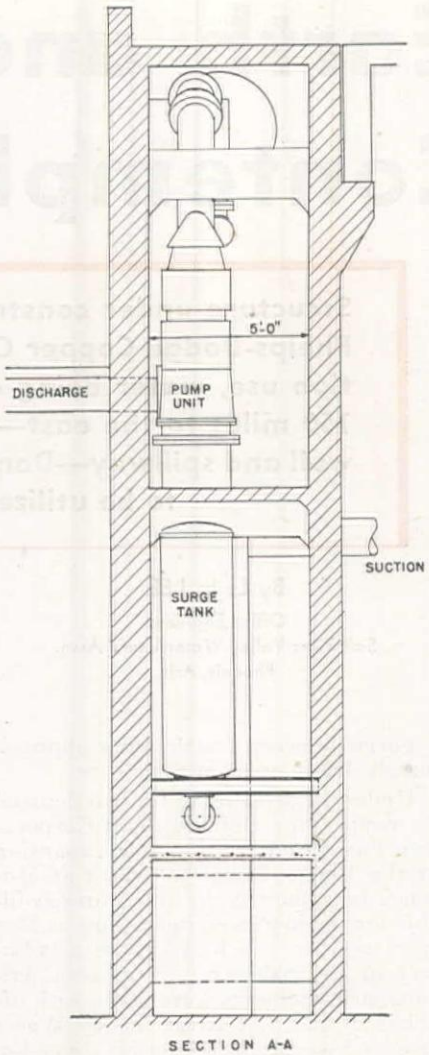
Change orders were issued to Miller and Stoutenburg on an existing contract for water system additions at Yerba Buena to provide for the installation of a 12-in. cast iron connecting main extending from Treasure Island reservoir to a valve box at the base of Pier YB-1 on Yerba Buena Island for future connection of the bridge section pipe line. The change order also provided for the pulling of control circuits in existing duct lines and construction of a few short sections of new duct lines to provide a two-wire control circuit from the Treasure Island reservoir to the San Francisco-Oakland Bay Bridge structure at the east end of the tunnel.

Bridge section

The second construction contract was for the bridge section of the pipe line and included the pumping station. This work was done under contract by the Haas Construction Company of San Francisco. This work involved installation of the 12-in. cement mortar lined steel pipe from the connection to the 14-in. land line at the end of the bridge (Pier E-29) to the pumping line at Pier E-23, the installation of the pumping equipment with necessary electrical service and of the pipe line on bracket supports from Pier E-23 to Pier YB-1 on Yerba Buena Island and to a connection with the 12-in. cast iron supply main at the base of this pier. The length of the pipe line in this section was 10,800 ft.

The pipe line from Pier E-29 to E-23 was carried on roller supports directly on the bents supporting the truck and railway decks. The pipe line from Pier E-23 to YB-1 was carried on bracket supports along the north side above the truck lane. All brackets were bolted to the bridge members. Pipe was supported on the brackets with roller supports and with anchors and expansion joints adjacent to angle points and at required intervals.

The roller supports were similar to the units used on the West Bay crossing by the San Francisco Water Department and had special roller bearing shafts to allow free motion to guard against undue bracket twist on the bridge verticals. The expansion joints were internally-externally guided units to provide for longitudinal motion only and were manufactured by the American District Steam Co. The expansion joints for all locations except adjacent to Pier E-9 were for 12-in. traverse. At Pier E-9 two double joints providing for a total movement of 48 in. were installed. Nine drops to hydrant outlets were provided at locations requested by the bridge authorities.



SECTION THROUGH the pump room which was installed in a bridge pier to provide a sound footing and to place the pump as near as possible to the reservoir, thus reducing friction head in pipe.

The contractor was unable to secure delivery of the complete steel pipe with cement mortar lining to meet the specifications for this line. He was finally able to procure standard steel pipe from the Republic Steel Co., which he had lined with a centrifically spun mortar by the American Pipe and Construction Co. The pipe line was designed with two wall thicknesses, one-quarter inch for the truss span sections of the bridge which had unsupported lengths up to 42 ft. and ⅜ in. for all pipe spans over 42 ft. up to the maximum of 55 ft.

The contractor received the ¼-in. pipe in random lengths of approximately 28 ft. Two lengths of pipe were welded together at the end of the bridge and then carried on to the structure on dollies and hoisted into place for field weld connection. The random lengths were cut as required for installation of expansion joints and angle fittings. On the long span pipe lengths requiring ⅜-in. wall thickness, the joints were required to be made at the quarter point of support so that all lengths were cut before being installed. It was also required that the expansion joints be placed at the quarter point of the support, which required fitting the pipe lengths to these points.

Pumping station

The pumping station installed at Pier E-23 required modification of the existing structure for pipe entrances and installation of the suction wells, surge tanks and operating floor in the basement portion. The lower portion of the structure was open to tide water with vent holes at the bottom. This portion had to be pumped out and cleaned of accumulated mud before construction could proceed. The pump units and heavy sections of the installation were brought to the site by barge and lifted into the room through an access door below the truck deck.

Electric service for the pump station was provided by submarine cable from the Pacific Gas and Electric Company substation at the end of the earth causeway. The submarine cable was made available to the contractor by the P. G. & E. from stock.

The pump control circuit is provided by a Chrono-Flow telemetering unit with transmitter located at the Yerba Buena Island, Treasure Island reservoir. A water level indicator was installed adjacent to the electric pump control switchboard with suitable actuating switches for control of operation.

Personnel

The project was carried out under the direction of Capt. W. W. Schneider, Officer-in-Charge of Construction for Public Works Projects in the 12th Naval District. Project Manager was Lieut. Comdr. R. S. Thomas, who was succeeded by Lieut. I. F. Kuhn. Resident Officer in Charge of Construction was Lieut. H. F. Pollack, who was succeeded by Lieut. Comdr. D. W. Hunter. Plans and specifications for the project were prepared by the engineering office of Clyde C. Kennedy, San Francisco.

COMPLETION of the final section of the 37-mi. Madera canal has been announced by the Bureau of Reclamation. This important feature of the Central Valley Project of California has been placed in full operation, and water stored behind Friant Dam on the San Joaquin River is now reaching Ash Slough, a tributary of the Chowchilla River.

The Madera canal has a capacity of 1,000 cu. ft. per sec., and provides supplemental water for about 80,000 ac. of San Joaquin Valley farm land. It is in general a trapezoidal open ditch, but numerous siphons are necessary at valley crossings. The second canal contemplated as an outlet for Friant water is the Friant-Kern canal, which will flow southward from the dam and when completed will serve nearly a million acres of farm land where water tables have been gradually lowering. The contract for the first unit of Friant-Kern canal was awarded last month.

Arizona Earth and Rock Fill On Site Contemplated Fifty

Structure under construction on Verde River by Phelps-Dodge Copper Corp. to replace for irrigation use, water being diverted from Black River 150 miles to the east—Dam has concrete cut-off wall and spillway—Dam crest and spillway apron to be utilized for highway

By L. L. LEE
Office Engineer
Salt River Valley Water Users' Assn.
Phoenix, Ariz.

THE COMPLETION of Horseshoe dam on the Verde river in central Arizona will culminate a reclamation project started over 50 years ago and resumed recently to replace, for the irrigated lands of central Arizona, water diverted by the Phelps Dodge Copper Corp. from the upper Salt River Basin. The structure is the sixth dam to be built for the Salt River Project, which is considered the oldest and most successful irrigation project in the United States. It was for many years referred to as the model of achievement in desert reclamation and is outstanding for its financial stability.

This new dam is the first earth core, rock filled dam undertaken in the Salt River Basin, four of the five dams being of reinforced concrete arch construction. The fifth, Roosevelt dam, which at the time it was built in 1905 was the largest gravity type masonry dam in the world, was named after and dedicated by Theodore Roosevelt in 1911.

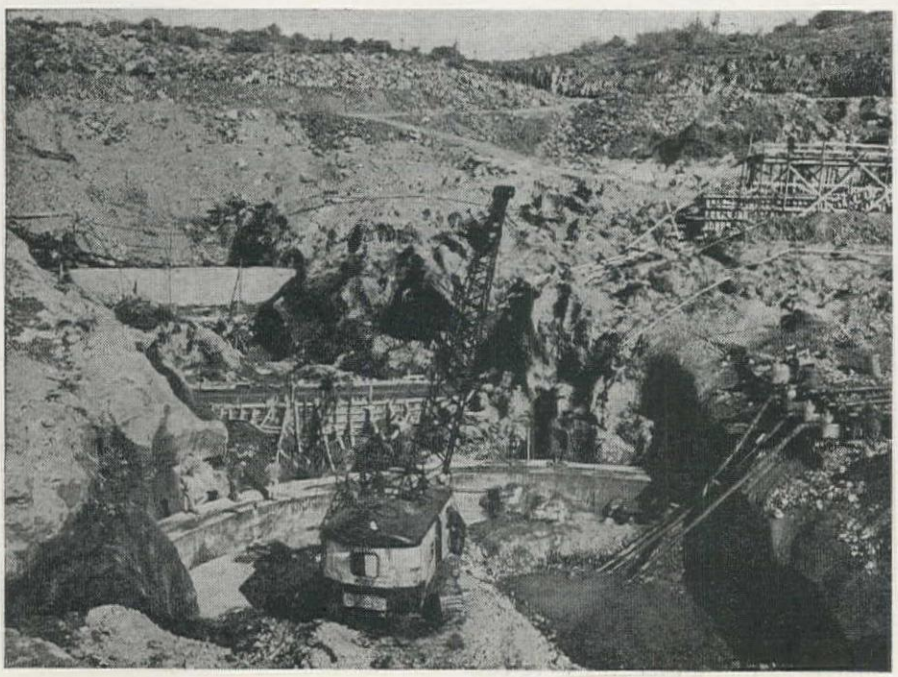
History of the dam

Horseshoe dam site has been considered for a number of years as a possible storage reservoir but has been by-passed for more favorable locations until the present time. It is located in a horseshoe bend, from which it derives its name, on the Verde river approximately twelve miles above Bartlett dam. At this point the Verde river valley narrows to a gorge between basalt cliffs approximately 450 ft. apart at their base.

Under the pressure of the war demand for copper, the Defense Plant Corporation financed a considerable expansion of the Phelps-Dodge activities at Morenci. Inasmuch as the only water available for the increased operations at Morenci was on the Black river, a tributary of the Salt river, in eastern Arizona, arrangements were made with officials of the Salt River Valley Water Users' Association to permit diversion of not more than 40 ac. ft. per day to Morenci, provided an equivalent amount of water be restored to the farmers in the project for irrigation. This is accomplished by construction of Horseshoe dam, behind which will be impounded flood waters of the Verde river, which in former years have been lost. An incidental benefit from the dam is eradication of the flash flood danger in the central Arizona area. Construction is financed by the Phelps-Dodge Copper Corp.

Work was started at the dam site in 1893, over ten years before construction was commenced on Roosevelt dam, and was the first attempt to build a storage reservoir in Arizona. Approximately 700 ft. of tunnel, 12 ft. in diameter, was drilled through the west cliff and was intended for use as a diversion tunnel during construction. Further work on the dam site was abandoned in 1894 and not resumed until fifty years later.

THREE CUTOFF WALLS were used at the maximum section of the dam. The true cutoff wall, however, was the center one, which extended for the full length of the structure, the two others serving only as dams to facilitate excavation of foundation.



Construction contracts

The construction of the dam has been carried on in two phases. The old tunnel was first cleaned of debris, trimmed to neat lines and concrete lined under a contract awarded to the Vinson-Pringle Company of Phoenix, between Nov. 31, 1943, and May 25, 1944. The cost of rehabilitation, together with the incidental cost of building necessary roads, water supply, etc., was $164,000.

The contract for the construction of the dam was awarded to the Arundel Corp. & L. E. Dixon Co., contractors, on a bid price of $1,656,349.

When the present construction is completed this earth core, rock filled dam will be 140 ft. high, 450 ft. in length at the base and 1,150 ft. along the crest. It has been so designed that 40 ft. may be added to its height, which would increase the reservoir capacity from 67,000 ac. ft. to 163,000 ac. ft. The width of the base at the maximum section is 710 ft. and would be increased to 790 ft. when the dam is raised the additional 40 ft. in elevation.

The crest of the dam is 50 ft. in width and will be used as a highway after completion. The rolled earth fill 135 ft. wide at river bed and 35 ft. wide at the crest has a zone of fines on each side, varying in width from 18 ft. at the base to 11 ft. at the crest. Outside of the zone of fines is a rock fill on both the up-stream and the down-stream sides which will be dumped in place on a 2:1 slope.

Dam Rising Years Ago

The fill zones

Borrow pits for the compacted earth core were selected in the valley fill 3,000 ft. downstream from the dam on the west side of the river. The material is a brown, sandy loam of 110 lb. per cu. ft. dry density, having a percolation rate of 0.05 ft. per year at unity gradient. The borrow pits are irrigated to supply a pre-moistened material which will give a maximum density when compacted with a sheepsfoot roller. Moisture is supplemented when necessary by sprinkling the fill.

The fines which adjoin the earth core are of well-graded sand, gravel and small cobbles secured from the river bed about 1,000 ft. below the dam.

The rock fill is a free draining mixture of stones, boulders, and rock fragments without limit to size. The material is dumped in, in layers not to exceed 15 ft. in thickness, and the rock fragments sluiced between the larger rocks so that no open or bridged spaces occur. It was anticipated that the rock fill could all be secured from the excavation for the spillway, but due to the fact that almost 40 per cent of the spillway material was deemed unfit for fill and was wasted, it was necessary to open a quarry slightly south and west of the spillway.

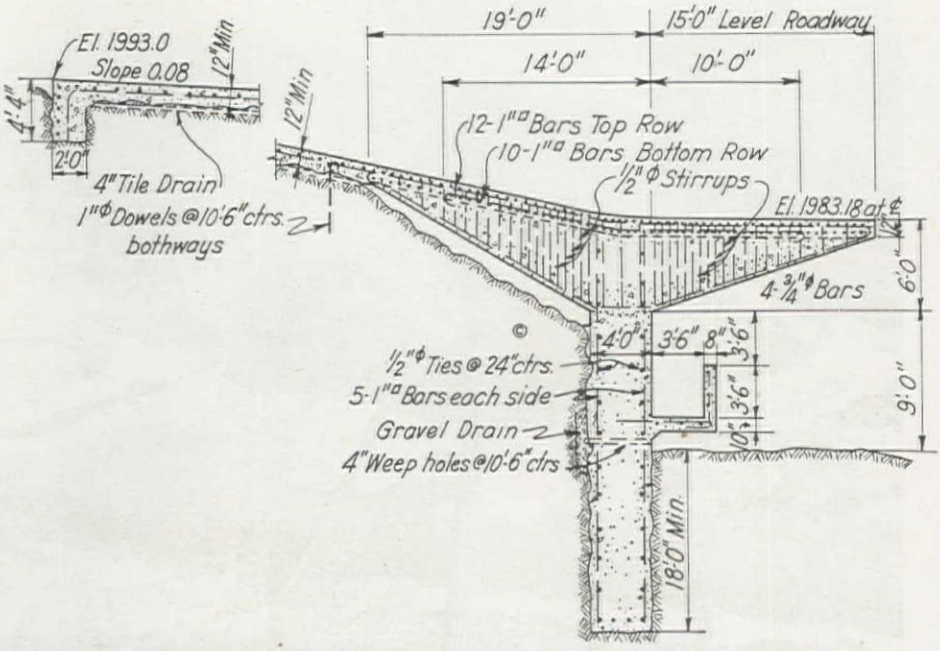
The spillway, 320 ft. in width, with a designed capacity of 250,000 cu. ft. per sec., passes over the tongue of land in the center of the horseshoe, in solid basalt rock 200 ft. west of the west abutment, the maximum excavation being 140 ft. deep. The crest of the spillway will be located 500 ft. back from the edge of the reservoir with a slightly ascending grade to the crest at elevation 1993.

A paved area 86 ft. long extends from the crest to the spillway lip, which is supported by a T-wall and will be used as a roadway. The spillway lip is slightly curved in order to concentrate low flows and is expected to eliminate erosion and cavitation immediately under the lip. The excavation downstream from the paved section will be on a descending 15 per cent grade to the old river bed and is unpaved.

Construction methods

Many interesting methods of construction have been used in the building of this dam. The tunnel was trimmed to neat lines and all excess material removed by use of a bulldozer.

EARLY STAGE of construction with a hydraulic monitor removing alluvium from the west abutment of the dam, top. Compacted fill being placed, using rock and earth from the spillway cut in the background, center. View showing deposition in zones, and water rising near the tower.



SECTION THROUGH the T-wall and lip of spillway designed to carry traffic across structure. Balcony below the lip is man-passage for maintenance men or pedestrians.

Plywood forms for the tunnel lining were held in place by anchor bolts grouted into the wall rock. Also supported on the anchors and welded to them were the reinforcing bars for the concrete lining. A portable electric welder was used inside the tunnel to cut to length and fabricate the anchors and steel reinforcing bars. The concrete lining was placed by pumpcrete methods with the exception of a narrow arch ring at the top which was filled with gunite. The gunite of this section afforded a more compact and impervious section than is usually obtained in ordinary methods of pouring the top of the arch rings. Construction of this tunnel was discussed in *Western Construction News* for September, 1944.

A horizontal intake to the tunnel, of draft tube design, was constructed, and forms the base for the outlet tower of the reservoir.

The tower and cylinder valve of the outlet works are unusual in both design and construction. The struts for the tower were pre-cast in the material yard with cast iron trash rack sockets embedded in the concrete, 18 in. center to center. These pre-cast struts were supported on timber bents and the protruding reinforcing steel was welded to the reinforcement for the pillars as well as to the reinforcing steel of the adjoining strut. Three 6-ft. sections of the tower were poured at a time, and the forms left on until the next three sections were poured, thus necessitating only two sets of forms for its entire construction.

The cylinder gate, the highest 9-ft. diameter gate in the world at the present time, was fabricated in sections and bolted and welded in the field. The hollow design of the cylinder valve eliminates any surging action in the flow to the tunnel. Entrapped air flows upward through the cylinder, and a fine spray may be felt rising from the top of the gate over 100 ft. above the water surface. A cast steel shoe attached to the bottom of the cylinder is provided with synthetic rubber inserts which are bolted to the shoe for ease of replacement. This shoe seats in a machined cast steel base plate and has a 4-ft. vertical travel. The weight of the cylinder gates and base shoe is 112,500 lb., and is counterbalanced for operational purposes with a 92,500-lb. counter balance. A gas-electric operated 12-ton hoist will be the mechanism used for controlling the gates.

The trash rack bars are made of 6x4x ½-in. angles 64 in. in length, and weigh approximately 80 lb. each. These can be easily removed, one at a time, when necessary to clear trash and debris from around the tower.

POURING CONCRETE at the Horseshoe dam spillway. This structure will carry a roadway between the lip and the first section of spillway wall standing on far side of the structure. The triangular struts rising from the lip will support a road guard.

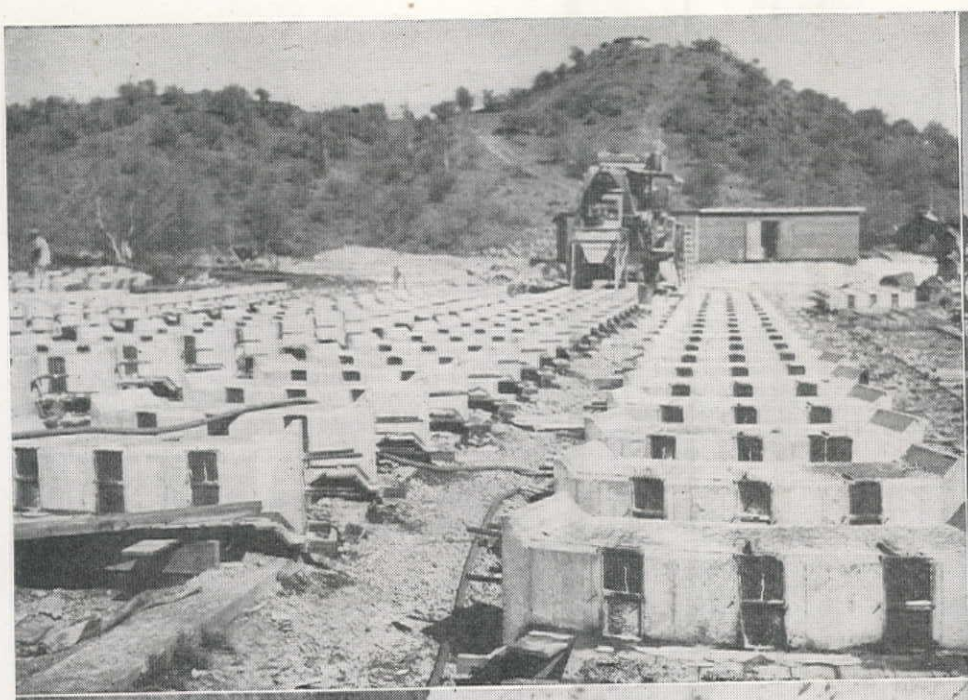
Construction progress

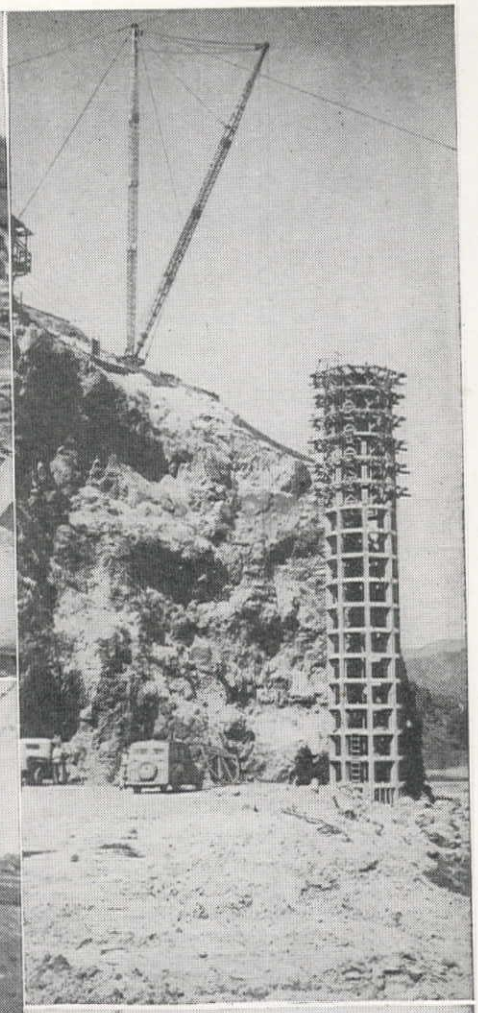
Work on the dam proper was started in August, 1944. After removing overburden from the abutments by means of bulldozers, the abutments were sluiced clean of any loose material by use of a hydraulic monitor. Excavation was taken to solid rock at an elevation of 1846, 50 ft. below the stream bed. Considerable trouble was encountered in trying to de-water the excavation at this point and it was necessary to build concrete bulkheads both up and down stream from the toe of the compacted earth section. These bulkheads were of the same design as the concrete cut-off wall and were left in place when the fill was started.

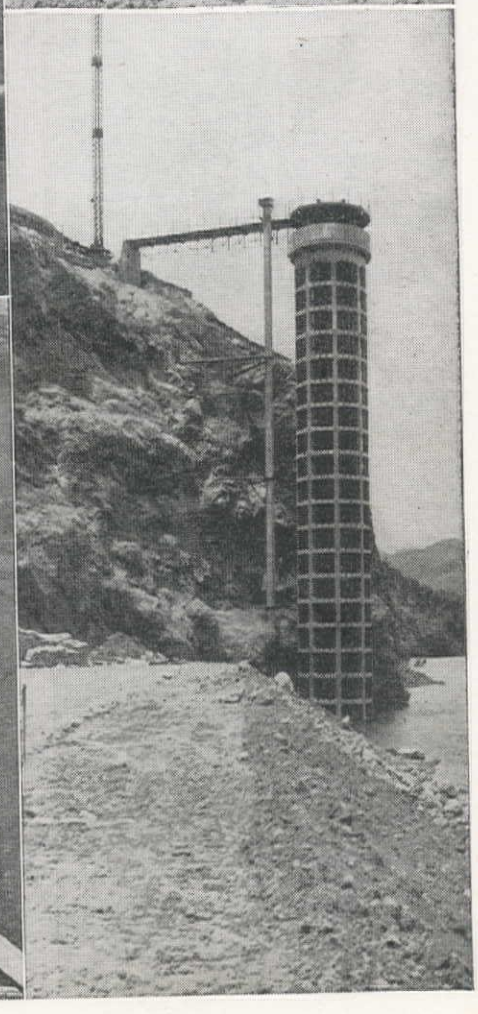
Excavation in the gorge of the river disclosed a volcanic tuff which showed much evidence of erosion by water. This strata of tuff was massive in formation with very few fractures and afforded an excellent foundation for the dam. The cut-off wall was extended approximately 10 ft. into this formation and the area adjoining the cut-off wall was pressure-grouted for positive seal. The cut-off wall up to an elevation of 1890 is 3 ft. thick and rises 10 ft. above this point, varying in thickness from 30 in. at the base to 18 in. at the top. Approximately 2,000 cu. yd. of concrete were used in the cut-off wall.

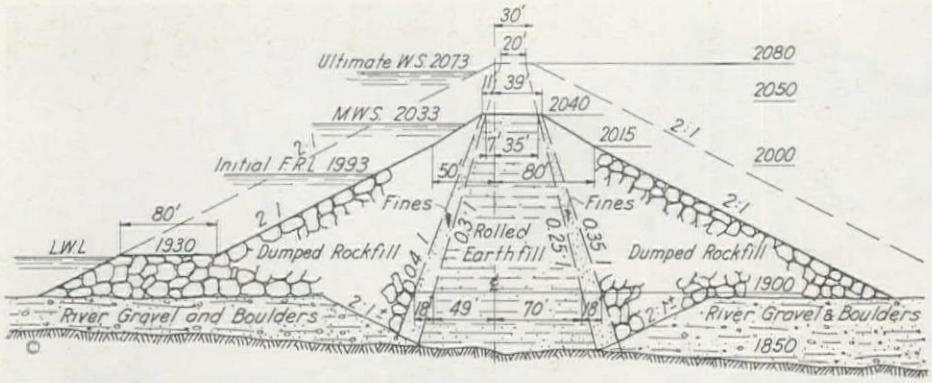
Due to the amount of seepage in the excavation, it was found necessary to pour a concrete slab approximately 8 ft. thick over the gorge section. Extreme care was taken in placing the rolled earth fill in order to carefully bond it to the bed rock. Pneumatic hand-tamp-

ON OPPOSITE PAGE precasting reinforced concrete ringstruts for the outlet tower, top. Wooden trestles supported the sections while the reinforcing bars were welded to the column bars and the unit poured, center. Inserting the trash bars in the sockets of the finished tower, bottom. The entire tower was poured with six sets of 6-ft. forms, three sections being poured at a time, upper right. The completed tower with access bridge.









SECTION THROUGH Horseshoe dam, designed with a compacted earth-fill core, flanked on both sides by heavy rock-filled sections. The dam will have a base length of 450 ft. and a crest length of 1150 ft. Berm is for ultimate 40-ft. lift.

ers were used on the edges and along the cut-off wall and one of the crawler tractors was equipped with cylindrical tamping lugs cut from 3-in. rolled steel and welded to the treads to compact fill in places which were inaccessible to the sheepsfoot roller.

A by-pass channel, 20 ft. wide on the bottom, was excavated in the east abutment to take care of spring floods in excess of that which could be carried by the diversion tunnel. In March, 1945, this by-pass channel successfully carried over 2,000 cu. ft. per sec. of flood water during the peak of the spring run-off without any damage to the dam and with very little delay to the construction.

The progress of the construction has been satisfactory at all times with the exception of approximately six weeks during the spring when work was retarded by high stages of the river and the inundation of the borrow pits.

Construction is about 75 per cent complete at the present time and it is expected that the dam will be completed and accepted late this fall. Upon completion, the following quantities of material will have gone into the dam:

Rolled earth fill	290,000 cu. yd.
Fines	146,000 cu. yd.
Dumped rock	670,000 cu. yd.
Concrete (all classes)	8,700 cu. yd.
Reinforcing steel	300,000 lbs.
Structural steel	210,000 lbs.

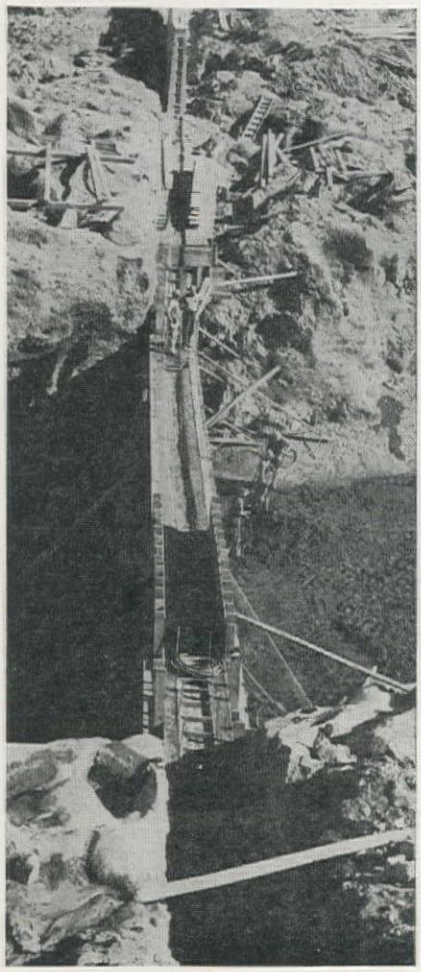
Organization

The construction work was supervised for the Arundel Corp. & L. E. Dixon Co., contractors, by W. V. Parry, project manager, assisted by R. J. Conley, superintendent of construction.

Leeds, Hill, Barnard, and Jewett, consulting engineers of Phoenix and Los Angeles, designed the dam and engineered construction. J. L. Burkholder started construction as resident engineer and was followed by his assistant, R. V. Sass, who is in charge at the present time.

Upon completion, the dam will be turned over to the Salt River Valley Water Users' Association for operation. Horseshoe Dam makes the sixth structure built for this reclamation project, which consists of over a quarter of a million acres of highly fertile land.

CONSTRUCTION JOINT in the main cutoff wall. The cutoff extends from bedrock to both abutments. Pneumatic tampers are being used to compact the earth near the wall where tractor operated sheepsfoot rollers cannot be maneuvered.



Modern Mint and Equipment For Denver Plant Expansion

NEW FEATURES in mint design and equipment are embodied in a million-dollar addition the Public Buildings Administration, Federal Works Agency, is preparing to build and equip at the Denver, Colo., mint.

W. E. Reynolds, Commissioner of the Public Buildings Administration, states that these include electrically-heated melting furnaces, instead of oil and gas-fired furnaces now used in the Denver, Philadelphia, and San Francisco mints. They also include water-cooled rolling mills considerably bigger than the air-cooled rolling mills now used in mints.

A "sweep celler," where floor sweepings will be stored until enough accumulate to be bagged and sold for the precious metal content; electrical precipitators to salvage metal from the fumes of the furnaces; a device for retrieving from wash basins and showers particles of metal that cling to the hair and bodies of workers, and the bank-like design of the building are included in the plans and specifications now being drawn.

From the outside, the addition, which will extend for 161 ft. along Cherokee St. and be 94 ft. wide, like the existing building of which it will form an integral part, will resemble a bank. The exterior will be faced with granite to match the rest of the structure. Like the present mint, too, it will have a terra cotta cornice and wooden windows. The addition will cover a tract of approximately 14,900 sq. ft., and will contain 1,081,772 cu. ft.

Inside, however, the resemblance to a bank will cease. Except for the use of precious metals, the work done there is the same as is done in a steel mill. So the interior arrangements will be essentially those of a factory.

The sweep cellar provides a repository for all particles swept off the floors. Into it, too, is put brick-dust when some of the mint's melting furnaces need rebuilding. The bricks, to which particles of precious metals adhere, are first ground to powder. On account of its gold and silver content, the accumulated dust, both sweepings and ground-up bricks, is sold.

Chiefly, the first floor will be given over to rolling mills. These mills will have 10- to 18-in. rollers. They will take a billet of metal and roll it down to the precise thickness of a coin. This operation requires extreme accuracy, as does also the punching out of coin dies. Coins are accounted for by weight rather than by numerical count in many operations. They are weighed in containers that hold over a bushel. Thus if the metal were a bit thick, or the diameter of the punch were slightly off balance, the count would not be correct.

The second floor will be given over to the furnaces in which precious metals are melted down, together with a predetermined proportion of base metals, to form the alloys from which coins are made. Here, also, the alloys will be annealed so that they will be soft enough for stamping.

New Traffic Study Method Devised

Public Roads Administration with the co-operation of the Bureau of Census are using a new means to obtain traffic data from which future grade separations and highway improvements will be designed

A NEW AND MORE practical method of conducting traffic origin and destination studies in cities, as an index to the proper location and design of arterial improvements, has been developed by the Public Roads Administration with the cooperation of the Bureau of the Census, state highway departments and local planning authorities.

The new method, based upon home interviews in which the occupants of a representative number of sample dwellings are questioned in regard to all travel done on the preceding week day, is similar to the sampling technique employed in public opinion polls. It is more economical and more effective than earlier types of urban traffic studies. The method has been used successfully in 34 cities, and will be extended to other cities as postwar highway planning gains momentum.

In previous years the travel habits of city dwellers have been ascertained by stopping traffic at points of concentration and interviewing the drivers or handing them questionnaires which they were asked to fill in and return by mail.

The roadside interview method is feasible on rural highways and in small or medium-sized cities, but in metropolitan areas, where traffic volumes are larger, it is applicable only to problems of limited scope. Traffic within an urban area is more complex than traffic on rural highways. Traffic arteries are more numerous, and parallel streets offer alternate routes of travel. Consequently, a great many interview stations would be required if all traffic were intercepted.

It is not possible to determine from observing traffic volumes alone where urban traffic really wants to go. In many instances vehicles travel a considerable distance out of their way to use exceptionally attractive routes and thus avoid congested and unattractive routes.

Examples of this have been noted in many cities and it frequently has been found, after making origin and destination surveys, that the facts were different from the general conclusions drawn by traffic experts long familiar with local conditions.

For several years the need for a new method of determining the origin and destination of traffic in urban areas has been apparent, and efforts have been made in a number of cities to develop improved survey methods.

When it became evident that urban construction would constitute an important part of the post-war highway program, a study was made of all urban traffic survey methods previously used. After a series of conferences between representatives of the Public Roads Administration, State highway departments and the Bureau of the Census, which has had extensive experience in conducting surveys based upon the sampling technique, the home interview method was developed. It was first applied experimentally in traffic studies made in the early months of 1944 in Little Rock, Tulsa, New Orleans and a few other cities.

The method, in practice, consists of selecting a certain percentage of dwellings throughout all sections of a metropolitan area for home interviews. After the dwellings are selected, the list of addresses is rigidly adhered to and substitution is not allowed. If a dwelling unit in the sample group is vacant, that fact supplies the answer, as no travel was performed by persons residing in it.

The percentage of dwellings selected for interviews varies according to the size of the city. The smaller the city, the larger the sample. In cities of about 100,000 to 300,000 population, a 10 per cent sample has generally proved to be sufficient. In cities around 500,000 population a 5 per cent sample is considered adequate, and in larger cities the sample consists of one address in 25 or 30 dwelling units.

If the sample is 1-to-10 in a zone of one-family houses, every tenth house is selected for interview, proceeding clockwise around the block. If there are apartment houses in the area, each apartment is considered a separate dwelling unit and the interviewer proceeds through the apartment house, interviewing occupants of every tenth apartment.

All occupants of the dwellings are questioned concerning trips made on the preceding day by automobile, bus or street car, the origin and destination of the trip, its purpose, the time of starting, the location and purpose of intermediate stops, and the use of parking facilities.

The sampling technique also is employed in surveys of truck and taxi movements. License numbers are selected from motor vehicle registration lists and the owners of the vehicles are interviewed in regard to trips made on the previous day, the origin and destination, the time of starting and ending the trip, and stops made en route. Truck owner are asked to state the type of commodity carried on each trip.

Since the number of truck trips usually is smaller than the number of trips made by passenger cars or public conveyances, the percentage of trucks selected from registration lists for investigation is greater than the percentage of dwellings selected for home interviews.

As a check on the accuracy of the survey and the completeness of the information obtained, certain arteries through which traffic funnels in large volume, such as bridges and important arterial routes, are chosen as control points. Traffic passing these points is counted and classified, and the results are compared with the data supplied in home interviews.

In nearly all traffic studies conducted thus far, responsibility for the survey has been assumed by the state highway department. Immediate direction of the work is assigned to a highway planning survey division where well-trained personnel is available to organize and supervise the study. Various city agencies, as a rule, assist in the work. The Public Roads Administration has usually provided the services of one or more experienced men to aid in organizing the survey and in training interviewers.

International Engineer Standards to Be Set Up

A CONFERENCE between the United States, Canada and Great Britain on unification of engineering standards and practice will be held in Ottawa, Canada, on Sept. 24.

This will be the third in a series of such conferences that have been held during the last two years under auspices of the Combined Production and Resources Board.

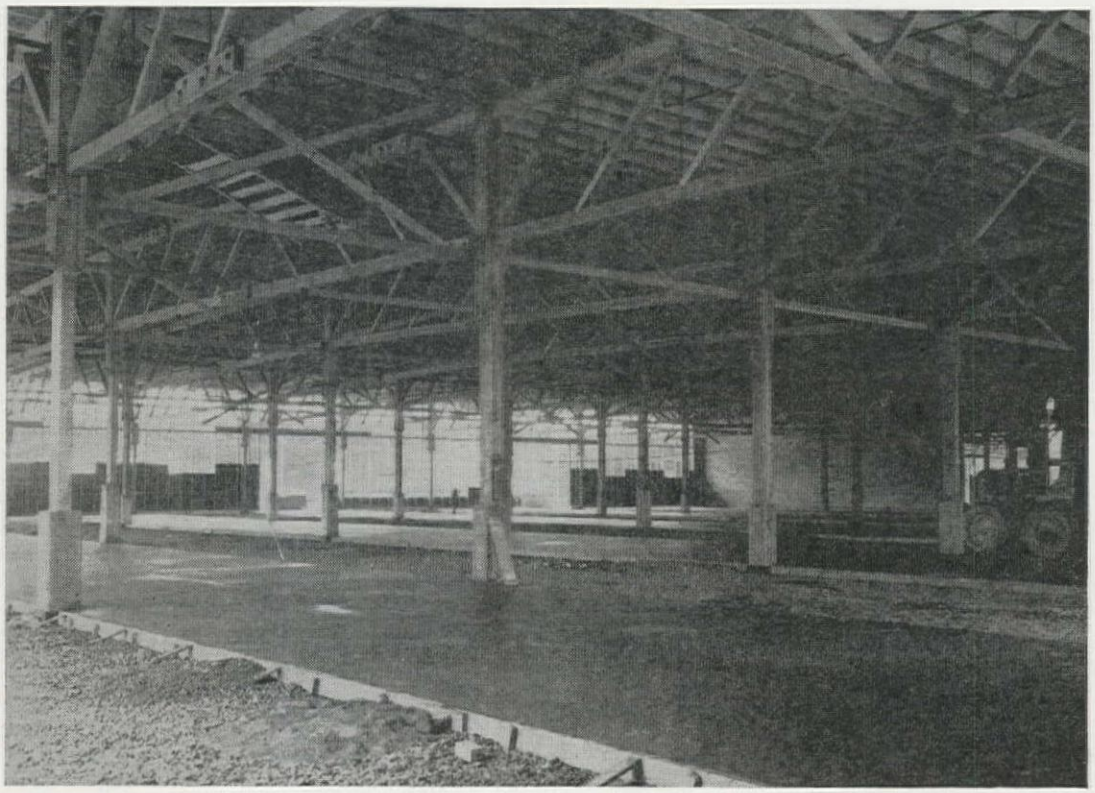
Included in the agenda for the meetings are the standardization of screw threads (including pipe threads), limits and fits, drawing practices and metrology in mechanical engineering.

The national standardizing groups of the countries concerned have been closely identified both with the work of the conferences and with developing resulting proposals. It is hoped, as a result of the conference, that differences in practices among the three countries will be reduced still further and that a series of common standards necessary in connection with their joint requirements will be ultimately achieved.

The development and acceptance of common standards will take time, and it has been pointed out that insofar as screw threads are concerned,there is no intention of seeking an immediate and complete scrapping of plants, equipment and stockpiles, which would cause widespread disruption in industry.

Most of the production equipment affected would be tools and gauges, expendable items that are continually being replaced and are therefore a normal expense under any circumstances. There is little doubt that these costs are at present much greater than they would be if standardization were more widely extended. Expenditures necessary in the gradual change-over should be considered, CPRB said, in the light of the savings that would ultimately result.

Dual Warehouse for Boeing



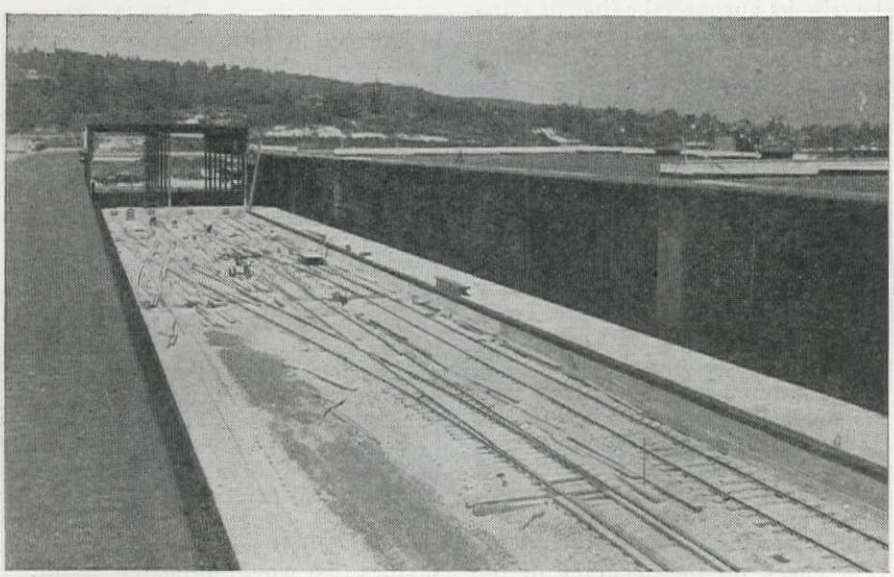
U. S. Engineers build large warehouse for Boeing Aircraft at Renton, Washington Plant with a total floor space of over 335,000 sq. ft.—Unstable topsoil included considerable carbonaceous silt which required removal and replacement with layers of gravel to establish sound footing

A DOUBLE WAREHOUSE structure, in which the two sections are connected at one end by an arcaded open shed, has recently been completed at the Renton, Wash., plant of Boeing Aircraft Co. by the U. S. Engineer Department, Seattle district office.

Each of the warehouses is 835 by 201 ft. in area, and with the open connecting shed 100 x 135 ft., the whole structure forms a vast letter U, in the center of which an intricate system of depressed railroad tracks makes it possible to spot cars beside canopied docks for either side or end unloading.

The Boeing plant is located on sand flats at the southern end of Lake Washington, and the sandy soil, containing a considerable quantity of carbonaceous and silty detritus, is not a suitable foundation for a warehouse liable to be the site of storage of much heavy material. Therefore it was necessary to excavate through the top soil for as much as 5 ft. until more substantial layers of sand were reached.

Upon this was laid a blanket of pit-run gravel, the surface of which was about 1 ft. below the final floor level. Above this was placed a 6-in. layer of crushed stone, and finally the 6-in. concrete floor. The filled area was thoroughly compacted before the floor was placed. Because metallic objects will be stored directly on the concrete floors, and also because steel-tired vehicles will be used in moving materials throughout the structures, the floors were finished with a particularly hard-wearing surface.



DEPRESSED TRACKS serving two canopied decks and terminating in four tracks abutting against the unloading arcade in rear. All tracks are graded to place car floor and warehouse platforms on the same level.

Warehouse construction

The twin warehouses, 835 x 201 ft. in overall dimensions, are of frame construction on concrete footings. The footings are spread varying from 3 ft.

square to 4 ft. 6 in. square at 2 ft. under the surface, and project through the floor as 14 x 14 in. columns to a height of from 0 ft. 6 in. to 4 ft. 7 in. From these, one center dowel extends upward and serves to hold in place 6 x 12 in. timber columns used in supporting the roof trusses.

The trusses are Howell-type construction, 6 ft. deep, and extend for the full 201 ft. width. They were pre-fabricated in 50 ft. spans and were raised into position by mobile cranes operating on the floor of the warehouse. They are placed on 19 ft. centers, and support 1-in. roof sheathing, which is covered with smooth-surfaced asphalt, built-up, four-ply roof, one layer 30-lb. felt, three layers of 15-lb. felt.

The walls of the warehouse are single Ballon type construction with asphalt-impregnated cane fiberboard ⅞ in., with mineral granule outer surface on 2 x 6 studding for lower wall section and 2 x 4 in. studding for upper wall section. The fiber cane siding is protected inside against warehouse use by shiplap wainscoting varying from 3 ft. 6 in. to 6 ft. 0 in. high depending on the location in the warehouse.

Interior design

Inside each structure are 3 fire walls, thereby dividing the building into 4 sections of 208 ft. square each. These are built of concrete blocks, and plastered on both sides with ¾-in. cement plaster, and have a metal-covered sliding door. The doors are overhead-mounted on a sloping rollerway, so in the event of releasing the restraint, they automatically roll closed. Normal restraint is furnished by a counterbalance suspended by a rope, in which has been set a fuse similar to that employed in overhead sprinklers. When the fuse element is heated by a fire, it melts away, releasing the door.

