WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

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