The warehouses are partly heated by a bank of three coal-fired boilers in the south building. These are in a room separated from the main storage area by a concrete block wall and fire door. In the event that it is later desired to heat the entire structure, space has been allowed for two additional boilers.

A 110-ft. stack has been erected over the boiler room. It is the only portion of the entire structure which is set on piling. It is constructed of concrete pier to the breeching opening and of brick for the remainder of the stack.

CALIFORNIA BEARING TESTS were conducted at the site of the warehouse prior to construction by the Army Engineer Soils Laboratory at the University of Washington. A truck heavily loaded with concrete slabs was used for measuring soil resistance. Surface soil was sandy, with deposits of silt and carbonaceous material.

The buildings are completely sprinkled, even to the canopy extending over the rail loading dock. A dry piping sprinkler spstem is employed throughout the warehouse.

Loading facilities

Of particular interest are the truck and railroad loading facilties. The floor of the warehouses and connecting shed are at ground level, so that trucks may drive directly into the structure without traversing any ramps or special roadway. The project included paving on all sides of the structure, 75 ft. wide, as well as a considerable parking area.

For rail loading facilities, the court in the center of the U was depressed, so that boxcar or flatcar floors are level with the floor of the warehouses, extended 20 ft. to form a loading platform. The intricate switching pattern illustrated in the accompanying sketch terminates in four tracks abutting against the platform under the open shed, for end unloading, and allows side unloading for the full length of each warehouse.

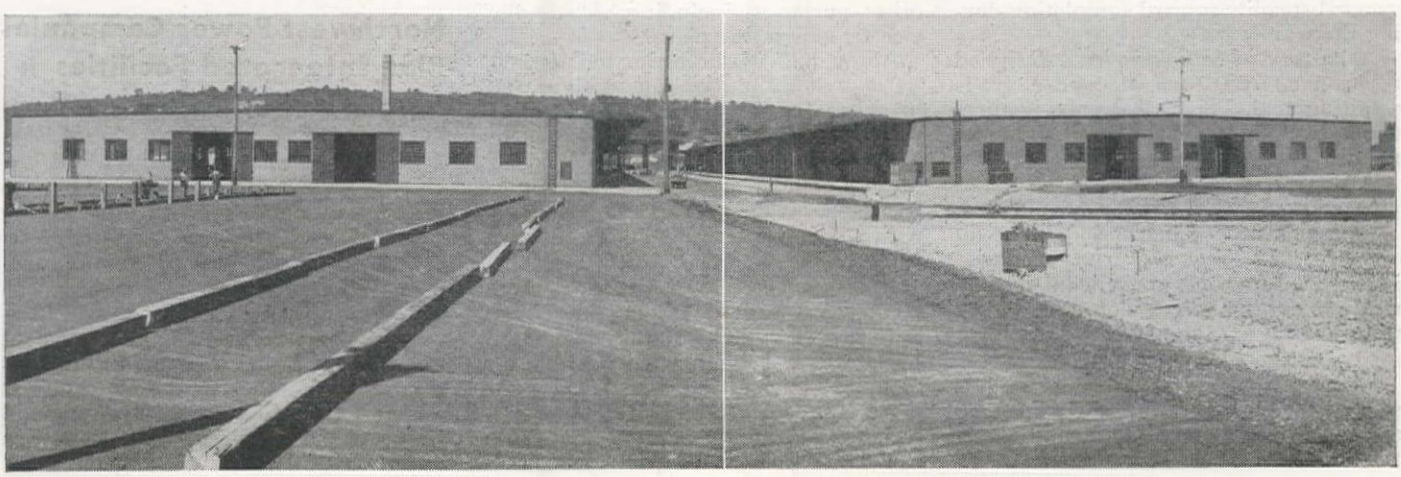
The rail used in the spur was relay, secured from Benicia Arsenal in California, with the exception of switch points and frogs, which were new. The spur connects to the Northern Pacific Railroad, which passes the structure on the east. The area of the depressed trackage is paved with blacktop and covered drainage ditches keep it dry.

Also included in the contract were fencing, lighting, offices, toilets, sanitary and water facilities.

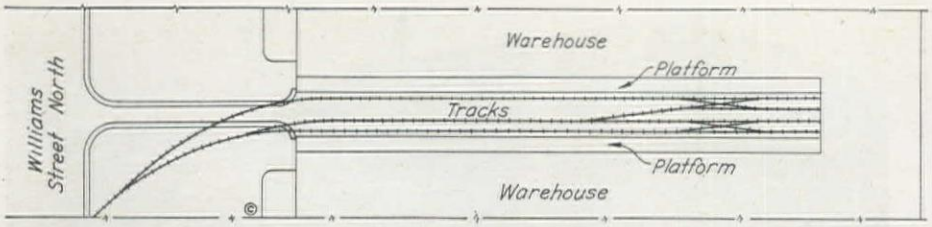
The total cost of the structure was $920,000, including materials furnished by the government.

Organization

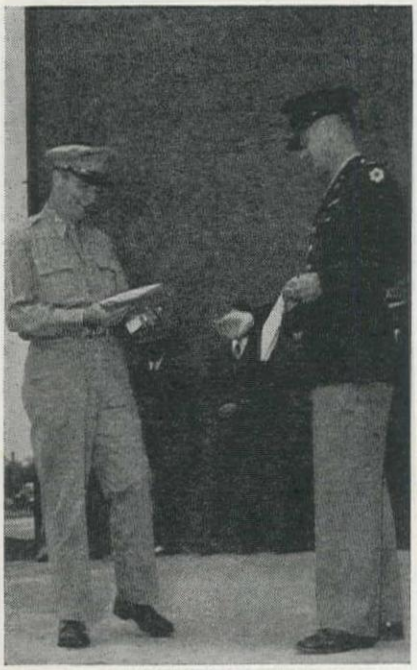
The twin warehouse was designed and constructed under the supervision of Col. Conrad P. Hardy, District Engineer of the U. S. Engineer Department at Seattle. Maj. L. W. Bindon is chief of operations in the district office, and C. C. Arnold is head of the con-



COMPLETED WAREHOUSES, showing depressed trackage area between and ground level entrances for trucks. Foreground paved area is parking space for workers. Heating facilities are located in south building, left, brick stack showing.



RAILROAD TRACK LAYOUT designed to give both end and side unloading facilities, at the same time permitting switching without disturbing spotted cars. Rail was all relay except for switch points and frogs. Below, COL. CONRAD P. HARDY, right, Seattle District Engineer, formally transfers the completed structures to COL. HARLEY JONES, plant representative, Boeing Air Technical Service Command.



Brazilian Steel Plant Now Nearly Completed, Production Starts Soon

THE VOLTA REDONDA STEEL plant, biggest steel-making enterprise in Latin America, is almost ready to begin production after overcoming many wartime obstacles in obtaining equipment and material.

Rising on a site about 80 mi. west of Rio de Janeiro and 230 mi. northeast of Sao Paulo, Brazil's main industrial center, the Volta Redonda plant has progressed steadily toward completion during the war years.

A battery of 55 coke ovens, designed to produce 1200 tons of coke daily, is awaiting coal. The coal supply, in turn, depends upon transportation arrangements.

A blast furnace, boiler house and power house have been completed. Three open hearth furnaces, which will convert into steel pig iron produced in the blast furnace, are scheduled to be ready in September. A blooming mill to roll steel ingots into plate is scheduled for operation in November.

The rail and structural steel mill is scheduled for operation early in 1946 and the sheet metal and tin mill about the middle of 1946.

Equipment for recovering valuable by-products, such as benzol and ammonia, from the coking process is installed. These by-products will be important to Brazil's growing industry, which now depends almost entirely on imported materials. Volta Redonda will set the pace itself in utilizing by-products, by using gas generated in the coking ovens for the blast furnace and other purposes, including a "standby" electric generating plant.

About half of the estimated $90,000,000 cost of Volta Redonda, with its auxiliary coal mines and other facilities, was provided by a $45,000,000 loan from the Export-Import Bank of Washington. Remainder of the cost was supplied largely by the Brazilian government, with a small interest held by the Brazilian public.

Approximately 150,000 tons of equipment were ordered from the United States to build the plant, of which about 130,000 tons have been delivered. For technical advice and assistance, 50 or more United States engineers and technicians at a time have labored at Volta Redonda with their Brazilian colleagues.

struction branch. Supervising engineer for the district was O. C. Falkenbury, and the project engineers were G. A. Barkoff, G. C. Brewer, and F. Wojack.

The prime contract was held by A. F. Mowat Construction Co. and John H. Sellen Construction Co., both of Seattle, operating as a joint venture. General superintendent for the company was Earl Smith, and John Hansen was their engineer. Project manager was Don Mowat.

N. Fiorito, Inc., was the sub-contractor on grading, excavation, pit-run gravel, crushed stone, and concrete paving. The firm was represented by Paul Fiorito, general superintendent.

Other sub-contractors were: W. L. Henson, firewalls and brick work; Grinnell Co., sprinklers; Washington Asphalt Co., blacktop paving; Leo S. Ross, fencing and railroad; Valley Construction Co., water lines and sanitary and storm sewers; Morgan Electric Co., electrical installations; ABC Roofing Co., roofing and flashing; American District Telegraph Co., fire alarm system.

Besides the massive steel mill structures, construction on the Volta Redonda site includes hundreds of tidy well-equipped homes for workers.

When the plant is in full operation, the steel city is expected to have a population of around 30,000.

The housing plans call for the construction of 2,750 homes for workers' families. About half of these houses have been built. Other facilities completed or projected include church, school, clubs, with recreational facilities, football stadium, hospital, hotel.

A farm operated by the steel company produces vegetables, fruits, milk, meat and other foods and sells them to workers at cost. In addition, the steel company buys food at wholesale prices and resells at cost to employees.

Volta Redonda was chosen as the site because it has good transportation facilities. It is on the Central do Brasil Railroad. It also is on the highway connecting Brazil's two largest cities. The elevation, about 1,500 ft., gives the locality a healthful climate.

Iron ore can be brought downgrade from mines in Minas Gerais. Limestone comes from the same region.

The third principal ingredient for steel-making, coal, will come from southern Brazil mines being developed in Santa Catarina by the company. Transporting this coal involves a rail-water-rail haul of 600 mi. or more. Probably some United States coal will be imported for use in the coke ovens.

The equipment now being installed at Volta Redonda can produce a maximum of 350,000 tons of steel a year—about 150,000 tons more than all of Brazil's small charcoal furnaces produced before the war, and almost equal to the 450,000 tons imported in an average prewar year. It will be possible, by installing more furnaces, to produce up to one million tons a year.

While this production theoretically could replace imports, both Brazilian and American technicians at Volta Redonda contend that it will have just the opposite effect. They reason that Volta Redonda's full production can be easily absorbed in filling such essential needs as iron rails for the railroad expansion Brazil needs greatly and structural steel for buildings, now being erected almost entirely of reinforced concrete.

Northwest Power Companies Plan Integrated Facilities

APPLICATION is being made by the Washington Water Power Co. of Spokane, Wash., to the Securities and Exchange Commission for permission to integrate its facilities with those of the Pacific Light & Power Co., Northwestern Electric Co., and the Montana Power & Light Co. in a new northwestern electric utility unit.

At the same time this announcement was made, a denial was given to rumors that common stock of the Washington Water Power Co., owned by American Power & Light Co. of New York was being sold to public ownership.

Folsom Dam Foundation Explorations

Geologists drive tunnels and shafts into Sierra granite in preconstruction examination of bedrock underlying site of 354 ft. earthfill flood control and irrigation structure on the American River — Main dam will be 11,500 ft. long and excavation to total 21,000,000 cu. yd.

By CLYDE J. GORMAN
U. S. Engineer Office
Sacramento, California

THE WAR END has suddenly thrown into sharp perspective the huge water development programs contemplated for the Western states. Not least among these is the Folsom reservoir, some 2½ mi. above the California town of the same name on the American River.

As presently authorized by Congress under the provisions of the 1944 Flood Control Act, the initial stage is ready to go as soon as necessary funds are released. This act recognizes the principle of multiple-purpose construction so that none of the work so performed will interfere with the ultimate benefit of irrigation and power as well as flood control and other conservation benefits.

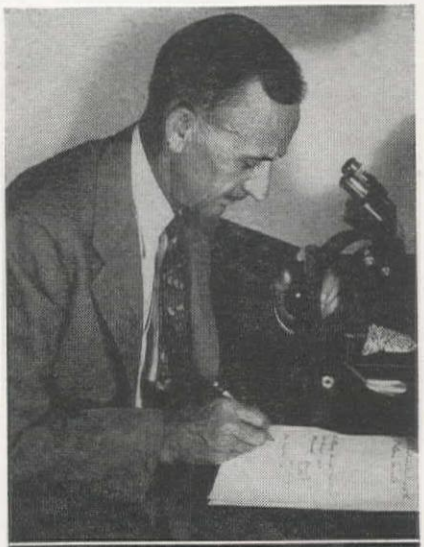
Geological investigations

However, before construction can begin, and before contract specifications can be drawn up, it is necessary to make a minute exploration of the earth's surface in the vicinity of the site and along the proposed axis of the dam. In this way the man-job of harnessing a river can be best fitted to utilize the formation of the earth crust. Not to do so is to invite complete failure at any one of the countless natural booby-traps that have always obstructed the ambitious schemes of man.

The burden of discovering what Nature has up her sleeve at any given point falls on the geologist. In the Sacramento U. S. District Engineer office, and at the Folsom damsite, War Department geologists are hard at work.

They know generally that the earth at Folsom has had a curious history. They know that at one time it laid perhaps at the shoreline of the Sierras, once the edge of the North American continent, and as the Coast Range emerged, it became the boundary of an inland sea, until finally it raised to a great sloping plain over which many rivers fingered their way to the sea. Blue Ravine, a landmark familiar to many, is the ancient channel of one such river. Hydraulic dredges, seeking gold, have long followed the dry beds of these countless old rivers. Even more strange to the lay observer are deposits of gravel on hill tops and ridges that show where other rivers once flowed.

After 150 million years or so of these earth changes the original granites are now near the surface of the Folsom site, overlaid by a scant cover of organic soil and decomposed granite. Breakdown of the original rock structure is known to have followed joint planes and fractures



CLAIRE P. HOLDREDGE, top right, chief geologist in the Sacramento District Army Engineer Office, is in charge of foundation explorations; PAUL JOHNSTON, center, examines formation by aid of a Brunton compass; MARION S. KELLY, resident engineer, with phone, and MIKE ORENO, foreman, study drawings; below skid and air winch used to lower heavy machinery into position on the river bank.

OFFICERS IN CHARGE of U. S. Engineer construction program for the Central Valley are COL. LESTER F. RHODES, right, district engineer at Sacramento, and GEN. THOMAS M. ROBINS, assistant Chief of Engineers, Washington, D. C.

to a considerable depth into the earth. The geologist enters the picture after a general site has been selected. His job is to furnish the design engineers with exact information about the formations at the proposed axis. From this data the design men work out a dam that is suited to local conditions.

Planning the project

The plotting of this vertical cross-section of the earth is a matter of interest. Long before construction boom towns spring up, or the earthmovers gather in force, a small pioneer cadre begins digging trenches and large shafts, and small core holes are drilled into the earth. The accompanying drawing shows how they are placed. Eventually, the solid rock line is plotted, and this is the stuff that is expected to hold the tremendous weight of a dam and its impounded waters. Sometimes, a whole project has been abandoned when these findings are not favorable, but so far things look good at Folsom.

In 1942 the Bureau of Reclamation made some core drillings on the Folsom site while the U. S. Engineers made similar explorations on the Feather river, and there has been a free exchange of technical information as a springboard for current studies. It follows, that so far as engineering is concerned, there is agreement as to the top capacity of the reservoir and legal provisions whereby the Corps of Engineers will turn over to the Bureau of Reclamation irrigation water and power at the damsite for distribution by the latter agency. Other incidental benefits, such as recreation features of the reservoir itself will be developed by the Secretary of War.

CROSS-SECTION of American River bed at Folsom damsite showing shafts and drill holes used in geological explorations. The rock is a hard granite with scant cover of organic soil and decomposed rock. Joint planes and fractures are numerous and will necessitate crack grouting.

When the so-called high dam is authorized it will be big. Something over five miles — 27,000 ft. — of man-made ridge 480 ft. above sea level will string around the low end of the reservoir, blocking old channels, saddles in hills, and the American River itself. And while the present authorization is for less-than-ultimate capacity, it is designed with a broad base (1,800 ft.) so that it can be raised to accommodate a storage of 1,000,000 ac. ft. of water. In fact, such a dam has been recommended in the U. S. Engineer's comprehensive report, recently issued as a result of studies ordered as far back as 1936 and '38. In turn these late studies were based on an initial survey of all the water resources in the United States—quite a large order—from the Congress to the Corps of Engineers in 1927.

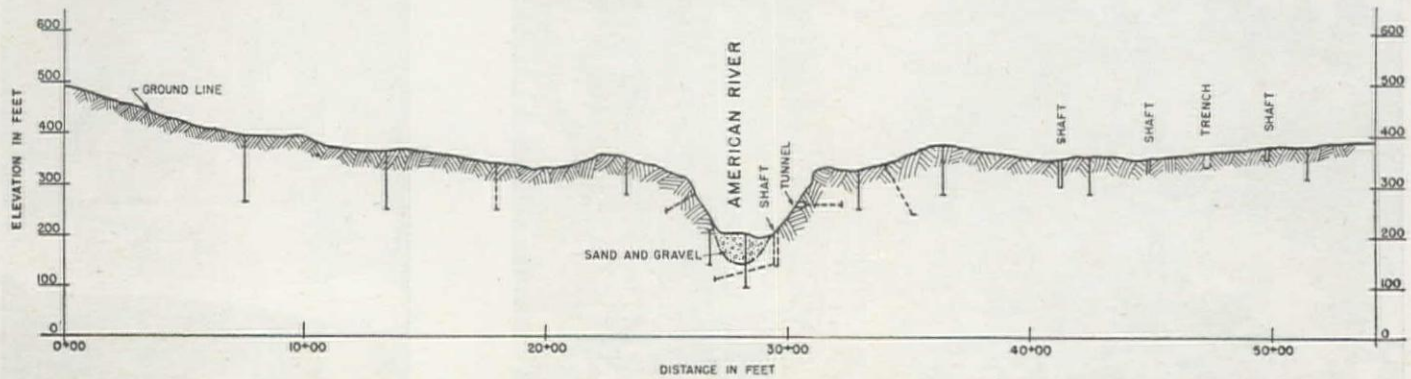
Design features

Included in the proposed earth works at Folsom are eight auxiliary dams and the main dam stretching 11,500 ft. The earth to make it will come from the reservoir area, from a new channel connecting the spillway and the river, and other convenient points—with the total for everything coming to 21,000,000 cu. yd.

Two 34-ft. diameter tunnels will divert the river while work is going on. Later these tunnels will become a part of the regular structure, with one running to the power house and the other for the controlled release of other waters. Atop the concrete spillway, some 675 ft. in length, and a few hundred yards north of the present river channel, there will be mounted 15 gates, each 30 ft. high and 45 ft. wide. With these, the desired storage can be maintained above the spillway crest, while down in the tunnels giant valves, with ports 12 by 20 ft., four to a tunnel, can maintain required flows. From one of them will pour sufficient water to turn two hydroelectric generators with a combined capacity of 64,000 kva.

The geologists who are taking the measure of California's crust at Folsom are headed by Claire P. Holdredge, chief of the Sacramento district's geological section.

Col. Lester F. Rhodes is district engineer at Sacramento in charge of all exploration and design studies.



GEOLOGIC EXPLORATION AT FOLSOM DAM SITE — LOOKING DOWNSTREAM

LEGEND

SOLID LINES INDICATE EXPLORATORY WORK COMPLETED
DASHED LINES INDICATE EXPLORATORY WORK NOW IN PROGRESS
CORE DRILL HOLES INDICATED BY SINGLE LINE

Salem Plant to Make Alumina

Four million dollar pilot plant built at Salem, Oregon, will use new Chemico process to convert Western aluminum-bearing clays into alumina—Plant will use large prestressed concrete tanks as digesters and for storage of fluid used in intermediate chemical processes

By BEN MAXWELL
Salem, Oregon

AN EXPERIMENTAL pilot plant is nearing completion at Salem, Ore., which is intended to develop the "Chemico" process of converting aluminum-bearing clays into alumina. The new plant is financed through the Defense Plant Corporation and will represent an investment of $4,060,000 when completed. It is one of several plants built in the Western states to utilize the abundant clay deposits in this region at a time when the heavy demands of war economy were rapidly depleting the domestic sources of high-grade bauxite, the usual ore of aluminum.

Chemical Construction Corporation, originators of the "Chemico" ammonium bisulphate replacement process are building the plant for Columbia Metals Co. This chemical replacement process is comparatively simple and has the highly desirable advantage of recovering a high percentage of the reagents involved for reuse.

First step in the reduction of kaolinite clays is to pulverize them and thoroughly mix ammonium bisulphate with the clay. It is then heated in a rotary kiln. The resulting sinter is leached with water to dissolve the aluminum sulphate, residual ammonium-bisulphate and some iron sulphate. Ammonium alum is precipitated and filtered from the mother liquor. The filtrate contains considerable quantities of ammonium-bisulphate and is returned to the digester step for use in treating more fusion products. The aluminum sulphate crystals extracted from the leaching step are dissolved and the ammonia generated from the initial reaction of the process is then added to precipitate aluminum hydrate.

This is washed, settled and calcined to form alumina, the end product of this plant. The Salem alumina will be shipped to other plants for reduction as metallic aluminum, chemicals or refractories.

Construction

The plant is situated one-half mile north of Salem's city limits, on a 100-ac. tract. The chemical works occupies 20 ac. and the remaining 80 ac. are developed into diked reservoirs for use as sludge pools.

Due to the large consumption of water by the plant, three 6,000-gal. pumps were installed to furnish 8,640,000 gal. per day from the Willamette river. An extensive layout of tanks and control circuits are required to handle the large quantity of liquids used in the process, many of them acid resistant lead lined, while others are brick lined.

An interesting innovation in the tank installation was the use of prestressed concrete tanks. This was accomplished by placing strands of wire in spiral wraps around concrete tanks. The wire is applied at a stress of 150,000 lb. per sq. in., and later covered by additional concrete applied with a pneumatic gun. The prestressed tanks do not crack when fluid loads are applied to them as do tanks constructed in the conventional manner with unstressed reinforcing bars imbedded in the concrete, because

ALUMINA PRODUCERS—from left, JAS. O. GALLAGHER, president of Columbia Metals Corp., plant operator; W. R. SEYFRIED, project manager for the Chemical Construction Corp., and CLARENCE D. MARTIN, ex-governor of Washington.

the tension in the wires is calculated to exactly equal the outward pressure when the tank is filled.

The tanks constructed by this method were 62 ft. in diameter and were prestressed with 11 mi. of No. 8 steel wire, which was applied in 8 hrs. working time.

Application of the wire is handled by a specialized wire winding machine suspended from a carriage traveling around the rim of the cylindrical concrete tanks. The preloader machine carries a coil of wire which is applied through a resistance mechanism to develop the tension in the wire.

A large electric automatic steam plant is another unusual feature of this plant. Fifty thousand kilowatts of Bonneville power are used to steam this big electric boiler.

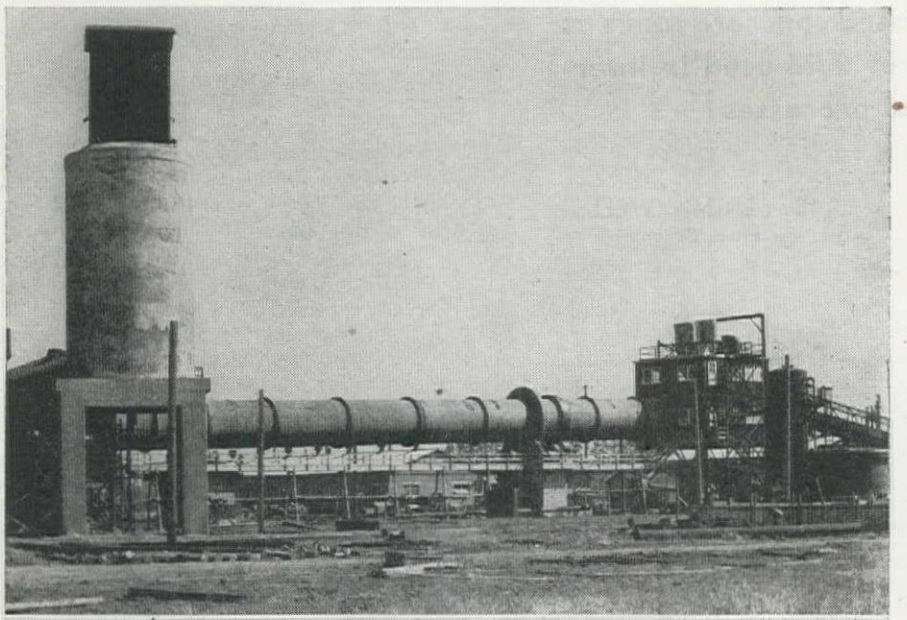
Clay handling

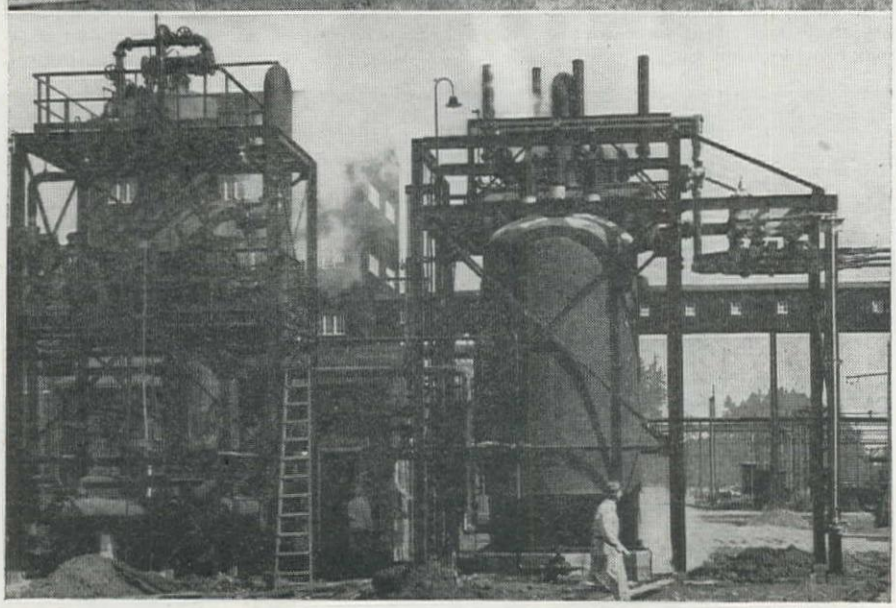
The plant as constructed consists of a clay pulverizing and screening unit, a rotary furnace to sinter the clay-ammonium bisulphate mix.

Next in line is the bisulphate generator housed in a steel structure 62x140 ft., with 11,810 sq. ft. of floor space. From the bisulphate building the clay by-products pass to the crystallizer building, 48x300 ft., which contains 33,636 sq. ft. of floor space.

In this building aluminum sulphate is converted to aluminum hydrate. The hydrate is transferred from the crystallizer building by conveyor to the feeder of a second large rotary furnace. The furnaces are supported on reinforced concrete piers which carry the drive and roller mechanisms. Flow of material through the furnace is caused by the tube being inclined in the direction of flow. Oil-firing is directed counter-current to the material flow, assuring a gradual and complete reduction of aluminum hydrate to alumina. The finished alumina is elevated from the furnace discharge to a reinforced concrete silo.

ROTARY KILN discharges finished alumina into the storage silo where it is stored until shipments can be made to the refinery, top. Steam is furnished to the plant by an electric automatic boiler which requires 50,000 kilowatts of Bonneville power.





W. R. Seyfried, project manager, states the daily output of the plant will be 50 tons of alumina. Kaolinite clay stockpiled at the plant was secured from Cowlitz deposits in the vicinity of Castle Rock in southwestern Washington. Another deposit located near Molalla, Ore., is estimated to contain 50 million tons of 25 per cent alumina clay. Other sources of alumina-bearing clay are located near Cottage Grove, Ore., in the vicinity of Spokane, Wash., and at Troy, Ida.

Salem's alumina plant will employ approximately 265 persons when operating at full capacity on three shifts.

No chemicals are used here that might settle as a dust deposit to become injurious to either animal or plant life. The plant is neither malodorous nor dusty.

Statistics

During construction of the plant 6,132 cu. yd. of concrete were used in footing, piers and tanks. The plant building and furnace structure required 1,571,800 lb. of structural steel, and 839,590 lb. of sheet lead and piping went into the chemical circuits.

The prime contractor was Chemical Construction Corporation of New York. Subcontractors were: Neoprene lining by Gates Engineering Co., Wilmington, Del.; Tice Electric Co., Portland, Ore.; prestressed tanks by Preload Company, New York; lead installation by O. G. Kelly, New York; road and railroads, C. T. Malcom, Portland, Ore.; Gabriel Fabrication Co., Portland, Ore., and Globe Automatic Sprinkler Co., Philadelphia, Pa.

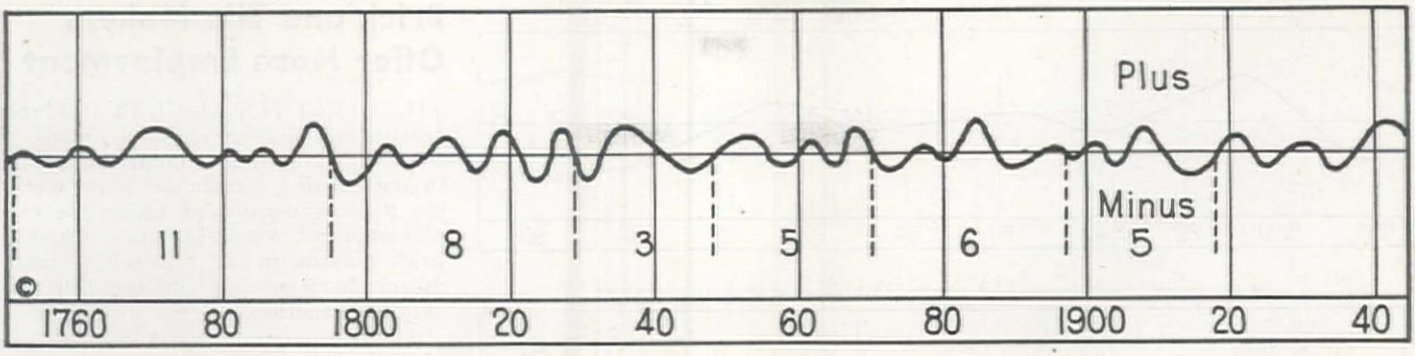
Safe Use of Blasting Caps Shown in New Film

THE STORY of the blasting cap is dramatically portrayed in a new film of that title just completed by the Institute of Makers of Explosives. Its purpose is to acquaint the public, and especially children, with the dangers of children playing with blasting caps.

The new picture is an all-color, 16mm., sound version, especially produced for school safety programs to inform boys and girls of the dangers hidden in the apparently harmless little blasting caps. These caps are used to set off millions of tons of high explosives which every year serve in such tasks as mining coal and metal, driving tunnels, building roads, draining swamps, and clearing land. Blasting caps are part of a peacetime industry, but when they sometimes fall into the untrained hands of careless or uninstructed boys and girls, serious injury may result.

Prints of the film are available for scheduled meetings, on request to the Institute of Makers of Explosives, 103 Park Avenue, New York 17, N .Y.

The Institute also has illustrated posters and leaflets which are suitable for bulletin board use or in discussion groups. A supply will be sent without charge.



Rainfall Cycles—
Factor in Planning Hydraulic Design

Minor fluctuations in rainfall over short periods have been reduced to a fundamental graph with which the effect of rainfall upon conservation and flood control can be predicted, and the intriguing suggestion is made that precipitation cycles may influence the trend of world affairs

By HONORÉ EVERETT GERRODETTE
Consulting Engineer
Seattle, Wash.

THE GENERAL FACTS revealed in this article should be of interest to engineers concerned with the designing of drainage, hydroelectric irrigation and flood control works; also to any other technologists concerned with rainfall and its effects over the next approximately 20 years. The matter of anticipated increased rainfall over the next 20 years should be an important factor to owners and users of land in semi-arid areas. The aim here has been the unlocking of valuable information contained in factual data compiled through research about rainfall particularly covering approximately 500 years past and to indicate how this information could be used to look and plan ahead.

The derivation of the fundamental graph illustrated is a result of a considerable interest in graphical analysis of the phenomena of a repetitive or cyclic nature. I have, over a period of about ten years, made an exacting study in search of a method for isolating the many long and short term trends that add up to the resultant graphs of natural facts, such as rainfall charts and stream flow data. I have developed a method of isolating and subtracting the shorter term variations (which in themselves are complicated repetitions) and after subtracting those short term variations, isolated or revealed the long term trend. This long term trend is, from a practical point of view, the fundamental graph or main variation.

It has been my observation that the patterns of the longer trends are more uniform and more definitely projectable. From a practical point of view, it is more valuable to know how nature reacts and thus derive an easily usable law or rule that is projectable, than to attempt to find out, as in the case of rainfall, what the variations are in the complicated solar or extraterrestrial phenomena that cause the long and short term trends that add up to the actual composite result.

Graph analysis

It is evident from the above, that the developing of the method of graph analysis is the problem. Collecting and tabulating information such as rainfall data is valuable as a base or source of factual material; however, a further type of analysis is required as a basis of projection for use.

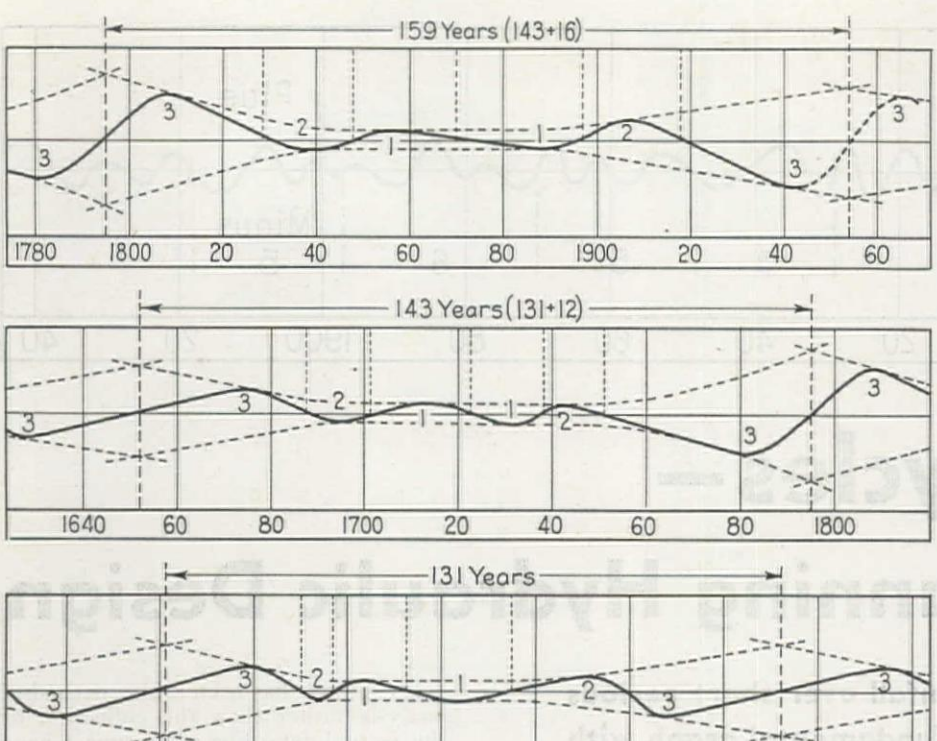
HONORÉ E. GERRODETTE is a graduate electrical and mechanical engineer, and for twenty years has been connected with construction work of all kinds. He is a Fellow of the American Geograpical Society, a member of the National Society of Professional Engineers, and numerous other professional groups. He is presently engaged in consulting work in Seattle.

My interest has been in the method of analysis rather than the collection of the factual data. For some time I have been interested in the possibility of deriving a graph of relative rainfall variation that I believed would reveal over a long period of years a "Fundamental Graph of Rainfall Variation" or, in other words, a fundamental symmetrical repetition about an axis. Such a fundamental graph is projectable.

For the factual material it is necessary to acknowledge the valuable sources of rainfall, runoff and tree growth data found in matter published by the American Geographical Society, of which I am a Fellow. To these facts on rainfall and related subjects, I applied my methods of trend isolation. The net result is the revelation of the fundamental graph shown in the illustration.

This graph is presented and it is believed will be useful in connection with various local graph data of rainfall, stream flow, etc., now available as a means, in connection with such data, of predicting with a more reasonable degree of accuracy than heretofore the probable conditions in these natural phenomena in the years ahead at various local areas; especially, for example, from the extreme low of 1943 to the extreme expected high of 1965, with resultant consequences. It is to be noticed that such extreme periods re-occur about every 150 years. We have passed through a period of extremes in economic affairs and it now appears that we have passed through approximately 25 per cent of a period of extremes in the matter of rainfall variations and its resultant effects.

The 3, 2, 1, 1, 2, 3 curve presented is a fundamental graph. I have found that the smoothed-out curve of the year-to-year variations forms a short term trend that if superimposed upon the fundamental graph makes a full number of half cycles for each of the 1, 2 or 3 half cycles of the fundamental graph. In other words, these short term trend half cycles are harmonically related to the fundamental graph. The short term



THREE SIMILAR rainfall cycles show on the above graphs the repetitive condition of precipitation from the year 1500 to the present time. The top chart predicts an increase in rainfall from now until approximately 1965 which will be good news for the farm and ranch owners of the West and a hint to those interested in flood control.

trend illustrated for period from 1750 to date is typical especially of California and vicinity.

Relation to economics

Passing to other matters of interest in connection with this graph, it is noted that the periods of extreme lows of rainfall have their lows in the years 1496, 1627, 1782, and 1943. These happen to coincide with the following periods of more pronounced adjustments in world history:

Year of Extreme Low Point	Period in History
1496	Period of discovery
1627	Period of renewed expansion
1782	Period of general revolt
1943	Period of general world disturbances and commercial and sociological adjustments

It would be interesting if possible to establish a further relationship between the graph extreme lows and the above tabulated periods. For example, that these periods of low rainfall produced unsettled conditions agriculturally which in turn created pressures causing the above tabulated changes, migrations and movements.

It might prove an interesting subject to a student of history and/or sociology to determine if there is also a possible relationship between the extreme highs that follow immediately after the extreme lows to determine if such extreme high periods are times of less unrest and greater economic prosperity and greater stability. This is pertinent as we are tending toward such a high period about 1965.

It is interesting to note the relationship of the last extreme low of the graph to the time of the dust bowl conditions in this country; also the fact that the extreme low has passed on the graph and coincidentally agricultural conditions have improved in the dust bowl. This first definite physical evidence of the turning of the longer tide should be interesting to such people as those mentioned in the beginning of the article.

Brick and Tile Makers Offer More Employment

THE STRUCTURAL CLAY Products Institute is urging regional offices of the War Manpower Commission to aid in encouraging former war plant workers to seek permanent peacetime employment in brick and tile plants and as brick masons, in order to relieve manpower shortages and help speed up private construction.

About 10,000 additional workers are needed to permit clay products manufacturers to resume peacetime production on a large scale, and another 63,000 bricklayers are required to execute the large volume of masonry construction which will get under way rapidly, according to the Institute, which is the national association of brick and tile manufacturers.

Clay products manufacturers have no reconversion problems to delay large-scale output, inasmuch as they continued to produce their peacetime lines in meeting the demands of the war construction program. The shortage of manpower, which WMC regional offices can help to eliminate, is the only obstacle to all-out production.

The shortage of brick masons also requires prompt attention, in order that all demands for masonry construction can be met without delay. The need is especially great at this time, owing to the fact that relatively few young men entered the trade during the depression years when the volume of new construction was relatively small.

The volume of masonry construction is expected to break all records when the peacetime construction program gets well under way, and the demand will be especially great in the next few months as a result of the serious shortage of lumber for residential construction and other types of building.

W. P. B. Gives Clearance to Resume Construction Work at Davis Dam

WORK ON DAVIS DAM, Bureau of Reclamation structure on the Colorado river in Bullshead canyon, between Nevada and Arizona, will be resumed shortly, having received clearance by the War Production Board. The clearance will allow completion of the project with the exception of a switch yard at Gene, Ariz., and the Davis - Parker - Phoenix transmission line.

Funds available from previous appropriations total $1,396,000 and are not sufficient to carry out the program to any great extent during the fiscal year of 1946. Additional funds have been requested, however, according to a statement by Harry W. Bashore, reclamation commissioner.

The average employment estimate over a three and one-half year period will be 1,200, with 3,000 being the peak expected during the time that construction work is at its height.

The Davis Dam was started before the war in an effort to provide additional flood control on the Colorado river below the Boulder dam, and to supplement the power generated at Boulder dam. At the outbreak of the war, construction was halted due to the inaccessibility of labor and materials. A contract had been awarded to the Utah Construction Co. and eight other firms, in the amount of $18,966,392, just prior to the shut-down order, but work had gotten no further than erection of a camp and other preliminary features. The contract will probably be reinstated.

It is estimated that the Davis dam project, when complete, will produce 750,000,000 firm kilowatt and 145,000,000 secondary kilowatt hours annually.

Adjustment Act Speeds Tax Refunds

Adoption of the 1945 Tax Adjustment Act enables private business to use its own capital for expansion or other needs through immediate refund of certain tax monies paid to the government during war time

By JAMES G. SMYTH
Collector of Internal Revenue
First California District
San Francisco, Calif.

SPECIFIC PROCEDURES to expedite for businessmen the various benefits provided for them in the Tax Adjustment Act of 1945 have been outlined by the Collector of Internal Revenue.

The wartime tax laws, recognizing possible inequities and hardships on business which might result in some cases, provided eventual refunds of certain tax amounts. The Tax Adjustment Act speeds up these repayments so that American business may make immediate use of its own money for reconversion and other pressing needs.

In fulfillment of this objective, procedures have been adopted which will make these adjustments as simple and speedy as the law allows. Specific instructions are being issued to the field offices of the Bureau of Internal Revenue, and any businessman seeking further information about the specific application of the new law to his particular situation is invited to consult the nearest office of a collector of internal revenue or a revenue agent-in-charge.

The principal benefits, and the general methods by which they will be realized, are:

1. **Current Credit-Excess Profiits Tax** (in lieu of former postwar credit)—Formerly, each corporation paying excess profits tax was entitled to a postwar credit equal to 10 per cent of the excess profits tax paid. Under the new law, for taxable years beginning on or after Jan. 1, 1944, the amount of tax payable is reduced 10 per cent and the postwar credit is abolished. This plan will be put into effect as follows:

(a) In the case of a corporation paying remaining installments due on excess profits tax for a year which began on or after Jan. 1, 1944, the corporation should divide its credit by the number of remaining installments, and reduce each remaining installment payment by that amount. (Example: Corporation X filed an excess profits tax return on March 15, 1945, showing it owed $400,000 excess profits tax for the preceding year. The corporation paid one installment of $100,000 on March 15 and another of $100,000 on June 15. Normally, it would make similar payments on September 15 and December 15. However, under the new law it is entitled to a current credit of 10 per cent of the tax—10 per cent of $400,000 or $40,000. Since the corporation has two more installments to pay, it should divide the $40,000 by 2, and take a credit of $20,000 on each of the remaining installments. Thus, the corporation should pay $80,000 on September 15 and $80,000 on December 15, instead of $100,000 each time.)

(b) In the case of a corporation paying remaining installments due on excess profits tax for a year which began prior to Jan. 1, 1944, the corporation should reduce its last installment by the amount of the credit. Although the new law is silent on this point, the Commissioner has authorized this special procedure so that affected corporations will not have to pay the credit and then wait for its refund. (Example: Corporation Y filed an excess profits tax return on Feb. 15, 1945, showing $300,000 excess profits tax due for its fiscal year which ended Nov. 30, 1944. It has already paid three installments totaling $225,000. Normally, it would owe another installment of $75,000 on Nov. 15. However, it is entitled to postwar credit of 10 per cent of $300,000 or $30,000. In this case the corporation should reduce its last installment, in November, to $45,000.)

(c) In the case of a corporation making payment on a deficiency assessment for a taxable year which began prior to Jan. 1, 1944, the corporation also will be permitted to reduce this payment by the amount of the postwar credit applicable to the deficiency.

(d) In the case of a corporation which has paid in full the excess profits tax due for a year beginnng on or after Jan. 1, 1944, the Bureau will, on its own initiative, refund the amount of the current credit to the corporation.

(e) In the case of all corporations filing excess profits tax returns (Form 1121) hereafter, the credit should be taken on the return, reducing the total tax by 10 per cent. This reduced total tax should be paid in the usual installments. If using a 1944 edition of Form 1121, the corporation should enter the credit on line 21, page 1 (line 21 originally indicated a "credit for debt retirement," which has been replaced by the current credit under the new law). The 1945 form will specifically indicate the current credit.

2. **Redemption of Excess Profits Refund Bonds**—Formerly, a corporation was issued "Excess Profits Tax Refund Bonds" to evidence the 10 per cent postwar refund due on its excess profits tax. These bonds were to become redeemable at specified dates after the war. Under the new law, all bonds of this type will become redeemable in cash, at the option of the holder, on or after Jan. 1, 1946. Specific procedure for presentation of the bonds for redemption will be issued soon by the Secretary of the Treasury.

3. **Deferment of Current Taxes Due to Anticipated Carryback**—The new law permits corporations who anticipate carryback refunds (due to either "net operating loss" or "unused excess profits credit" in the current year) to defer current tax payments equal to the anticipated refund, pending final determination of the refund. The Bureau has prepared a special blank, Form 1138, for the taxpayer to use in applying for such deferments to the collector to whom the tax is payable.

4. **90-Day Refund Due to Carryback**—The deferment described in the preceding paragraph will be based on a mid-year estimate by a corporation of its carryback. Therefore, when the taxable year is over and the exact amount of carryback can be determined, a corporation which has deferred current taxes on account of an anticipated carryback should file an application on Form 1139 for an expedited adjustment. Similar applications also may be filed by corporations which, though entitled to carrybacks, have not deferred any current taxes. Individuals having a net operating loss carryback may apply for corresponding adjustments by making an application on Form 1045. In all these instances the Commissioner will, within 90 days, make a tentative refund of any amount due in excess of deferred taxes, unless he finds "material omissions or errors" in the applications.

5. **90-Day Refunds Due to Amortization Allowances on Terminated War Facilities**—Many taxpayers with war contracts have received special permission to take amortization deductions over a five-year period on certain "emergency facilities." If before the expiration of the five years the War Production Board has certified that the facilities are no longer needed for emergency purposes (or the President proclaims the end of the emergency) the taxpayer may file a notice terminating the arrangement, and file an application for tentative adjustment or refund of his prior years' taxes on the basis of the shorter period of amortization. Unless he finds material omissions or errors in the application, the Commissioner will, within 90 days, determine the amount due the taxpayer, apply as much of it as necessary to outstanding taxes owed by the taxpayer, and refund the balance. Two special forms (Form 1140 for corporations and Form 1046 for individuals) have been prepared for the use of war contractors desiring such tentative adjustments.

6. If for any reason, not covered in the preceding paragraphs, the taxpayer has any tax payments coming due while an application is pending for a 90-day refund on account of a carryback or amortization allowance, he may apply to the collector of internal revenue for an extension of time so as to avoid making any payments which would thereafter have to be refunded to him.

Piledriving for Guam Docks

A skillful combination of men and machines was required when Americans undertook development of a deep-water harbor at Guam for a port—Coral, native to the waters, proved a helpful surfacing material for docks, when Seabees began driving steel sheet piles for the zig-zag bulkhead

WHISTLING ACROSS Guam at 30 knots, the wind ruffed the water and made the Seabee's floating piledriver dance a crazy jig against the sheet pile bulkhead wall. Stern lines jerked taut, wood fenders groaned, and the hoisting engineer watched for his chance. When the home-made hammer "pants" lined up with the MZ pile sections he took his foot off the brake and the big steam hammer dropped true, belling perfectly.

"We cain't never seem to ketch up with them guys," he complained to his fireman. "They'd set pile if the damn wind was blowin' so hard you'd have to lash yourself to the deck!"

"Yeah, that was a pretty smart stunt when they started settin' pile out ahead of us with a shore crane," said the fireman. "At least the crane is solid, and don't do no dancin' around."

These men, in their conversation, were hitting very close to the solution of a construction problem. When Seabees were assigned the job of driving steel sheet piles to make a dock bulkhead on one side of a harbor at Guam, the prevailing western winds were something to be considered.

Some of the pile sections had practically watertight interlocks. Joining these interlocks by hand, 40 ft. in the air, with the 60-ft. pile hanging off the end of a 110-ft. crane boom was no small demonstration of skill, and the Seabees who alternated with each other in holding down that job risked their lives for their country just as surely as if they were being fired upon by the enemy.

Additional dockage required

The bulkhead was designed in a zig-zag pattern to take advantage of all the natural dropoffs between existing coral reefs and deeper water. Supplemented by dredging of another activity, the piledriving will provide dockage, with bitts and cavels, with a deep water maneuvering and approach for vessels to berth alongside the finished dock. An unusual feature of the work is the fact that fine coral was used as it was deposited by dredge pipelines, without other surfacing, for the vehicles hauling ship cargoes away.

When Americans came back to Guam, there was a shortage of docking space for shipping in the harbor. In order to develop such space in a hurry, work on piledriving and dredging was being pushed to the limit, and it created a problem for the officers in charge of piledriving which was solved only by stringing the job out as much as possible. The situation was complicated by the fact that in stringing out the dock, a narrow ribbon of coral only 150 ft. wide was strung out along the dock line, leaving a lagoon area to be filled at leisure. It was difficult to maneuver piledriving equipment in such limited territory. Sometimes the arrival of piles did not coincide with the progress of the fill, and steel piles had to be reloaded on pontoon barges and brought around to the drivers.

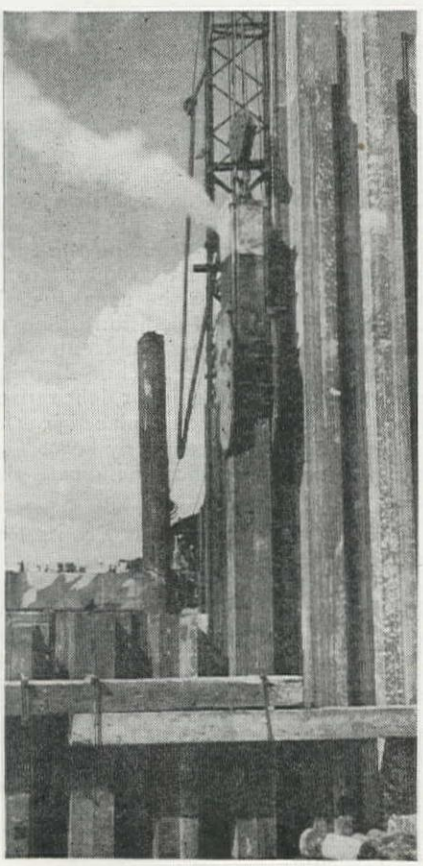
Order of procedure

Operations were set up on as much a routine basis as possible, and the job was carried forward in the following steps:

(a) A survey party, using U. S. Coast & Geodetic triangulation points, flagged the bulkhead alignment by setting targets 4 ft. square on the proposed line.

(b) A floating piledriver, mounted on a barge fabricated from 5 x 5 x 7-ft. pontoon sections, moved in and drove creosoted wood piles on 30-ft. centers approximately five feet seaward of the target row. These wood piles were driven as a temporary construction measure to carry the 12 x 12-in. timber falsework described in the next step.

DRIVING STEEL sheet piling for the dockage bulkhead, using a hammer in 75-ft. steel leads, and a follower fabricated by Seabees from materials on job.



The floating piledriver, carrying a pile hammer in a set of 75-ft. steel leads, was built on the job using equipment and materials previously shipped. Eight lofts are provided in the leads of this floating driver, with 62 ft. of headroom allowed between the pile hammer and the surface of the water.

Power for the main hammer and pile-line hoist, and for the swinging and haul-back lines is furnished by a 70-hp. boiler. Both forward lines are controlled by a 2-drum hoist mounted on the port beam, while a 3-drum hoist mounted on the port beam handles both stern lines and a haul-back line.

(c) A falsework crew of 10 men, using a crane with a 70-ft. boom, worked from the shore side to lay the timber falsework guides on the dock line. The purpose of these guides was to guarantee proper alignment of each pile, and to make the setting of each piece easier.

Stringers of 12 x 12-in. timber were lashed by U-bolts to the wood piles. Timber shores were then laid from shore to these stringers, and fastened together. Surveyors struck a line by instrument on each timber shore, marking it with lumber crayon. Timbers of similar size were then laid along this horizontal alignment and fastened, to form the channel guide.

Setting the piling

(d) A crane with a 100-ft. boom and 10-ft. jib extension next moves in to set 60-ft. MZ sections. There have been a few changes made on this machine to suit local problems that are a departure from normal practice.

In order to allow the machine to boom down and up in a hurry, the boom line was re-rigged and led in on the drag drum, making a "live" boom out of the worm-driven framework. This immediately resulted in increased efficiency and a lowering of the time necessary to boom down, pick up a pile out of a barge, and boom back up to setting position, from 5 minutes to 10 seconds. But certain other disadvantages also had to be overcome.

First, there was a danger of new operators coming on this machine, being unfamiliar with the boom rigging, and accidentally dropping the boom by releasing the drag drum brake. The action of this brake was reversed by disengaging the spring, welding a clamp on the bottom part of the brake quadrant, and hooking the spring up again to the end

of the clamp. The boom is therefore lowered by pressing down on the brake pedal, and the spring automatically holds the drum brake in the locked position at all times except when the operator deliberately presses his foot down on the pedal.

Secondly, there was a safety element as well as lost time to consider in the case of wire rope on this machine. The boom line passed through a small 12-in. diameter sheave, and under ordinary conditions, when the boom was worm-driven, the speed through this sheave was slow. When the boom was changed, the speed of the wire rope line was accelerated so much that the cable paid out at speeds up to 800 ft. per min.

A ¾-in. diameter preformed boom rope, 6 x 37 construction, regular lay, with a hemp center, was installed here, and the old one removed. Preformed rope is made by a process which relieves all the inner stresses of the wires so well that they do not fight each other. A preformed rope passes across a sheave without squirming, and because its wires stand such flexing individually, the rope lasts longer. This long life was so pronounced here that 3,250 piles were set on one preformed boom line, reaching down to pick up almost every piece.

A special load line was also installed. The Seabees used a preformed 18 x 7 non-rotating rope. A non-rotating rope is made up of six inner strands laid in one direction to form a core, while the twelve outer strands are laid in the opposite direction. The finished rope lifts an unguided load, such as the piles on this job, without any tendency toward unspinning, untwisting the rope lay, and otherwise damaging the rope. Before each rope was installed, the Seabees mounted the cable spools on carriers and dragged the rope off with a tractor. A swaged fitting was used on the non-rotating rope.

Also, in order to keep the crane level, Seabees lashed a spare pile hammer to the back end of the crane cab. This increased the stability, and helped to offset the weight of the heavily braced long boom.

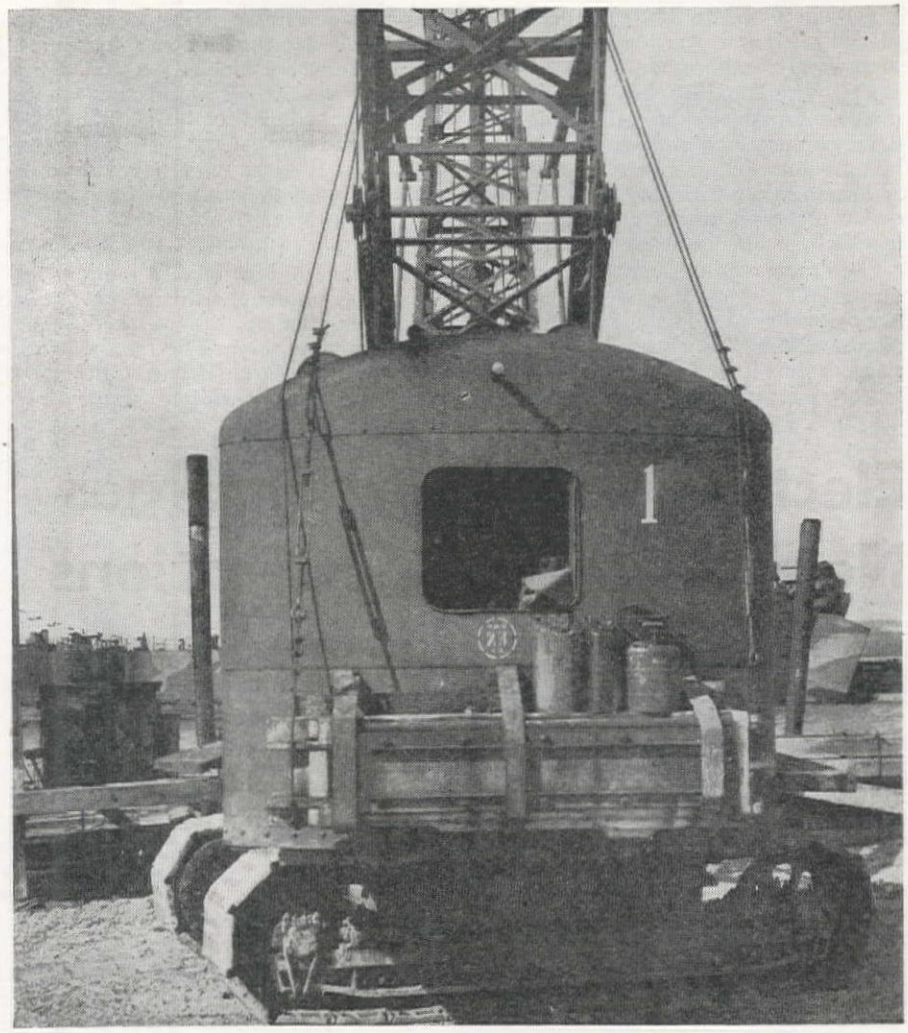
The machine worked two 9-hour shifts daily and set a job record of 125 lin. ft. of wall in one shift under favorable conditions. Average rate of progress was 70 ft. per shift, with a dropoff in performance noted whenever the wind was exceptionally high.

The finest kind of coordination between the crane operator and the Seabee on top of the pile wall was necessary in order to effect the interlocking of each pile. When the first stretch was finished this had been accomplished without any serious accidents, although men were knocked off the top of the wall and jumped into the water several times.

A bulldozer was used through the rough places on land to smooth out a road for the crane.

Driving the piling

(e) A crane equipped with a 70-ft. boom and mounted on a pontoon barge, handled the pile hammer which followed setting operations as closely as possible.



TO INCREASE the stability of the working cranes and keep them level, spare pile hammers and barrels of concrete were lashed to the back end of the crane cabs, as counterweights to help offset the weight of the heavily braced extra-length boom.

Steam was furnished by a 60-h.p. oil-fired boiler, also mounted on the barge.

A standard anvil block was used on the base of the hammer, but all types of guides crystallized and failed until the Seabees hit on the idea of making a slotted guide and holding it on the hammer by friction only. The guide was made from 1½-in. steel plate stock, slotted, and drilled. Three special 1½-in. round bolts held these plates flush against the sides of the hammer, but no tack welding was done.

The pile hammer was operated at its rated capacity of 120 blows per minute, and driving conditions varied from refusal to tricky holes where the piles dropped almost down to grade. One such hole, 300 ft. across, had to be dredged, filled in with harder coral, and 30-ft. MZ sections were scab welded to every third pile in crossing it. The scabs were 24 in. long, and were fillet welded on all edges.

Generally, the sheeting went down at the rate of 5 blows per in. when the top grade of plus 8, referred to mean low tide, was reached. An important factor in driving such tightly interlocked piles was whether or not they were set plumb both ways, but the boys on the lead rig took care of that part of it by checking each piece with a carpenter's level.

(f) An anchor wall of short piles was driven by a crane and a drop hammer 50 ft. behind the main bulkhead line, and parallel to that axis.

(g) The space between the bulkhead and anchor wall was excavated by a dragline or tractor-drawn scraper to low tide elevation, so brace rods could be placed. Earth from this operation was dumped adjacent and landward of the anchor row, to be used in backfilling.

(h) Double 12-in. channel irons were hung at Elevation O on the inside of the bulkhead wall. This work could be done only at low tide, and had to be rushed. This metal waling placed on the inside of the wall is an unusual design, in that it is ordinarily placed on the seaward side, according to Warrant Officer Frank H. Hunt, supervising the job in the field.

(i) Fifty-foot tie rods, 2⅝ and 3 in. in diameter, are fastened between the channels and the anchor row, and are tightened by turnbuckles in the center of each rod. This work must also be done at low tide while the site is exposed. Maximum tidal fluctuation at Guam is 4 ft.

The rods are spaced on 9-ft. centers. They are sometimes handled by a crane when one is available; otherwise a gang of Seabees manhandle them through the mud.

(j) The first 12 x 12-in. timber is then placed on the seaward side of the completed wall, and bolted.

(k) The floating piledriver which drove the first wooden guide piles then drives creosoted wood fender piles to a penetration of 25 ft. along the bulkhead. A bracing crew working with this piledriver on this phase of the work cut and fitted chalk blocks between each pile.

(l) Tractor-drawn carryalls and bulldozers fill the area between pile walls back up to grade. The coral is not compacted other than through normal settlement, but it is a peculiarly well fitted material for this use and never settles very much after being brought up to grade. When the fill nears the top of the wall, concrete blocks 4 x 7 x 5 ft. are poured over wood foundation piles, and the anchor bolts for bitts and cavels are set in the blocks. The bitts are generally set after the last grading has been done, and that finishes the bulkhead so it can be turned over to shipping.

The work the Seabees have done here has been of inestimable importance in the development of this port. When difficulties piled up, they worked doggedly to overcome them. The rate of progress compares favorably with contemporary construction anywhere.

Electric Manufacturer Urges New Electrode Specifications

Lack of definite standards and the existence of irrelevant tests for the performance of electrodes constitute a handicap for the welding industry, according to Lincoln

Editor,
Western Construction News.

Dear Sir:

Industry in general, and the welding industry in particular, is, and has been, greatly handicapped by the lack of a real technical standard covering electrodes.

True, it is, there has been in existence for some years a so-called standard which actually might be termed a "buyers' guide." This is known as "Tentative Specifications for Iron and Steel Arc Welding Electrodes," published by the American Welding Society.

However, even in this long and complicated "buyers' guide," there are so many discrepancies with ambiguous and contradictory statements that it is rendered entirely unsatisfactory. Let me cite a few examples:

To qualify any electrode for any classification, the tests are so complicated and so costly as to render them useless in manufacturing practice. They are too costly to be repeated periodically as a check on manufacturing standards.

Tests are required on all sizes of 5/32 in. and above, but note—no tests are required on 1/8 in. and smaller, so why have tests on each larger size?

A manufacturer cannot use the same electrode for two or more classifications; this in spite of the fact that the ideal electrode, of course, is one which would fulfill all classifications.

Then there are specifications as to the electrical resistance of the coating, which certainly has nothing to do with the performance of the electrode.

Also, it says: "The coating shall not have scabs, blisters, abnormal pockmarks, bruises, or other surface defects that shall be injurious."

Just what is injurious?

These are only a few of the idiosyncracies of this "buyers' guide." Therefore, it can readily be seen that what is needed is a simple, easily understandable standard which would enable a manufacturer to manufacture to such standards consistently and would enable the purchaser to readily and easily test the electrodes, if he wished to do so, to see if the manufacturer was conforming to the standards.

Since there is no need for a weld stronger or better than the material to be welded, I suggest for mild steel, which covers 90 per cent of the requirements, a simple standard, something as follows:

The electrode shall be of such characteristics that it will withstand the following tests to be made any time a buyer might desire:

(a) A weld made in 3/8- or 1/2-in. plate of mild steel, planed to the same thickness as the parent metal, must break outside of the weld when pulled in a standard tension machine.

(b) On a section from the same plate mentioned in (a), welds to be bent in any way desired and elongation of 25 per cent in the outside fibers must show no fracture.

It is quite evident that an electrode which will perform as indicated in these two tests will give a weld equal in physical qualities to the plate.

With such a weld, obviously, the matter of porosity is of no consequence. However, if it should be desired to cover the question of porosity, a simple test could be made as follows:

A fracture shall be made through the weld. On a straight line through the fractured weld there shall be voids of no more than 5 per cent cumulatively.

There is no question but that an electrode which will withstand the above very simple tests will be satisfactory in welding mild steel, so why complicate matters?

It sems to me that this is a question to which the Filler Metal Committee of the American Welding Society, 33 West 39th Street, New York City, should give proper attention.

Very truly yours,
The Lincoln Electric Company
J. F. Lincoln, President.

Generators at Grand Coulee Produce 15 Billion Kwh. of Power Since 1941

FIFTEEN BILLION kilowatt-hours of electricity, valued at more than $37,000,000, has been produced by Grand Coulee Dam since it first began serving the Pacific Northwest in March, 1941, Regional Director Frank A. Banks of the Bureau of Reclamation said in reporting on the 1945 fiscal year accomplishments of the world's second largest power plant.

Operating six of the mightiest hydrogenerators ever constructed and using two smaller units on loan from Shasta Dam in California, Grand Coulee Dam sent more than 5,650,000,000 kw.-hr. of electricity, valued at $14,150,000, to lines of the Bonneville Power Administration during the past twelve months to approach the previous fiscal year's record output of approximately 5,750,000,000 kw.-hr. Grand Coulee Dam provides more than two-thirds of the power carried on Bonneville's distribution system. The value of Grand Coulee power is figured on an approximate market value of 2.5 mills per kw.-hr.

As an example of the huge amount of energy created by Grand Coulee Dam, Banks pointed out that production consistently exceeds the output of all combined power plants—public and private—in Oregon, Idaho and Utah and that in one average year the Grand Coulee plant turns out more electricty than was produced at all generating plants on the Pacific Coast in 1922.

Under the impetus of war, Grand Coulee Dam power installations frequently operate 10 to 15 per cent above capacity. The plant's rating of 818,000 kw. is less than half its ultimate capacity of 1,974,000 kw.

Regularly receiving huge blocks of electrical energy from the massive powerhouse on the Upper Columbia River are 14 military centers, five alumina reduction plants and a dozen other plants producing sheet aluminum, ferro-silicon, magnesium, calcium carbide, ferro alloys, chlorates and manganese. Two shipbuilding yards are served regularly by the system.

Because of the availability of immense quantities of low-cost electricity, 15 electro-process and related plants have been established in the Pacific Northwest since 1940. These facilities, representing an investment of approximately $160,000,000, have contracted for nearly 800,000 kw. of firm power from the Grand Coulee Dam-Bonneville Dam installations.

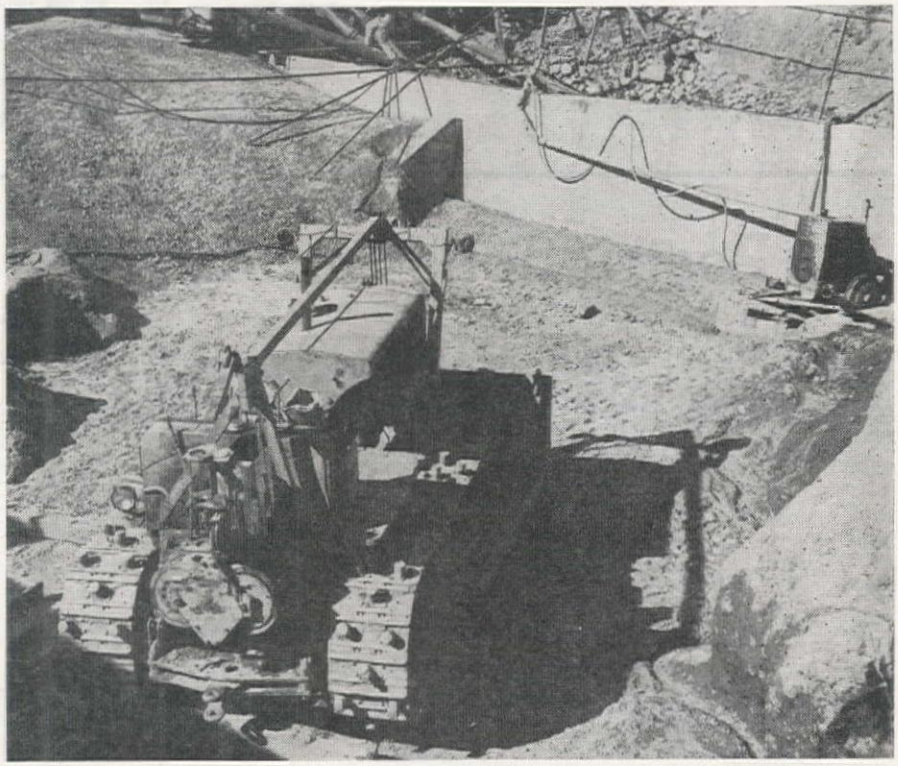
HOW IT WAS DONE

JOB AND SHOP TIPS FROM THE FIELD EDITOR'S NOTEBOOK

Tractor With Feet Tamps Tight Spots

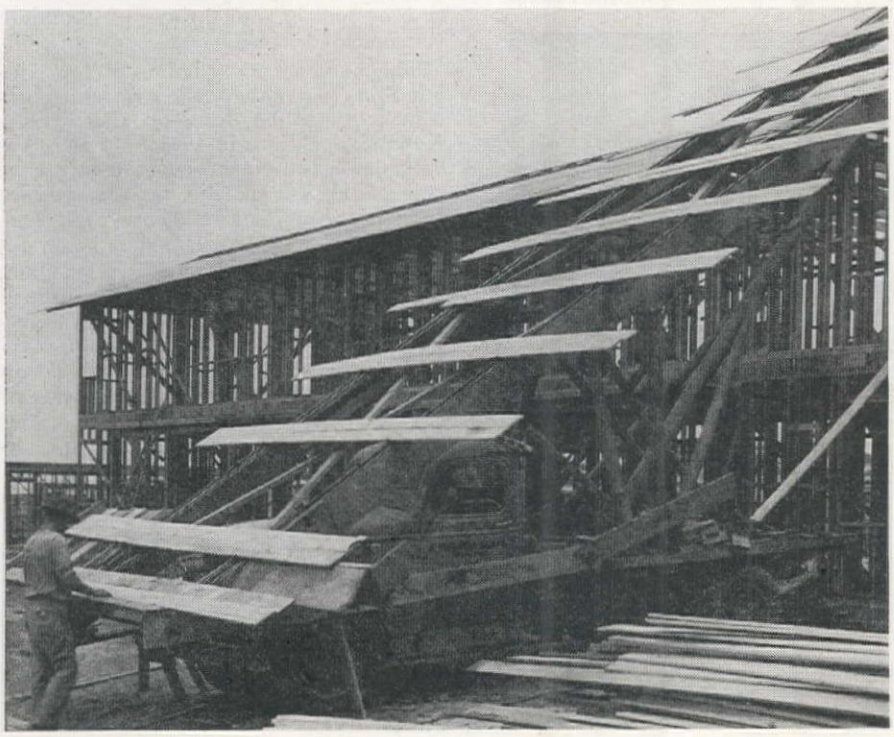
DURING CONSTRUCTION of the cutoff walls in the river bed at Horseshoe dam on the Verde river in Arizona, described on page 92 of this issue, it was desired to tamp the lowest layers of earth fill very thoroughly, so as to secure maximum bond with the exposed rock surface. Since the gorge was very narrow, it was not practical to use a standard sheepsfoot roller with its large turning radius. Accordingly, L. E. Dixon Co. and Arundel Corp., contractors, developed a tamper by welding short pieces of 3-in. cold rolled steel to the treads of a crawler tractor, which was able to reach all but the most remote corners and to within a few inches of all walls. These remaining points of inaccessibility were tamped using pneumatic hand tampers.

A considerable amount of this foundation tamping was required because it was necessary to construct three cutoff walls, two being seepage bulkheads. The bedrock is a massive tuff, much eroded by the water of the stream. The cutoff walls were imbedded into this material about 10 ft.



TAMPING LUGS cut from 3-in. cold rolled steel were welded onto the treads of a tractor for tamping closely confined areas of earth fill in the foundation of Horseshoe dam in Central Arizona. L. E. Dixon Co. and Arundel Corp. have the contract.

ROOF PLACING MACHINE developed by A. Farnell Blair during construction of the Voltaire housing project at San Diego, Calif. The device cuts sheathing to proper length and raises it to roof in one operation. Saw is on right side of the conveyor.



Sheathing Cut and Raised by Machine

TO OVERCOME the manpower shortage in the San Diego, Calif., area, key men of the construction firm of A. Farnell Blair, with T. C. Brittain, superintendent, improvised the lumber conveyor shown at the left for use on the Voltaire housing project near San Diego, on which the firm held the contract. The conveyor was actually built by M. M. Patillo, one of the three Patillo brothers, all of whom were foremen.

The conveyor passes the roof sheathing material through the saw, shown at the right in the photograph (with guard removed for convenience in photographing) and cuts to even foot lengths, indicated on the measuring board on the opposite side of the device. The machine is reported to cut and place on the roof 5,000 board feet of lumber per hour when operating at full capacity with motor idling.

The Blair firm was originally from Decatur, Ga., but during the war has performed numerous large building contracts in the West, establishing offices at both Los Angeles and San Francisco.

NEWS OF WESTERN CONSTRUCTION

SEPTEMBER, 1945

All Restrictions on Plywood Orders Are Stopped by WPB

WAR PRODUCTION BOARD advises that all limitations on plywood orders are being abandoned. Any future government orders are to be handled under the general priority system, PR.29. The balance of plywood production is moving immediately into peacetime channels.

Under the limitation order, approximately 35 per cent of all government orders were allocated to 325 distributing warehouses which had been selected by the War Production Board. This 35 per cent, which formerly could be released only for direct war uses, can now be transferred to the stocks of retailers.

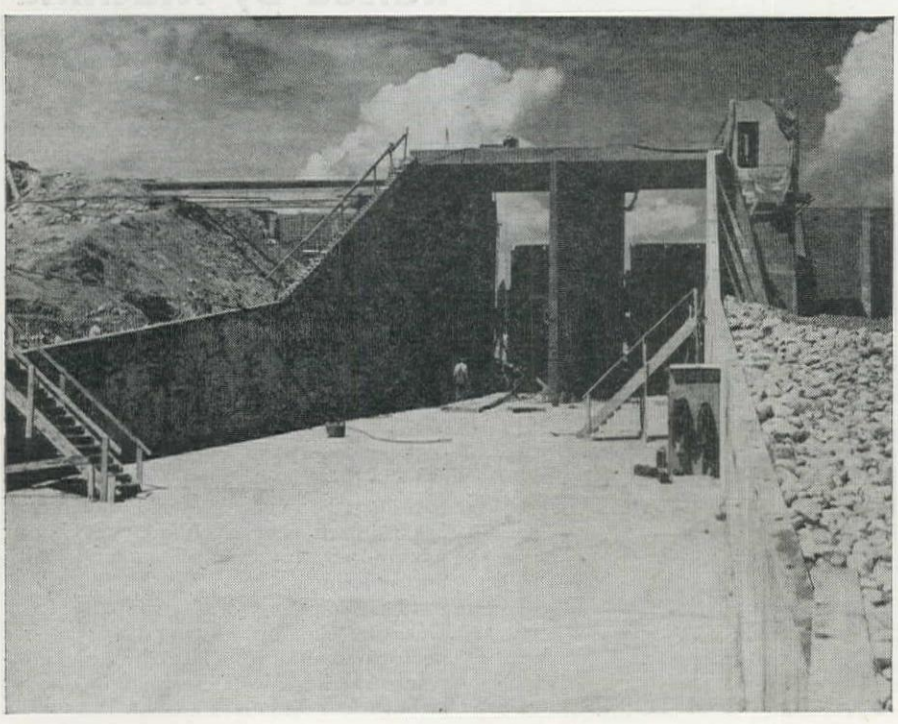
Jobbers who are not already qualified under the present WPB allocation order may place their orders with plywood mills. The orders will then be taken care of in the order of their acceptance. Distributing warehouses at present have an estimated inventory of thirty million square feet of plywood. Inventories in all jobbers' warehouses, when back to a normal level, will be two hundred million square feet.

Since plywood has been virtually eliminated from dealers' inventories, jobbers' stocks should move to dealers in a steady flow until all dealers have some inventory available. It would appear that it will be some time before dealers' stocks reach the normal prewar levels, although with the expanded capacity of the plywood industry, this may not take as long as originally predicted.

Survey figures show that dealers anticipate carrying postwar inventories of plywood that will average at least 100 per cent higher than those of prewar stock requirements. The immediate placement of orders by dealers and jobbers is urged by the plywood industry, since cancellation of lumber contracts releases that supply of shop lumber for non-governmental distribution.

SPILLWAY GATES INSTALLED AT SHADOW MOUNTAIN DAM

RADIAL, FLOAT-CONTROLLED gates weighing 21,650 lb. each have been installed at Shadow Mountain Dam, a unit of the Colorado-Big Thompson transmountain water diversion project of the Bureau of Reclamation now being constructed by J. F. Shea Co. of Los Angeles, Calif. The gates are 18 ft. wide and 20 ft. high and will remain open during the remainder of construction for the diversion of river water. A roadway will surmount both the spillway gate opening and the earth-filled dam.



First Contract on Friant-Kern Canal

PETER KIEWIT SONS' COMPANY of San Francisco and Omaha, Neb., has been awarded a contract for the construction of the first 5.6-mi. section of the 160-mi. Friant-Kern Canal of the Central Valley Project. The contract price of $1,163,340 was the low figure among the 11 bids submitted. The contractor will have 600 days to complete the specified work.

The contract awarded to Peter Kiewit Sons' Co. covers the first construction work to be done on the Friant-Kern Canal. Late in 1941 bids were received for the start of construction of this canal, but all bid proposals were rejected after Pearl Harbor.

The Friant-Kern Canal, to extend 160 mi. southward from Friant Dam, will serve as one of the main southern arteries of the entire Central Valley Project water distribution system, serving new and supplemental irrigation water to lands on the upper east side of the San Joaquin Valley in Fresno, Tulare, Kern and Kings counties of California. A full irrigation supply for nearly 1,500,000 ac. of land is dependent on the construction of this canal.

After nearly two years of continuous effort on the part of the Bureau of Reclamation, State officials and other agencies to get work started on this huge waterway, a War Production Board order issued on June 7 permitted construction of the canal to proceed without priority assistance. In less than two

months after WPB action the Bureau of Reclamation issued specifications, advertised for bids, and let a contract.

The Friant-Kern Canal, which will be the longest and third largest canal in California, is exceeded in capacity only by the Delta-Mendota Canal, another Central Valley Project feature, and by the All-American Canal in the southern part of the state. Its capacity of 4,000 cu. ft. per sec. at the northern end will diminish as it flows southward toward its terminus near Bakersfield. It will carry a stream of water with a maximum depth of more than 15 ft. and a maximum water surface width of more than 100 ft.

The Friant-Kern Canal will cost approximately $23,500,000 at 1940 prices. The construction will involve heavy excavation work and numerous bridges, siphons, culverts, and other works. About 40 per cent of the canal will be concrete lined. The Bureau estimates that about 3 years will be needed to complete the project from the time of ground breaking. At peak of the work approximately 2,500 men will be employed.

Negotiations for the sale of water from the Friant-Kern Canal are in progress between the Reclamation Bureau and 15 irrigation districts and water users' groups, and with one municipality for a domestic water supply.

War Prisoners Dismantle Costly Alaska Facility

BECAUSE OF A SHORTAGE of experienced salvage labor and the critical need for lumber in the Pacific Theater of Operations, 700 German prisoners of war have been sent to Excursion Inlet, Alaska, to salvage facilities there to be sent to the Pacific.

All of the German prisoners are highly experienced men, who have performed salvage operations at Camp Hale, Colo. Decision was made to send prisoners instead of employing local labor because immediate civilian labor was not available and because most of the 14,300,000 sq. ft. of lumber expected to be recovered are critically needed in the Pacific.

Ten American officers and 70 enlisted men accompanied the prisoners to supervise the job. It is expected that the work will be completed by mid-December when, with the exception of a few prisoners who will remain until approximately mid-January as a clean-up detachment, the group will be returned to the Ninth Service Command.

The Excursion Inlet facility, recently declared surplus, consists of a barge trans-shipment terminal and related installations. The original construction cost about $18,000,000.

Before the decision was made to send the German prisoners to Alaska, a survey of labor sources was made in the Alaskan area. This survey revealed a labor shortage and the same result was obtained from an investigation conducted in the Pacific Coast area, from which it was thought civilian labor could be sent if it were available.

NEW 100-TON PNEUMATIC TIRED ROLLER USED BY GUERIN BROS.

HUGE ROLLER used by the contractor to compact runway fill on the Santa Monica, Calif. airport is examined by a party of Civil Aeronautics Administration engineers. Left to right, W. McKINLEY HOWARD, assistant district airport engineer, R. W. F. "BOB" SCHMIDT, superintendent of airports, T. P. WRIGHT, administrator (Washington, D. C.), H. A. HOOK, regional administrator, A. S. KOCH, assistant administrator (Washington, D. C.), S. S. BOGGS, senior airport engineer, and C. B. WORTHLEY, lighting engineer.

First Step of Portland's $12,000,000 Sewer Plan Ready for Construction

PORTLAND, OREGON'S $12,000,000 sewer system project is comprised of nine sections, the construction schedule for which has already been tentatively mapped out.

One of two branch interceptor sewer lines, the first $750,000 phase of the system, could be started within 60 days if the city officials so desired, it was stated by Civil Engineer John W. Cunningham who, with Ray E. Koon, of Stevens & Koon and Ben Morrow, city engineer, makes up the engineering board in charge of the multi-million dollar program.

It is anticipated that Public Works Commissioner William A. Bowes and various members of the City Council will delay construction until war veterans from the Portland area return and can participate actively in, and derive great benefit from, the $12,000,000 expenditure. However, the following schedule for construction is likely to be effective:

1. Columbia Slough branch interceptor sewer, $750,000.

2. Outfall sewer extending from Columbia Slough to the Columbia River.

3. Second branch interceptor line from the vicinity of the St. Johns end of the suspension bridge looping around the area of dock terminal No. 4 until the line comes back southeastward to the S. P. & S. bridge.

4. Main interceptor or turn sewer south from the planned disposal plant immediately east of S. P. & S. bridge, across Sullivan Gulch to pumping station at Glisan and E. Third Ave., then parallel to Grand Ave. to a point near S. E. McLoughlin and Tenino.

5. Primary treatment sewage disposal plant and first large pumping plant directly south of Columbia Slough between the Union Pacific and S. P. & S. railroads, at approximately $2,000,000.

6. Second large pumping plant, west of the Willamette river at about Ankeny St. and waterfront.

7. Pipeline under Willamette river to the large east side pumping plant at Glisan and Third.

8. East side laterals.

9. West side laterals.

Ten or eleven small pumping plants will be required in addition to the three large ones. The system will also require about 20 mi. of concrete pipe, ranging in dimension from 8 to 60 in.

Missouri Basin Agency Opposes Authority Plan

THE MISSOURI RIVER States Committee, at a meeting in Omaha, Neb., on August 15, passed several resolutions relative to the development of the Missouri river. After approving the progress made by the Army Engineers and Bureau of Reclamation on design of dams and other structures included in the unified development program worked out by the two agencies in 1944, and the activities of the Valley Inter-Agency Committee, the committee recommended: (1) that appropriations for construc-

tion of projects already authorized be now made so that work may proceed as a contribution to postwar employment and the securing of the permanent benefits by the area affected; (2) continued adjustment of all detailed specifications of individual projects so that each project may make the greatest possible contribution to the basin-wide development; (3) that continued efforts be made through existing agencies for land and water use policies most advantageous to the affected regions, since different sections of the valley are in need of differing benefits such as irrigation, drainage, flood control, power, industrial use, etc.; (4) that during planning, construction and operation of all these facilities, Congress respect the rights of the states, their economic interests and the general welfare of the people, feeling that the best interests of all the people will be best advanced by support of the coordinated plan of the Bureau and Engineer Corps.; (5) continued opposition to the delegation of authority over natural resources to any valley authority, and endorsement of the adverse report of the Senate Commerce Committee on the Authority proposal.

Public Works Planning Funds Allotted to West

ALLOTMENTS have been made by the Federal Works Agency from Federal funds for the advance preparation of plans to the following Western cities:

Alameda, Calif., an $11,000 advance for planning $300,000 worth of improvements to its sewage and sanitation system, as a part of the East Bay sewage disposal plan; Oxnard, Calif., $4,500 for planning a storm drain estimated to cost $94,120, and a further allotment of $2,820 to plan a sanitary sewage project estimated to cost $77,761; San Diego, Calif., four advances aggregating $9,750 to the Unified School District to prepare plans for school facilties valued at $229,610.

Denver, Colo., has been granted two allotments totaling $11,500 to prepare plans for the Vasquez-St. Louis and Ranch Creek water collection conduits. The construction cost of these water facilities is estimated at $2,825,000.

St. Francis, Kan., receives an advance of $4,380 to plan hospital facilities at the Cheyenne County Hospital, valued at $149,000.

School District No. 2 at Billings, Mont., was allotted $21,384 to blueprint a four-unit school project at Billings estimated to cost $719,650; School District No. 1 at Glasgow, Mont., received $3,600 for two new buildings at the Glasgow High School, estimated to cost $96,260.

Two allotments to the McCook, Neb., School District are $665 to prepare plans for a $20,200 field house, and $19,250 to plan educational building facilities valued at $586,000.

The Board of Education of Bismarck, N. Dak., has received an advance of $12,800 for the planning of school facilities estimated to cost $344,800.

The town of Lawton, Okla., received $21,980 for preparation of plans for an auditorium and city hall, estimated to cost $682,470.

Allotments in Texas include two to the City of Fort Worth for the planning of fire stations, one of $1,200 being applicable to a $40,000 fire station and another of $1,350 is applicable to a $45,000 fire station. The same city has been allotted $450 for preparation of plans for a municipal swimming pool; Robstown received $2,000 for the planning of sewerage facilities estimated to cost $54,000; Sweetwater, $3,500 for planning street facilities which will cost $184,700; Weatherford, three allotments as follows: $1,460 for a sewage treatment plant which will cost $32,500; $2,133 for storm sewers which will cost $47,500; and $1,823 for a swimmng pool estimated to cost $41,000. The County of Andrews was allotted $2,955 to plan water facilities which are expected to cost $140,000.

Canadian Fish Project Completion Is Delayed

COMBINATION OF labor shortage and delays in securing delivery of essential materials has prevented the completion of the fish ladders on the west bank of Hell's Gate, on the Fraser River in British Columbia, in time for this season's run. The ladder on the east bank, however, has been finished by the Coast Construction Company Ltd. of Vancouver, which was awarded the contract for this work. The fish ladder construction is being carried out under the supervision of B. M. Brennan, chief supervisor for the International Pacific Salmon Fisheries Commission.

The project at Hell's Gate is the first of several which have been mapped out by engineers of the commission in an attempt to bring the Fraser River back to normal in commercial fishing.

The 1945 salmon season is considered an off-year as far as cycles are concerned. The big run should come in 1946 if there was sufficient escapement in 1942, the year when the canneries were hard pressed to handle the catches at the various plants on account of a shortage of labor and an unusually late run. Officials of the international commission will be stationed at Hell's Gate to compile daily reports of the number of fish that pass through the special ladders.

NEW BOOKS...

PUMP ENGINEERING DATA—Compiled by the Economy Pumps, Inc., Hamilton, Ohio; 416 pages 6x9 in. Price $2.00; free to engineers upon request presented on business letterheads.

A useful handbook on hydraulics and pumps which will be helpful to the engineer or designer in selecting pumps for any type of project. Special data have been compiled and presented in handy form for pump users in water works, sewage disposal plants, yachts and ships, oil refineries, fire protection, mines and quarries, power plants, greenhouses, food industries and meat packing, sugar refineries and chemical plants.

* * *

PIPING HANDBOOK by Sabin Crocker, published by the McGraw-Hill Book Co., New York, N. Y. 1376 pages, 4½x7 in. Price, bound in flexible cover, $7.00.

An up-to-date volume with improved tables and charts designed to facilitate the layout of water systems, heating plants, and steam plants by the designing engineer. A well-arranged section on hydraulics with a comprehensive treatment of the Scobey, Williams-Hazen and Kutter-Manning formulas will provide authoritative and accessible data for the engineer interested in piping design. The fourth edition has been extended to include separate chapters on "Gas Piping," "Refrigeration Piping," "Hydraulic Power Transmission Piping" and "Corrosion," which treats the subjects of protective coatings.

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BUILDING TRADES BLUEPRINT READING — PART I, FUNDAMENTALS; PART II, SPECIFICATIONS & EXAMINATIONS, by J. Ralph Dalzell. Published by American Technical Society, Chicago 37, Ill. 234 pages, 8x11 in. Price, $2.00 for each volume.

Volume One, a how-to-do-it text, explains the fundamentals of blueprint reading, which develops the reader's ability to visualize without the necessity of having a mechanical drawing background. It is designed to be of benefit to students or apprentice mechanics, draftsmen, and designers.

Volume Two includes 9 sets of complete blueprints and specifications for residences, apartment house, and a commercial building. Gives direction for an examination on masonry, carpentry, plumbing, lathing, heating, linoleum, and sheet metal work.

* * *

BUILDING INSULATION by Paul D. Close. Published by American Technical Society, Drexel Avenue at 58th Street, Chicago 37, Ill. 328 pages, 6x9 in. Price $3.50 in washable cloth binding.

A practical volume useful in schools and to building supply dealers, insulation salesmen and individuals building homes. Contents: Thermal building insulations, methods of application, fundamentals of heat transfer through building materials, transmission coefficients and tables for calculating heat losses. The book also covers the economic aspects of insulation with respect to fuel saving, heating plant size, and the use of insulating materials for machinery isolation, architectural acoustics and noise quieting.

WASHINGTON NEWS
. . . for the Construction West

By ARNOLD KRUCKMAN

WASHINGTON, D. C.—The end of the war has brought out what seems to this reporter an inexplicable black underlining of pessimism. This scare psychology, repeated and hammered at the business man from many responsible sources, naturally upsets and bewilders him; but it does not seem to stand up even to superficial analysis, particularly in relation to heavy construction. Assured factual data show that, demonstrably, $27,000,000,000 are waiting to be spent as soon as industry can do the job. Current government appropriations, now available, total $5,000,000,000 for construction work. Commerce Department reports its recent survey reveals that over-all the private industry of the United States is ready to spend $9,000,000,000 on required construction. Moreover, in September or October, Congress will make the appropriations for the postwar programs already authorized for highways, rivers and harbors, flood control, reclamation, power projects, and similar construction, which roughly gross $4,000,000,000. The continuing program to support the military needs, consisting of aircraft, munitions, shipping, and similar supplies, all entailing some construction sequences, is expected to total approximately $12,000,000,000 per year for an indefinite period.

The funds for construction now in the Treasury awaiting Navy spending total $2,128,000,000. Army has to its credit, unspent, $2,237,000,000. Of this sum, the Corps of Engineers may spend $516,000,000 for current rivers and harbors, and flood control improvements. Federal Works Administration has, for various construction projects, a fund of $110,500,000, which includes $43,000,000 for disbursement by the Public Roads Administration. (Bear in mind, however, this appropriation has no connection with the postwar billion for a new Federal highway system.) National Housing Administration has a fund of at least $100,000,000 to spend immediately on a housing program. The Department of Agriculture has $8,728,000 to spend on roads and highways. There is upwards of $50,000,000 in the Interior Department account for construction.

It is impossible, obviously, under present circumstances, to pin down even an approximation of the proportion which will be spent in the West. It is reasonable to assume that the West slope, and the Pacific area, will get more than its ordinary share, because the life of the immediate future, as well as the long-range future, lies in the global region that abuts upon the Pacific.

The foregoing is a rough, and partial, outline of the funds now in hand for spending and how they will be spent and by whom. The $4,000,000,000 for postwar highway projects, for postwar flood control improvement, for postwar rivers and harbors work, and for postwar projects for land and water development, mainly in the West, will not be available until it is actually appropriated by Congress. Swift validation of authorizations by appropriations is one of the tasks for which the Congress was called back in a hurry.

Industrial construction

The $9,000,000,000 construction forecast by the Department of Commerce is projected for the year ending next summer. It covers new plants and equipment for manufacturers; and a construction program planned by railroads and gas and electric utilities. Roughly the prospective expenditures are classified thus: plant, equipment and alterations, $4,500,000,000; increasing inventories of non-military goods, $2,800,000,000; increasing trade receivables, $1,900,000,000; railroads and utilities on expansion of facilities, $1,500,000,000. The gross total of actual direct expenditure on construction is calculated as approximating $7,000,000,000, and upwards of $2,000,000,000 to be spent on construction equipment and supplies. The survey published by the Department of Commerce reports the railroads will spend $785,000,000 upon construction for expansion, not involving expenditures for maintenance and repairs. Over half of the amount will be spent by the western railroads, a total of almost $400,000,000. Approximately $300,000,000 is to be spent on direct construction and the balance on essential equipment and supplies. The utilities plan $700,000,000 worth of improvement, of which sum the electric utilities plan to spend almost $500,000,000.

Industrial construction has a program of $340,000,000 for those who make iron, steel, and similar products; for plants making transportation equipment, $600,000,000; machinery and electrical goods, $450,000,000; textiles, leather, and apparel, $550,000,000; chemicals, petroleum, rubber, and coal, $800,000,000; food, drinks, and tobacco, $665,000,000; printing and publishing, $530,000,000; non-ferrous metals, $130,000,000; glass, stone and clay, $200,000,000; miscellaneous, $75,000,000.

It is interesting to note that the United States Bureau of Labor also has issued a study on postwar construction, and calculates that during the first year after the close of the war, construction will total about $8,000,000,000, increasing to $15,000,000,000 in the fifth postwar year. On the other hand, Rep. William M. Colmer, Chairman of the House Committee on Postwar Policy and Planning, told the Associated General Contractors that during the fifth year after the war, construction should be somewhere in the neighborhood of $21,000,000,000 annually, with $15,000,000,000 to $16,000,000,000 for new construction and major alterations, and the balance for maintenance and current repairs. The United States Bureau of Labor Statistics expects the annual volume of non-farm residential building will total about 900,000 units per year, at a cost of $3,400,000,000 annually, starting immediately after the war with 550,000 units and reaching 1,040,000 units in the fifth postwar year. Colmer estimates the number at 275,000 per year. The United States Bureau of Labor Statistics estimates the annual postwar utility construction program at $1,150,000,000 per year, and that new public work will total annually about one-third of all private projects, or, approximately $15,000,000,000 per year.

LATE WIRE

DEPENDABLE REPORTS indicate that Secretary Ickes gave notice he would fight violently if given the Morgenthau resignation treatment. It is now anticipated he will quit sometime within the year on his own terms and under his own steam. It is also indicated that Abe Fortas, Undersecretary and source of the drive for "power at the expense of other water services," may also resign, in which case Mike Straus will step up to his position. Rumor is also abroad that Reclamation Commissioner Bashore is tiring of the intriguing and unequal fight and may retire, in which case Assistant Commissioner Warne, Straus' brother-in-law, is said to be slated for the post.

WPB is holding up heavy construction in public works programs involving $8,000,000,000 by maintaining restrictions on materials, equipment and machinery affecting all types of proposed undertakings. It has released restrictions on production of four 108,000-hp. generators for Grand Coulee to be placed in the right power house. Present borrowed generator equipment from Shasta will be restored to that project.

As contracts are completed 67,000 Mexican railroad workers in the West will be sent home . . . Federal agencies now temporarily domiciled in the West will not be returned to the Capitol for at least a year because of lack of offices and living room . . . If you place duplicate orders for any item with the idea of accepting only the first delivery WPB can have you jailed and fined . . . National Skyway Freight Corp., with seven transport planes having 70,000 lb. freight capacity daily, is starting 24-hour nonstop operations between Los Angeles and New York . . . Brooklyn Federal Court has ruled that a veteran has absolute precedence for job priority over any non-veteran, no matter what the non-veteran's background.

Other prospects

To facilitate public works, FWA has organized a Public Works Construction Advisory Committee, composed of representatives of 11 organizations interested in planning, design, construction, or operation of public works. The United States Conference of Mayors, and the Building and Construction Trades Department of the American Federation of Labor have been invited to sit in on the conferences.

The Philippines expect to spend $165,000,000 to reestablish electrical communications, roads, bridges, irrigation systems, and other public works, destroyed during the war. It will require four years to reestablish the communications systems.

In June, Canada had immediately ahead a construction program which totaled $59,000,000. To speed construction the Canadian Government has removed sales and excise tax on building materials, and made special provisions for swift discharge from the armed services of building trades workers.

It should interest the heavy industry community of the West to know that in Washington the most long-headed observers of postwar trends hold the opinion that the people of the United States have the ready as well as eager capacity to absorb all commodities the consumer-goods plants and facilities now existing in America may be able to produce; but that our surplus will come from capital-goods production facilities. It has been estimated by those who are seasoned and competent that our capital-goods production is approximately 500 per cent greater than our capacity to absorb. Obviously, a large part of this surplus capacity stems from the war.

Foreign possibilities

It is this surplus which makes necessary, according to this school of economic thinkers, swift development of an intelligent plan and program for foreign trade. In addition, they think this foreign trade must be bastioned mainly in Asia, somewhat also in Latin America. They see small hopes in Europe. The historic old continent across the Atlantic, from which our civilization sprang, is regarded as capable of taking little more than the Russians and the British may be able to supply. On the other hand, Asia is considered to need practically all the capital goods we can supply. China inevitably will build a number of Boulder Dams and Grand Coulee projects. She is considered to be bound to establish a chain of great power projects; to construct railroads, great highways, rebuild cities in a modern fashion, establish great plants to fabricate the materials which modern machinery will bring from her vast expanse of farms, forests, mines, streams, and other resources.

Russia may be capable of supplying the budding Asiatic market for modern consumer goods; but it is not thought she can compete with us in supplying the capital goods which we can provide from our great surplus.

In the not remote future it will become popular politics in Washington to urge industry, particularly the heavy industries, to focus attention upon the rebuilding, and the upbuilding, of Asia. And in the normal logic of events it seems probable that the political leaders of the West slope will take a lead in this trend. The Pacific littoral, with its population of four-fifths of the humanity of the globe, is the front yard of the Pacific slope of the United States. You get some idea of the significance of this postwar prospect when you realize that China has 600,000,000, India 400,000,000, and the rest of Asia, including Asiatic Russia, another 400,000,000 people. That makes a total of 1,400,000,000 human beings on the continent alone.

Legislative future

In 1939 our national production overall totaled $88,600,000,000. With June 30, 1945, the annual production for the fiscal year ending on that date was $200,000,000,000. The immediate object of the government undoubtedly will be to use the increased manpower, the expanded facilities, and the great technological advances, to establish an annual production of not less than $160,000,000,000.

When Congress begins to roll there is every probability that the Full Employment Bill will be enacted. This is the legislation which enables the government to borrow from the banks private funds to use to take up any slack in employment that may be left by private industry. Veterans' unemployed pay, on the basis of 52 weeks, is expected to be increased from $20 to $25 a week. Unemployment insurance will undoubtedly be liberalized and underwritten during the next 18 months by the Federal Government. War workers, returning to their homes, will in all likelihood get travel pay. Minimum-wage rate will be hoisted from 40c an hour to 50c, and quite possibly 60c.

Irrigation projects

The plans to irrigate the 2,500,000 ac. of the Columbia Basin have been altered by the Bureau of Reclamation. The dams planned at each end of the Grand Coulee are now to be replaced by smaller dams, and four additional dams, two farther down in the irrigated area, a third south of the proposed South Coulee Dam, to be known as Long Lake Dam, and a fourth at Crab Creek to be known as Pothole Dam. The new program calls for four tunnels, over-all 25,150 ft. long, 488 mi. of canals, and 66 siphons. Power to pump water to acreage beyond gravity flow is to be generated where the canals drop. Water is expected to be delivered to 1,029,000 ac. It is expected the new program will cost $280,000,000, and that $200,000,000 will be spent by 1955. Power is to absorb $200 of the cost of water service, leaving $85 per acre against the land.

A few days before the Senate went on its summer vacation, its Committee on Irrigation and Reclamation reported in favor of the Marble Gorge route to enable Arizona to make use of its share of Colorado River water. Diversion is planned at a high dam in Marble Gorge near Utah, and via a tunnel with 3,000 cfs. capacity the water would be carried 139 mi. to a high point of the Verde River valley. By passing through a sequence of power plants the water would be delivered for irrigation in the Phoenix area. It would cost $487,000,000 to build. The study was made by E. B. Debler, former director of project planning for the Bureau of Reclamation. It was chosen for its advantages, freedom from possible earthquakes, economy in water loss, and economy of operation. The alternate proposal of Bridge Canyon, which would cost $325,000,000, or the Parker pumping project, cost $134,000,000, were turned down for various reasons.

Buildings and highways

Eugene Meyer, publisher of the Washington Post, and arch foe of Jesse Jones, has taken up the cudgels for a naval academy and a military academy on the West Coast, preferably in California, around the Bay region. Sen. Sheridan Downey has introduced a bill which might lead to consideration of the plan. Powerful opposition already has arisen both in the Navy and the Army, as well as in various Eastern centers. It is the intention of the Eastern interests to secure the expanded naval academy facilities for Annapolis, and in doing so to wipe out of existence St. John's College, one of the oldest and most historic institutions in America. Really concerted effort, thoroughly organized, and led by responsible elements of the whole West, might at this time get either both or one academy for the West Coast.

Public Roads Administration has announced a new method of conducting traffic origin and destination studies in cities. The new method is based upon home interviews in which occupants of every tenth house or apartment are questioned in regard to all travel done on the preceding week day. The technique is similar to the method employed in sampling public opinion. The American Road Builders' Association is authority for the statement that more than $5,000,000 worth of tractors, trucks, and other highway building machinery will go from the United States to Sao Paulo, Brazil, as soon as available. Sao Paulo is building superhighways and other highways and improving highways in a five-year program.

Miscellaneous

The Missouri Valley Authority bill hearings are scheduled to be resumed about Sept. 20. The Inter-Agency Committee in the Missouri Valley, consisting of representatives of the Bureau of Reclamation, the Corps of Engineers, the Department of Agriculture, and the Missouri Valley states, is scheduled to have a meeting at Billings, Mont., on Sept. 20. . . . Floyd O. Hagie, secretary-manager of the National Reclamation Association, and driving force of the Water Conservation Committee which acts for 28 states and 31 national land and water associations in fighting authorities and a variety of other issues,

now has an assistant, a former newspaperman from Denver, John Henry Shaw.

If ODT does not object, the National Reclamation Association will have a much-desired convention in Denver, or some other Western city, either in October or November. The war being over it is the general feeling in Washington that civilian needs should have the right of way over military movements, if there is no special urgency about a military transaction. There are numerous civilian needs that are now far more pressingly urgent than the military requirements.

Reconversion problems of the construction industry in relation to the government are handled by an interagency committee appointed by John W. Snyder, the head of the OWMR. Hugh Potter, Houston, Tex., heads the committee. Its objects are to break bottlenecks, create jobs, expedite activity, survey programs and plans of various government agencies, and coordinate policies and procedures. Agencies represented on the committee are OWMR, OES, WPB, OPA, NHA, WLB, FWA, WMC, Department of Commerce, Department of Labor, SWPC, War, Navy, Interior and Agriculture.

Personals

Dr. William F. Durand, long identified with engineering on the Pacific Coast, especially at Stanford University, was awarded the American Society of Mechanical Engineers Medal, its highest honor, in recognition of his work in hydrodynamics and aerodynamics. Dr. Durand began so early that he is literally one of the pioneers who made the science of aerodynamics. He is now Chairman of the Division of Engineering and Industry of the National Research Council, in the Capital.

The name of another distinguished Californian, Dr. Frederick G. Cottrell, appeared in a suit filed by the Department of Justice charging the companies who use his patents as violators of the Sherman Anti-Trust Act. The civil action was aimed at the International Precipitation Company of Los Angeles, the Western Precipitation Company of Los Angeles, and the Research Corporation of New York.

Congressman Dean M. Gillespie, Colorado, is a member of the House Committee on Appropriations, now in Europe to conduct a survey of the Foreign Service establishment. . . . Robert H. Hinckley, of Utah, Director of the Office of Contract Settlement, was made very conspicuous in the stinging Mead Committee report. The report accused other government agencies of being unready for conversion, and of lacking in leadership; but it singled out Hinckley, the Westerner, as doing an extraordinary job "efficiently, speedily, with a minimum of dislocations." . . . K. M. Robinson, head of Washington Water Power Co., Spokane, is one of the three organizers of the National Association of Electric Light Companies, which has established an office here as contact with government.

Report Finds California Will Need To Build 625,000 New Postwar Houses

THE CONSTRUCTION INDUSTRY in California will have to double its prewar pace in order to fill postwar requirements for homes, because the people of that state will need at least 625,000 new homes in the first five years after the war to meet housing needs.

This is pointed out in a report of the State Reconstruction and Reemployment Commission, based on findings of its northern and southern California Project Committees on Postwar Home Building in California.

In submitting the report to Governor Earl Warren, Colonel Alexander R. Heron, director of the commission, stated that the commission's interest in home building is based on:

1. The fact that home construction is one of the few industries which will not need to re-tool, but will be ready to make immediate contribution to solution of the postwar employment problem.

2. The fact that the quality of California's postwar homes and neighborhoods will be one of the determining factors in the level of living.

In answering the question as to how many homes will be needed in California during the first five postwar years, the report states:

250,000 more to take care of further increase in the number of family households.

75,000 more to replace temporary public war housing to be demolished.

180,000 more if only half of the number of prewar substandard dwellings are replaced.

120,000 more to maintain a 5 per cent vacancy reserve, needed to provide leeway for future population growth.

This total of 625,000 new homes is compared with the 300,000 houses which were constructed in California from 1935 to 1940. The needed homes are roughly divided into 300,000 for Northern and 325,000 for Southern California.

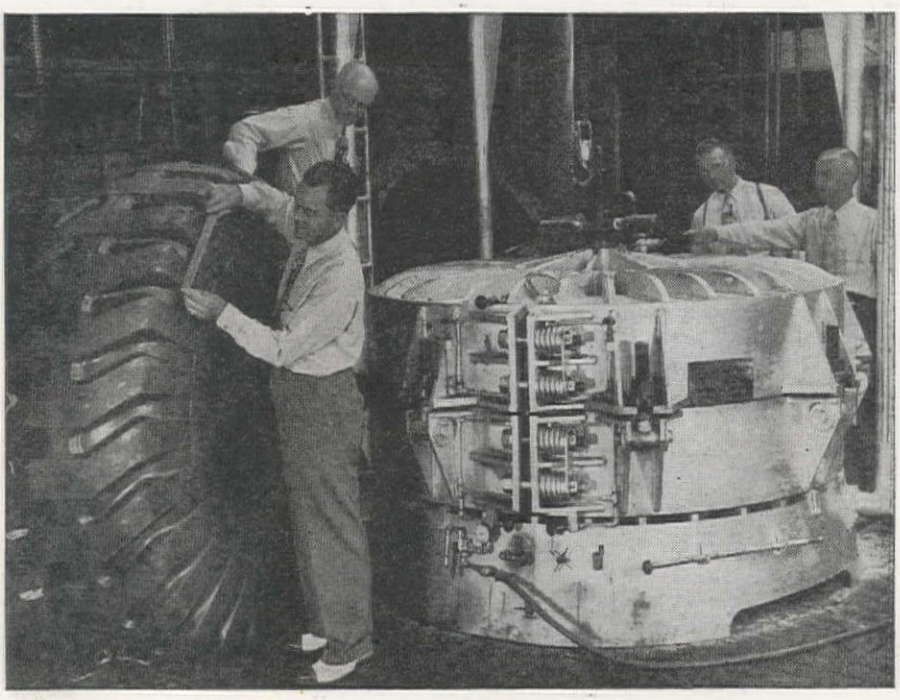
The report points out that California's wartime housing shortage probably was more acute than in most other states and that the postwar shortage is likely to be equally serious. The observation is made that California depends for much of its economic success upon its physical attractions and physical living conditions.

It is stated that authorities are agreed that the only means of assuring livable neighborhoods is through effective local planning for broad-scale community development. Legal machinery for clearing "blighted" neighborhoods is provided in the so-called "urban redevelopment" legislation recently signed by the governor.

The committees which made studies for the report were headed by David D. Bohannon of San Francisco for Northern California and Fritz B. Burns of Los Angeles for Southern California.

WORLD'S LARGEST RETREADING MOLD FOR EARTHMOVER EQUIPMENT

FIRST RECAPPING job turned out by the huge earthmover retreading mold built by the Lodi Co. for Rogers Supertread Co. at Yakima, Wash., was a 2,100 x 24 tire, and 275 lb. of rubber was used in the job. This is the first retreading unit of the size manufactured in the United States, and will assist in easing shortages of tires for heavy construction equipment. Rogers and Lodi officials are shown in the picture.



AA Ratings Abolished, New Priority Established by WPB Regulation 29

WPB WILL ELIMINATE at the end of September its old wartime price control system including "CMP", and substitute a new, limited system for use during the reconversion period. The changes were made through amendments to Priorities Regulations 28 and 29.

New Priorities Regulation 29 provides:

(1) Cancellation, effective at once, of all "AA" priority ratings (which include all ratings except special "top priority" AAA, the new military MM rating previously announced, and new CC rating described below) on purchase orders which call for delivery after Sept. 30, 1945. There is one exception—AA ratings will still apply to textiles.

(2) Revocation of CMP, WPB's master plan for controlling wartime production, effective Sept. 30, 1945.

(3) Cancellation of all allotments of steel, copper, and aluminum for fourth and subsequent quarters.

(4) Introduction of new junior, non-extendable, civilian "CC" priority to be used in limited cases to break bottlenecks in reconversion and insure when necessary continued production and services.

WPB cautions that its general policy is not to assign priorities assistance for non-military needs. The new "CC" rating will be used sparingly. It is expected that almost all material will either be in surplus or in comfortable supply and that ratings will therefore generally not be needed. Applicant must show he has not been able to get delivery without rating, and that the item to be rated is "bottleneck," needed for reconversion construction or other essential construction.

"CC" rating may be assigned, where needed, to increase production by breaking "reconversion bottlenecks," or in other cases to protect public health and welfare or prevent extraordinary hardships.

The MM rating for military use will be continued for the time being to support requirements of occupation forces and other continuing military needs.

Through Sept. 30 the MM rating is equivalent to AA-1 and CC rating equivalent to AA-2. After Sept. 30 sequence of ratings will be AAA, MM, CC, in the order named.

OBITUARIES . . .

Charles E. Carey, Regional Director of the Bureau of Reclamation, Region II, since Sept. 1943, died on Sept. 2 at Sawtelle, Calif., at the age of 55. Carey was an electrical engineer and had had many years of service with Westinghouse Electric Co., northwest power companies, The National Resources Committee and the Bonneville Power Administration, where as principal construction engineer he was responsible for all construction required to provide an integrated electrical transmission system. In the Region II office of the Bureau of Reclamation at Sacramento he was responsible for all construction, planning, and administration of the Central Valley Project.

* * *

A. J. T. Taylor, 57, designer of the Lions Gate Bridge across the entrance to Vancouver, B. C., harbor, and builder of many other important structures in his native British Columbia, died recently in a New York hospital. Taylor had been ill for several months and went east in June for medical care. The past four years he spent in Washington, D. C., as one of Canada's "dollar-a-year" men, being second in command there with the British Purchasing Commission.

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Charles Benjamin Wing, professor emeritus of Stanford University and internationally known engineer, died August 22, at Palo Alto Hospital. Professor Wing, who was 82, became a pioneer member of the Stanford faculty on his arrival in California in 1892, after teaching at the University of Wisconsin and Cornell. Professor Wing was well known for engineering work on some of the country's largest projects, and for his wide interest in civic and state activities.

Larry Coluccio, 57-year-old owner of L. Coluccio Co., Seattle, Wash., died recently at Seattle. He was found near the Lakeside county airport where he had gone to inspect progress of work for which his firm held the grading contract. Coluccio had been active in airport and highway construction for the past 40 years.

* * *

Lt. George Hamilton Greenwood, civil engineer, lost his life in December of 1944, when a Japanese ship carrying prisoners of war was sunk, it has just been announced. Greenwood was at the time a member of the U. S. N. R. and had been a war captive since the surrender of Corregidor.

* * *

Anthony Coppetto, 52-year-old Seattle, Wash., sewer contractor, died suddenly at a Seattle hospital recently. Coppetto, a native of Italy, went to Seattle in 1910 and for 27 years he had been a contractor there.

* * *

J. L. Conner, Sr. of the firm of J. L. Conner & Sons, Eureka, Calif., passed away at the age of 64. Conner began his construction career as a street contractor in the city of Los Angeles.

* * *

William B. Robinson, Los Angeles, Calif., building contractor, passed away recently at the age of 53. Robinson went to Los Angeles 30 years ago to organize his own firm.

* * *

Samuel V. Atwood, Altadena, Calif., general contractor, died recently at a local hospital. He had been in the contracting business in the Los Angeles area for more than 15 years.

San Francisco Drops Tax Rate, Ups Water Charges

WATER RATES for all San Francisco consumers, including peninsula communities served by the San Francisco Water Department, have been increased. The boost is intended to put the water department on a self-supporting basis, thereby having the effect of reducing the anticipated record tax rate for 1945-46 by approximately 10 cents. The expected revenue from the increase totals $1,163,000 annually.

According to the present bills, the increase for San Francisco will be the restoration of the 15 per cent cut made in the water rates in 1943, and therefore slightly exceeding 15 per cent.

For the wholesale purchase of water by the peninsula communities a straight 15 per cent increase will become effective.

Although opposition to the higher rates was expressed to the board of supervisors, the commission's recommendation was upheld by a 9-2 vote.

Due to the water rate advance, it is anticipated that a reduction of the tax rate in following years will be in excess of 20 cents.

Aluminum Railings Will Be Installed at Coulee

SYMBOLIZING the role played by the Grand Coulee Dam in the light-metals industries of the Pacific Northwest, aluminum railings with self-contained "cold" lights will be installed atop the massive barrier when materials are available, Regional Director Frank A. Banks of the Bureau of Reclamation has announced.

Banks said the railings will be permanently tarnish-proof and will appear as a silver lining on both sides of the roadway atop the dam. The top railing of the three members in the assembly will be equipped with cold cathode tubes which, at night, will bathe the roadway in a glareless light so that motorists driving across the span need not use their headlights.

From the sky, the roadway will appear as a 4,000-ft. ribbon of subdued light reaching from one side of the Columbia River to the other. Samuel Judd, designing engineer for the Bureau, commented that he believes the assembly will be the longest continuous lighted railing in the world.

Holland Reuses Famous London Waterloo Bridge

DUTCH ENGINEERS will use the seven spans of London's old Waterloo Bridge (replaced by a new structure during the war) to rush the reconstruction of several important railway bridges in Holland. Waterloo's largest span is 280 ft. long, the second, 150 ft., and the remaining five measure about 135 ft. each.

One of the spans will be used to repair Moerdijk Bridge, which is the longest and most famous span in Holland. It straddles Hollandsche Diep south of Rotterdam, and across it runs the railroad to southern Holland, Belgium and France. Some 500 yd. of the structure were demolished by the Germans last September. Earlier plans called for the building of a land tongue, leaving a length of 100 ft. to be spanned by the use of two auxiliary spans of 40 to 60 ft.

The longest span will be used in repairing the Caterveer Bridge over the Isel River, near Zwolle, which links the northeastern provinces with the main railroad networks to the west. Reconstruction officials have been using Bailey spans at some crossings, which must give way to permanent structures as soon as possible. At least 70,000 tons of steel will be necessary to repair the bridges across the "big rivers" dividing northern and southern Holland.

Clay Sewer Pipe Design Standards Established

A SIMPLIFIED PRACTICE Recommendation for Clay Sewer Pipe has been approved for promulgation, according to an announcement of the Division of Simplified Practice of the National Bureau of Standards. It is effective immediately, and will be identified as R211-45.

The Recommendation lists the variety of standard-strength and extra-strength pipe and fittings that should be considered as stock items. It is presented in two schedules, A and B, the latter covering practice for the States of California, Washington, Oregon, and Utah.

The need for Schedule A and Schedule B was recognized as desirable when simplified practices were established by the War Production Board. Schedule A of this proposal lists 348 standard strength items and 192 extra strength items, a total of 540. Schedule B lists a total of 548 varieties, 320 in standard strength and 228 in extra strength. Thus, the number of varieties recommended in each Schedule amounts, roughly, to one-third of the 1,500 to 1,600 items formerly carried by the industry.

Until printed copies are available, free mimeographed copies may be obtained from the Division of Simplified Practice, National Bureau of Standards, Washington 25, D. C.

PERSONALLY SPEAKING

Wesley Winans Horner, consulting civil engineer of St. Louis, Missouri, has been selected as the official nominee for president of the American Society of Civil Engineers for 1946, it was announced by Wm. N. Carey, secretary of the Society. For 15 years Horner was chief engineer of sewers and paving for the City of St. Louis. In addition to various projects for St. Louis, including the extensive River Des Peres Drainage Works, for which he was responsible, Horner's experience has taken him to many parts of the country as consultant on drainage and sewer system problems, highway planning, and also airport design. He has served the A.S.C.E. on numerous committees and was one of the recipients of the Society's Rudolph Hering Medal for notable study on rainfall and runoff.

* * *

E. G. Cahill, San Francisco, Calif., utilities manager and member of the contracting firm of Cahill Brothers, resigned his city post after 13 years of public service. Cahill declared that during the war era he had felt the urgent need for individuals holding public service positions to stay with them through the crisis. Now that the war is over, and feeling that he has fulfilled the duties of his office, he feels free to give his full attention to his private business. The Cahill resignation becomes effective November 15.

* * *

Lester C. Walker is now engineer-in-charge of River Basin Work at the Chicago Regional Office of the Federal Power Commission. The work of the Chicago office includes all of the Missouri River Basin; the Mississippi above Cairo; the Illinois; the Wabash and the drainage into Lakes Superior, Michigan and Huron. Walker is engaged in planning development of the water resources, particularly as it affects hydroelectric power. His principal duty will be as assistant to the Federal Power Commission's representative on the Missouri Basin Interagency Committee, attending all meetings of the committee and representing the commission's committeeman when he is not in attendance.

KENNETH MARKWELL, assistant commissioner of the Bureau of Reclamation since 1944, known throughout the U. S. for his engineering feats, has a major role in resource development of the West, the world's largest electric power producer.

* * *

Four engineering promotions in the Department of Water and Power of the City of Los Angeles, Calif., were announced recently. **Wayne W. Wyckoff,** named engineer in charge of the Aqueduct division, advanced from assistant head of that division; **Grant E. Benkesser,** former engineer of station design, is now head of the design and construction division; **John P. Stratford** takes over the duties of engineer of station design, leaving the position of office engineer in the Power Executive division; **Joseph F. Marisca** succeeds Stratford to the post as office engineer after having returned from active duty with the Navy, where he has been since 1942.

* * *

Lieut. Comdr. Gordon W. Battey is new public works officer at the El Toro, Calif., Marine Base. A former contractor at Miami, Fla., Comdr. Battey entered naval service in 1941 and was public works officer at Camp Lejeune, N. C., for 18 months, as well as having been stationed at Guantanamo Bay, Cuba, and in the Bahamas. Battey succeeds **Lieut. Comdr. Joseph R. Kirby** at El Toro, who has been stationed there for the past year. After having been on active duty with the Navy for five years Lieut Comdr. Kirby returns to civilian life in his home town, Bismark, North Dakota.

* * *

Harry E. Fowler, senior civil engineer and assistant superintendent of the Seattle (Washington) City Building Department, has retired. In making the announcement, Building Superintendent **John B. Cain** viewed with regret the retirement of one of Seattle's principal city officials. Fowler had served in the department for 31 years and has been the chief technical officer in charge of enforcement of building regulations. In the future he will spend the majority of his time on his farm at East Sound, Orcas Island.

* * *

Fred W. Clayton, registered engineer in California and Nevada, has opened his own office as a consulting engineer in the Byington Bldg., Reno, Nev. He has served as a hydraulic engineer with the City of San Diego, Calif., and California Water Service Co., and recently has been in the employ of Blanchard & Maher at the Naval Ammunition Depot in Hawthorne, Nev.

* * *

Phil F. Helmer, formerly assistant resident engineer on the Naval Magazine project at Bangor, Washington, and **Frank W.**

Hughes, engineer on the same project, will open a general surveying and civil engineering office at Wenatchee, Wash. Both men were in responsible positions with the U. S. Engineers at Moses Lake and Ephrata airports, with headquarters at Wenatchee, and are registered and licensed engineers in the state of Washington.

* * *

Robert A. Monroe has been appointed Chief Design Engineer of TVA, succeeding **George R. Rich,** who recently resigned to enter private practice. Monroe, who came to TVA early in 1937 from the U. S. Bureau of Reclamation, has previously served as Assistant Chief of the Water Control Planning Department and recently as Assistant Chief Engineer. A graduate of the University of California, he has, since 1912, been engaged in the planning and design of hydroelectric plants.

* * *

Raymond A. Hill of Leeds, Hill, Barnard and Jewett, a Los Angeles, Calif., firm of consulting engineers, has accepted an appointment by the El Paso County, Texas, Water Improvement District No. 1 and Elephant Butte Irrigation District to examine the plans of U. S. Army Engineers and the Bureau of Reclamation, relative to a postwar construction program which these agencies propose for the upper Rio Grande Basin.

* * *

Horace P. Hinckley was recently appointed general manager of the Bear Valley, Calif., Mutual Water Company. Hinckley succeeds **J. J. Prendergast,** who retired following twenty-nine years of service with the company. At present Hinckley is president of the San Bernardino, Calif., Chapter of the American Association of Engineers; chairman of the Redlands-Bryn Mawr Farm Bureau, and a director of the Redlands Kiwanis Club.

* * *

Reed Hoover has received an appointment as an engineer in the County Planning Commission, Salt Lake County, Utah. Hoover has 20 years' experience with the Utah State Highway Commission behind him and formerly served as a resident engineer as well as having been manager of the state planning survey, state highway patrol. He replaces **Aoh Jacobsen,** who tendered his resignation, to the post of county engineer.

* * *

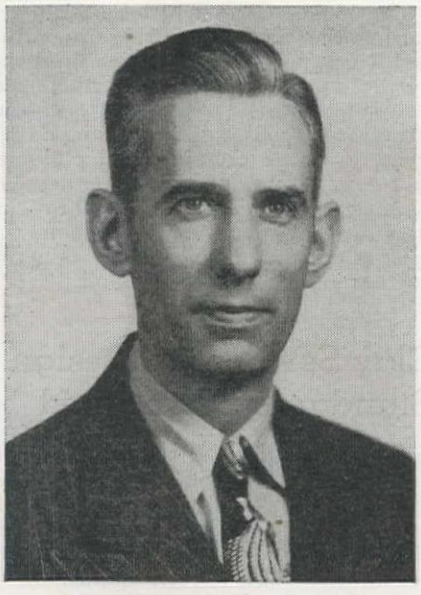
Lieut. Wm. H. Edwards, formerly with Bonneville Power Administration, in transmission design section, is now a construction officer with the U. S. Navy in the Pacific area. Edwards, just having completed 18 months overseas, is in charge of construction battalion operations.

* * *

Noel Pike has joined the Imperial Irrigation District, Imperial, Calif., as chief electrical engineer, after having spent 15 years as an engineer in the Republic of Mexico. Pike succeeds **E. H. (Ed) Aiken,** who resigned the post after 8 years to accept a position with the General Electric Company at Los Angeles, Calif.

* * *

Raymond U. Harmon, newly-appointed assistant regional forester for the Rocky Mountain region, has assumed his duties as chief of recreation and lands with headquarters at Missoula, Montana. Harmon succeeds former chief **M. H. Wolff,** who now heads a new division of land use coordination. Harmon, since 1939, has been regional head of the division of operation for the North Central region, headquartered at Milwaukee, Wisconsin.



CARL E. NELSON, who heads the San Francisco office of Donald R. Warren Co., has many major structural designs to his credit, the latest being design of the $28,000,000 Naval Supply Depot, Rough & Ready Island, Stockton, Calif.

* * *

E. M. Bussard, M. J. Bussard and **George A. Heap** have formed an architectural and engineering firm to be known as Bussard, Bussard & Heap, Los Angeles, Calif. Their immediate attention is centered on current postwar projects and municipal improvements and utilities.

* * *

L. J. (Larry) Dolan, formerly hydraulic engineer in charge of irrigation and drainage on the 10,000-ac. War Relocation Authority Project at Lamar, Colo., is now assistant project engineer in charge of irrigation on the Post Falls Project at Coeur d'Alene, Idaho.

* * *

Les Brett, civil engineer, announces that he has formed the Northwest Surveying and Mapping Co., to be located at Auburn, Washington. **Harold C. Lake** of Seattle, Washington, will be Brett's associate in the new venture. Both men were formerly with the U. S. Army Engineers on Alaskan work.

* * *

Paul L. Johnson, former chief engineer of the Southern California Telephone Company, has been appointed general plant and construction manager. He will have direct supervision of construction and maintenance of telephone facilities at Los Angeles, California.

* * *

H. O. Erwin of Portland, Oregon, has been named research engineer with the Oregon Forest Products Laboratory at Oregon State College, Corvallis. Erwin is in charge of carbonization studies covering both sawdust and lignin, according to **Paul M. Dunn,** dean of forestry.

* * *

L. C. Jones, foreman of the Pasadena, Calif., street and construction department, who has been a municipal employee for forty-one years, is listed among those who retired from municipal service under the new retirement program effective Aug. 1.

* * *

C. S. Munson, field engineer and construction superintendent in the office of the city engineer's department at Seattle, Wash., has taken the post as chief engineer for B. H. Sheldon Co., Spokane contractors and industrial engineers.

* * *

Hugh Wood has been promoted from assistant superintendent to superintendent of the Ventura, Calif., water department. Wood succeeds **Charles Zapf,** who resigned after serving in that capacity for the past 13 years. Wood will retain the post of acting city engineer which was assigned to him two years ago.

* * *

Basil McHugh, city engineer of Enumclaw, Wash., for the past twenty-five years, resigned from his public service position recently to accept a position as engineer with the City of Renton, Wash.

* * *

D. D. Altermatt and **L. L. Creasey,** former employees of the Fluor Corporation of Los Angeles, Calif., are now in business for themselves as petroleum and industrial contractors, at Santa Maria, Calif. The company will be known as Altermatt and Creasey.

* * *

F. Murphy and **Barney Campbell** have formed a partnership and now announce the opening of Northwest Tractor and Equipment Co., for reconditioning construction machinery and sales at 5800 E. Marginal Way, Seattle, Wash.

* * *

Dorothy King Curran of San Diego, Calif., has just become the first woman Licensed Land Surveyor in the state. **Laura Munson** is still the only woman Registered Civil Engineer.

* * *

Obert Peterson, county surveyor for Choteau County, Mont., has resigned his post, where he has been for 24 years, to manage private business interests.

BECAUSE MANY returning servicemen will be looking for positions in the construction field, *Western Construction News* is initiating a new service next month. Men seeking employment in this field may have published, at NO EXPENSE whatever, a brief statement of their availability and qualifications. A similar service will be available to contractors needing men for specific projects. The job location and skills required will be published FREE. It is hoped this feature will be particularly valuable to discharged veterans, but all readers of the magazine are invited to use it.

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SEATTLE . . . 3410 First Avenue South

SUPERVISING THE JOBS

S. Mattoon is superintending the construction of a runway, taxiways, parking apron and other miscellaneous construction at the Merced Army Air Field near Merced, Calif., for N. M. Ball Sons, Berkeley, Calif., on their $1,046,795 contract. On the same project, **George Elliott** and **E. Frost** are grade foremen; **Eddie Givens** and **Earl Boswell,** paving foremen; **R. J. Hapgood,** concrete superintendent; **W. D. Sorensen,** master mechanic; **Walt Carson,** office manager, and **"Slim" Wentworth,** concrete foreman.

* * *

Eric Plath, formerly job superintendent for Bouten Construction Co. of Spokane, Wash., on the construction of the cadet nurses' home at Sacred Heart Hospital at Spokane, is again superintending for that company the construction of two additional stories to the nurses' building. Others on the $157,000 job at Spokane are **John Charlton,** carpenter foreman, and **Bill Gibson,** labor foreman.

* * *

Paul Scroggs, many time superintendent for Peter Kiewit Sons Co., Los Angeles, Calif., is job superintendent of the $293,321 contract for construction of barracks for the convalescent hospital, including miscellaneous facilities, and another $101,360 project for modification of officers' quarters at the Santa Ana Army Air Base, Santa Ana, Calif., recently awarded the Kiewit firm.

* * *

Carl C. Jacobson, job superintendent for the Tanner Construction Co., of Phoenix, Ariz., is in charge of the conversion of hangars to PLM and appurtenances at Williams Field, Chandler, Ariz. Others holding key positions on this $178,585 contract are **A. W. Rogers,** assistant superintendent, and **E. O. Olsen,** carpenter foreman.

* * *

Nick M. Ninteman, formerly general superintendent for P. J. Walker Co., Los Angeles, Calif., on the construction of barracks and personnel housing at the Navy magazine and net depot, Seal Beach, Calif., is now supervising for that company the construction of a $656,358 factory at Mentone, Calif., for the making of pottery, plumbing fixtures, etc. Assisting him are **L. A. Walsh,** general foreman, and **R. C. Marr,** chief clerk.

* * *

N. H. Daniels has been appointed job superintendent for the Hoagland-Findlay Engineering Co., Long Beach, Calif., of its $211,400 contract for alterations and additions to the sewage treatment facilities at Oxnard, Calif. Foremen on the sewage job are **Ole Veltzen, Marion Spires** and **E. E. Epperson.**

* * *

Norman Robinson is supervising another Peter Kiewit Sons Co., project in Washington state. The $79,104 contract calls for grading, surfacing, construction of light bituminous surface treatment, etc., on Secondary State Highway No. 9-B and on the Quaillayute Naval Air Station access road. Office manager for the road job is **William Culbreth.**

* * *

Wes Widmer, assisted by **Dick Thomas,** is superintending the addition of new, and conversion of buildings at Mitchel Convalescent Hospital, Camp Lockett, Calif. Job engineer is **Bob Ours,** and **Dale Griffith** is Los Angeles purchasing agent. This is a $1,957,007 contract which was recently awarded the firm of Del E. Webb Construction Co., Phoenix, Ariz.

* * *

R. M. Turpin is job superintendent and **C. M. Lowry** office manager for Big Horn Construction Co., Sheridan, Wyo., on its $83,059 contract for highway improvements of the Saratoga-Centennial Rd., Wyo.

* * *

F. L. Oliver was named job superintendent for Roush Construction Co., Crawford, Neb., for the construction of earthwork and structures, Sturgeon and Fairfield lateral and sublaterals on the Mirage Flats Project in Dawes County, Neb. **Frank Henderson** is foreman of the $168,655 job.

* * *

Frank Zimmerman is general superintendent and **Robert Trask** is job superintendent for Eaton and Smith of San Francisco, Calif., on the $393,392 contract awarded that firm for excavation work at the Naval Drydocks, Hunters Point, Calif. Other key men on the job are **James C. Dawson,** office manager, and **George O'Neal,** superintendent of equipment.

* * *

Thornton Miller was appointed job superintendent by A. P. Rheiner and Son, San Antonio, Texas, to complete the $113,156 contract which they hold for the construction of two recreational buildings at Brooke Hospital Center, Fort Sam Houston, Texas.

* * *

Roy C. Knapp, job superintendent for Buttress & McClellan, Los Angeles, Calif., is in charge of constructing a $110,000 warehouse and factory building on Anaheim-Telegraph Rd., Los Angeles. **W. L. Davis** is holder of another key position on the building project.

* * *

L. E. Webb is job superintendent, with **V. M. Bull** and **Carl Johnson** assisting him on the construction of 34 mi. of natural gas pipe line in the vicinity of Baker, Montana, for W. A. Bechtel Co., San Francisco, Calif., holder of the contract. **Revilo Fuller** is office manager for the project..

* * *

Floyd Downum, superintendent of construction of the Brunzell Construction Co. and V. O. Brunzell, Gardena, Calif., is now in charge of the erection of the North School at Hawthorne, Calif., for that company, which holds the $89,424 contract. **V. O. Brunzell** and **E. S. Brunzell** of the contracting company are equipment superintendent and office manager of the project.

* * *

A. V. Toolson is job superintendent for Gibbons and Reed, Salt Lake City, Utah, on their $292,109 contract to construct an airport at Idaho Falls, Idaho. Others in key positions on the job are **W. W. Taylor,** office manager; **John Leg,** excavation foreman; **Sam Warner,** asphalt plant foreman, and **Tom Varley,** engineer.

* * *

B. L. Richards, job superintendent for the construction of Lytle and Cajon Creeks improvement, levee and bypass and appurtenant work in California, has with him on the project as excavating superintendent, **Leonard Jones.** Other vital positions on on the Winston Bros. Co.-Utah Construction Co.-Vinnell Co. $2,768,432 job are held by **O. T. Bekken,** office manager, and **Charles Peters,** purchasing agent.

* * *

Paul Wintz, project manager; **L. L. Sheddy,** breakwater superintendent; **Roy**

Thornberg, master mechanic, and **Dave Collins,** truck foreman, are completing the contract at Morro Bay, Calif., for the Guy F. Atkinson Co. **Frank Huddlestone** still represents the U.S.E.D. on the project.

* * *

Fred E. Lowell has been named superintendent of construction for Big Horn Construction Co., Sheridan, Wyo., on the $53,-592 contract awarded that company recently for grading, draining, culvert, bridge and miscellaneous work on the Dayton-Kane Rd. in Wyoming.

* * *

Norman Robinson is job superintendent for the Haas Construction Co. of San Francisco, Calif., on its $185,980 contract to construct Homoja housing at the Seabee Reconsignment Depot, Camp Parks, Shoemaker, Calif. **Fred Nicholson,** well known in the past for his contributions to the San Francisco-Oakland Bay Bridge and structural designs in the Panama Canal Zone, is engineer of the project.

* * *

Carroll Brown and **H. P. Graham** are co-superintendents for the Brown Construction Co. of Pueblo, Colo., on its $167,803 contract for gravel surfacing between Colorado Springs and Penrose, Colo., on State Highway No. 115.

* * *

Roy C. Knapp, superintendent for Buttress & McClellan, contractors of Los Angeles, Calif., is in charge of the construction of a warehouse and office building to be located on Calzona St., Los Angeles. Working with Knapp on the $65,000 job is **H. D. Hollinshead.**

* * *

Earl C. Bell is job superintendent, with **W. W. Means** assisting him, on the construction of 60 family dwelling units at Roseburg, Ore. Foremen on the job are **Roscoe Arent** and **Dan Cole.** Max Dudley, Shelton, Wash., is holder of the $143,967 contract.

* * *

Eugene D. Moore is superintendent for Trepte Construction Co., San Diego, Calif., on its contract for additions to the Ryan Aeronautical Corp. at San Diego. Carpenter foremen are **C. F. Voss** and **Jim Wilson, Johnny Winchell** is office manager, and project engineer is **S. F. (Niel) Nielsen.**

* * *

Arthur Cranmer is job superintendent of work on the Union Pacific Railroad between Pocatello and Glenns Ferry, Idaho, for the Morrison-Knudsen Co., Inc., of Boise, Idaho. The contract is for $115,000.

* * *

Wayne Morris is job superintendent for the construction of a storage area at the A. A. F. Intransit Depot, Alameda, Calif. **James Lester** is grade foreman on the $172,945 storage area contract held by N. M. Ball Sons of Berkeley, Calif.

* * *

H. E. Schroeder, well known for his participation in highway construction in California, is project manager for Schroeder & Co., Roscoe, Calif., on its $173,775 contract for highway improvements between Barstow and Field, Calif. **B. Peaker** has been named plant superintendent.

* * *

Frank Zimmerman is job superintendent on the construction of the Upper Army Street sewer system, San Francisco, Calif., for Eaton and Smith, San Francisco contractors. **James C. Dawson** is manager and **Louis Le Fevre** is controller on the $100,-000 project.

* * *

John Crouk is supervising the Mountain View Park special sanitary sewer district construction at Denver, Colo., for M. D. Latimer, Denver, who holds the $120,941 contract. Head operator and mechanic of the job is **Dave Goodman.**

* * *

J. B. Singer was recently appointed general manager, and **Herbert Atkinson** chief estimator of Empire Construction Co., Ltd., San Francisco, Calif., builders. Having been formerly in important positions throughout the San Francisco area, Singer and Atkinson are well known to the construction industry.

* * *

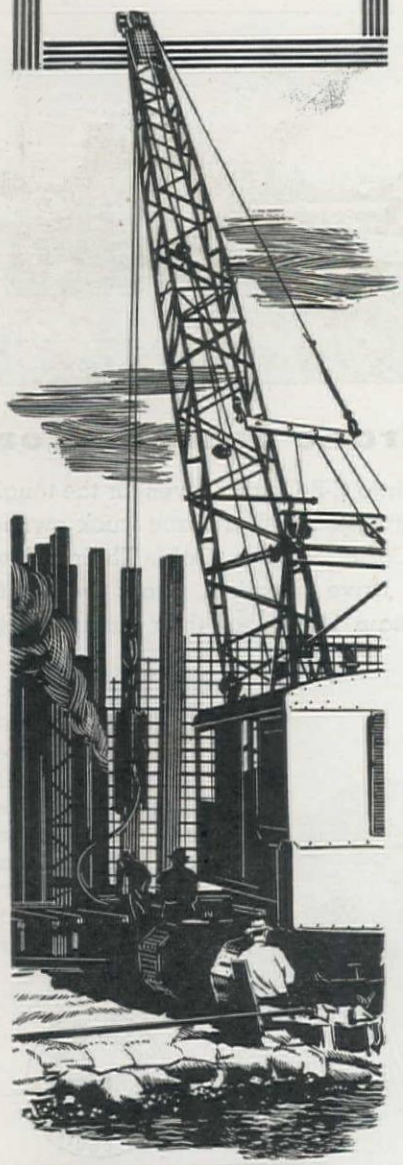
Harold J. Wood, for many years in key positions in the Los Angeles area, is now with **Gordon B. Findley** as superintendent on the construction of store buildings in the Newport Beach, Calif., district.

* * *

Everett Miner, for three years in Alaska with Bechtel-Price-Callahan and others, is now again employed with Morrison-Knudsen Co., Inc., in the Los Angeles area.

* * *

George C. Garrould is maintenance superintendent for Shannahan Brothers, Inc., operating out of their yard at Huntington Park, Calif.



UNIT BID SUMMARY

Highway and Street...

California—Ventura County—State—Grade and Surface

Griffith Construction Co., Los Angeles, presented the low bid of $114,735 to the Calif. Division of Highways, Sacramento, for the repair with plant-mixed surfacing of 3.4 miles of highway between 0.6 mile northwest of Hueneme Road and Callaguas Creek. The following is a summary of the unit bids received:

(1) Griffith Construction Co. $114,735
(2) R. R. Hensler Co. 119,930
(3) Frontier Construction Co. 120,976
(4) Norman I. Fadel $121,180
(5) Oswald Bros. 124,820
(6) Peter L. Ferry & Son 131,155

		(1)	(2)	(3)	(4)	(5)	(6)
180	sta. clearing	2.00	10.00	6.00	10.00	2.25	8.00
Lump sum,	shaping and compacting shoulder material	700.00	$5,000	$2,500	$2,000	$1,000	$3,600
Lump sum,	dev. water sup. and furn. watering equip.	450.00	750.00	121.00	600.00	800.00	500.00
850	M. gal. applying water	1.60	2.00	3.00	2.00	2.40	2.00
180	sta. finishing roadway	3.00	5.00	6.00	10.00	2.25	11.00
30,000	tons untreated rock base	1.82	1.70	1.80	2.00	2.00	2.18
95	tons liquid asphalt MC-2 (prime coat)	15.00	20.00	15.80	12.00	18.00	13.00
15,800	tons plant-mixed surfacing	3.50	3.60	3.68	3.30	3.70	3.50

Wyoming—Park County—State—Grade & Surface

Taggart Construction Co. was awarded the contract on the low bid of $84,483 by the Highway Department, Cheyenne, for the construction of 11.3 mi. of oilfield access road located between Meeteetse and Pitchfork. Total and unit bids are as follows:

(1) Taggart Construction Co. $84,483
(2) W. E. Barling 88,370
(3) Kinsley-Moore 91,922
(4) Inland Construction Co. 94,238
(5) Big Horn Construction Co. $95,910
(6) Northwest Engineering Co. 97,159
(7) Engineer's estimate 74,830

		(1)	(2)	(3)	(4)	(5)	(6)	(7)
900	hr. scraper operation	10.00	10.50	11.00	13.50	11.40	10.00	11.00
860	hr. patrol operation	6.00	6.50	6.50	7.50	8.49	7.00	7.00
200	hr. bulldozer operation	10.00	9.00	9.00	9.50	9.35	10.00	9.00
250	hr. ripper operation	6.00	10.00	8.00	9.50	9.45	6.50	8.00
1,200	M. gal. watering (emb.)	2.70	1.75	1.50	1.75	2.06	2.50	1.50
1,200	hr. sheepsfoot roller operation	4.00	3.25	3.00	3.00	3.61	4.00	3.50
220	cu. yd. excav. for pipe culverts	2.00	1.00	2.00	2.25	1.16	1.50	1.75
2.0	cu. yd. Class A concrete	50.00	30.00	50.00	50.00	44.94	50.00	35.00
1,317	lin. ft. 18-in. vitr. clay culvert pipe	3.10	3.00	3.00	2.75	3.36	3.00	2.50
795	lin. ft. 24-in. vitr. clay culvert pipe	4.90	4.00	5.00	4.50	5.15	5.00	3.25
292	lin. ft. 36-in. std. reinf. conc. pipe	8.10	8.00	9.00	9.25	9.46	10.00	8.50
60	lin. ft. 48-in. std. reinf. conc. pipe	13.20	14.37	15.00	12.00	18.38	16.00	13.00
20	lin. ft. 60-in. std. reinf. conc. pipe	21.00	22.00	24.00	20.00	23.33	24.00	21.00
140	lin. ft. 72-in. std. reinf. conc. pipe	26.65	27.00	33.00	26.00	32.09	32.00	27.00
250	hr. mechanical tamping	5.60	3.00	3.00	3.50	7.76	4.00	3.25
45	cu. yd. structure excavation	1.50	2.00	2.50	3.00	1.58	2.50	2.00
100	cu. yd. Class 1 Riprap	11.00	5.50	8.00	9.00	7.44	5.00	6.00
49,800	lin. ft. std. right-of-way fence	.13	.12	.12	.17	.15	.125	.095
70	ea., end panels	12.60	7.00	12.00	9.00	9.60	13.00	10.50
90	ea. brace panels	8.10	6.00	8.00	7.50	6.65	10.00	7.50
2	ea., timber project markers	10.00	20.00	20.00	15.00	18.57	15.00	10.00
Lump sum,	corral fences and loading pen	150.00	50.00	150.00	150.00	181.00	200.00	100.00
Lump sum,	removing existing structure	550.00	50.00	500.00	300.00	$1,293	600.00	100.00
30,500	ton crushed gravel base course (1-in. max.)	.89	1.20	1.20	1.12	1.01	1.30	.80
610	M. gal. watering (base)	1.80	1.75	1.50	1.75	2.06	2.00	1.50
310	hr. roller operation (base)	5.10	4.75	4.50	4.00	4.42	3.50	4.50
2.5	mi. removing and resetting tele. line	250.00	100.00	200.00	225.00	995.96	100.00	100.00
120	ea., telephone pole (8-ft. stubs) material	7.00	1.00	5.00	7.50	3.36	5.00	1.75
80	rod telephone wire, material	.03	.10	.25	.30	.43	.20	.25
1,468	M.B.M. untreated timber	200.00	100.00	150.00	200.00	174.92	150.00	180.00

Colorado—Summit County—Bureau of Reclamation—Grade & Surface

Hinman Bros. Construction Co. and L. M. Hawkins, Pittsburgh, Pa., submitted the low bid of $45,925 to the Bureau of Reclamation for the widening of State highway route No. 9 adjacent to the Big Thompson Project near Green Mt. Reservoir, Colorado. The following unit bids were received basd upon specification No. 1809-D:

(1) Hinman Bros. Construction Co. and L. M. Hawkins $45,925
(2) Trione Contracting Company 62,225
(3) Brown Construction Company $67,000
(4) Lowdermilk Bros. 99,987

		(1)	(2)	(3)	(4)
30,000	cu. yd. excavation	1.50	2.05	2.20	3.25
200	cu. yd. gravel surfacing	1.50	2.00	2.00	1.50
25	ea., removing and replacing guard posts	5.00	3.00	4.00	7.50
10 100	ft. finishing roadway	50.00	25.00	50.00	200.00

New Mexico—Santa Fe County—State—Grade & Surface

Floyd Haake, Santa Fe, submitted the low bid of $47,845 to the State Highway Department, Santa Fe, for the reconstruction of 15 miles of SR No. 30 and 4 on the Espanola-Los Alamos Road. The following is a summary of the unit bids:

(1) Floyd Haake $47,845
(2) Miller & Smith 55,933
(3) M. M. Sundt Construction Co. 59,915
(4) W. T. Bookout Construction Co. $69,468
(5) Walter L. Denison 73,710
(6) Lowdermilk Bros. 75,201

		(1)	(2)	(3)	(4)	(5)	(6)
Lump sum,	removal of old drainage structures	$1,000	$1,700	$2,100	$2,000	$4,000	$1,000
15,400	cu. yd. excavation—unclassified	.25	.37	.40	.40	.60	1.00
250	cu. yd. excavation for structures	2.00	1.50	1.20	2.50	3.00	3.00
55	cu. yd. excavation for pipe culverts	2.00	1.50	1.90	3.00	5.00	3.00
136	hr. rolling—sheepsfoot roller	6.00	10.50	6.00	7.00	5.00	7.50
151	hr. rolling—steel tired roller	6.00	6.50	4.00	7.00	6.00	6.00
188	M. gal. watering	3.00	4.00	3.00	4.00	4.00	3.50
450.5	cu. yd. Class "A" high early str. conc. (box culv.)	28.00	30.00	36.00	35.00	42.50	32.00
130	sq. yd. Class "A" conc.—rundowns	4.00	4.00	4.00	15.00	10.00	6.00
2.8	cu. yd. Class "A" conc.—cut off walls	30.00	30.00	50.00	75.00	90.00	80.00

(Continued on next page)

FASTER to the job — FASTER on the job

with speedy Rubber-Tired
LORAIN MOTO-CRANES

Moto-Cranes are fast-traveling between jobs (up to 30 m.p.h.) . . . move over the highways under their own power, thus eliminate loading and unloading of equipment . . . have plenty of flotation for off-the-road, cross-country traveling. On the job, they're the fast, low-cost answer to profitable excavating and material handling.

Moto-Cranes are highly versatile . . . as these pictures of shovel, crane, and dragline work indicate. That's because they're so easily converted into the proper tool to do the job. Built in 15, 20-ton capacities—the complete machine, chassis and turntable, manufactured as a unit by Lorain, the Moto-Crane is the pioneer in the high-speed, rubber-tired excavating equipment field. Benefit by this experience—get complete data from your Lorain Dealer on the 78 profit-making uses for the Moto-Crane on your jobs. *The Thew Shovel Co., Lorain, Ohio.*

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Le Roi-Rix Machinery Co., Los Angeles 11
Cate Equipment Co., Salt Lake City 4
Liberty Trucks & Parts Co., Denver 1
Coast Equipment Company, San Francisco 1
A. H. Cox & Co., Seattle 4, Washington
Bunting Tractor Co., Inc., Boise, Twin Falls, Gooding, Fairfield, and Burley, Idaho; LaGrande, Oregon
Connelly Machinery Company, Billings and Great Falls, Montana
Sanford Tractor & Equipment Co., Reno, Nevada
The Mountain Tractor Co., Missoula, Montana
The Tractor & Equipment Co., Sidney, Montana
P. L. Crooks & Co., Portland 10, Oregon

66,465 lbs. reinforcing steel	.07	.08	.10	.12	.08	.07
112 lin. ft. std. reinf. conc. pipe—24-in. diam.	5.00	5.00	5.00	6.00	5.50	6.00
216 lin. ft. std. reinf. conc. pipe—36-in. diam.	9.00	7.70	8.55	8.00	9.00	10.00
80 lin. ft. std. reinf. conc. pipe—60-in. diam.	15.00	17.50	18.00	20.00	20.00	18.00
363 lin. ft. removing and rebuilding fence	.06	.12	.20	.25	.50	.20
2,228 cu. yd. base course surfacing	1.60	2.90	1.20	2.25	1.50	2.00
2,940 cu. yd. selected borrow	.60	.66	.70	.50	1.50	1.25
1,027 cu. yd. top course surfacing	1.50	2.90	1.20	3.00	1.50	2.50
66 bbl. cutback asphalt, Type MC-1	6.00	6.70	5.60	10.00	8.00	12.00
598 bbl. cutback asphalt, Type MC-3	6.00	6.60	5.60	7.00	8.00	8.50
79 cu. yd. sand cover material	5.00	6.40	5.00	5.00	7.50	6.00
0.674 mile mixing asphalt and aggregate	$1,000	750.00	600.00	$1,000	$1,000	$1,000
1,572 sq. yd. patching oil mat	.75	.50	1.35	1.50	1.50	3.00
5,724 sq. yd. oil treated surfacing ditch pavement	.75	.50	1.50	1.25	1.00	1.00
264 hr. mechanical tamping	4.00	4.95	2.00	10.00	10.00	7.50
525 lb. wire fabric reinforcement	.10	.15	.20	.25	.30	.15

Idaho—Oneida County—State—Surfacing

H. A. Gardner, Blackfoot, Idaho, offered the low bid of $32,047 to the Idaho Bureau of Highways, Boise, for the resurfacing of 6 miles of SR No. 37 between Pleasantview and Holbrook. Unit bids received are as follows:

(1) H. A. Gardner $32,047
(2) Carl E. Nelson Co. 33,479
(3) Olof Nelson Construction Co. 33,989
(4) Duffy Reed Construction Co. $46,417
(5) Engineer's estimate 33,540

	(1)	(2)	(3)	(4)	(5)
1,840 mi. yd. haul on binder	.20	.20	.30	.20	.15
17 days rolling, power roller	50.00	38.00	48.00	40.00	30.00
280 mi. gal. watering base and surf. courses	2.50	1.50	2.50	2.50	1.50
920 cu. yd. binder	.50	.20	.75	.50	.30
5.974 mi. reconditioning existing roadbed	150.00	100.00	150.00	125.00	75.00
13,200 tons cr. gr. surf. course ¾-in. max. (alt.)	1.18	1.28	1.15	2.00	1.30
13,200 tons cr. rk. surf. course ¾-in. max. (alt.)	....	....	1.50	2.25	1.30
2,000 tons cr. gr. in stockpile ¾-in. max. (alt.)	1.18	.98	.80	1.50	1.20
2,000 tons cr. rk. in stockpile ¾-in. max. (alt.)	....	....	1.00	1.85	1.20
660 bbls. MC-1 liquid asph. prime coat	5.00	4.59	5.50	5.00	5.00
600 bbls. MC-3 liquid asph. seal coat	5.00	4.59	5.50	5.00	4.75
1,450 tons cover coat matl. cr. gr. ¾-in. max. (alt.)	1.75	2.50	2.50	2.25	2.00
1,450 tons cover coat matl. cr. rk. ¾-in. max. (alt.)	....	....	3.00	2.50	2.00
2,000 tons cover coat matl. cr. gr. Type "X" (alt.)	1.00	1.50	1.50	2.25	1.50
2,000 tons cover coat matl. cr. rk. Type "X" (alt.)	....	....	2.00	2.50	1.50

California—Riverside County—State—Grade and Surface

Arthur A. Johnson, Laguna Beach, submitted the low bid to the California Division of Highways, Sacramento, for the construction of 15 mi. of roadway on Route 146 between Imperial County line and 6 mi. north of Route 64. The bid submitted was $109,581. Summary of the unit bids are as follows:

(1) Arthur A. Johnson $109,581
(2) R. R. Hensler 110,055
(3) Norman I. Fadel 114,535
(4) Dimmitt & Taylor 115,687
(5) Peter L. Ferry & Sons $117,447
(6) Frontier Const. Co. 121,877
(7) Tanner Construction Co. 142,662

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
22,500 cu. yd. imported base material	2.00	2.00	1.95	1.30	2.10	2.20	2.75
550 M. gal. furnishing and applying water	3.00	4.00	6.00	4.00	4.00	3.50	2.75
12,300 cu. yd. mineral aggregate (R.M.S.)	2.00	2.10	1.95	3.00	2.45	2.55	2.75
1,375 tons liquid asph., MC-3 or 4 (R.M.S., Pr. Ct., Sl. Ct.)	18.00	17.00	17.00	21.00	17.50	18.50	20.00
177,500 sq. yd. mixing and compacting R.M.S.	.0575	.06	.10	.085	.06	.06	.08
750 cu. yd. sand (seal coat)	4.50	4.00	3.00	4.50	4.20	4.00	5.00

Montana—Dawson County—State—Surface

Big Horn Construction Co., Sheridan, Wyo., offered the low bid of $37,320 to the State Highway Commission, Cheyenne, for the reconditioning of 19 miles of SR No. 14 between Glendive and Sidney. Summary of the unit bids received follows:

(1) Big Horn Construction Co. $37,320
(2) Inland Construction Co. 37,850
(3) Union Construction Co., Inc. 39,670
(4) McLaughlin, Inc. $41,400
(5) Commission's estimate 33,555

	(1)	(2)	(3)	(4)	(5)
75,000 gal. appl. MC-3 cutback asph.	.15	.15	.14	.14	
75,000 gal. seal coat oiling (150-200 asph.)	.14	.15	.13	.13	
2,000 cu. yd. placing st. furn. grav. in surf. tr.	1.50	2.20	3.00	2.50	Total
2,500 cu. yd. placing st. furn. grav. in cover	2.90	2.40	3.00	3.50	only
340 hr. blading	8.00	7.50	8.00	10.00	
400 hr. rolling	6.50	6.00	8.00	10.00	

California—Alameda County—State—Grade and Surface

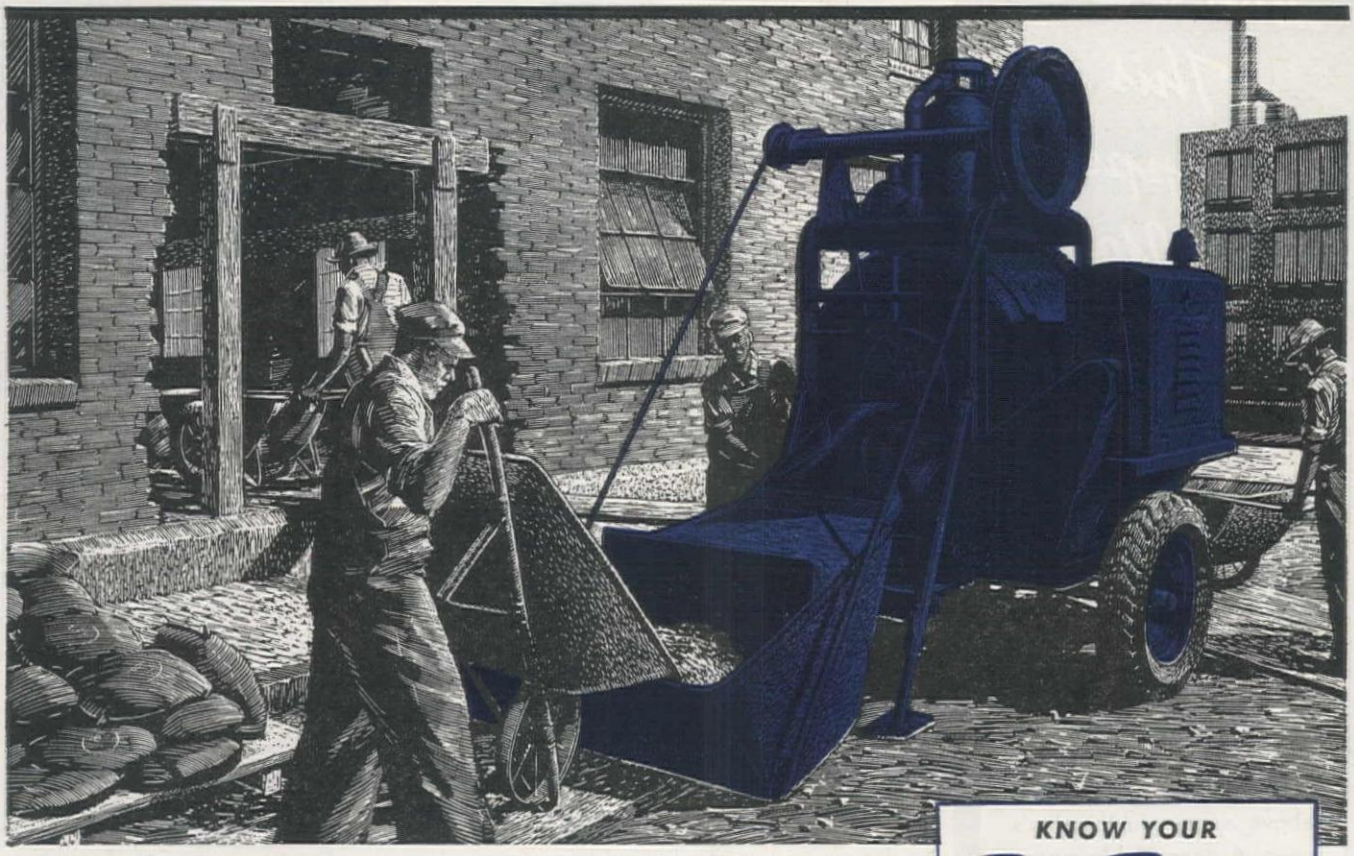
Fredrickson & Watson Construction Co., Oakland, offered the lowest bid of $147,179 to the California Division of Highways, Sacramento, for the construction of an access road from Maitland Drive to Earhart Road in the Auxiliary Naval Air Station, Oakland Airport, about 1.2 miles in length to be graded or surfaced with plant-mixed surfacing or crusher run base. Unit bids received are as follows:

(1) Fredrickson & Watson Construction Co. $147,179
(2) Lee J. Immel $154,777
(3) N. M. Ball Sons 164,249

	(1)	(2)	(3)
30 cu. yd. removing concrete	5.80	14.00	6.00
Lump sum, clearing and grubbing	520.00	140.00	$1,500
2,000 cu. yd. roadway excavation	.58	.40	.50
600 cu. yd. ditch and channel excavation	1.70	.80	1.50
12,000 tons imported base material	1.99	2.00	1.90
Lump sum, dev. water supply and furn. water equip.	230.00	400.00	$1,000
65 sta. finishing roadway	5.80	10.00	10.00
4,000 tons crusher run base	2.50	2.15	2.50
47 tons liq. asphalt MC-1 (pr. ct. and pen. tr.)	23.00	19.00	20.00
75 tons sand (pen. tr.)	4.00	4.00	5.00
2,400 tons mineral aggregate (P.M.S.)	4.45	4.50	4.00
120 tons paving asphalt (P.M.S.)	17.00	15.00	16.00
8 tons asphaltic emulsion (pt. binder and seal coat)	26.00	22.00	30.00
0.5 MFBM dense select all-heart struc. rdwd. timber	230.00	300.00	150.00
3 cu. yd. Class "A" P.C.C. (structures)	29.00	60.00	60.00
100 lin. ft. furnishing timber piles	.70	1.00	2.00
4 each driving piles	60.00	100.00	200.00
3,250 tons light stone riprap	3.50	3.20	4.50
8 cu. yd. Class "A" P.C.C. (curbs, gutters and sidewalks)	26.00	23.00	50.00

(Continued on next page)

BETTER CONCRETE FROM ACCURATE WATER CONTROL



Only Ransome Blue Brute mixers, large and small, have all metal spiral cut-offs in the water tank and non-by-passing valves for accuracy of water measurement throughout the life of the mixer.

There are many other reasons why Ransome Blue Brute Mixers have the reputation of making the best concrete at the lowest over-all cost, such as the famous Ransome mixing action perfected during 95 years' experience. The drum tracks of all Ransome mixers are made of high carbon steel for maximum resistance to wear; machined to a true circle after being welded to the drum. Drum rollers of tough car wheel metal, are equipped with double Timken bearings for permanent alignment to assure a smooth-running, long-lived machine with minimum maintenance.

For further details, read Bulletin *No. 181,* available from your nearby Worthington-Ransome Dealer or Blue Brute headquarters.

RB-16

BUY BLUE BRUTES

KNOW YOUR BLUE BRUTES

Your Blue Brute Distributor will gladly show you how Worthington-Ransome Blue Brute construction equipment will put your planning on a profitable basis and prove that *there's more worth in Worthington-Ransome.* Act now! His name is listed on page 00. The number beside his name indicates the Blue Brutes he handles.

1.
Blue Brutes include: Pavers, Concrete Spreaders**, Concrete Mixers, Concrete Placing Equipment, Big Mixers, Finishing Machines**, Pneumatic Placing & Grouting Equipment, Truck Mixers, Plaster & Bituminous Mixers, and accessories.

2.
Blue Brutes also include: Diesel, gasoline and electric driven Portable Compressors from 60 to 500 cu. ft. capacity in mountings to suit all jobs; Rock Drills and Air Tools in a wide range of weights and sizes; Contractors' Pumps.**

**Postwar Products

Truck Mixers
Capacities:
2, 3, 4½, 5½ cu. yds.

Portable Mixers
Capacities:
3½, 7, 10, 14 cu. ft.

Big Stationary Mixers
Capacities:
28, 56, 84, 126 cu. ft.

Pneumatic Placer
Capacity:
7, 14, 28 cu. ft.

WORTHINGTON

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

12 ea. culvert markers	3.50	3.50	4.00
100 ea. guide posts	4.00	4.50	4.00
Lump sum, drive gate and wing fence	185.00	150.00	500.00
18 lin. ft. 12-in. R.C.P.	2.00	3.50	3.00
36 lin. ft. 15-in. R.C.P.	2.50	3.60	3.60
72 lin. ft. 21-in. R.C.P.	3.40	3.70	4.60
1 ea. 12-in. automatic drainage gate	43.00	40.00	25.00
1 ea. 18-in. automatic drainage gate	49.00	45.00	30.00
2 ea. 24-in. automatic drainage gates	73.00	50.00	40.00
250 lbs. bar reinf. steel	.07	.10	.07
72,000 tons imported borrow	1.06	1.20	1.26
600 cu. yd. structure excavation	2.00	4.00	2.00
1,500 M. gal. apply water	2.25	1.50	1.50
2.5 MFBM bulkhead struc. rdwd. timber	230.00	300.00	150.00
64 lin. ft. 18-in. R.C.P.	3.00	4.00	3.00
128 lin. ft. 24-in. R.C.P.	3.90	4.20	4.00

Bridge and Grade Separation . . .

Wyoming—Sheridan County—State—Steel and Conc.

N. A. Nelson Co., Sheridan, Wyo., submitted the lowest bid to the Wyoming Highway Department, Cheyenne, for the construction of a steel-concrete bridge consisting of two 39-ft. and one 48-ft. I-beam spans over Little Goose Creek and 12 R.C. culverts on the 9 miles of road construction on the Sheridan-Buffalo highway. Unit bids received are listed as follows:

(1) N. A. Nelson Co. $63,211
(2) E. E. Peterson 63,785
(3) Geo. M. Carruth 63,967
(4) Blanchard Bros. $65,286
(5) Big Horn Construction Co. 68,467
(6) Engineers' Estimate 65,025

	(1)	(2)	(3)	(4)	(5)	(6)
500 cu. yd. sta. overhaul	.015	.015	.015	.015	.015	.015
850 cu. yd. structure excavation	1.75	2.00	1.00	2.00	1.50	2.00
460 hr. mechanical tamping	3.50	4.00	3.00	4.60	4.00	3.50
205 cu. yd. Class I riprap	5.00	7.00	5.00	6.25	5.00	6.00
40 cu. yd. grouted riprap	8.00	12.00	10.00	9.00	11.00	10.00
Lump sum, removing existing structures	200.00	$1,500	250.00	$1,000	100.00	500.00
1,000 cu. yd. excavation (for detours)	2.00	.50	1.00	.30	.44	.50
1267.1 cu. yd. Class A concrete	25.50	25.00	24.00	26.50	29.50	27.00
134.9 cu. yd. Class AA concrete	30.00	26.00	40.00	27.00	34.00	28.00
146,100 lb. reinforcing steel	.065	.065	.06	.065	.07	.07
100,020 lb. structural steel	.09	.09	.125	.0985	.09	.08
110 cu. yd. dry excavation for bridges	2.00	3.00	3.00	2.00	1.50	2.00
330 cu. yd. wet excavation for bridges	4.50	7.00	5.00	5.25	6.00	8.00

Idaho—Twin Falls County—State—Reflooring

Dan J. Cavanagh, Twin Falls, submitted the lowest bid of $129,861 to the Bureau of Highways, Boise, for the reflooring of Rim-to-Rim Bridge over Snake River and constructing 806 lin. ft. of approaches on US Highway No. 93 in Twin Falls and Jerome Counties. Unit bids are as follows for this project:

(1) Dan J. Cavanagh $129,861
(2) Morrison-Knudsen Co. 131,128
(3) Engineer's estimate $92,608

	(1)	(2)	(3)
128 lin. ft. remove guard rail	2.50	.75	.40
350 cu. yd. unclassified excav.	7.50	3.00	2.00
150 mi. yd. haul	1.00	.20	1.00
35 cu. yd. cr. gr. for shldrs. ¾-in. max., L.H.P.	1.50	1.75	1.00
1½ days rolling, power roller	90.00	40.00	50.00
6 mi. gal. watering base and surf. courses	10.00	2.00	5.00
80 cu. yd. gr. surfacing, ¾-in. max. L.H.W.	1.50	1.25	1.00
200 cu. yd. gr. surfacing, ¾-in. max. L.H.P.	1.50	1.50	1.00
6 bbls. liquid asphalt prime coat MC-1	10.00	7.00	6.00
6 bbls. liquid asphalt for seal coat MC-5	10.00	7.00	6.00
15 cu. yd. cover coat material Type "B"	8.00	7.50	4.25
0.153 mi. mixing, finishing and rolling	$1,000	750.00	$1,000
40 bbls. liquid asphalt for road mix MC-3	8.00	7.00	6.00
144 lin. ft. construct guard rail Type "A"	6.00	1.00	2.75
700 lin. ft. reconstruct guard rail Type "B"	6.00	1.75	1.50
Lump sum, steel bridge deck	$91,850	$101,400	$67,800
Lump sum, removal of bridge timber	$8,000	$7,850	$7,000
440 cu. yd. concrete Class "E"	45.00	40.00	32.00
16 bbls. liquid asphalt prime coat MC-1	8.00	7.00	6.00
27 bbls. liquid asphalt seal coat MC-5	8.00	7.00	6.00
41 cu. yd. cover coat material Type "B"	8.00	7.50	4.25

Irrigation . . .

California—Fresno County—Bureau of Reclam.—Earthwork & Structs.

Peter Kiewit Sons Co., San Francisco, Calif., submitted the lowest bid of $1,163,340 for the construction of earthwork, concrete lining, and structures of Friant-Kern Canal from Sta. 6 plus 10 to 301 plus 60. The following bids and unit prices were submitted to the Bureau of Reclamation office in Friant, Calif.

(A) Peter Kiewit Sons Co. $1,163,340
(B) Rhodes Bros. & Shofner 1,246,710
(C) S. A. Healy Company 1,295,010
(D) Guy F. Atkinson Company 1,346,885
(E) Larsen Bros. & Harms Bros. 1,376,120
(F) Morrison-Knudsen Co., Inc. 1,487,776
(G) Griffith Company 1,565,595
(H) N. M. Ball Sons $1,649,919
(I) Grafe-Callahan Const Co., Gunther & Shirley Co., Mark C. Walker & Sons Co. 1,780,580
(J) E. B. Bishop, L. E. Dixon Co., The Arundel Corp. 1,798,800
(K) Ralph A. Bell 1,994,270

(1) 613,000 cu. yd. excav., common, for canal
(2) 767,000 cu. yd. excav., rock, for canal
(3) 166,000 sta. cu. yd. overhaul
(4) 116,000 cu. yd. compacting embankments
(5) 4,000 cu. yd. excav., common, for drainage channels and dikes
(6) 5,000 cu. yd. excav., rock, for drainage channels and dikes
(7) 3,200 cu. yd. excav., common, for structs.
(8) 4,000 cu. yd. excav., rock, for structs.
(9) 143,000 sq. yd. preparing rock foundations for conc. lining
(10) 155,000 sq. yd. trimming earth foundation for conc. lining
(11) 4,000 cu. yd. backfill
(12) 2,000 cu. yd. compacting backfill
(13) 1,100 cu. yd. concrete in structs.
(14) 28,800 cu. yd. conc. in canal lining
(15) 1,300,000 lb. placing reinforcement bars
(16) 100 sq. yd. dry-rock paving
(17) 165,000 lb. erecting structural steel in bridge
(18) 75 M.F.B.M. erecting timber in structs.

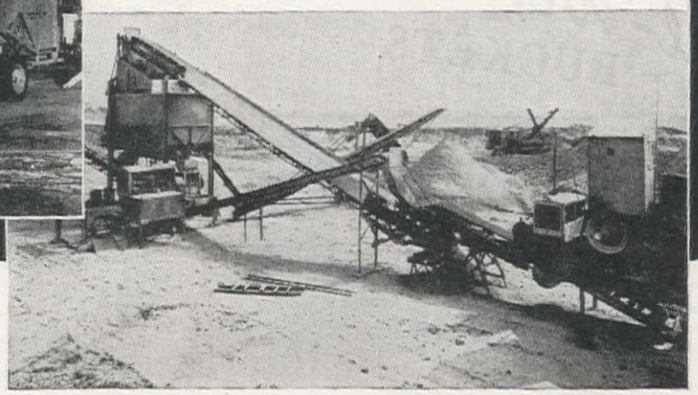
(Continued on next page)

Here Today (Producing 1,026-tons aglime, daily average)

Day after day this versatile Universal portable crushing plant turns out 100 to 114-tons of aglime for L. T. Renner of Rock Falls, Illinois. With a simple 15-minute adjustment both aglime and road rock can be produced without changing the screens. Plant consists of a 546-P primary crushing unit with 20″ x 36″ jaw crusher and 36″ x 8′ apron feeder, secondary pulverizer, 4′ x 12′ double deck screen, 3 compartment bin (lime, rock and surge compartments), conveyors.

gone tomorrow! (Moved on a moment's notice).

With all the ruggedness and stability of a lifelong permanent installation, this Universal engineered plant can be quickly moved to a new location. Primary and secondary units and bin with screens are built on chassis, on which pneumatic-tired wheels are readily installed. Renner gets flexibility of product, lowest cost per yard of finished material and mobility of entire plant. Send for further facts.



Universal Engineering Corporation
323 8th St., West, Cedar Rapids, Iowa

Photos courtesy Eighmy Equipment Co., Rochelle, Ill.—another "live wire" Universal dealer!

ARMY E NAVY

UNIVERSAL

ROCK AND GRAVEL CRUSHERS, CRUSHING ROLLS, HAMMER MILLS, COMPLETE CRUSHING AND SCREENING PLANTS, WASHING PLANTS, ASPHALT PLANTS, SPREADERROLLERS.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
(1)	.44	.53	.30	.58	.58	.19	.70	.74	.71	.84	.90
(2)	.44	.53	.80	.58	.58	.84	.70	.74	.71	.84	.90
(3)	.01	.05	.02	.045	.02	.022	.015	.02	.02	.02	.015
(4)	.30	.20	.06	.24	.25	.25	.22	.25	.22	.15	.16
(5)	.85	1.50	.50	1.75	2.00	1.63	.50	3.00	.86	2.00	1.60
(6)	.85	1.50	1.75	1.75	2.00	1.63	2.00	3.00	1.45	2.00	1.60
(7)	3.20	2.50	1.40	3.00	2.00	.77	2.00	4.50	4.25	3.00	2.70
(8)	3.20	2.50	2.20	3.00	2.00	8.95	4.50	4.50	8.50	3.00	2.70
(9)	.53	.32	.60	.50	.35	1.10	.81	.70	1.25	.56	.56
(10)	.53	.32	.40	.50	.35	.55	.27	.70	.30	.56	.56
(11)	1.00	.30	.45	.50	.50	.29	.55	2.00	.45	.50	.30
(12)	2.60	.60	1.00	2.50	1.00	1.30	2.00	2.00	3.50	1.25	1.00
(13)	36.00	34.00	30.00	40.00	45.00	38.00	34.00	48.33	54.00	45.00	40.00
(14)	8.00	9.50	8.00	8.00	10.00	10.60	9.60	6.97	12.75	10.00	14.00
(15)	.03	.0225	.03	.025	.04	.03	.033	.04	.03	.04	.05
(16)	10.00	8.00	5.00	8.00	6.00	5.00	11.00	15.00	5.00	10.00	10.00
(17)	.04	.05	.03	.025	.04	.025	.045	.025	.05	.06	.04
(18)	70.00	70.00	50.00	80.00	80.00	59.00	80.00	65.00	70.00	100.00	100.00

Oregon—Deschutes County—Bureau of Reclamation—Structures

W. C. Thompson, San Francisco, Calif., submitted the lowest offer of $245,290 to the U. S. Bureau of Reclamation, Bend, Oregon, for the construction of Lateral M-43 and sublaterals of the Deschutes Project located in central Oregon. The following unit bids were received on the quantities and work as outlined in Specification No. 1100.

(1) W. C. Thompson ..... $245,290 (2) E. B. Bishop $299,855

	(1)	(2)
145,000 cu. yd. excav., common, for laterals	.38	.50
1,000 cu. yd. excav., rock, for laterals	2.75	.50
7,000 sta. cu. yd. overhaul	.05	.05
1,400 cu. yd. compacting embankments	.40	.50
16,000 cu. yd. excav., common, for structures	.90	1.00
250 cu. yd. excav., rock, for structures	4.00	1.00
11,500 cu. yd. backfill	.40	.50
6,000 cu. yd. compacting backfill	1.00	1.00
3,550 cu. yd. concrete in structures	37.50	46.00
264,000 lb. placing reinforcement bars	.04	.055
400 sq. yd. dry-rock paving	5.00	6.00
73 M.B.M. erecting timber in structures	65.00	75.00
2,460 lin. ft. laying 18-in. conc. pipe	1.30	2.00
730 lin. ft. laying 24-in. conc. pipe	1.75	2.00
240 lin. ft. laying 30-in. conc. pipe	2.25	2.50
45 lin. ft. laying 36-in. conc. pipe	3.00	4.00
33,000 lb. installing gates and miscl. metalwork	.15	.15

Airport . . .

Nevada—Lander County—Civil Aeronautics Adm.—Runways

H. W. Polk, Glendale, Calif., offered the low bid of $439,295 to the Civil Aeronautics Administration for the construction of one runway, including clearing, grading, draining, paving, and lighting, at Battle Mountain, Nevada. Schedule of work quantities and unit bids submitted are as follows:

(A) H. W. Polk $439,295
(B) Gibbons & Reed Co. 490,727
(C) Frontier Construction Co. and Bert Calvert 500,353
(D) Carl E. Nelson Co. 535,807
(E) Bryce Trucking and Const. Co. $540,001
(F) Isbell Construction Co. 553,749
(G) Morrison-Knudsen Co., Inc. 566,638
(H) Theo. Scott (Schedule 3 only) 5,758

SCHEDULE I
Preparation of Site

(1) 86 acres clearing and grubbing
(2) 74,000 cu. yd. grading, unclassified
(3) 12,500 cu. yd. borrow excav., unclassified
(4) 101,000 cu. yd. borrow, selected, in place
(5) 5,000 M. gallons watering
(6) 150 sq. yd. erosion protection, grouted riprap
(7) 12,350 lin. ft. fence, new class "D," 4-wire, wood posts
(8) 6,200 lin. ft. fence, relocate, similar to cl. "D"
(9) 1 cattle guard, wood, relocate
(10) 1 gate, 14-ft.
(11) furn. and install 3-in. fiber duct, type I conc. encased, including excav. and backfill
  (a) 624 lin. ft. 2-way bank, per ft. of run
  (b) 312 lin. ft. 4-way bank, per ft. of run
(12) remove 4 cone light bases and cables

SCHEDULE II
Paving Runways

(13) (a) 85,340 tons gravel sub-base, pit run
  (b) 2100 M. gallons watering
(14) (a) 61,000 tons gravel base, 2-in. size
  (b) 1500 M. gal. watering
  (c) 68,900 gal. liquid asph., grade MC-1 (base course)
(15) (a) 15,400 tons asphaltic conc.
  (b) 1000 tons asphaltic conc., special
  (c) 985 tons paving asphalt, 120-150 pene.
  (d) 34,000 gal. liquid asph., grade RC-2, seal coat
  (e) 1020 tons mineral aggre., seal coat
  (f) traffic tests—rolling 37,000-lb. wheel load —first 25 hr.
  (g) 100 hr. traffic tests—addtl. hr.

SCHEDULE III
Lighting

(16) (a) 16,400 lin. ft. trench and backfill, 18 in. deep
  (b) 17,000 lin. ft. install cable, including necessary splices in trench or duct
(17) (a) 50 each, install and connect series cone lights
  (b) 10 ea., install and connect series flush lights

SCHEDULE IV
E-W and N-S Taxiway and Concrete Warm-Up Aprons

(18) 69 ac. clearing and grubbing
(19) 31,500 cu. yd. grading
(20) 35,000 cu. yd. borrow, unclass
(21) 1000 M. gallons watering
(22) 1400 lin. ft. 12-in. reinf. conc. pipe
(23) 10 cu. yd. conc. for headwalls
(24) 800 cu. yd. structural excav.
(25) furn. and install 3-in. fiber duct, type I, conc. encased, including excav. and backfill
  (a) 504 lin. ft. 2-way bank
  (b) 210 lin. ft. 4-way bank
(26) (a) 3,333 sq. yd. plain conc. pavement, warm-up apron
  (b) 75 ea., tie-down anchors
(27) (a) 39,000 tons gravel sub-base pit run
  (b) 1000 M. gal. watering
(28) (a) 22,300 tons gravel base, 2-in. size
  (b) 550 M. gal. watering
  (c) 27,000 gal. liquid asph., grade MC-1 (base course treatment)
(29) (a) 5,300 tons asphaltic conc.
  (b) 370 tons asphaltic conc., special
  (c) 540 tons paving asph., 120-150 pene.
  (d) 13,000 gal. liquid asph. grade RC-2, seal coat
  (e) 315 tons mineral aggre., seal coat.

Schedule 1—	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
(1)	32.50	25.00	22.60	30.00	100.00	25.00	25.00	.....
(2)	.28	.35	.435	.32	.47	.45	.40	.....
(3)	.49	.44	.475	.40	.47	.45	.65	.....
(4)	.59	.75	.71	.98	.60	.60	.65	.....
(5)	1.25	1.75	2.00	2.00	2.50	1.50	1.50	.....
(6)	4.10	6.50	6.00	4.00	4.00	10.00	4.00	.....
(7)	.27	.35	.23	.18	.23	.20	.20	.....

(Continued on next page)

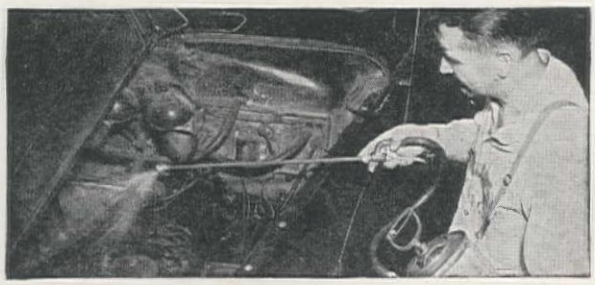
Kelite Simplifies Maintenance

By FASTER, EASIER CLEANING

STUBBORN grease and oil roll away when sprayed with Kelite Pro-Star. Dried-on crude oil and tar are removed by spraying with Pro-Star and steam cleaning with Kelite KDL No. 24.

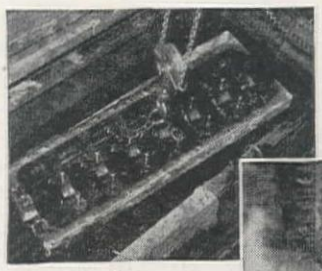
KDL No. 24 cleans rapidly, thoroughly, economically ... does not form scale, scum or curds. Stable at all temperatures up to 500° F. ... odorless ... free rinsing.

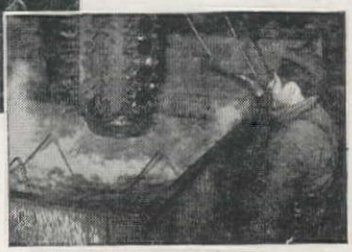
Spray of Kelite Protexol penetrates and loosens greasy deposits so they can



be rinsed off easily. Use Protexol on engines, machinery, tools, fittings, shop floors, cement driveways, lube racks, painted surfaces ... wherever oil, grease and dirt accumulate.

A simple, cold soak in Kelite Ketrex removes oil, grease, light carbon. Kelite Super Ketrex penetrates and loosens sludge and carbon for easy rinse-off.





Speed and economy of hot tank operations are improved by specialized Kelite materials with the high pH needed for rapid, thorough action. Kelite G-Stripper takes off paint in a hurry. Kelite No. 158 removes heavy petroleum deposits; widely used for cleaning greasy concrete floors.

Ask your local Kelite Service Engineer to show you how Kelite materials with pH Control can save you time and money in cleaning, or write: Kelite Products, Inc., 909 E. 60th St., Los Angeles 1, Cal.

(8)	.20	.26	.23	.10	.27	.15	.15	.....
(9)	650.00	850.00	680.00	500.00	660.00	500.00	750.00	.....
(10)	200.00	60.00	135.00	50.00	110.00	25.00	50.00	.....
(11)(a)	3.60	3.00	2.00	2.50	1.60	3.00	3.25	.....
(b)	6.00	4.90	3.05	3.50	2.15	5.00	6.35	.....
(12)	100.00	360.00	135.00	500.00	300.00	300.00	75.00	.....
Schedule 2—								
(13)(a)	.68	.55	.55	.75	.78	.60	.72	.....
(b)	1.25	1.75	2.00	2.00	2.50	1.50	1.50	.....
(14)(a)	.80	1.20	1.05	1.30	1.30	1.75	1.70	.....
(b)	1.25	1.75	2.00	2.00	2.50	1.50	1.50	.....
(c)	.10	.11	.115	.11	.12	.10	.10	.....
(15)(a)	2.40	3.10	3.27	2.60	3.40	3.25	3.80	.....
(b)	7.00	5.45	5.44	4.00	4.35	8.00	4.35	.....
(c)	25.00	22.00	24.00	23.00	20.50	22.00	20.00	.....
(d)	.11	.12	.115	.10	.13	.10	.12	.....
(e)	4.00	3.40	4.50	3.00	5.00	5.00	4.00	.....
(f)	$1,000	$2,400	$2,430	$3,000	375.00	$4,000	250.00	.....
(g)	10.00	16.00	20.40	20.00	14.00	25.00	10.00	.....
Schedule 3—								
(16)(a)	.15	.12	.30	.20	.06	.30	.20	.17
(b)	.17	.12	.15	.07	.03	.10	.04	.04
(17)(a)	50.00	50.00	13.60	25.00	30.00	87.50	22.50	38.00
(b)	100.00	50.00	34.00	50.00	30.00	110.00	35.00	39.00
Schedule 4—								
(18)	32.50	25.00	22.60	30.00	100.00	25.00	25.00	.....
(19)	.28	.35	.435	.32	.47	.45	.40	.....
(20)	.59	.44	.475	.40	.47	.45	.65	.....
(21)	1.25	1.75	2.00	2.00	2.50	1.50	1.50	.....
(22)	3.75	1.50	4.08	2.50	3.50	2.50	4.00	.....
(23)	60.00	60.00	68.00	50.00	25.00	60.00	40.00	.....
(24)	1.00	2.00	2.00	2.00	1.00	2.00	1.00	.....
(25)(a)	3.60	3.00	2.00	2.50	1.60	3.00	3.25	.....
(b)	6.00	4.90	3.05	3.50	2.15	5.00	6.35	.....
(26)(a)	4.00	3.00	4.00	4.75	2.00	4.30	4.50	.....
(b)	2.00	1.00	1.36	2.00	2.00	3.00	2.00	.....
(27)(a)	.80	.55	.55	.75	.78	.60	.72	.....
(b)	1.25	1.75	2.00	2.00	2.50	1.50	1.50	.....
(28)(a)	.75	1.20	1.05	1.30	1.30	1.75	1.70	.....
(b)	1.25	1.75	2.00	2.00	2.50	1.50	1.50	.....
(c)	.10	.11	.115	.11	.12	.10	.10	.....
(29)(a)	2.40	3.10	3.27	2.60	3.40	3.25	3.80	.....
(b)	7.00	5.45	5.44	4.00	4.35	8.00	4.35	.....
(c)	25.00	22.00	24.00	23.00	20.50	22.00	20.00	.....
(d)	.11	.12	.115	.10	.13	.10	.12	.....
(e)	4.00	3.40	4.50	3.00	5.00	5.00	4.00	.....

Sewerage . . .

California—San Joaquin County—City—Sewer & Water

Steve P. Rados, Los Angeles, was awarded the contract on the low bid of $269,356 by the City of Tracy for the construction of a sanitary sewer and water improvements for the city. Total and unit bids received by the city are as follows:

(A)	Steve P. Rados	$269,356	(E)	Stroud-Seabrook	$325,400
(B)	R. Goold & Sons	271,398	(F)	Bebek & Brkich and P. & J. Artukovich	330,301
(C)	Tom Gogo	285,160	(G)	Artukovich Bros.	343,835
(D)	McGuire & Hester	323,835			

		(A)	(B)	(C)	(D)	(E)	(F)	(G)
	SEWER LINES							
(1)	2,504 lin. ft. 30-in. vitrified sewer pipe	8.50	8.06	7.80	12.85	8.50	9.00	11.00
(2)	10,132 lin. ft. 24-in. vitrified sewer pipe	7.00	5.13	6.00	7.15	8.00	7.25	8.35
(3)	994 lin. ft. 21-in. vitrified sewer pipe	5.90	4.44	5.30	6.60	5.50	6.75	7.75
(4)	3,448 lin. ft. 18-in. vitrified sewer pipe	5.50	3.84	4.50	5.20	6.00	6.00	6.50
(5)	920 lin. ft. 15-in. vitrified sewer pipe	3.54	3.32	3.00	4.10	4.40	5.00	6.00
(6)	1,718 lin. ft. 8-in. vitrified sewer pipe	1.70	2.11	1.50	2.90	3.10	3.00	2.75
(7)	31 ea., manholes	165.00	115.00	160.00	155.00	150.00	250.00	200.00
(8)	2 ea., drop manholes	200.00	172.50	180.00	170.00	160.00	300.00	250.00
(9)	1 ea., bypass manhole	320.00	212.75	230.00	425.00	250.00	500.00	250.00
(10)	10 ea., 24x6-in. wyes	7.41	21.28	4.00	6.00	20.00	14.00	12.50
(11)	56 ea., 18x6-in. wyes	4.80	14.78	3.50	5.00	10.00	9.00	7.50
(12)	16 ea., 15x6-in. wyes	3.09	12.19	2.50	4.00	8.00	6.50	4.00
(13)	26 ea., 8x6-in. wyes	2.06	5.58	1.00	2.00	3.00	2.50	1.50
(14)	2,308 lin. ft. 48-in. RC pipe, effluent line	14.55	13.74	17.00	16.70	25.00	25.00	25.00
(15)	9 ea., manholes	262.00	427.30	300.00	300.00	250.00	400.00	350.00
(16)	1 outlet structure	500.00	459.79	800.00	1,560	1,000	1,200	750.00
(17)	Lump sum, settling and oxidizing ponds	48,000	78,458	75,000	66,700	72,000	72,000	62,000
	MAIN EXTENSION							
(18)	255 lin. ft. 16-in. cast iron pipe	6.90	6.57	8.00	9.70	6.50	8.50	9.45
(19)	1,150 lin. ft. 12-in. cast iron pipe	4.50	4.82	4.80	5.80	4.50	4.60	4.80
(20)	4,580 lin. ft. 10-in. cast iron pipe	4.50	4.22	4.00	5.60	4.20	3.65	4.20
(21)	2,605 lin. ft. 8-in. cast iron pipe	2.50	3.35	3.20	4.50	2.75	3.00	3.72
(22)	1,430 lin. ft. 6-in. cast iron pipe	2.00	2.78	2.00	3.65	2.00	2.30	2.85
(23)	100 lin. ft. 4-in. cast iron pipe	1.00	2.12	1.90	2.65	1.55	2.00	2.40
(24)	15 ea., hydrants	125.00	124.61	140.00	135.00	150.00	160.00	150.00
(25)	1 16x16x12x12-in. C.I. cross	150.00	113.91	125.00	175.00	225.00	192.00	155.00
(26)	1 16x12x16x6-in. C.I. cross	235.00	189.11	215.00	270.00	45.00	302.00	240.00
(27)	1 12x12x6x6-in. C.I. cross	65.00	70.55	45.00	80.00	45.00	83.00	67.00
(28)	1 12x10x10x8-in. C.I. cross	120.00	113.34	85.00	118.00	90.00	135.00	110.00
(29)	1 10x10x8x8-in. C.I. cross	75.00	64.92	38.00	160.00	30.00	72.00	60.00
(30)	1 10x10x6x6-in. C.I. cross	65.00	61.90	35.00	80.00	25.00	76.50	50.00
(31)	3 ea., 8x8x6x6-in. C.I. cross	60.00	55.29	32.00	75.00	20.00	50.00	40.00
(32)	2 ea., 8x8x4x4-in. C.I. cross	60.00	52.75	25.00	70.00	30.00	47.00	37.50
(33)	1 6x6x4x4-in. C.I. cross	45.00	46.79	18.00	60.00	30.00	40.00	25.00
(34)	10 ea., 10x10x6-in. tees	60.00	51.66	30.00	90.00	30.00	52.00	47.00
(35)	1 10x10x4-in. tee	60.00	50.60	30.00	75.00	30.00	51.00	45.00
(36)	3 ea., 10x8x10-in. tees	80.00	71.42	50.00	100.00	50.00	75.00	65.00
(37)	1 10x8x4-in. tee	80.00	66.77	45.00	100.00	50.00	69.00	57.50
(38)	1 8x8x8-in. tee	50.00	47.00	27.00	150.00	27.00	41.00	35.00
(39)	5 ea., 8x8x6-in. tees	50.00	45.05	25.00	75.00	27.00	40.00	35.00
(40)	2 ea., 8x8x4-in. tees	50.00	43.83	24.00	65.00	23.00	36.50	32.50
(41)	3 ea., 6x6x6-in. tees	40.00	39.33	20.00	60.00	20.00	27.00	25.00
(42)	3 ea., 4x4x4-in. tees	35.00	33.78	15.00	140.00	15.00	20.00	15.00
(43)	1 16-in. gate valve	350.00	232.71	225.00	250.00	225.00	285.00	300.00
(44)	1 12-in. gate valve	250.00	128.43	110.00	160.00	125.00	155.00	175.00
(45)	8 ea., 10-in. gate valve	125.00	95.45	80.00	115.00	90.00	122.00	125.00
(46)	5 ea., 8-in. gate valve	95.00	60.38	55.00	80.00	70.00	79.00	100.00

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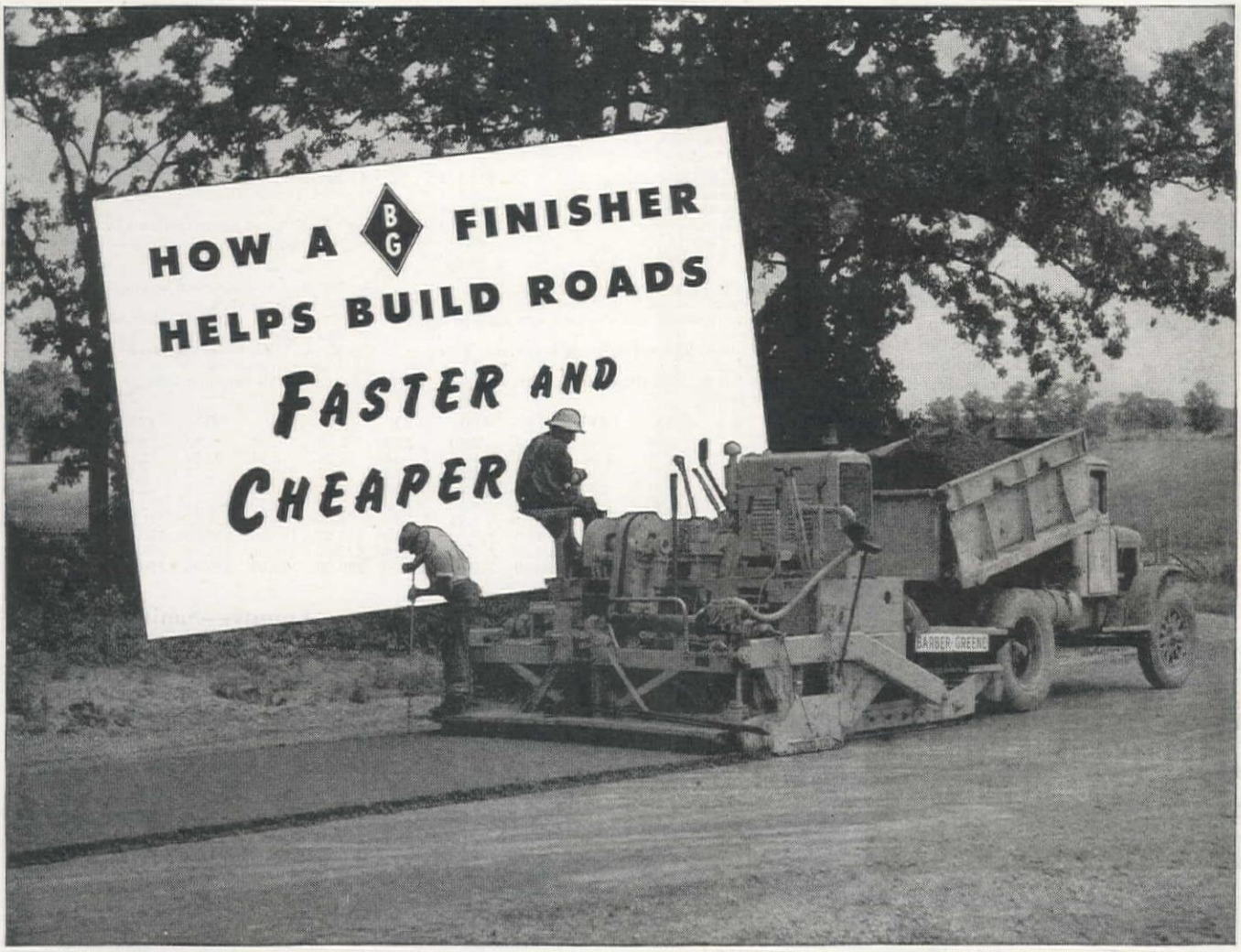


• Here's a machine that performs three jobs at once. And you can keep it moving steadily—all day long. In rapid succession, truckloads of asphalt mix are mechanically spread . . . "kneaded" and thoroughly *tamped* in place . . . and automatically leveled—all in one operation.

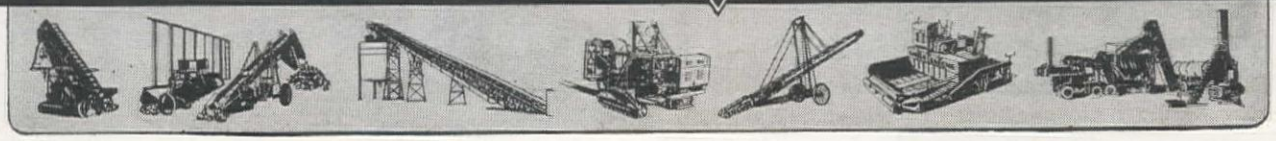
Moreover, the Barber-Greene Tamping-Leveling Finisher helps provide fast, cheap road construction by reducing the amount of rolling for adequate compaction . . . eliminating hand labor behind the machine . . . decreasing truck delay . . . cutting out the hazards encountered in other methods.

You'll find that a B-G Finisher saves days and dollars on every black top paving job. It handles mixes extremely difficult or impossible to lay by other means . . . maintains a mat of uniform thickness, ranging from ¼-inch to 6 inches . . . holds an accurate crown . . . and tightly seals joints with adjacent strips.

Before the call comes for the hurry-up resurfacing of worn-out highways, and the speedy construction of new roads and airports, plan to add a B-G *Tamping-Leveling* Finisher to your equipment. Write for literature outlining the functions and performance of this versatile machine. Barber-Greene Company, Aurora, Illinois.

45-B

Barber-Greene B G *Constant Flow Equipment*



(47)	20 ea., 6-in. gate valve	65.00	41.69	35.00	50.00	40.00	57.50	60.00
(48)	3 ea., 4-in. gate valve	45.00	28.18	25.00	35.00	15.00	40.00	30.00
(49)	39 ea., C.I. valve boxes	20.00	18.40	10.00	15.00	10.00	15.00	10.00
(50)	1 pump house and desilting unit	4,800	3,947	5,910	4,750	2,900	4,500	5,500

California—Los Angeles County—County—Sanitary

Burch & Bebek, Lynwood, offered the low bid of $57,535 to the Los Angeles County Board of Supervisors for the construction of 3.1 mi. of sanitary sewers in Lemoli and other streets. The follwing is a summary of total bids, work quantities and unit bids:

(A) Burch & Bebek.....$57,535
(B) B. D. Zaich & Sons..... 58,871
(C) B C & L Construction Co..... 59,604
(D) P. & J. Artukovich..... 61,693
(E) Tom L. Gogo 61,896
(F) V C K Construction Co..... 64,029
(G) Martin Construction Co.....$64,807
(H) Artukovich Bros. 65,498
(I) Leko & Radich 66,682
(J) Green-Mears Construction Co..... 68,913
(K) Peter S. Tomich 79,572

(1) 490 lin. ft. 10-in. extra strength vitr. clay pipe main sewer
(2) 1,050 lin. ft. 10-in. std. strength vitr. clay pipe main sewer
(3) 11,801 lin. ft. 8-in. extra strength vitr. clay pipe main sewer
(4) 13,690 lin. ft. 8-in. std. strength vitr. clay pipe main sewer
(5) 790 lin. ft. 6-in. extra strength vitr. clay pipe sewer connection
(6) 9,460 lin. ft. 6-in. std. strength vitr. clay pipe house connection sewer
(7) 57 ea., brick sewer structure
(8) 1 ea. trap manhole
(9) 1 ea. double trap manhole.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
(1)	3.00	2.40	2.40	2.50	2.70	2.38	3.00	3.00	3.00	2.60	3.55
(2)	2.75	2.25	2.30	2.40	2.50	2.23	2.90	2.50	2.60	2.50	3.30
(3)	2.25	2.10	2.20	2.10	2.60	2.13	2.70	2.75	2.50	2.40	2.75
(4)	1.75	1.90	1.94	2.00	2.00	2.10	2.10	2.17	2.30	2.20	2.98
(5)	2.00	1.90	1.77	2.00	1.80	2.03	2.10	2.50	2.30	2.15	2.15
(6)	1.75	1.80	1.74	1.75	1.80	1.98	1.80	1.85	1.80	2.10	2.05
(7)	140.00	140.00	150.00	165.00	150.00	150.00	160.00	150.00	150.00	175.00	155.00
(8)	200.00	160.00	200.00	250.00	250.00	175.00	250.00	175.00	300.00	250.00	175.00
(9)	250.00	175.00	250.00	300.00	250.00	200.00	300.00	250.00	350.00	275.00	225.00

California—Los Angeles County—County—Sanitary

Martin Construction Company, Montebello, submitted the lowest bid of $89,984 to the County Board of Supervisors, Los Angeles, for the construction of 4.3 mi. of sanitary sewers and appurtenances in Clara Street and adjacent streets. The following is a summary of bids received and unit prices for the work involved:

(1) Martin Construction Company.....$89,984
(2) B. D. Zaich & Sons..... 95,200
(3) Artukovich Bros. $96,331
(4) P. & J. Artukovich 98,489

600 lin. ft. 8-in. extra strength vitr. clay main sewer pipe	3.50	4.00	4.00	5.00
22,200 lin. ft. 8-in. std. strength vitr. clay sewer pipe	2.71	2.75	2.83	2.90
30 lin. ft. 6-in. extra strength vitr. connection sewer pipe	2.40	3.00	3.50	2.80
6,350 lin. ft. std. strength vitr. connection sewer pipe	2.00	2.60	2.50	1.70
91 ea., brick sewer structures	150.00	150.00	150.00	200.00
3 ea., trap manhole castings	200.00	250.00	225.00	350.00
2 ea., double trap manholes	250.00	300.00	300.00	365.00
2 ea., installing trap manhole castings	100.00	75.00	100.00	125.00

California—San Bernardino County—County—Disposal Plant

Paul Vukich Construction Co., Los Angeles, offered the low bid of $173,072 to the Board of Supervisors, San Bernardino, for the construction of sewage disposal facilities for the Loma Linda Sanitation District. The plant includes manually cleaned primary clarifier and digester, gas collection, standard trickling filter with recirculation and sludge drying beds. Summary of the bids received are as follows:

(1) Paul Vukich Construction Co.....$173,072
(2) P. & J. Artukovich 174,725
(3) J. S. Barrett..... 178,790
(4) J. J. Bakker.....$199,798
(5) Scherer & Prichard..... 237,367
(6) Martin Construction Co..... 247,859

	(1)	(2)	(3)	(4)	(5)	(6)
273 ft. 6-in. vitrified sewer pipe	2.00	1.80	2.05	2.75	2.10	3.00
30,303 ft. 8-in. vitrified sewer pipe	2.55	2.10	1.89	2.75	3.12	3.60
1,192 ft. 10-in. vitrified sewer pipe	2.69	2.55	2.10	2.75	3.64	4.30
754 ft. 15-in. vitrified sewer pipe	3.46	4.05	3.27	3.57	4.68	7.90
8,200 ft. 8-in. cement pipe underdrain	1.12	2.00	2.14	2.20	2.60	3.60
1,485 ft. 16-in. cement pipe underfall	2.76	2.00	1.87	4.12	3.90	8.40
Lump sum, 15-in. C.I. pipe	65.00	4.00	61.60	6.50	364.00	800.00
550 ft. backfill	1.55	3.00	2.70	4.40	1.60	2.50
50 ft. reinf. conc. encasement	20.00	6.00	10.16	11.00	3.30	3.00
122 manholes	150.00	140.00	234.75	137.50	160.00	180.00
Lump sum, sewage treatment plant	60,476	69,840	68,684	70,731	90,920	67,000

Dam...

California—Nevada County—Nevada Irrigation Dist.—Foundations

Guy F. Atkinson Co., San Francisco, submitted the low bid of $118,475 to the Nevada Irrigation District, Grass Valley, Calif., for the construction of first stage and foundation of Scotts Flat Dam, located approximately 4.5 mi. east of Nevada City. Total and unit bids received on the following work quantities are summarized:

(1) Guy F. Atkinson.....$118,475
(2) Guerin Bros. 142,300
(3) E. B. Bishop 164,350
(4) H. Earl Parker..... 174,250
(5) G. G. Clifford Construction Co. and Engle Construction Co. $193,830
(6) Frontier Construction Co. and Bert Calvert 250,262

	(1)	(2)	(3)	(4)	(5)	(6)
Diversion and care of stream flow and unwatering dam foundation	15,500	8,500	12,500	47,000	21,500	30,000
Excav. of approx. 110,000 cu. yd. of matl. for founda. dam	55,000	69,300	88,000	55,000	92,400	121,000
Excav. of approx. 600 cu. yd. of matl. for cut-off trench	1,050	6,000	3,000	3,000	6,000	6,000
Placing and compacting approx. 3,000 cu. yd. of selected clayey matl. in the impervious section	18,000	30,000	22,500	21,000	21,900	45,000
Placing and compacting approx. 5,000 cu. yd. of selected gravel and earth in the transitional section	3,000	2,500	3,750	3,500	3,650	7,550
Placing and consolidating approx. 60,000 cu. yd. of rock gravel and sand in pervious section	21,600	24,000	30,000	39,000	41,400	36,000
Drilling approx. 500 lin. ft. of grout holes in cut-off trench	2,000	500.00	1,500	2,500	2,850	1,000
Furn. and placing approx. 250 lb. of grout pipe and fittings	125.00	250.00	100.00	250.00	280.00	162.50
Placing of approx. 750 cu. ft. of pressure grouting	1,500	750.00	1,000	2,000	2,850	2,000
Excav. of approx. 2,000 cu. yd. matl. in remov. cofferdams	700.00	500.00	2,000	1,000	1,000	1,600

CONSTRUCTION SUMMARY

The following pages contain the most complete available tabulation of construction contracts awarded in the eleven western states during the past month. Except for certain instances, contracts amounting to less than $10,000 are not listed. Space is not available to list more than a small proportion of the proposed projects. For your convenience, all items are prepared in an identical manner to provide the following information: County of job location (capital letters); name and address of contractor (bold face); bid price; brief description of work; awarding agency; and approximate date of award. More detailed information on many of these projects is often available, and will gladly be furnished upon your request to the Editor, WESTERN CONSTRUCTION NEWS, 503 Market Street, San Francisco.

CONTRACTS AWARDED

Large Western Projects...

Walter L. Denison and **G. I. Martin,** Albuquerque, N. M., on a bid of $307,517 were awarded a contract for grading, drainage, preparation of subgrade, etc., on approximately 19.0 miles of U. S. Highway Route No. 62, between Hobbs and Lovington, N. M., by State Highway Dept., Santa Fe, N. M.

Haddock-Engineers, Ltd., Los Angeles, Calif., received a $816,000 contract for excavating imported borrow for the construction of runways, taxiways and lighting at the Naval Air Station, San Clemente Island, Calif., by Bureau of Yards and Docks, Washington, D. C.

Guy F. Atkinson Company, San Francisco, Calif., holds a $1,164,885 contract for earthwork, pipeline and structures from north station 0 plus 10 to north station 138 plus 86, San Diego Aqueduct, California, by Bureau of Yards and Docks, Washington, D. C.

S. A. Healy Co., Chicago, Ill., on a bid of $2,597,344 was awarded the contract for concrete pipe lines and structures from mile 46.8 to 71.3 of the San Diego, Calif., Aqueduct, by Bureau of Yards and Docks, Washington, D. C.

S. A. Healy Co., Chicago, Ill., was awarded a contract for $874,218 to construct the Rainbow, Lilac, Red Mountain and Oat Hill tunnels for the San Diego, Calif., Aqueduct, by Bureau of Yards and Docks, Washington, D. C.

Swinerton and Walberg Company, Los Angeles, Calif., received a $1,500,000 contract for alterations and additions involved in the reconversion of a South Gate, Calif., plant for the production of motor cars, by General Motors Corp., South Gate, Calif.

P. A. Weeger, Los Angeles, Calif., was awarded a $324,700 contract for a new primary school unit and a new kindergarten bldg. near Compton, and a new kindergarten bldg. at the existing McKinley School in the city of Compton, Calif., by Enterprise School District, Compton, Calif.

Robert E. McKee, Los Angeles, Calif., received a $1,353,000 contract for construction of a main hospital bldg. at the Veterans' Hospital at Reno, Nev., by Veterans' Administration, Washington, D. C.

Hal C. Dyer, Dallas, Tex., was awarded a contract for $600,000 for a stone and reinforced concrete, two-story and basement bldg. at Dallas, Tex., by Security National Fire Insurance Co., Dallas, Tex.

J. L. Hair Construction Co., Wichita Falls, Tex., received a $415,450 contract to construct a two-story senior high school bldg., at Odessa, Tex., by Board of Education, Odessa, Tex.

Lawless and Alford, Corpus Christi, Tex., on a bid of $478,707 received the contract for housing at the Naval Auxiliary Air Station, Kingsville, Tex., by Bureau of Yards and Docks, Washington, D. C.

Nelse Mortensen and Company, Seattle, Wash., received a contract at $1,450,000 for reconstruction of 1392 domitory units at

Bremerton, Wash., by Federal Public Housing Authority, Seattle, Wash.

Sound Construction and Engineering Co., and **Peter Kiewit Sons Co.,** Seattle, Wash., on their bid of $1,888,925 were awarded the contract to construct five storehouses with concrete block sidewalks, and other miscellaneous bldgs. at the U. S. Naval Depot, Spokane, Wash., by Bureau of Yards and Docks, Washington, D. C.

Highway & Street...

California

CONTRA COSTA CO.—**Lee J. Immel,** Box 65, Station A, Berkeley—$49,081 for improvement of Garrard Blvd., between Cutting Blvd. and Barrett Ave., Richmond—by City Council, Richmond. 8-29

KERN CO.—**Lewis Construction Co.,** 214 S. Vernon St., Los Angeles—$70,160 for about 12.2 mi. repairing by placing plant mix surfacing and applying seal coat thereto between 23.8 mi. east of Inyokern to Inyokern—by State Division of Highways, Sacramento. 8-7

KERN CO.—**Oilfields Trucking Co.,** Box 751, Bakersfield—$66,408 for about 4.7 mi. repairing with imported borrow base and road mix surfacing between Lost Hills and Wasco—by State Division of Highways, Sacramento. 8-23

LOS ANGELES CO. — **Benjamin C. Boydston,** 7434 Baird Ave., Reseda—$12,585 for additional paving and resurfacing at Birmingham General Hospital, Van Nuys—by U. S. Engineer Office, Los Angeles. 8-17

LOS ANGELES CO.—**Charles J. Dorfman,** 124 N. La Brea Ave., Los Angeles—$34,369 for highway improvements in the city of Burbank and in the county district between Orange Grove Ave. and San Bernardino Blvd., to be graded and surfaced with asphaltic concrete on existing surface and new crusher run base—by State Division of Highways, Sacramento. 8-17

LOS ANGELES CO.—**Griffith Co.,** 502 Los Angeles Railway Bldg., Los Angeles—$35,830 for addit. paving, resurfacing, stabilization and misc. construction at Roosevelt Base, Terminal Island—by Bureau of Yards and Docks, Washington, D. C. 8-6

LOS ANGELES CO.—**R. A. McAdam,** 7356 Kester Ave., Van Nuys—$12,725 for street improvements at the Alexander Hamilton High School, Los Angeles—by Board of Education, Los Angeles. 8-24

LOS ANGELES CO.—**T. E. Sherlock,** 1103 W. 40th Pl., Los Angeles—$23,549 for grading, paving and misc. improvements in the North Outfall sewer right-of-way and Cabora Dr., between 150-ft. west of Fordham Rd. and Falmouth Ave., Los Angeles—by Board of Public Works, Los Angeles. 8-3

MARIN CO.—**Edward Keeble,** Box 64, San Jose—$65,390 for curb and gutter, street pavement and sewer installation of 11,500 ft. of streets in Fairhills Subdivision, San Rafael—by Marvelous Marin Realty Co., San Rafael. 8-10

PLACER CO.—**R. A. Westbrook,** 1331 C St., Sacramento—$43,155 for about 7.1 mi. net length repairing with plant mix surfacing on existing roadbed and constructing shoulders of improved borrow on portions of the project between Roseville and Lincoln—by State Division of Highways, Sacramento. 8-23

SACRAMENTO CO.—**McGillivray Construction Co.,** Box 873, Sacramento—$18,236 for improvement of Tahoe Terrace, between 61st and 63rd Sts., Sacramento—by City Council, Sacramento. 8-23

SACRAMENTO CO.—**McGillivray Construction Co.,** Box 873, Sacramento—$71,406 to construct 2.8 mi. of access road to U. S. Army Signal Corps Depot, Sacramento—by Public Roads Administration, San Francisco. 9-4

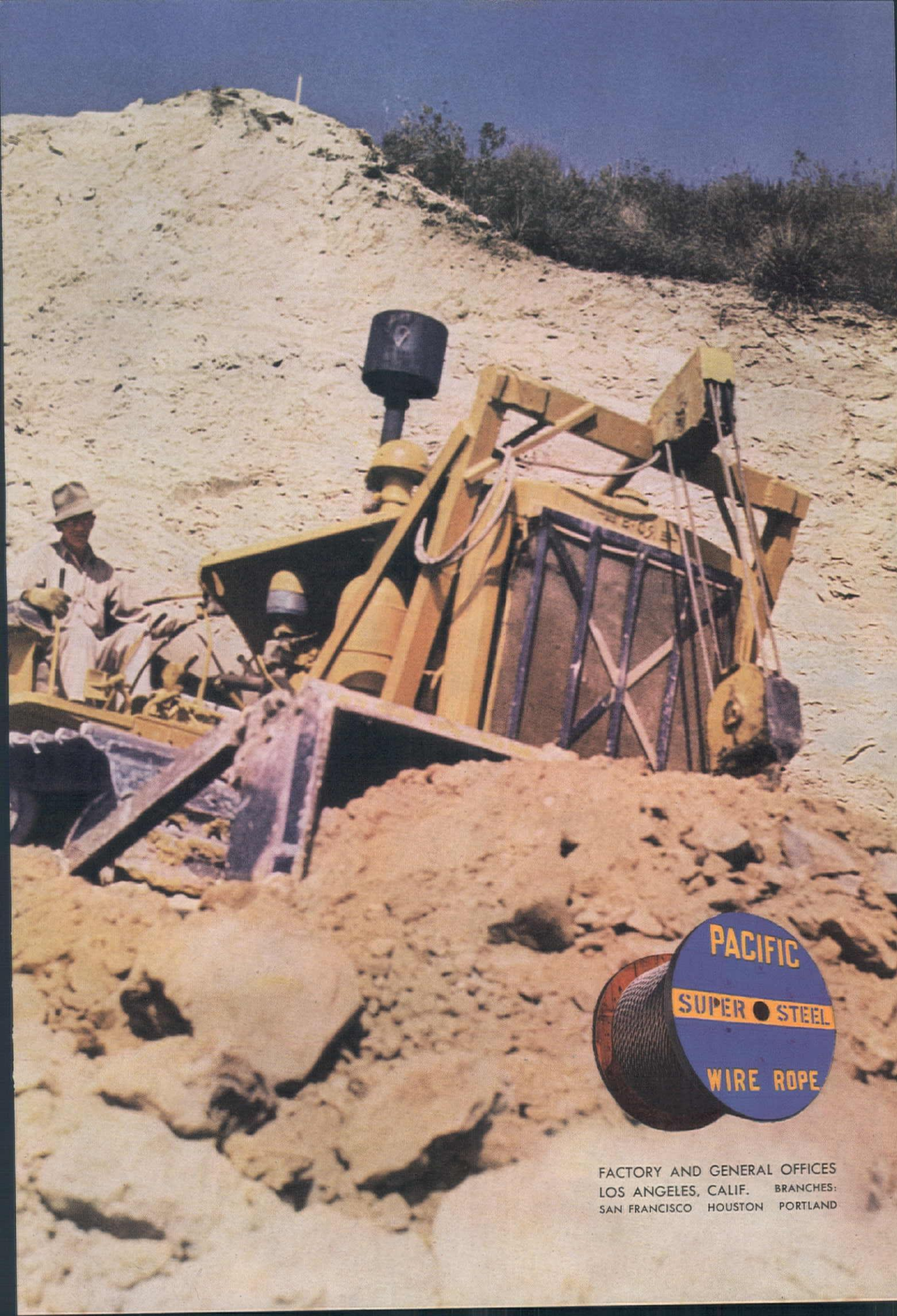
SACRAMENTO CO. — **A. Teichert & Company,** Box 1133, Sacramento—$11,764 for improvement of San Luis Court, Muir Way and south, etc., at Sacramento—by City Council, Sacramento. 8-7

SAN FRANCISCO CO. — **Peter Kiewit Sons Co.,** 442 Post St., San Francisco—$173,303 for new hardstanding pavement at Islais Creek Channel, San Francisco Port of Embarkation—by U. S. Engineer Office, San Francisco. 8-7

SAN JOAQUIN CO.—**M. J. B. Construction Co.,** 322 Elks Bldg., Stockton—$17,019 for additional open storage area at Stockton Ordnance Depot, Stockton—by U. S. Engineer Office, Sacramento, Calif. 8-7

SAN MATEO CO.—**W. G. Ebright,** 1491 Benito Ave., Burlingame—$16,990 for placing riprap and misc. grading at San Andres Outlet No. 3 and Baldhill Outlet—by Public Utilities Commission, San Mateo. 8-2

SAN MATEO CO. — **Union Paving Co.,** 212 Babcock Bldg., San Francisco—$67,527 for grading, paving, curbs, gutters, sidewalks, sanitary sewers and storm drains in the streets in and adjacent to Redwood Village No. 1—by County Board of Supervisors, Redwood City. 8-24



FACTORY AND GENERAL OFFICES
LOS ANGELES, CALIF. BRANCHES:
SAN FRANCISCO HOUSTON PORTLAND

SOLANO CO.—**Sheldon Oil Co.,** Main St., Suisun—$40,674 for about 0.9 mi. resurfacing with asphalt conc. pavement on cement-treated base on Tennessee and Georgia Sts., between Vallejo and Rte. No. 7—by State Division of Highways, Sacramento. 8-7

Colorado

GRAND CO.—**Hinman Brothers Construction Co.,** and **L. M. Hawkins,** Box 2882, Denver—$45,925 for widening of State Hwy. No. 9, Green Mountain Reservoir, Colorado-Big Thompson Project—by Bureau of Reclamation, Denver. 8-29

Idaho

BLAINE CO.—**Western Construction Co.,** Pocatello—$12,992 for seal coating 24.7 mi. of U. S. Hwy. 93, between Timmerman Hill and Ketchum—by State Director of Highways, Boise. 8-29

BOISE CO.—**Triangle Construction Co.,** Boise—$15,184 for a road mix bituminous mat and seal coat on 3.0 mi. of S. R. No. 15, from Old Horseshoe Bend, north—by State Director of Highways, Boise. 8-29

Kansas

CHEYENNE CO.—**D. G. Hansen,** Logan—$15,141 for application of bituminous sealing on 18.7 mi. of state hwy.—by State Highway Commission, Topeka. 8-8

ELLIS CO.—**Inland Construction Co.,** 3867 Leavenworth St., Omaha, Neb.—awarded two contracts for work on roads in the county, $10,759 for 12.0 mi. bituminous sealing and $5,758 for 6.4 mi. bituminous sealing—by State Highway Commission, Topeka. 8-8

NORTON CO.—**Inland Construction Co.,** 3867 Leavenworth St., Omaha, Neb.—$10,009 for 10.5 mi. bituminous sealing on state highways in that county—by State Highway Commission, Topeka. 8-8

PHILLIPS CO.—**Inland Construction Co.,** 3867 Leavenworth St., Omaha, Neb.—$14,486 for applying bituminous sealing to 15.5 mi. of state hwy.—by State Highway Commission, Topeka. 8-8

RAWLINS CO.—**D. G. Hansen,** Logan—$15,808 for applying bituminous sealing to 16.5 mi. of state roadway—by State Highway Commission, Topeka. 8-8

ROOKS CO.—**D. G. Hansen,** Logan—$10,323 for 15.5 mi. of bituminous sealing applied to state highways—by State Highway Commission, Topeka. 8-8

SMITH CO.—**Cook & Cone,** Ottawa—$13,703 for 15.0 mi. bituminous sealing on county roads, and a second contract at $2,218 for 2.2 mi. of bituminous sealing—by State Highway Commission, Topeka. 8-8

SMITH CO.—**Harry Henery,** Ottawa—$12,826 for reconstruction, single asphalt surface treatment and bituminous surfacing to 3.1 mi. of state hwy.—by State Highway Commission, Topeka. 8-8

SMITH CO.—**Harry Henery,** Ottawa—$69,224 for bituminous surface, reconstruction and single asphalt surface treatment on 17.0 mi. of state roadway—by State Highway Commission, Topeka. 8-8

Nevada

WASHOE CO.—**I. Christensen,** 234 Gardner, Reno—$134,920 for portland cement concrete combined curbs and gutters at returns, portland cement concrete sidewalks at returns, etc. in Reno—by City Council, Reno. 8-3

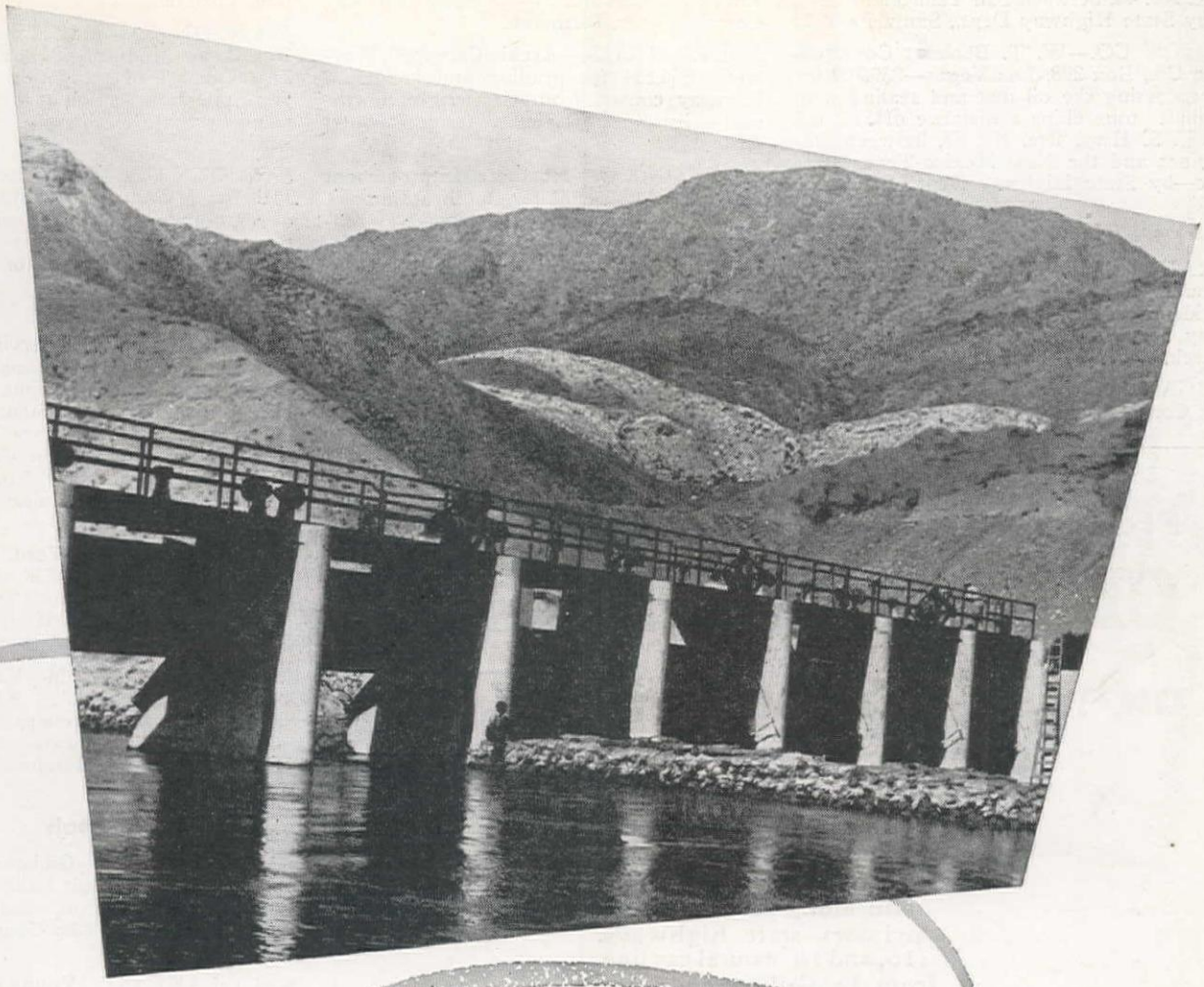
New Mexico

BERNALILLO CO.—**D. D. Skousen,** Springer Bldg., Albuquerque—$37,161 for approx. 7.5 mi. of grading, minor drainage and base course surfacing on State Hwy. Rte. 10, between Miera and Chilili—by State Highway Dept., Santa Fe. 8-24

CHAVEZ & ROOSEVELT COS.—**J. E. Skousen,** Gallup—$21,949 for sealing with rock asphalt approx. 24.4 mi. of U. S. Hwy. Rte. No. 70, between Acme and Kenna—by State Highway Dept., Santa Fe. 8-15

LEA CO.—**Walter L. Denison** and **G. I. Martin,** 520 S. Tulane, Albuquerque—$307,517 for grading, drainage, preparation of subgrade, adding leveling course, asphalt tack coat, bituminous top course surface and misc. construction of approx. 19.0 mi. of U. S. Hwy. Rte. No. 62, between Hobbs and Lovington—by State Highway Dept., Santa Fe. 8-13

SANDOVAL CO.—**Littlefield Construction Co.,** Elida—$68,405 for placing new oil mat and sealing with asphalt and stone



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ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

chips on approx. 27.8 mi. of State Hwy. Rte. No. 44, between San Ysidro and Cuba —by State Highway Dept., Santa Fe. 8-24

UNION CO.—**W. T. Bookout Construction Co.,** Box 298, Las Vegas—$39,709 for reprocessing the oil mat and sealing with asphalt stone chips a distance of 51.2 mi. on U. S. Hwy. Rte. No. 87, between Des Moines and the New Mexico-Texas state line—by State Highway Dept., Santa Fe. 8-13

North Dakota

GRANT CO.—**Megarry Brothers,** St. Cloud, Minn.—$23,396 for structures and incidental hwy. constr. south of Brisbane —by State Highway Commissioner, Bismarck.

LOGAN AND McINTOSH COS.—**Summit Construction Co.,** Rapid City, S. Dak. $85,694 for gravel replenishment on State Hwys. 11, 3, 56 and 34—by State Highway Commissioner, Bismarck.

McKENZIE CO.—**Archie Campbell,** Warwick—$66,531 for grading and incidental highway constr. from Cartwright, northeast—by State Highway Commissioner, Bismarck.

MORTON CO.—**Northern Improvement Co.,** Fargo—$334,231 for stabilization base, bituminous surfacing, etc., from New Salem, west—by State Highway Commissioner, Bismarck.

Oregon

GRANT CO.—**Lucich & Co.,** 3001 21st Ave., S., Seattle, Wash.—$47,629 for constructing the Fox Valley timber access road in Malheur National Forest, near John Day—by Public Roads Administration, Portland. 8-24

JACKSON CO.—**M. C. Linninger & Sons,** Box 1386, Medford—$21,425 for approx. 27,000 cu. yd. of excavation on Bear Canyon-State Line section of the Pacific Highway—by State Highway Commission, Salem. 8-30

LINCOLN CO.—**O. C. Yocom,** 902 S. E. 11th St., McMinnville—$13,191 for 0.2 mi. of regrading and surfacing on Nelscott section of the Oregon Coast Highway—by State Highway Commission, Salem. 8-30

Texas

BEXAR CO.—**Sunset Servicing Co., Inc.,** 310 Center St., San Antonio—$11,789 for furnishing and placing prime coat and double asphalt surface treatment type of pavement on the Nacogdoches Rd. from the Lockhill-Selma Rd. to the Cibolo Creek in Commissioner Precinct No. C, San Antonio—by County Commissioners, San Antonio. 7-31

BEXAR CO.—**Dean Word,** P. O. Box 330, New Braunfels—$79,538 for additional road and parking facilities at Brooke Hospital Center, Fort Sam Houston—by U. S. Engineer Office, San Antonio. 8-1

DALLAS CO.—**W. M. Van Ness,** Box 487, Hamilton St., Dallas—$14,846 for constructing 0.2 mi. concrete pavement, widening and turnouts, located at Milford on Hwy. 77—by State Highway Dept., Austin. 7-31

Utah

SALT LAKE CO.—**Gibbons & Reed,** 259 W. 3rd South St., Salt Lake City—$22,418 for sidewalk constr. in various sections of Salt Lake City—by City Council, Salt Lake City. 8-23

SALT LAKE CO.—**Young & Smith,** 1678 Browning Ave., Salt Lake City—$29,842 for sidewalk constr. in various sections of the City of Salt Lake—by City Council, Salt Lake City. 8-23

WEBER CO.—**Wheelwright Construction Co.,** 2300 East Ave., Ogden—$19,010 for oil surfacing approx. 8.0 mi. State Road No. 226 between junction State Road No. 39 above Pine View Dam and the Forest Shelter House at Snow Basin—by State Highway Commission, Salt Lake City. 8-8

Washington

ADAMS CO.—**C. E. O'Neal Co., Inc.,** 209 Elliott, Ellensburg—$52,108 for grading, draining, surfacing with selected roadway borrow and crushed stone surfacing, constructing light bituminous surface treatment, and a reinf. conc. T-beam bridge on Secondary State Hwy. No. 4-B, Junction of Primary State Hwy., 18 South—by State Director of Highways, Olympia. 8-15

KITSAP CO.—**Scheumann & Johnson,** Lloyd Bldg., Seattle—$31,370 for grading, draining, surfacing with selected roadway borrow, constructing bituminous surface treatment roadmix and a reinf. conc. continuous girder bridge on Primary State Hwy. No. 14, Mitchell Road Undercrossing —by State Director of Highways, Olympia. 8-15

KITSAP, MASON AND PIERCE COS. —**Western Asphalt Co.,** 309 W. 39th, Seattle—$42,715 for constructing nonskid single seal treatment on 65.5 mi. of State highways from Port Orchard to Gig Harbor—by State Director of Highways, Olympia. 8-15

PEND OREILLE CO.—**D. A. Sullivan,**

Parkwater—$44,583 for 8.4 mi. of surfacing with selected roadway borrow and crushed stone surfacing, stockpiling crushed cover stone and mineral aggregates, and constructing a light bituminous surface treatment on State Hwy. No. 6, Wolfred North—by State Director of Highways, Olympia. 8-24

PIERCE CO.—**J. D. Shotwell,** Puget Sound Bank Bldg., Tacoma—$73,402 for paving storage areas and storm drainage facilities at the Mt. Rainier Ordnance Depot, Fort Lewis—by U. S. Engineer Office, Seattle. 8-24

Canada

BRITISH COLUMBIA—**Dawson Wade & Co., Ltd.,** 775 Clarke Dr., Vancouver—$100,000 for road work in connection with the development of Richmond, under the Veterans' Land Act—by Dept. of Public Works, Ottawa. 8-27

BRITISH COLUMBIA—**Dawson Wade & Co., Ltd.,** Vancouver—$86,276 for improvements on the Drought Hill section of the Okanogan Highway—by Dept. of Public Works, Ottawa. 9-4

BRITISH COLUMBIA—**Dawson Wade & Co., Ltd.,** Vancouver—$46,119 for highway improvements to be constructed on the Chase-Salmon Arm section of the Okanogan Highway—by Dept. of Public Works, Ottawa. 9-4

BRITISH COLUMBIA—**General Construction Co.,** Vancouver—$32,390 to construct 3.1 mi. of the Shawnigan-Mill Bay highway—by Dept. of Public Works, Ottawa. 9-4

Bridge . . .

California

MENDOCINO CO.—**John Burman & Sons,** 2404 F St., Eureka—$66,699 for a concrete bridge and about 0.2 mi. grading and surfacing with improved borrow and applying seal coat thereto at Blue Slide Gulch., north of Fort Bragg—by State Division of Highways, Sacramento. 9-4

SAN DIEGO CO.—**Oberg Brothers,** 401 Redondo Blvd., Inglewood—$146,867 for a reinforced concrete girder bridge across San Mateo Creek, about 18 miles north of Oceanside—by State Division of Highways, Sacramento. 8-23

Idaho

JEROME AND TWIN FALLS COS.—**Dan Cavanaugh,** Box 1083, Twin Falls—$129,861 for reflooring the Rim to Rim bridge over Snake River and constructing 806 lin. ft. of approaches on U. S. No. 93, in the two counties—by State Director of Highways, Boise. 8-2

Washington

GRAYS HARBOR CO.—**Cascade Construction Co.,** foot of Abernathy St., Portland, Ore.—$24,036 for reconstruction deck on a part of the Wishkah River Bridge, Aberdeen on Primary State Hwy. No. 9—by State Director of Highways, Olympia. 8-15

THURSTON CO.—**F. E. Wilder,** Rte. 6, Olympia—$17,238 for reconstruction of the Ellis Creek bridge—by State Director of Highways, Olympia. 8-22

Wyoming

SUBLETTE CO.—**George M. Carruth &**

Construction Plant and Equipment From Shasta Dam, California

Available For Sale **Immediate Delivery**

CABLEWAYS AND HOISTS

3—Lidgerwood, 3-drum electric hoists with 500 H.P. G.E. Motors. Ward Leonard control, complete with controls and all electric equipment.

2—Lidgerwood, 3-drum electric hoists with 500 H.P. Westinghouse motors complete with controls and all electrical apparatus.

5—Cableway towers, structural steel, 3—125 ft.; 1—75 ft. and 1—45 ft., complete with travel mechanism.

6—Complete sets of carriages, main and auxiliary, fall and dump blocks, fall rope carriers, buttons, takeup bars and takeup sheaves.

1—American pillar crane. Cap. 5 T. at 48½ ft. and 15 T. at 25 ft. radius.

1—Colby elevator hoist, double drum, 75 H.P., equipped with brakes and emergency equipment including one hoist cage. 15 ton capacity.

12,000 lin. ft. of used 3" dia. locked coil cable in length from 500 to 2600 lin. ft.

Misc. lot of sheaves, jewels, blocks, etc.

CEMENT PLANT

1—Dual #265 Fuller Fluxo cement pump, duplex type complete with gravity feed and automatic control equipment. 400 bbls. per hr. capacity. Pumping distance 3300 ft.

1—Fuller-Kinyon Pump—type "D" 125 h.p. complete with air hose power control cable, control cabinet.

1—C-200 Fuller single stage rotary compressor Westinghouse motor 100 h.p.

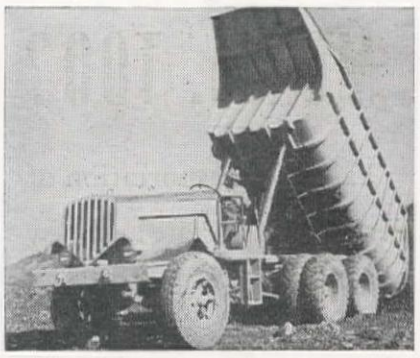
CONVEYORS

66—Motor operated gates for sand and gravel up to 6" cobbles with 1-h.p. Allis-Chalmers gear motor.

2—Complete sets, including 42" tandem drive pulleys, 42" head pulleys, 36" tail pulleys.

3—150 h.p. Westinghouse gear motors, 144 r.p.m., 2300 volts, 3-phase, 60 cycle.

1—Airplane tripper for 36" belt with two 17' wing belts, capacity 1,000 T per hour, complete with pulleys, drives and gear motors.



16—White Dump Trucks Model 1580-691, 24 cu. yd. capacity in good condition.

DRILLING EQUIPMENT

2—Mod. 315 I-R portable compressors, gas driven.

5—I-R paving breakers.

8—I-R drifters DA35.

2—I-R Wagondrills—pneu. tires, hoists, X71 drifters mounted.

1—I-R-54 Drill Sharpener.

10—I-R Jackhammers.

TANKS & RECEIVERS

10—8 cu. yd. steel hoppers including gates and air rams.

2—Water filters.

2—Wallace & Tiernan Chlorinators.

1—9500 bbl. all welded water tank, 48' dia., 30' high.

1—5400 bbl. all welded water tank, 36' dia., 30' high.

1—200 bbl. steel water tank.

10—Sandblast tanks 24" x 96" with hoppers and fittings.

10—Lubricator tanks 14" x 30"; 24" x 48"; and 24" x 60".

PUMPS

3—Bingham type SVD submersible pumps.

1—Byron-Jackson 150 h.p. 10 in. deepwell.

2—Byron Jackson 200 h.p., 5 K-H type 8Q1 deep well turbine pumps.

1—Gardner-Denver grout pump model FD-FS, 10" x 2½" x 10", with case-hardened liners and Calmex pistons and rods, 1,000 lb. pressure at 90 lb. air.

10—I-R #25 Sump Pumps.

MIXING PLANTS

1—3000 cy. bin with 5 compartments for aggregates, 2 compartments cement, incl. turnhead, gates.

1—Complete set C. S. Johnson fully automatic batching equipment for 5 aggregates, cement and water for 4 cy. batchers.

5—4 cy. Koehring Concentric zone mixers, incl. batchmeters, timers, consistency meters.

1—100-ton steel bin.

MISCELLANEOUS

1—P.A.X. Automatic Telephone Switchboard with 76 phones.

1—Robbins Contractor Screen 16" x 36".

Valves—1, 2, 3, 4, 6, 8, 10, 12, 16-inch.

Pole line hardware.

Floodlites—500 to 1500 w.

1—1¼ cu. yd. Heavy Duty Clamshell Bucket.

12—Muck Skips, 7—14 cu. yds.

50—Chicago Pneumatic concrete vibrators, Nos. 417, 518 and 519.

Several sizes of monkey wrenches, wood borers, chipping and riveting guns.

New and used rubber hose ¾" to 4".

MACHINERY AND SUPPLIES

1—125 KW. motor generator set, 275 volts DC.

5—Blowers; American and Buffalo.

Complete stock of Warehouse supplies.

Complete line of transformers and electric motors.

ALL ITEMS SUBJECT TO PRIOR SALE

PACIFIC CONSTRUCTORS, INC.

GENERAL CONTRACTORS — BOX 898, REDDING, CALIFORNIA **Phone 512 REDDING**

Son., Evanston—$45,522 for one steel and conc. bridge and grading of approaches and misc. work on Jackson-Pinedale Rd.—by State Highway Commission, Cheyenne. 8-2

Airport . . .

California

LOS ANGELES CO.—**E. S. McKittrick Co., Inc.**, 7839 Santa Fe Ave., Huntington Park—$30,100 for additional paving and lighting of plane parking area at the Navy-Lockheed Service Center, Van Nuys—by Navy-Lockheed Service Center, Van Nuys. 8-10

LOS ANGELES CO.—**Nathan A. Moore**, 2951 W. Valley Blvd., Alhambra—$105,000 for additional work at the Los Angeles Airport, Mines Field—by Board of Public Works, Los Angeles. 8-17

ORANGE CO. — **Haddock Engineers, Ltd.**, 605 W. Olympic Blvd., Los Angeles—$816,000 for excavating imported borrow for the constr. of runways, taxiways and lighting at the N. A. S., San Clemente Island, San Diego—by Bureau of Yards & Docks, Washington, D. C. 8-8

SONOMA CO.—**John C. Spaletta**, 442 S. A St., Santa Rosa—$28,577 for improvements at the Naval Outlying Fields, Cotati—by Bureau of Yards and Docks, Washington, D. C. 8-13

Nevada

CHURCHILL CO.—**Dodge Construction Co.**, Fallon—$168,570 for repairs to runway and stabilization of shoulders and seal coat at N. A. A. S., Fallon—by Bureau of Yards and Docks, Washington, D. C. 8-16

Texas

KLEBERG CO. — **Heldenfels Brothers**, Ship Channel, Corpus Christi — $277,120 for construction of return taxiways at Naval Aux. Air Station, Kingsville — by Bureau of Yards and Docks, Washington, D. C. 8-2

TARRANT CO. — **L. H. Lacey & Co.**, 3009 No. Henderson St., Dallas—$46,003 for asphalt paving at Meacham Field—by Bureau of Yards and Docks, Washington, D. C. 8-17

WEBB CO.—**H. B. Zachry Co.**, Box 850, San Antonio—$122,466 for alterations and repairs to taxiways and runways at Laredo Army Airfield, Laredo—by U. S. Engineer Office, San Antonio. 8-7

Washington

ISLAND CO. — **Northwest Construction Co.**, 3950 6th N.W., Seattle—$258,090 for widening taxiways at the ends of runways at the Naval Air Station, Whidby Island—by Bureau of Yards and Docks, Washington, D. C. 8-2

Water Supply . . .

California

ALAMEDA CO.—**R. Goold and Son**, Box 190, Stockton—$59,685 for (Schedule 1) installation of bell and spigot cast iron water main in Alice St. between 9th St. and Tidal Canal, Oakland, and in right-of-way and Webster St. between Tidal Canal and Tynan Ave., Alameda—by East Bay Municipal Utility District, Oakland. 8-7

ALAMEDA CO.—**Pacific Bridge Co.,** 333 Kearny St., San Francisco — $49,964 for (Schedule 2) installing approx. 1110-lin. ft. of 24-in. ball and socket submarine cast iron pipe across Tidal Canal at Alice St., Oakland—by East Bay Municipal Utility District, Oakland. 8-7

ALAMEDA AND CONTRA COSTA COS. — **Underground Construction Co.,** 75th Ave. and San Leandro Blvd., Oakland —$23,935 for installing 24,423 lin. ft. of cast iron water mains in various streets in Orinda and Lafayette—by East Bay Municipal Utility District., Oakland. 8-24

LOS ANGELES CO.—**Macco-Robertson Co.,** 811 Paramount Blvd., Clearwater—$2,010 for installing cast iron, bell and spigot water mains in Valley Blvd., adjacent to the Harlow Aircraft plant at Alhambra—by City Council, Alhambra. 8-24

SAN DIEGO CO.—**Guy F. Atkinson Co.,** Russ Bldg., San Francisco—$1,164,885 for earthwork, pipeline and structures from north station 0 plus 10 to north station 138 plus 86, San Diego Aqueduct—by Bureau of Yards and Docks, Washington, D. C. 8-27

SAN DIEGO CO.—**Tom L. Gogo,** 10024 S. Figueroa St., Los Angeles—$144,100 for erection of a pumping plant, reservoir and sand trap at Fallbrook—by Fallbrook Public Utility Dist., Board of Directors, Fallbrook. 8-27

SAN DIEGO CO.—**S. A. Healy Co.,** 450 Stevens Hotel, Chicago, Ill.—$2,597,344 for concrete pipe lines and structures from mile 46.8 to 71.3 of the San Diego Aqueduct. Work will include placing of conc. pipe, conc. vent, manholes, blowoff and riser structures, including appurtenant parts and accessories and various crossings, fencing and misc. materials and work—by Bureau of Yards and Docks, Washington, D. C. 8-15

Nevada

CLARK CO.—**McNeil Construction Co.,** 5860 Avalon Blvd., Los Angeles, Calif.—$200,000 for a 1,500,000-gal. reservoir at Las Vegas. The reservoir will be of conc. constr. with wood roof supported with precast conc. columns—by Las Vegas Land & Water Co., Los Angeles, Calif. 8-24

Oregon

WASHINGTON CO.—**Empire Construction Co.,** 4506 S. E. 39th St., Portland—$10,944 to replace a 12-in. main at Hillsboro with 6196 ft. of 18-in. cast iron water pipe—by City Council, Hillsboro. 8-23

Texas

DALLAS CO.—**Dellone Construction Co.,** 4201 Versailles, Dallas—$70,107 for the construction of water mains and sanitary sewers in various locations at Dallas—by City Council, Dallas. 8-17

DEAF SMITH CO. — **Amarillo Bridge Co.,** Amarillo—$34,082 for construction of water works and sewerage improvements at Hereford—by City Council, Hereford. 8-2

Utah

WEBER CO.—**Wheelwright Construction Co.,** 2300 E Ave., Ogden—$11,000 for constructing a 12-in. water main from Harrison west on 12th St. to the Utah A. S. F. Depot, Ogden — by City Commissioners, Ogden. 8-7

Canada

BRITISH COLUMBIA — **Bennett & White Construction Co.,** 510 West Hastings St., Vancouver—$25,000 for installation of a water system at Richmond, in connection with development under the Veterans' Land Act—by Dept. of Public Works, Ottawa. 8-27

Sewerage . . .

California

LOS ANGELES CO.—**P. & J. Artukovich,** 13305 S. San Pedro St., Los Angeles—$44,621 for installation of vitrified clay trunk sewer line in Hermosa Ave., between 13th Court and 3rd St., and between Lyndon St. and Herondo St., Hermosa Beach—by City Council, Hermosa Beach. 8-29

LOS ANGELES CO.—**B C & L Construction Co.,** 3726 Lee St., Los Angeles—$24,525 for 1.6 mi. of sanitary sewers and appurtenances in Gephart Ave. and other streets in the county—by County Board of Supervisors, Los Angeles. 8-17

LOS ANGELES CO.—**Burch & Bebek,** 2803 Los Flores, Lynwood—$57,535 for 3.1 mi. of sanitary sewers in Lemoli Ave. and other streets in the county district—by County Board of Supervisors, Los Angeles. 8-23

LOS ANGELES CO.—**Martin Construction Co.,** 1529 E. Olympic Blvd., Montebello—$89,984 for 4.3 mi. of sanitary sewers and appurtenances in Clara St. and other streets at Montebello—by County Board of Supervisors, Los Angeles. 8-13

LOS ANGELES CO.—**Ivan Metkovich,** 143 E. 81st St., Los Angeles—$3,132 for installing sewer lines on Hoke and Willat Sts., from Washington Blvd. to the north boundary lines of Culver City—by City Council, Culver City. 8-17

LOS ANGELES CO.—**Fred Weber,** 540 E. 3rd St., Downey—$4,400 for a sewer extension in Firestone Blvd. and Rayo Sts., South Gate—by City Council, South Gate. 8-10

SAN DIEGO CO.—**H. E. McNeil,** 4017 42nd St., San Diego—$13,398 for installation of a sewer system in the city of San Diego and for a portion of the intersection of Imperial Ave. and 45th St., of the county—by City and County of San Diego. 8-23

SAN MATEO CO.—**C. Dudley DeVelbiss,** Eastshore and Huntington Ave., Richmond—$56,480 for misc. work and improvements to the sewerage lines at Atherton—by City Council, Atherton. 8-24

SAN MATEO CO.—**Harry Lee,** 216 California Dr., Burlingame—$20,578 for installation of 8-in. water main from Citrus Ave. pumping plant to Reservoir No. 1, Daly City—by City Council, Daly City. 8-29

Colorado

ARAPAHOE CO.—**Thomas Bate and Sons,** 2311 10th St., Denver—$94,989 for a sanitary sewer line in Aurora—by Aurora Sanitation Dist., Aurora. 8-8

Texas

DALLAS CO.—**Dellone Construction Co.,** 4201 Versailles, Dallas—$55,272 for construction of sanitary sewer mains at Dallas—by City Council, Dallas. 8-9

TARRANT CO.—**W. R. West,** Fort Worth—$158,238 for a drainage system in lowland area north of Trinity River and adjacent to N. Main, Fort Worth—by City Council, Fort Worth. 8-20

Washington

SPOKANE CO.—**Porter Construction Co.,** E. 4409 Spring Ave., Spokane—$20,380 for the constr. of industrial waste facilities at the Army Air Depot, Spokane—by U. S. Engineer Office, Seattle. 8-13

Canada

BRITISH COLUMBIA—**Marwell Construction Co.,** Vancouver—$60,967 for construction of a sewage disposal plant at Abbotsford for the R. C. A. F.—by Dept. of Public Works, Ottawa. 8-27

Waterway . . .

California

ALAMEDA CO.—**George A. Renner,** 8514 Holly St., Oakland—$15,623 for repair of 7th St. unit wharf, Outer Harbor Terminal, Oakland—by Board of Port Commissioners, Oakland. 8-8

CONTRA COSTA CO.—**San Francisco Bridge Co.,** 503 Market St., San Francisco—$22,112 for dredging at Richmond Harbor—by U. S. Engineer Office, San Francisco. 8-8

SAN FRANCISCO CO.—**M. B. McGowan, Inc.,** 625 Market St.—$61,678 for construction of outer wharf of Fleet Landing at Ferry Bldg., San Francisco—by Board of State Harbor Commissioners, San Francisco. 8-23

SAN FRANCISCO CO.—**Mercer-Fraser**

Co., 2nd and Commercial Sts., Eureka—$33,000 for repairing car ferry slip at Pier 43, on the waterfront at San Francisco—by State Harbor Commissioners, San Francisco. 8-2

SAN FRANCISCO CO.—**J. D. Proctor, Inc.**, 681 Market St., San Francisco—$50,880 for repairing car ferry slip at Pier 43 on the waterfront at San Francisco—by Board of State Harbor Commissioners, San Francisco. 8-10

SANTA BARBARA CO.—**Case Construction Co.** and **American Construction Co.**, Box 6, Berth 109, San Pedro—$47,000 for dredging at Santa Barbara Harbor—by U. S. Engineer Office, Los Angeles. 8-6

SONOMA CO.—**K. R. C. Construction Co.**, 3068 Austin Way, Berkeley—$43,600 for repair and restoration of Jenner Jetty at the mouth of the Russian River—by State Division of Water Resources, Sacramento. 8-3

Nevada

WASHOE CO.—**Johnson, Drake & Piper,** 1736 Franklin, Oakland, Calif.—$79,800 for landing and shore facilities including enlargement of existing rock-faced jetty, timber pier, railway track, etc., at the N. A. F., Pyramid Lake, Sutcliffe—by Bureau of Yards and Docks, Washington, D. C. 8-16

Oregon

COOS CO.—**Tauf Charneski,** 1992 Washington St., Eugene—$10,559 for repairing and reconstructing existing levees and revetments along the Coquille river in the Beaver Slough drainage district—by County Commissioners, Marshfield. 8-21

Dam . . .

Washington

KING CO.—**Goerig & Philp,** and **N. W. Savier,** Lloyd Bldg., Seattle—$24,000 to construct a concrete dam, intake structure, pipe lines and fishway at Warrenton on the Lewis and Clark river, seven miles east of Seattle—by City Council, Warrenton. 8-10

Irrigation . . .

Idaho

TWIN FALLS CO.—**The Salmon River Canal Co.**—$100,000 for repair work in irrigation tracts covering 35,000 ac. southwest of Hollister—by U. S. Bureau of Reclamation, Boise. 8-7

Tunnel . . .

California

SAN DIEGO CO.—**S. A. Healy,** 450 Stevens Hotel, Chicago, Ill.—$874,218 for construction of the Rainbow, Lilac, Red Mountain and Oat Hill tunnels for the San Diego Aqueduct—by Bureau of Yards and Docks, Washington, D. C. 8-13

Building . . .

Arizona

COCONINO CO.—**Buttress & McClellan,** 1013 E. 8th St., Los Angeles—$80,000 for a garage and sales bldg. in Flagstaff—by C. C. Chesshere Motor Co., Flagstaff. 8-23

MARICOPA CO.—**E. J. Wasielewski,** Rte. 6, Box 545, Phoenix—$45,000 for an addition to a parochial school at Phoenix—by St. Mary's Catholic High School for Girls, Phoenix. 8-10

MARICOPA CO.—**P. W. Womack Construction Co.,** Box 2414, Phoenix—$74,412 for a classroom addition to the Longview School near Phoenix—by Board of Supervisors, School Dist. No. 8 of Maricopa Co., Phoenix. 8-15

PIMA CO.—**John Joynt,** 2533 E. Helen St., Tucson—$57,000 to construct a warehouse bldg. of reinforced concrete, 80x138 ft. in area, with full basement, at Tucson—by Martin Drug Co., Tucson. 8-24

PIMA CO.—**M. M. Sundt Construction Co.,** 440 S. Park Ave., Tucson—$45,000 to complete the educational bldg. at E. Broadway and N. 3rd Ave., Tucson—by First Southern Baptist Church, Tucson. 8-10

California

ALAMEDA CO.—**Leo Epp,** 317 Broderick St., San Francisco—$84,377 for 36 portable dwelling units and two portable laundries at Alameda—by Federal Public Housing Authority, San Francisco. 8-13

ALAMEDA CO.—**Haas Construction Co.,** Merchants' Exchange Bldg., San Francisco—$218,467 for tent housing, areas A and D, Oakland Army Base—by U. S. Engineer Office, San Francisco. 8-14

ALAMEDA CO.—**MacDonald & Kahn, Inc.,** 200 Financial Center Bldg., San Francisco—$287,550 for barracks and mess hall housing, Postal Concentration Center, Oakland Army Base, Oakland—by U. S. Engineer Office, San Francisco. 9-4

ALAMEDA CO.—**Newsome and Bechtel,** 2287 Telegraph Ave., Berkeley—$249,176 for 126 family dwelling units; gypsum board exterior walls, rolled roof, wood floors, etc., at Berkeley—by Federal Public Housing Authority, San Francisco. 8-10

ALAMEDA CO.—**J. D. O'Connor Construction Co.,** 391 Sutter St., San Francisco—$814,364 for an office bldg., cafeteria and boiler house at A. A. F. Intransit Depot, Alameda—by U. S. Engineer Office, San Francisco. 8-7

ALAMEDA CO.—**C. F. Parker,** 1644 Monterey Blvd., San Francisco—$78,640 for construction of tent housing, Area C, Oakland Army Base, Oakland—by U. S. Engineer Office, San Francisco. 8-10

ALAMEDA CO.—**J. H. Pomeroy & Co.,** 333 Montgomery St., San Francisco—$189,985 for additional Homoja housing at the Alameda Naval Air Station, Alameda—by Bureau of Yards and Docks, Washington, D. C. 8-3

ALAMEDA CO.—**Swinerton & Walberg,** 225 Bush St., San Francisco—for constr. of a can factory at San Leandro. Structure will be 1-story, reinforced concrete constr., steel frame, etc.—by Pacific Can Co., San Francisco. 8-9

LOS ANGELES CO.—**Harvey Adair Construction Co.,** 1147 E. Garvey Blvd., El Monte—$50,000 for six 10-room, frame stucco double dwellings at El Monte—by DeWitt-Harvey, Inc. 8-24

LOS ANGELES CO.—**Atkins & Wiggins,** 1221 Reeve St., Long Beach—$42,750 for an addition to the Lindbergh Junior High School at Long Beach—by Board of Education, Long Beach. 8-15

LOS ANGELES CO.—**James I. Barnes Construction Co.,** 1119 Montana Ave., Santa Monica—$190,775 for additions to the

Grant Grammar School at 24th and Pearl Sts., Santa Monica—by Board of Education, Santa Monica. 8-23

LOS ANGELES CO.—**John Bayer,** 3744 Clayton Ave., Los Angeles—$50,000 to construct three apartment bldgs. in the Van Nuys Dist., Los Angeles—by Self. 8-3

LOS ANGELES CO.—**R. J. Blanco,** 5170 Overland Blvd., Culver City—$125,000 for the construction of 24 frame and stucco dwellings at West Los Angeles—by Self. 8-3

LOS ANGELES CO.—**M. Burgbacher & Sons,** 469 S. Fairfax Ave., Los Angeles—$60,000 for twelve five-room dwellings of frame and stucco constr. at Long Beach—by Belmont Properties, Long Beach. 8-24

LOS ANGELES CO.—**Buttress & McClellan,** 1013 E. 8th St., Los Angeles—$50,000 for a warehouse bldg. at the corner of 55th and Alameda Sts., Vernon—by Pioneer Division, Flintkote Co., Los Angeles. 8-3

LOS ANGELES CO.—**R. J. Daum,** 6803 West Blvd., Inglewood—$113,450 for the constr. of an 8-classroom addition to the Montebello Park School, Montebello—by Montebello Unified School Dist., Montebello. 8-10

LOS ANGELES CO.—**Griffith Co.,** 502 L. A. Railway Bldg., Los Angeles—$68,000 to repair fire damage to a college bldg. in Los Angeles—by University of Southern California, Los Angeles. 8-10

LOS ANGELES CO.—**C. L. Hess,** 938 W. Washington Blvd., Los Angeles—$50,000 for constr. of offices in the ground floor of a bldg. at the corner of 6th and Olive Sts., Los Angeles—by Western Air Express, Los Angeles. 8-17

LOS ANGELES CO.—**Ray Hommes,** 6521 Wilshire Blvd., Los Angeles—$50,000 for four 20-room four-unit apartment bldgs. at Long Beach—by Homestead Investment Co., Long Beach. 8-10

LOS ANGELES CO.—**Jaeger-Powers & Branch,** 1025 Mateo St., Los Angeles—$65,000 for a brick warehouse and sales bldg. on E. Olympic Blvd., Los Angeles—by Self. 8-3

LOS ANGELES CO.—**S. W. Luban,** 1205 W. Jefferson Blvd., Los Angeles—$165,000 for twenty-five frame and stucco dwellings on W. 87th St., Venice Dist., Los Angeles—by Self. 8-3

LOS ANGELES CO.—**Joshua H. Marks Co.,** 816 W. 5th St., Los Angeles—$200,000 for the constr. of a one-story store bldg. to house home appliance equipment at Orange Grove Ave. and Wilshire Blvd., Los Angeles—by May Co., Los Angeles. 9-4

LOS ANGELES CO.—**McNeil Construction Co.,** 6860 Avalon Blvd., Los Angeles—$225,000 for a 1-story masonry freight house on Olympic Blvd., Los Angeles—by Union Pacific Railroad Co., Los Angeles.

LOS ANGELES CO.—**Miller & Miller,** 4863 W. Washington Blvd., Los Angeles—$85,274 for alteration and modernization of the waiting rooms of the Pacific Electric Bldg. at 6th and Main Sts., Los Angeles—by Pacific Electric Railway Co., Los Angeles. 8-24

LOS ANGELES CO.—**Monarch Construction Co.,** 1286 Redondo Blvd., Los Angeles—$132,000 to erect 24 frame and stucco dwellings at Los Angeles—by Self. 8-3

LOS ANGELES CO.—**Nowell Building Co.,** 8540 Sepulveda Blvd., Venice—$172,-

500 for 25 six-room frame and stucco dwellings in the Venice District—by Self. 8-10

LOS ANGELES CO.—**Leo A. Paige,** 126½ Hubbard St., San Fernando—$42,000 for seven 6-room frame and stucco dwellings, Sunland-Tujunga district—by Self. 8-10

LOS ANGELES CO.—**Stratton Construction Co.,** 149 S. Rosemead Blvd., Pasadena—$48,661 for added construction at Jet Propulsion Laboratory, California Institute of Technology, Pasadena—by U. S. Engineer Office, Los Angeles. 9-4

LOS ANGELES CO.—**Steed Brothers,** 714 Date Ave., Alhambra—$60,000 for a hospital addition of reinf. conc. construction at 206 S. Garfield Ave., Alhambra—by Alhambra Hospital, Alhambra. 8-14

LOS ANGELES CO.—**Swinerton & Walberg,** 605 W. Olympic Blvd., Los Angeles—$1,500,000 for alterations and additions involved in the reconversion of a South Gate Plant for the production of motor cars—by General Motors Corp., South Gate. 8-30

LOS ANGELES CO.—**J. K. Thomas & Beyer Construction Co.,** 611 Chamber of Commerce Bldg., Los Angeles—$125,000 for a store and theater bldg. to cover an area 140x155 ft., at Long Beach—by Cabart Theaters, Inc., Long Beach. 8-6

LOS ANGELES CO.—**Thornburg Construction Co.,** 15080 Crenshaw Blvd., Gardena—$63,600 for 22 frame and stucco dwellings on Daphne St., Gardena—by Self. 8-10

LOS ANGELES CO.—**P. A. Weeger,** 4565 Santa Monica Blvd., Los Angeles—$324,700 for a new primary school unit and a new kindergarten bldg. near Compton, and a new kindergarten bldg. at the existing McKinley School at Compton—by Enterprise School Dist., Compton. 8-15

MARIN CO.—**Litchfield Construction Co.,** 721 Francisco Blvd., San Rafael—$55,000 for a theater and store bldg. of reinf. conc. at Novato—by A. W. Bowman, Novato. 8-24

ORANGE CO.—**O. L. Carpenter,** 353 Spreckels Theater Bldg., San Diego—$115,061 for a 84-man bachelor officers' quarters, shop office bldg., and addition to bachelor officers' quarters galley at Auxiliary Air Station, San Clemente Island—by Bureau of Yards and Docks, Washington, D. C. 8-9

RIVERSIDE CO.—**W. D. Haxton,** 515 Broadway Bldg., San Diego—$99,853 for 35 family dwelling units at Indio—by Federal Public Housing Authority, San Francisco. 8-10

RIVERSIDE CO.—**W. J. Hunter,** 660 Heliotrope Dr., Los Angeles—$53,000 for the constr. of a post exchange bldg., type PX, at Torney General Hospital, Palm Springs—by U. S. Engineer Office, Los Angeles. 8-27

RIVERSIDE CO.—**Mead & O'Donnell,** 7769 Melrose Ave., Los Angeles—$62,430 for the constr. of a mess hall and appurtenant facilities for debarkees at Camp Haan, Riverside—by U. S. Engineer Office, Los Angeles. 8-10

SACRAMENTO CO.—**Holdener Construction Co.,** 2608 R St., Sacramento—$72,326 for a parochial school bldg., brick and frame constr., containing five classrooms, kindergarten and lavatory—by Sacred Heart Parish, Sacramento. 8-29

SAN DIEGO CO.—**L. C. Anderson Co.,** 3040 Hancock St., San Diego—$89,870 for the constr. of a mezzanine floor in the south end of bldg. 94 at the Naval Air Station, San Diego—by Bureau of Yards and Docks, Washington, D. C. 8-10

SAN DIEGO CO.—**Kenneth Frasier,** 1542 N. Lake Ave., Pasadena—$49,000 for an aviation lubrication oil storehouse at the Naval Air Station, San Diego—by Bureau of Yards and Docks, Washington, D. C. 8-15

SAN FRANCISCO CO.—**Barrett & Hilp,** 918 Harrison St., San Francisco—$60,000 for alterations to a warehouse at 750 Pennsylvania St., San Francisco—by Taylor and Spotswood, San Francisco. 8-9

SAN FRANCISCO CO.—**De Luca and Son,** 1745 Filbert St., San Francisco—$244,700 for 110 family dwelling units at San Francisco—by Federal Public Housing Authority, San Francisco. 8-10

SAN JOAQUIN CO.—**Shepherd & Green,** 309 First National Bank Bldg., Stockton—$56,000 to remodel a hotel bldg., including modern facade and five stores for lower floor—by John Barkett and Emil Gumpert, Windsor Hotel Bldg., Stockton. 9-4

SAN LUIS OBISPO CO.—**Close and Lewis,** 721 C St., Hayward—$41,130 for construction of a school addition, including two separate frame wings containing five classrooms, at Paso Robles—by Paso Robles Public Schools, Paso Robles. 8-8

SOLANO CO.—**J. A. Bryant,** 1815 Capitol St., Vallejo—$81,150 for a community center bldg. at Floyd Terrace, Vallejo—by Housing Authority, City of Vallejo. 8-7

SOLANO CO.—**Freethy - Kimball Co.,** Kohl Bldg., San Francisco—$43,811 for submarine attack teacher bldg. at the Mare Island Navy Yard—by Bureau of Yards and Docks, Washington, D. C. 8-6

SOLANO CO.—**A. J. Hopper Co.,** 243 Langton St., San Francisco—$45,207 for an office addition to special materials storehouse bldg. at the Navy Yard, Mare Island

—by Bureau of Yards and Docks, Washington, D. C. 8-23

STANISLAUS CO.—**Parker, Steffens & Pearce,** 135 S. Park, San Francisco—$250,000 for an agricultural laboratory at Salida, to include three bldgs., one story, brick and structural steel constr.—by Shell Chemical Co., San Francisco. 8-10

TULARE CO.—**Noel M. Calhoun,** 845 N. Highland Ave., Los Angeles—$125,000 for a storage bldg. and an addit. to the cottage cheese plant on Ocean Ave., Visalia—by Knudsen Creamery Co., Visalia. 8-6

Idaho

MADISON CO.—**H. J. McKean,** Dooly Bldg., Salt Lake City, Utah—$80,000 for remodeling the gymnasium and auditorium bldgs. at Ricks College, Rexburg—by L. D. S. Church, Board of Education, Rexburg. 8-23

Nevada

CLARK CO.—**Pioneer Construction Co.,** Box 2111, Las Vegas—$250,000 for a one-story and part basement club and casino bldg., masonry constr., at Las Vegas—by Guy McAfee, Las Vegas. 8-10

CLARK CO.—**Horace Shidler,** Box 2110, Las Vegas—$123,000 for three apartment bldgs. containing a total of 24 units at 7th St. and Charleston Blvd., Las Vegas—by Howell Garrison, Las Vegas. 8-16

MINERAL CO.—**Wm. P. Neil Co., Ltd.,** 4814 Loma Vista Ave., Los Angeles—$256,755 for a battery charging bldg., additions and alterations to the tank repair bldg. at the Naval Ammunition Depot, Hawthorne—by Bureau of Yards and Docks, Washington, D. C. 8-10

NYE CO.—**Frank Pinkerton,** 108 Southwest Blvd., Corona—$203,000 for construction of 202 family units at Tonopah—by Federal Public Housing Authority, San Francisco, Calif. 8-7

WASHOE CO.—**I. Christensen,** 234 Gardner St., Reno—$134,920 for construction of P. C. C. combined curbs and gutters, concrete sidewalks, alley approaches, grading and paving alley at Reno—by City Council, Reno. 8-7

WASHOE CO.—**Robert E. McKee,** 4700 San Fernando Road West, Los Angeles—$1,353,000 for constr. of the main hospital bldg. at the Veterans' Hospital, Reno—by Veterans' Administration, Washington, D. C. 8-23

WASHOE CO.—**Walker Boudwin Construction Co.,** 214 Gazette Bldg., Reno—$104,286 for a reinf. conc. north wing to the county courthouse at Reno—by County Board of Supervisors, Reno. 8-13

New Mexico

CHAVES CO.—**J. D. Leftwich,** Lubbock, Tex.—$458,600 for the construction of 175 family war dwelling units at Roswell—by Federal Public Housing Authority, Fort Worth, Tex. 8-3

CURRY CO.—**McCann Construction Co.,** Box 2097, Fort Worth, Tex.—$135,393 for 60 war dwelling units to be constructed at Clovis—by Federal Public Housing Authority, Fort Worth, Tex. 8-2

Oregon

HOOD RIVER CO.—**H. J. Settergren,** 5627 N. E. 26th St., Portland—$65,000 for a hospital and nursery at Government Camp on Mt. Hood. Bldg. will be of frame and

conc. or stone—by Dr. Otto George, Portland. 8-14

LANE CO.—**Wayne H. Shields,** Eugene—$69,249 for a 60x151-ft., two-story and basement freight terminal at Eugene—by McCracken Motor Freight Co., Portland and Eugene. 8-23

MARION CO. — **Viesko & Hannaman,** 1440 S. 13th St., Salem—$80,000 to build a battery manufacturing plant at Salem—by National Battery Co., Salem. 8-17

MULTNOMAH CO. — **George Mangus,** Railway Exchange Bldg., Portland—$82,000 to build an old peoples home at 530 SE. 30th Ave., Portland—by Mount St. Joseph Home for Aged, Portland. 9-4

MULTNOMAH CO. — **Ross B. Hammond,** Box 3901, Portland—$75,000 to construct a plant at Portland, covering an area 200x100 ft. without basement. The structure will be of reinforced concrete with plate glass front—by Electric Distributing Co., Inc., Portland. 8-23

Texas

BELL CO.—**Taylor Construction Co.,** Box 648, Taylor—$79,797 for a guest house and civilian cafeteria at McCloskey General Hospital, Fort Sam Houston—by U. S. Engineer Office, San Antonio. 8-20

BEXAR CO.—**F. A. Nunnelly,** San Antonio—$57,299 for a recreation bldg., War Dept. Personnel Center, Dodd Field—by U. S. Engineer Office, San Antonio. 8-8

DALLAS CO.—**V. B. Fitzhugh,** 2519 McKinney St., Dallas—$75,000 for erecting a modern theater bldg. on Maple Ave. near Lucas Dr., Dallas. 7-30

DALLAS CO.—**Vivrett & Vivrett,** Southland Life Bldg. Annex, Dallas—$83,664 for a one and two-story brick and tile theater bldg. at Dallas — by Interstate Theaters, Dallas. 7-30

DALLAS CO.—**Marshall E. Baker,** Dallas—$100,000 for constr. of brick and reinforced concrete bldg. at Garley and Haskell Sts., Dallas — by F. J. Boerner, Archt., Dallas. 8-17

DALLAS CO.—**Cowdin Brothers,** 411 So. Haskell, Dallas—$40,000 for a theater bldg., one-story and mezzanine, brick and reinforced concrete, at Dallas — by Forest White, Dallas.

DALLAS CO.—**Hal C. Dyer,** Dallas Gas Bldg., Dallas—$600,000 for a stone and reinforced concrete, two-story and basement bldg. at Dallas—by Security National Fire Insurance Co., Dallas. 8-20

DALLAS CO.—**Henger Construction Co.,** 1600 Dallas National Bank Bldg., Dallas—$50,000 for construction of a one-story and basement addition at 1413 Jackson, Dallas—by Baker Hotel, Inc., Dallas. 8-7

DALLAS CO.—**Arch Munn,** 5319 Junious, Dallas—$70,000 for warehouse addition of brick and reinforced concrete at Dallas—by Volker Co., Dallas. 8-9

ECTOR CO.—**J. L. Hair Construction Co.,** Wichita Falls — $415,450 for a two-story senior high school bldg. at Odessa — by Board of Education, Odessa. 8-1

KLEBERG CO.—**Lawless & Alford,** Box 1248, Corpus Christi—$478,707 for housing at Naval Aux. Air Station, Kingsville—by Bureau of Yards and Docks, Washington, D. C. 8-21

KLEBERG CO.—**Lawless & Alford,** Box 1248, Corpus Christi — $520,000 for constructing low-cost housing project of 100 units and trailer housing of 130 units with utilities and furnishings at Naval Aux. Air Station, Kingsville—by Bureau of Yards and Docks, Washington, D. C. 8-17

MAVERICK CO.—**Taylor Construction Co.,** Taylor—$110,459 for construction of the Eagle Pass High School—by Eagle Pass School District, Eagle Pass. 8-15

McLENNAN CO.—**C. C. Ramsey,** Waco—$100,000 for a one-story auto sales bldg., 250x165 ft. in area of reinforced concrete and steel to be located at Waco—by Bird-Kultgen Co., Waco. 8-17

Utah

SALT LAKE CO.—**Bowers Building & Construction Co.,** Salt Lake City—$400,000 for the construction of a machine shop and acetylene generator house at Copperton—by Utah Copper Co., Salt Lake City. 8-30

SALT LAKE CO.—**Robert G. Gray,** 51½ West Third South, Salt Lake City—$60,000 for construction of a fruit processing plant at Salt Lake City—by Lee E. Nielson, Salt Lake City. 8-7

SALT LAKE CO.—**John H. Mickelson,** 528 E. Center St., Logan—$50,000 for enlargement operations including remodeling and addition to the service and parts department of a motor company at Salt Lake City—by Blair Motor Co., Salt Lake City. 8-16

UINTAH CO. — **Junious W. Jackson,** Roosevelt—to construct fourteen new cinderblock modern dwellings at Vernal—by

Federal Public Housing Authority, Salt Lake City. 8-23

Washington

CHELAN CO. — **Atherton Construction Co.,** Terminal Sales Bldg., Seattle—$90,000 to construct a one-story extension to a bldg. at the Great Northern railroad terminal at Appleyard, near Wenatchee—by Great Northern Railroad Co., Seattle. 8-11

KING CO. — **Atherton Construction Co.,** 1101 Terminal Sales Bldg., Seattle—$125,000 to construct a dairy bldg. at 38th and Stone Way, Seattle. The bldg. will be of reinforced concrete — by Golden Rule Dairy, Seattle. 8-30

KING CO.—**B. H. Sheldon,** 2022 Third, Spokane—$349,000 for 250 family dwelling units at Seattle—by Federal Public Housing Authority, Seattle, Wash. 8-10

PIERCO CO.—**Sam Bergesen,** Box 428, Tacoma—$216,031 for two mess halls and an issue warehouse at Fort Lewis—by U.S. Engineer Office, Seattle. 8-22

PIERCE CO.—**C. F. Davidson,** Provident Bldg., Tacoma—$160,857 for two mess halls at Fort Lewis—by U. S. Engineer Office, Seattle. 8-22

PIERCE CO. — **The Puget Sound Construction Co.,** 1208 N. Eye St., Tacoma—$85,493 for improvements and additions to War Dept. Personnel Center at Fort Lewis —by U. S. Engineer Office, Seattle. 8-13

SPOKANE CO.—**Sound Construction & Engineering Co.,** and **Peter Kiewit Sons Co.,** 1403 W. 45th St., Seattle—$1,888,925 for constr. of five storehouses with concrete block sidewalls, administration bldg., trackage, etc., at the U. S. Naval Depot, Spokane—by U. S. Bureau of Yards and Docks, Washington, D. C. 8-7

WALLA WALLA CO.—**A. Ritchie and Co.,** Box 253, Walla Walla—$60,696 for a theater bldg. and guest house at McCaw General Hospital, Walla Walla—by U. S. Engineer Office, Portland, Ore. 8-7

Territories

ALASKA—**Alaska Construction Co.,** Juneau—$157,500 for constr. of 30 dwelling units at Juneau—by Federal Public Housing Authority, Seattle. 8-13

ALASKA—**Henrik Valle,** 407 Third Ave. W., Seattle, Wash.—$157,500 for three 2-story frame bldgs. at Juneau—by Federal Public Housing Authority, Seattle. 8-7 8-7

HAWAII—**E. E. Black, Ltd.,** Honolulu—$457,137 for site work on 700 family dwelling units on Oahu — by Federal Public Housing Authority, San Francisco. 8-10

Miscellaneous . . .

California

ALAMEDA CO.—**Monson Brothers,** 475 Sixth St., San Francisco—$70,527 for correction of damage and soil erosion at the San Leandro Naval Hospital, San Leandro —by Bureau of Yards and Docks, Washington, D. C. 8-3

RIVERSIDE CO.—**Clifford C. Bong and Co.,** 6 N. First St., Arcadia—$96,000 for construction of patient loading and unloading facilities at Camp Haan, Riverside—by U. S. Engineer Office, Los Angeles. 8-6

RIVERSIDE CO.—**Mead & O'Donnell,** 7769 Melrose Ave., Los Angeles—$62,430 for a mess hall and appurtenant facilities for debarkees at Camp Haan, Riverside—by U. S. Engineer Office, Los Angeles. 8-6

SAN DIEGO CO. — **V. R. Dennis Construction Co.,** P. O. Box F, Hillcrest Sta., San Diego—$171,900 for constr. of additional facilities for airplane operation, including pavement, drainage, fencing and utilities at San Diego—by Ryan Aeronautical Co., San Diego. 8-6

SAN FRANCISCO CO.—**Guy F. Atkinson,** 682 Russ Bldg., San Francisco—$168,800 for site clearance and pile driving for ordnance shop at U. S. Naval Drydocks, Hunters Point, San Francisco—by Bureau of Yards and Docks, Washington, D. C. 8-29

Nevada

MINERAL CO. — **William P. Neil Co.,** 4814 Loma Vista Ave., Los Angeles, Calif. —$263,300 for battery charging bldg., loading dock, etc., roadmix surfacing, roads and concrete pavements, etc., at the N.A.S., Hawthorne — by Bureau of Yards and Docks, Washington, D. C. 8-2

New Mexico

DONA ANA CO.—**Robert E. McKee,** Box 217, El Paso, Tex.—$93,535 for constructing a technical area at the White Sands Proving Grounds near Las Cruces — by U. S. Engineer Office, Albuquerque. 8-7

Oklahoma

COTTON CO.—**J. & J. Construction Co.,** Oklahoma City — $39,717 for construction of 50 mi. of electric line—by Cotton Electric Cooperative, Walters. 8-16

Oregon

MULTNOMAH CO. — **Oscar Butler &**

Son, 4910 N. E. 42nd Ave., Portland—$50,932 for constr. of roads, grade crossings, unloading ramps and water distribution and sanitary sewer lines at the Portland sub-port of embarkation—by U. S. Engineer Office, Portland.

South Dakota

FALL RIVER CO.—**Colorado Pre-Mix Concrete Co.,** 400 S. Lipan, Denver, Colo.—$174,425 for additional facilities at Black Hills Ordnance Depot, Igloo—by U. S. Engineer Office, Denver, Colo. 8-7

Texas

BELL AND MILAM COS.—**Taylor Construction Co.,** Box 648, Taylor—$74,995 for 95 mi. of rural electrification line extensions in the two counties—by Bartlett Electric Cooperative, Bartlett. 8-21

BEXAR CO.—**Automatic Sprinkler Corp. of America,** Jones & Britain Sts., Youngstown, Ohio—$62,100 for installation of automatic sprinkler system at San Antonio Aviation Cadet Center, San Antonio—by U. S. Engineer Office, San Antonio. 8-7

BEXAR CO.—**Judson H. Phelps,** 503 American Hospital & Life Bldg., San Antonio—$58,800 for construction of roads, hard surfaces, loading facilities and utilities for storage warehouse at San Antonio—by Reconstruction Finance Corp, San Antonio. 8-21

DeWITT CO.—**Gregg Walsh Company,** San Antonio—$78,293 for the construction of 110 mi. electric line throughout the county—by DeWitt County Electric Cooperative, Inc., Cuero. 8-22

DICKENS CO.—**Eugene Ashe Electric Co.,** Fort Worth—$194,906 for constr. of 240 mi. of electric line to serve 500 members in that county—by Dickens County Electric Cooperative, Inc., Spur. 8-7

PROJECTS PROPOSED

Bridge . . .

California

LOS ANGELES CO.—A vertical lift bridge to Terminal Island, the first section of a project to provide a speedway type service from Roosevelt Base northeasterly, will soon be under construction. The entire project is estimated to cost $14,000,000, although est. amount of this section has not been announced to date. 8-10

Water Supply . . .

Washington

KING CO.—A $450,000 water improvement project for West Seattle is now being planned. Included in the project is a 1,000,000-gal. covered reservoir and installation of more than 3 mi. of 30-in. pipeline. 8-10

Dam . . .

Washington

DOUGLAS CO.—Construction of 3 new generator units, valued at more than $2,000,000 each, has been authorized by the War Production Board, to be constructed at Coulee dam. The 3-year job will begin as soon as contracts can be let.

Building . . .

California

ALAMEDA CO.—California School for the Deaf, is planning the constr. of a 3-story reinf. conc. kindergarten dormitory bldg. and a 2-story reinf. conc. girls' dormitory bldg. at Berkeley, to cost approx. $468,000. 8-24

LOS ANGELES CO.—Plans are being completed for the construction of the new technical institute on American Ave. at Long Beach. The bldg. will be a four and part five-story structure covering an area 100x350 ft. Estimated cost is $1,000,000. 8-8

SACRAMENTO CO.—The constr. of a new State Office Bldg. at Sacramento is being planned. The T-shaped six-story bldg. will cost about $675,000, and be an addition to the State Business and Professional Bldg. 8-24

Nevada

CLARK CO.—Plans are being completed for the construction of an auto supply store, of concrete block constr., at Las Vegas, for Motor Supply Co., Inc., Las Vegas. 8-10

TRADE WINDS

News of Men Who Sell to the Construction West

CALIFORNIA

Appointment of **James L. Ray** as head of the turbine department was recently announced by **George F. Gayer,** chief engineer of the JOSHUA HENDY IRON WORKS, Sunnyvale, Calif. The company's gas and steam-turbine engineering department in San Francisco will be under his direction. He will also supervise the considerable enlargement of its technical staff. Ray has a background of many years experience in the engineering field, having spent four years as chief gas-turbine design engineer of the Allis-Chalmers Manufacturing Co. His career included several years with Westinghouse Electric & Mfg. Co., a period with Fairbanks, Morse & Co., a year with the Murray Iron Works as general engineer. At one time he was located in England in the study of gas turbines.

☆ ☆ ☆

KEROTEST MANUFACTURING CO., Pittsburgh valves and fittings manufacturer, has established a new warehouse at Los Angeles, Calif., in an effort to improve its methods of distribution in the Pacific Coast area. **J. A. Swaton** is district manager for steel valves and **J. A. Norris** is district manager, brass division. **Van D. Clothier** will continue as the southern California representative for brass valves, headquartered in Los Angeles. Swaton, with Kerotest for over twenty years, and Norris will maintain offices in the new warehouse and the latter will coordinate all activities throughout the entire Pacific Coast area.

☆ ☆ ☆

Bert W. Reynolds, the new San Francisco district appliance sales manager for GENERAL ELECTRIC SUPPLY CORP., is well known in Pacific Coast electrical circles, having for several years past been manager of domestic sales for the Pacific Gas & Electric Co. In his new position, Reynolds will direct all appliance sales in the San Francisco district, which embraces all of northern California as well as a portion of Nevada. Announcement of his appointment was recently made by District Manager **C. W. Goodwin, Jr.**

☆ ☆ ☆

SOULÉ EQUIPMENT COMPANY of Oakland and Sacramento has been appointed distributor in northern California for Bucyrus-Erie ⅜- to 2½-yd. shovels, draglines, cranes. Their territory extends from the Oregon border to the southern boundaries of Monterey and Fresno counties, but does not include the counties of Plumas, Alpine, and Mono, or the eastern portions of Sierra, Nevada, Placer, and El Dorado counties, and includes only the northwest corner of Lassen county.

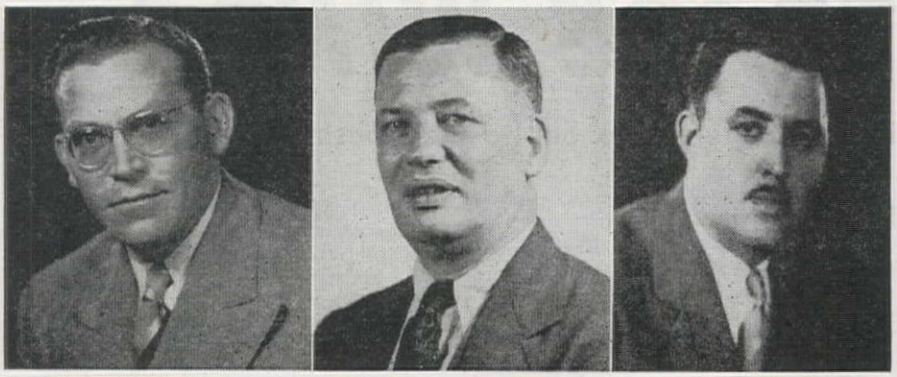
C. S. Beesemyer, a director of GENERAL PETROLEUM CO., and formerly president of Gilmore Oil Co., has been appointed director of marketing for General, to fill the post left vacant when **A. H. DeFriest** was named assistant to the president

EXECUTIVE STAFF of the General Petroleum Corporation, from left to right, are JOHN C. SAMPLE, general sales manager; HERMAN ALBER, assistant general sales manager; C. S. BEESEMYER, vice president; and C. H. WARTMAN, assistant general sales manager.

of SOCONY-VACUUM OIL CO., New York City. General manager of the marketing department of General is to be filled by **John C. Sample,** promoted from general sales manager.

☆ ☆ ☆

Harold K. Wilson, architect of Hoquiam, Wash., who for the past eight years has specialized in the design of plywood



OFFICIALS OF THE new California service and sales organization of Cummins Engine Co., are, left to right, S. B. COOK, J. H. FLANAGAN, and T. J. COLLINS. Headquarters of the new organization will be in Los Angeles, to serve 11 counties.

structures and plywood boats of various types, is the new Southwest representative for DOUGLAS FIR PLYWOOD ASSOCIATION. His headquarters are in the Chamber of Commerce Bldg., Los Angeles, Calif. He succeeds **Joseph Weston,** who resigned after seven years with the association to become manager of The Warfield Co., a new building development company in southern California.

☆ ☆ ☆

Cummins diesel engines are now being sold and serviced in the nine counties of southern California by a new organization, CUMMINS SERVICE AND SALES OF LOS ANGELES. The executive personnel are **J. H. Flanagan, S. B. Cook,** and **T. J. Collins,** none of whom is a stranger to the trucking industry in that territory. Flanagan and Cook formed the C-F EQUIPMENT CO. in 1943. They have both relinquished their dealership, and Collins, a Cummins dealer for ten years, has resigned that post. The new dealership has taken over the quarters formerly occupied by the C-F Equipment Co. at Los Angeles, Calif.

☆ ☆ ☆

D. L. Holbrook, formerly manager of the Aircraft Division of THE FAFNIR BEARING COMPANY, New Britain, Conn., recently became West Coast manager for his company. As manager of Fifnir's West Coast branches in Los Angeles, San Francisco, Seattle, and Portland, he brings a vast engineering experience to the job. His headquarters will be in Los Angeles, Calif.

Carl R. Olson, general manager of the PERMANENTE CEMENT CO., with general offices in Oakland, Calif., recently announced the promotions of **Wallace A. Marsh** to the position of assistant general manager and of **James K. Beatty** to general sales manager. **Jack Jansse** has been named northern California district sales manager and **Festus T. McDonough** sales manager of the southern California district. **Charles M. Chapman** remains division manager of the Yosemite cement division at Merced, Calif.

☆ ☆ ☆

ANDRUSS EQUIPMENT SERVICE CO., Fresno, Calif., was founded early this year by **Cliff G. Andruss** and has recently been appointed dealer for the DAVEY COMPRESSOR CO. of Kent, Ohio, to handle the Davey line of portable and stationary compressors, heavy-duty truck power take-offs and pneumatic saws for the central California territory embracing the counties of Fresno, Merced, Madera, Mariposa, Kings and Tulare.

☆ ☆ ☆

Hayward Thomas, president of CLARKE AERO HYDRAULICS, INC., Pasadena, Calif., announces that the company has received for the third time in the past eighteen months the Army-Navy production award for achievement in manufacturing war materials. The corporation was organized in 1940 and now operates four large plants for the production of turret control valves used on guns carried by military planes.

☆ ☆ ☆

Floyd Pratt, formerly assistant manager of gasoline sales, is the newly-appointed district sales manager for TIDE WATER ASSOCIATED OIL CO. in the Territory of Hawaii, according to an announcement recently made by **W. A. Reanier,** sales manager. Starting as a plantman and salesman in 1919, he progressed through a series of sales supervisory positions, occupying executive posts at Reno, Nev.; Salt Lake City, Utah; Seattle, Wash.; and at Sacramento, Los Angeles and San Francisco, Calif. In the new set-up, **Ford King** becomes manager of operations of the entire Hawaiian district. **M. C. Coleman** succeeds Pratt as assistant manager of gasoline sales in San Francisco.

☆ ☆ ☆

Five important promotions in the staff of the GENERAL PETROLEUM CORPORATION, Los Angeles, Calif., have been announced by **R. C. Wheeler,** vice president and manager of the manufacturing department. **P. S. Magruder** has been elevated from manager of the gas department to assistant manager of manufacturing. **H. L. Eggleston** has been named manager of the gas department, at the same time continuing to supervise the manufacturing activities of the GILMORE ROAD OIL & ASPHALT CO. **M. W. Kibre** has been appointed assistant manager of the gas department; **H. A. Sting,** superintendent of the gas department of the southern division; and **A. C. Lyles,** gas engineer in charge of the Santa Fe Springs gas laboratory. **Jack T. Hanafin** has been promoted from industrial lubrication engineer to fuel and lubrication consultant for the southern California division.

☆ ☆ ☆

AMERICAN HOIST & DERRICK CO. of St. Paul, Minn., through Vice President **Stanley M. Hunter,** has announced the appointment of **Harvey A. Mylander** as Pacific Coast manager, with headquarters in the Russ Building in San Francisco, Calif. A graduate of the University of Arizona, majoring in mechanical engineering, Hunter has had many years of experience in the heavy equipment field.

☆ ☆ ☆

ELECTRON EQUIPMENT CORP. of South Pasadena, Calif., will soon open a new factory to manufacture electronic equipment that will be dispensed to contractors and builders, according to a special zoning permit recently granted by the city of South Pasadena. Directors include **W. B. Clark, Harrison Matthews, Florence E. Klingel, L. F. Atwood, Berna I. Groll, H. Cunningham** and **A. R. Schindler.**

☆ ☆ ☆

OIL WELL SUPPLY CO., U. S. Steel Corp. subsidiary, has purchased the assets of NEILSEN PUMP CO. of Los Angeles, Calif. The company, long-established factor in California oil production circles, was owned by **Karl P. Neilsen** and **Edward D. Sports,** partners. Under the new plan the organization will be known as the Neilsen Pump Division of Oil Well Supply Company, for the manufacture of oil field materials. Neilsen will remain with the organization as general manager of the new division.

☆ ☆ ☆

POMONA PUMP WORKS of FAIRBANKS, MORSE AND CO., Pomona, Calif., were among the first western recipients of the Distinguished Service to Safety Award which was instituted by the National Safety Council in October, 1942. Other prominent recipients of this safety award in the western states are the CALIFORNIA SHIPBUILDING CORP., UNION PACIFIC RAILROAD, BETH-

NEW AND LARGER quarters now occupied by Shaw Sales and Service Co. at 5100 Anaheim Telegraph Rd., Los Angeles, with about 30,000 sq. ft. of space. Below, officers of the company are J. EARL CONLIN, sales manager; BEAL SHAW, president; B. V. OLSON, purchasing; H. O. HICKMAN, sales engineer.

LEHEM STEEL CO. of San Pedro, STANDARD OIL OF CALIFORNIA, and the BETHLEHEM-ALAMEDA SHIPYARD.

☆ ☆ ☆

Oedekerke and Ludwig Company of Pasadena, Calif., manufacturers of rockets for the Navy, has been awarded the Army-Navy E award for excellent production in the construction of rockets.

Andy Lee is the new branch manager of the Sacramento office and shop of SOULÉ EQUIPMENT CO. Lee succeeds **C. H. Elliot,** who resigned recently. For the past year Lee has been San Francisco representative for Soulé and prior to that was associated with the NORTHWEST ENGINEERING CO. for several years. He will have charge of both sales and service in his new post.

Among the first recipients of the Distinguished Service to Safety Award of the National Safety Council in the eleven western states is the POMONA PUMP WORKS of FAIRBANKS, MORSE & CO., Los Angeles, Calif. The presentation to the Pomona Plant was made on June 15, 1945, by **J. C. Stennett** of the National Safety Council, to **R. H. Morse, Jr.,** vice president of Fairbanks, Morse & Co., who turned it over to the employees at the plant.

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AMERICAN TRACTOR EQUIPMENT CORP. moved recently from its former Emeryville, Calif., plant to new quarters at 9131 San Leandro Blvd., Oakland, Calif. **Mack Wooldridge,** manager of the corporation, announces that modernization and expansion of facilities at the new 4½-ac. site is progressing rapidly.

☆ ☆ ☆

Culmination of a national safety contest in which 40 factory branches of FRUEHAUF TRAILER CO. participated has been announced with the naming of the Fresno, Calif., branch as the national winner. Formal presentation of the plaque will be made in September to **W. E. Lauritzen,** Fresno branch manager. **Gus Dewey,** shop superintendent, will receive a cash prize for his part in guiding employees in safety practices.

Victor S. Herrington has been appointed district manager of the newly-created Transportation Division of GENERAL ELECTRIC CO.'s Pacific District Apparatus Department. He will make his headquarters in San Francisco. Herrington joined General Electric in 1923 and is well known for his work in connection with such projects as Boulder Dam in Las Vegas, the Los Angeles Aqueduct and Grand Coulee Dam.

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Standard Machinery Company, San Francisco, Calif., has been named exclusive distributors in the Northern California area for the products of Construction Machinery Company, Waterloo, Iowa. Some of the more prominent items of equipment are: Concrete guns and mixers, power saws, hydraulic cranes and bin batchers.

☆ ☆ ☆

Herbert P. Mee, a former vice president of CATERPILLAR TRACTOR CO., died July 3 at his home in Santa Barbara, Calif., after an illness of several months. Mee joined the C. L. BEST TRACTOR CO. in 1920 and when that company and the HOLT MANUFACTURING COMPANY merged in 1925 to form CATERPILLAR TRACTOR CO. he became treasurer of the organization. Three years after he was made vice president of sales, he resigned his position, coming to the West Coast where he operated citrus ranches in the Santa Barbara vicinity.

☆ ☆ ☆

PACIFIC NORTHWEST

H. E. Simi, widely-known bus engineer, has joined the staff of KENWORTH MOTOR TRUCK CORP. to take charge of bus engineering and production. Simi was chief engineer of the TWIN COACH CO. of Kent, Ohio, for 16 years, and comes to Kenworth from the TIMKEN-DETROIT AXLE CO., where for the past two years he has been in charge of development of postwar axles.

☆ ☆ ☆

UNITED STATES PLYWOOD CORPORATION has purchased stock control of the SIUSLAW FOREST PRODUCTS CO., Mapleton, Ore., which owns about 300 million ft. of standing timber with options on additional tracts. Siuslaw maintains a sawmill at Mapleton, and U. S. Plywood intends to construct a veneer mill there to increase the supply available to its Seattle, Wash., plywood plant.

☆ ☆ ☆

WESTERN GEAR WORKS, Lynwood, Calif., through President and General Manager **Thomas J. Bannan,** has announced the appointment of **Roy Crawshaw** to the position of manager of engineering and sales, with headquarters in Seattle. He was formerly manager of the company's affiliated plants in the Los Angeles, Calif., district. **W. A. Witham** has been named assistant manager of engineering, and **G. A. DeArmand** has been appointed assistant to **P. L. Bannan,** company treasurer, who is in charge of manufacturing in the company's several plants.

☆ ☆ ☆

INTERMOUNTAIN

POWER EQUIPMENT CO., Denver, Colo., and BUD FISHER CO., Albuquerque, N. M., new construction equipment distributors, recently signed franchises with WORTHINGTON PUMP AND MACHINERY CORP.'s Construction Equipment Division.

☆ ☆ ☆

Mr. Duemling of STEEL CONVERSION CORP. of Las Vegas, Nev., has completed arrangements with CONSOLIDATED DISTRIBUTORS CORP. of San Francisco to distribute Steel Conversion Corp.'s industrial tools to northern California, Washington and Oregon. Mr. Duemling also has complete control of STEEL CONVERSION AND SUPPLY CO. of Pittsburgh, Penn., which plant will augment the supply of the Las Vegas plant.

☆ ☆ ☆

A new company, SQUARE D de MEXICO, has been formed to manufacture electrical distributing and control equipment for the Mexican market, according to an announcement by SQUARE D CO. officials. **Lauron W. Mercer,** vice-president and general sales manager of the domestic company, will represent that firm on the new board of directors. A plant will be built in Mexico City as soon as all arrangements can be made.

☆ ☆ ☆

AMONG THE MANUFACTURERS

E. J. Hergenroether, who has been serving with the War Production Board and predecessor agencies in Washington since 1941, has resumed his duties with the Development and Research Division of THE INTERNATIONAL NICKEL CO., Inc., New York City. He will be in charge of the automotive steel development of the division and will make his headquarters at the company's field office in Detroit.

BRODERICK & BASCOM ROPE CO., St. Louis, Mo., now flies the Army-Navy "E" flag with five stars, having recently won the award for the sixth time as a result of its excellence in production of wire rope and slings.

☆ ☆ ☆

The BARCO MANUFACTURING CO., Chicago, Ill., has been granted the new "Approved Quality Control Rating" by the U. S. Army Air Forces. This is an official expression of confidence and is assigned to a manufacturer who has demonstrated that its own inspection organization can be entrusted with full responsibility for meeting all requirements of the Army Air Forces, eliminating all future need for duplicate inspection by the Air Corps. This company, headed by **F. N. Bard,** manufactures aviation devices for the war effort, as well as gasoline hammers, flexible ball joints, and many steam, air and hydraulic specialties for industries and railroads.

☆ ☆ ☆

VITA-VAR CORP., paint manufacturers of Newark, N. J., have received the Army-Navy "E" for the second time, as a result of their activities in furnishing material to proof clothing and other supplies against flame, water, fungus, etc.

☆ ☆ ☆

Joseph H. Hayden, with 27 years' experience in the company, has been elected vice-president of HEWITT RUBBER CORP., Buffalo, N. Y., and **William H. Watkins,** with 20 years' experience, has been named controller and assistant treasurer. Hayden is also secretary of the firm.

☆ ☆ ☆

DIAMOND TOOL CO., Chicago, Ill., is proud of a diamond tool dresser, believed to be the largest in the world, which it furnished to Northwest Engineering Co. on Oct. 18, 1940, and which has been continuously in use since then. Originally it weighed 62.5 carats and was mounted on a

24-in. diameter, 3-in. face crankshaft grinder. It has since been reset seven times by the tool company. At its most recent resetting, it still weighed 29.75 carats, after having yielded 8,064 dressings during its lifetime.

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In a recent statement, **J. F. Lincoln,** president of THE LINCOLN ELECTRIC CO., of Cleveland, Ohio, pointed out that the company's policy of "no increase in selling prices," as announced on Oct. 2, 1939, has been maintained throughout the entire war period, and despite increased cost of labor, materials and distribution, and despite governmental regulations, there has been no rise in the cost of their products, and in some instances actually a reduction. Lincoln said: "This has been made possible by our incentive system . . . a method which, if it had been applied throughout industry, would have doubled America's output of war goods for a quicker victory and would have cut the cost of the war by 50 per cent. America's future depends largely upon her efficiency of production. Our proved incentive system has in it the seeds of a satisfactory answer to the difficulties of this nature in industry."

☆ ☆ ☆

MINNEAPOLIS - HONEYWELL REGULATOR CO., Minneapolis, Minn., in preparation for postwar sales, recently announced the reorganization of its heating controls division and the appointment of six men to sales management capacities. **C. D. Lyford** has been named sales manager of that department. **H. E. Chapler** becomes sales manager of oil controls, with headquarters in New York. **C. C. Cochran** will direct heat control sales in the Midwest, while **D. J. Peterson** has been made sales manager in the central zone, with headquarters in Detroit. **T. S. Carley,** formerly in Minneapolis, has been made assistant sales manager of stocker controls, and will make his headquarters in San Francisco, Calif.

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A. L. Scaife was recently appointed advertising and sales promotion manager of GENERAL ELECTRIC CO.'s appliance and merchandise department, with headquarters at Bridgeport, Conn. He has been

a member of the G-E staff for fifteen years, and is succeeding **B. W. Bullock,** recently resigned. Assistant manager of the division will be **George B. Park. E. F. Vickery** will be operating manager.

☆ ☆ ☆

Appointment of UNITED STATES PLYWOOD CORPORATION as exclusive sales agent for Pliobond, universal synthetic adhesive cement, was announced by GOODYEAR TIRE & RUBBER CO., which developed and manufactures Pliobond. **Charles P. Joslyn,** head of Goodyear's Chemical Products sales division, said Pliobond will be marketed through U. S. Plywood's twenty distributing units throughout the country.

☆ ☆ ☆

PEERLESS PUMP DIVISION of FOOD MACHINERY CORP. has rearranged territorial distribution by the establishment of five sales districts in preparation of postwar distribution of water pumps, **Warner G. Vaughan** has taken over as Atlantic district sales manager, with offices at Ardmore, Penn. **Charles E. Tierney** has been placed in charge of the Southeastern territory headquartered at Decatur, Ga. **Edward W. Pierce** will continue in charge of the Central territory, making his headquarters at the Canton, Ohio, works. The Southwestern territory has for its district sales manager, **William E. Griffin,** Plainview, Tex. **B. A. Tucker,** with offices in Los Angeles, is Pacific district sales manager. Tucker for several years past was manager of the Fresno, Calif., division of the company.

☆ ☆ ☆

A. G. Bussmann, and **L. D. Granger** were elected vice presidents of the WICKWIRE SPENCER METALLURGICAL CORP. at a recent meeting of the board of directors. Having been associated with Wickwire since 1930, Bussmann is also vice president in charge of sales. Granger, prominent steel metallurgist and engineer, has previously been assistant to the executive vice president of this company as well as vice president of the AMERICAN WIRE FABRICS CORP., another Wickwire Spencer subsidiary. Bussmann will continue to be located at the executive offices in New York, while Granger will headquarter at the plant and offices in New Jersey.

☆ ☆ ☆

MARMON - HERRINGTON CO., INC., Indianapolis, Ind., has organized a Transit Equipment Division, specializing exclusively in the design and manufacture of trolley coaches. Vice president and division manager of the new section is **Charles Guernsey.**

☆ ☆ ☆

UNITED STATES STEEL SUPPLY CO., subsidiary of U. S. Steel Corporation with headquarters in Chicago, Ill., recently announced the election of **William L. Davis** as vice president in charge of operation. Davis has been associated with U. S. Steel subsidiaries for the last forty years.

☆ ☆ ☆

Among the recent appointments to important positions in THE GLENN L. MARTIN CO. of Baltimore, Md., are the following: **Peyton M. Magruder,** director of commercial sales; **John H. Humpstone** becomes his assistant; **Howard Stansbury,** sales engineer of the Mars and other flying boats; **John E. Soenke,** domestic commercial sales and manager of special projects. The new duties of these men are in conjunction with their present war assignments.

Henry F. Dever, who has been serving as vice president in charge of engineering for MINNEAPOLIS - HONEYWELL REGULATOR CO., succeeds **Charles B. Sweatt** as president of BROWN INSTRUMENT CO., a wholly-owned subsidiary of Minneapolis-Honeywell. Sweatt, vice president and director of the parent company, has withdrawn from Brown and will henceforth devote his entire attention to supervision of the expanded sales activities of the Honeywell organization and its subsidiaries. Dever will also assume the responsibilities of **E. B. Evleth,** general manager of Brown Instrument, who, because of ill health, has requested that he be relieved of his duties at an early date. **W. J. McGoldrick,** who has been vice president in charge of aeronautical engineering, will head the engineering activities of the Honeywell concern.

☆ ☆ ☆

M. E. Montrose, president and general manager of THE MARION STEAM SHOVEL CO. of Marion, Ohio, recently announced the appointment of **Axel W. Hedberg** as works manager. Hedberg brings to his new position a wide experience in supervisory and plant management duties. He was associated with General Motors Research, Republic Steel Co., Briggs Mfg. Co., and until recently was branch manager of the St. Clair Division of Parker Appliance Co. of Cleveland.

☆ ☆ ☆

THE INSLEY MANUFACTURING CORP., Indianapolis, Indiana, for three years has produced shovels and cranes entirely for the armed forces. Its first Insley excavator sold to a civilian buyer since 1942 was delivered in July. The unit, a ½-yd. Model K-12 with trench hoe attachment, was sold to the Jacob Day Excavating Co., of Indianapolis. Insley was recently authorized to sell its surplus production to civilian users upon authorization of WPB.

☆ ☆ ☆

Robert F. Nelson has been named to the executive staff of R. G. LeTOURNEAU, INC., Peoria, Ill., as vice president and assistant to the president. This addition to the staff will enable **R. G. LeTourneau** to devote more time to research and engineering activities. Nelson, former vice president and director of the ARMA CORP., Brooklyn, N. Y., brings to LeTourneau an extensive background of engineering, production and administrative experience.

☆ ☆ ☆

Theodore A. Havens, Jr., has been appointed tungsten engineer for WICKWIRE SPENCER METALLURGICAL CORP., a subsidiary of WICKWIRE SPENCER STEEL CO. He was formerly associated with Westinghouse light division.

☆ ☆ ☆

The Army-Navy "E" production award for excellence in production of vital war machinery was awarded to BAY CITY SHOVELS, INC., Bay City, Mich., on May 17.

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 *Western Construction News*, 503 Market Street, San Francisco, California.

All-Wheel-Drive Trucks

Manufacturer: Marmon - Herrington Company, Inc.

Equipment: Multiple-wheel-drive trucks.

Features claimed: Scheduled to start soon on the production of two models, MH555-4 and MH440-4, the former and larger model will be powered by a 131 hp. engine, on a wheelbase of 161 inches, designed to carry a permissible gross loaded weight of 27,000 lbs. on 11.00x20 tires. Model MH440-4 will be powered by a 118 hp. engine, on a wheelbase of 158 in., with a permissible gross loaded weight of 22,500 lbs. on 10.00x20 tires. Both models will have 10 forward speeds and 4 reverse. The new all-wheel-drives will embody numerous design and construction refinements arising out of the company's long years of experience in producing heavy-duty military and commercial vehicles. These improvements include new double-reduction axles, power air brakes, and a new steering gear design which makes for easier and more positive steering control. Big and husky, they are especially suitable for arduous work where exceptional power, traction and stamina are required such as snow removal, off-the-road oil surveys and drilling, mining and logging operations. In addition to the new truck models the company is prepared to produce its original all-wheel-drive conversions of Ford vehicles in 1½-ton trucks and ½-ton Ford pickups and station wagons.

Moisture Tester

Manufacturer: Moisture Register Company, Alhambra, Calif.

Equipment: Moisture Register.

Features claimed: This new type K-2 moisture register incorporates a new electrode equipped with buttons individually spring-cushioned to allow every button to maintain contact regardless of the contour of the material tested. The Model K-2 is

especially adapted for testing paper in stacks or rolls of varying diameter; rolls or bolts of cloth; rough lumber; plaster and other materials having curved or irregular surfaces. The K-2, like all other moisture registers, is operated on the principle of power absorption from a high-frequency oscillator circuit. An important feature of the instrument is its ability to rapidly determine low moisture percentages.

Tractor-mounted Dragline and Crane

Manufacturer: Hyster Company, Portland 8, Oregon.

Equipment: Working combination of bulldozer, dragline, clamshell and crane.

Features claimed: A highly practical tractor-mounted unit embodying all of the

above-mentioned features without inhibiting the normal mobility of the tractor. When full bulldozer production is required the Hystaway can be removed in an hour

and installed within two hours. Hystaway is readily transported on either flatbed or dump trucks from one constrcution job to another. The new unit is useful in equipment yards and where heavy machinery must be dismantled on the project as well as on excavation work.

Conveyor Stop

Manufacturer: Barber-Greene Co., Aurora, Ill.

Equipment: Improved differential band back stop for conveyors.

Features claimed: A shoe acting directly on the brake drum is one of the unique features on a new improved differential band-type back stop. The unit is available in 12, 18, and 24 in. diameter drum sizes. It is said to be the simplest, trouble free back stop yet devised for preventing belt conveyors or bucket elevators from running backwards due to this belt or bucket load when, for any reason, the power is shut off.

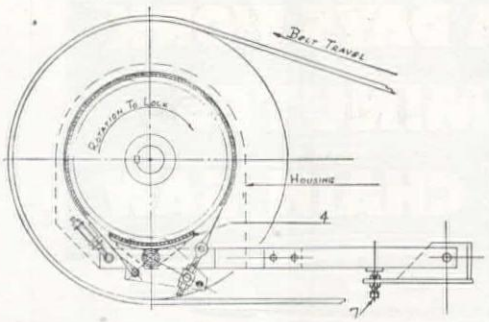


DIAGRAM OF THE Barber-Greene automatic conveyor stop, designed to prevent a loaded conveyor or bucket line from running backward in the event of a power failure.

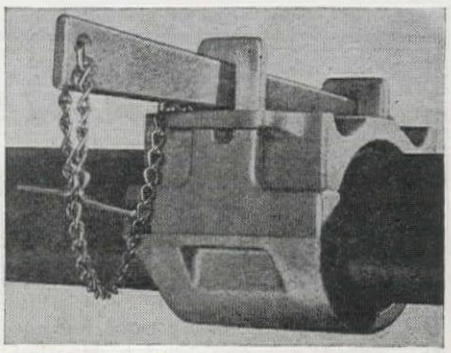
Instead of the brake band taking all the torque required to hold the conveyor, the shoe takes an appreciable part of the load. When the differential acts and the band tightens, the shoe is pulled up against the drum with great force, giving added friction (18 to 20 per cent additional drum circumference is brought into contact through use of the shoe). Ordinarily, the braking forces must be taken through the conveyor frame which requires an extremely heavy structural support. In this new design, these forces are resisted internally and only force going through the conveyor frame is that required to prevent a rotation of the brake.

Flexible Pipe Coupling

Manufacturer: Drinkwater, Inc., 2323 S. Michigan Ave., Chicago 16, Ill.

Equipment: Presto-Lock flexible pipe coupling.

Features claimed: A simple strong three-piece coupling that can be used with any plain pipe without threads, grooves or flanges. No wrenches or special tools are needed to assemble the parts. Only a hammer is required to tighten the wedge key after the two interlocking sections have been fitted over the pipe ends and the wedge keys have been inserted. The three simple parts are the two corrosion-resistant malleable iron castings and the quick-locking wedge key. Sizes from 1¼ to 3 in. are equipped with a chain assembly to prevent loss of coupling parts. Sizes 3 to 16



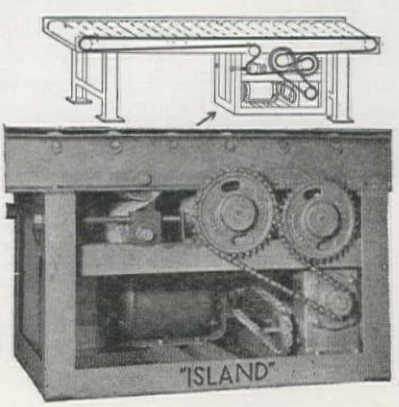
in. have two wedge keys but no chain assembly. Gaskets used with the couplings are supplied in natural and synthetic rubber and neoprene, all of which are designed to effect a permanent tight seal on all types of pipe lines. All parts can be salvaged readily and reassembled in a compact unit for transportation. Actual tests show that the Presto-Lock flexible coupling gives up to 40 degree flexibility at each joint. The lock acts as a combined sleeve, elbow and ball union at the same time. Couplings can also be used to stop any pipe leak which it will cover. Only the following sizes are immediately available: 1¼, 1½, 2¼, 2½, and 3 in. A 4-page bulletin will be mailed upon request which gives engineering data and complete specifications.

Conveyor Drive

Manufacturer: Island Equipment Corp., New York City, N. Y.

Equipment: Conveyor drive Power-Pac Unit.

Features claimed: Self-contained assembled unit, built solidly in an iron frame, ready to be quickly bolted to the chassis of any piece of conveying equipment that needs to be mechanically operated.



The unit consists of motor, driving rolls, switch speed reducer (where wanted), controls proper gears and all necessary mechanism to enable the user to make the proper connections to their equipment.

The entire unit measures 15 x 24 x 17 in. and weighs but 167 lbs. crated for shipment.

Tool Marker

Manufacturer: Ideal Commutator Dresser Co., Sycamore, Ill.

Equipment: Electric Tool Marker.

Features claimed: A sturdy, small tool marker only 6 in. long, weighs only 10 oz., yet it packs 30 per cent more power than previous models and it can be used continuously on the toughest marking jobs. The marker operates on the principle of an electric hammer, making 7,200 cutting strokes per minute, cutting right into the surface leaving lines that cannot be wiped away or worn off with ordinary use. An adjusting nut makes it possible to vary the impact so that it can even be used to mark on glass. Marks iron, steel, bronze, aluminum, ceramics, tile marble, lead, plastics and porcelain with the standard hardened alloy point. If extra hard materials are to be marked, ranging from 54 up to 64 Rockwell hardness Scale C, a diamond point is recommended.

Ratchet Vise

Manufacturer: Grand Specialties Co., Chicago, Ill.

Equipment: Quick opening mechanic's vise.

Features claimed: Eliminates running the vise screw completely in or out to open and close this machinist's vise, as this Grand 3-in. Quikcet alloy-steel model is designed to open or close with the use of a rachet release screw and two precision guide rods.

Additional features claimed for the Quikcet vise are that it is made of alloy-steel, balanced precision grip at all points, with polished, serrated and hardened jaws. It is also described as spatterproof for welding use with copper plating on all working parts and handles.

This new speed vise is claimed to meet precision tool standards for production line use.

Diesel Engine

Manufacturer: Joshua Hendy Iron Works, Sunnyvale, Calif.

Equipment: Diesel engine, series 20, 6 to 8 cylinder models.

Features claimed: The new series 20 engines range from 190 to 250 h.p. and are made in marine, stationary, and Diesel-electric models of the four-stroke cycle type. They are designed to operate as heavy-duty, medium-speed (900 r.p.m.) self-contained units, with all main accessories engine mounted. They are air starting, marine models are direct reversing, and completely enclosed. The new models are similar to the Series 50 units, with overhead camshaft, unit fuel pumps and injectors, precision-type bearings, and full pressure lubrication.

Series 20 engines are single acting, with 7¼ in. bore and 8½ in. stroke. The pistons are of simple design with four compression and two oil-control rings. Piston heads are designed for maximum heat dissipation and efficient combustion. Full-floating wrist pins are pressure lubricated through drilled connecting rods, which are forged of high-strength steel, completely machined and carefully balanced for smooth operation.

The crankshaft is dynamically balanced, with all bearing surfaces accurately ground

and polished. Lubrication is carried from the main journals to the crank pins through inserted steel tubes. An extra long rear main bearing supports the flywheel and any additional loads that may be imposed at this end.

Fresh-water cooling is a design feature of the Series 20. This assures freedom from rust, scale, or chemical deposits in water jackets and materially reduces maintenance costs. The raw water enters the raw-water pump, passes through a heat exchanger and is discharged. The fresh water is circulated by a centrifugal pump which passes it first through the oil cooler and thence into the engine water header, which is cast integrally in the side of the cylinder block. Entrance of the water to each cylinder space is through a metering hole which gives a tangential swirl around each cylinder liner. It next passes from the cylinder block through two pass-overs to the cylinder heads, where it is directed for maximum cooling of the injectors and exhaust valves.

The use of unit fuel pumps and injectors, operating in conjunction with the overhead camshaft, reduces the number of moving parts and makes unnecessary the use of long, high-pressure fuel lines between a separate injector pump and the nozzles. The unit-injector assembly can be quickly and easily removed for cleaning and inspection.

The fuel control shaft is operated through anti-friction linkage from the governor, with emergency stop levers located at each end. Injectors are connected individually through spring-loaded linkages which allow the operator to shut off any injector during operation.

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, California.

Timber Engineering Co., Inc., Washington, D. C.—A 19-page booklet has just been issued by this company offering valuable information pertaining to the use of Teco connectors. The book is well illustrated by photographs of construction jobs where the connector joints are being used, and by structural designs showing the special uses and advantages of these modern connectors. Termite protection, by use of Teco termite shields, is also outlined and explained in this publication.

The Jaeger Machine Co., Columbus, Ohio—A leaflet has been issued introducing and explaining the Auto-Loader, a new half-bag trailer with the same high speed, non-stop mixing cycle as big commercial plant mixers. The leaflet describes and illustrates the economy and ease with which this small shaker-batcher can be utilized.

R. G. LeTourneau, Inc., Peoria, Ill.—A new bulletin displaying the use of Tournapulls on the job. Illustrated by pictures of this equipment at work on actual jobs, the bulletin shows how the machine may be used to the best advantage, explaining the right and wrong methods of application.

Barnes Manufacturing Co., Mansfield, Ohio — A new Catalog-Selling book for Automatic Centrifugal pumps has just been published. This book has full color illustrations of each model, complete details of the applications of each pump, as well as performance tables. Four pages of the book are devoted to special construction features of the new line of automatic centrifugal pumps.

Bay City Shovels, Inc., Bay City, Mich.—Catalog L is a pictorial publication showing many applications with minimum text, including necessary specifications designating size and capacity. This catalog will appeal to users of excavating and material handling equipment. Displaying a wide range of equipment available for postwar requirement, the right size and capacity shovel or crane for many jobs can be determined easily.

Besser Manufacturing Co., Alpena, Mich.—A 6-page booklet showing the versatility of Vibrapac concrete masonry units, and the record of advancement of the Vibrapac machine. Control and variety of concrete masonry units in density and texture is discussed and illustrated.

American Standards Assn., New York, N. Y.—Approximately 800 standards are listed in the new American Standards booklet just issued. The listing covers specifications for materials, methods of tests, dimensions, definitions of technical terms, procedures, etc., in the electrical, mechanical, building, transportation, textile, and other fields. For convenience, the standards are listed alphabetically as well as by engineering fields.

Caterpillar Tractor Co., Peoria, Ill. — A colorful new 16-page booklet, "There's Work to Be Done," illustrates numerous jobs previously done by the earth-moving contractor in this country and at the same time gives an indication of the big job that lies ahead in building new highways, rebuilding old ones, new dams, levees, etc.

W. C. Dillon & Co., Inc., Chicago, Ill.—The traction type dynamometer is presented for the first time in complete manual form describing the increasing number of uses which are being found for it in simplifying testing and weighing procedures in many industries. The 19 pages of this booklet offer precise information concerning both the use and care of the nine various type capacity dynamometers.

Bucyrus-Erie Co., South Milwaukee, Wis.—"In War and Peace Progress Starts with Excavation," second in a series of booklets which report on equipment in the war, has just been published. It contains dramatic photographs of yard shovels, dragline, and cranes, and presents the "shovel story" in an interesting, graphic style. It describes the basic part excavating has played in building the modern standards of living, how the dirt-moving industry prepared the groundwork for American defense, and worked on the fighting fronts. Finally, how progress in the postwar period may start with excavation.

West Coast Lumbermen's Assn., Seattle, Wash.—A revised Membership Directory has just been issued. The new compilation of members is corrected in accordance with the latest information reported for each operation. In the directory the mills are listed alphabetically and arranged for convenience of reference. In addition to the mill location and sales manager address, data is tabulated showing capacity, equipment, market species, and items manufactured.

Drinkwater, Inc., Chicago, Ill.—A colorful 4-page engineering bulletin has just been released introducing a new line of pipe couplings known as Presto-Lock Flexible Pipe Couplings. The couplings may be used for permanent or temporary repair of

pipe lines, and are of the wedge type, with three simple parts chained together to prevent loss of coupling parts.

Davidson Brick Co., Los Angeles, Calif.—A book of design formula and procedure covering Steeltyd reinforced grouted walls and other masonry members is presented in a handsome 80-page manual of design sheets defining many of the most prominent problems confronted. The table of contents includes loads and stresses, bearing walls, support for joists, beams, columns, etc. For technical reference this book should prove valuable to engineers and architects.

Tyson Bearing Corp., Massillon, Ohio—Reproduction of a speech outlining the prospects and bright future for the construction machinery industry during the next ten years of the postwar era, is offered in booklet form.

Ideal Commutator Dresser Co., Sycamore, Ill.—The wire stripper leaflet illustrates the new electric "hot blade" stripper which strips cotton, silk, synthetic insulation or rubber coverings from fine stranded or solid conductors, and also reviews, with specifications, a number of other tools manufactured by this company.

Douglas Fir Plywood Assn., Tacoma, Wash.—Two additional sections for the handbook, "Technical Data on Plywood," have been issued. Section 1A has been revised and is now more complete. Section 9, "The Design of Plywood Beams," is new material—the culmination of three years of research in response to current needs of new theories and new materials in this type of construction.

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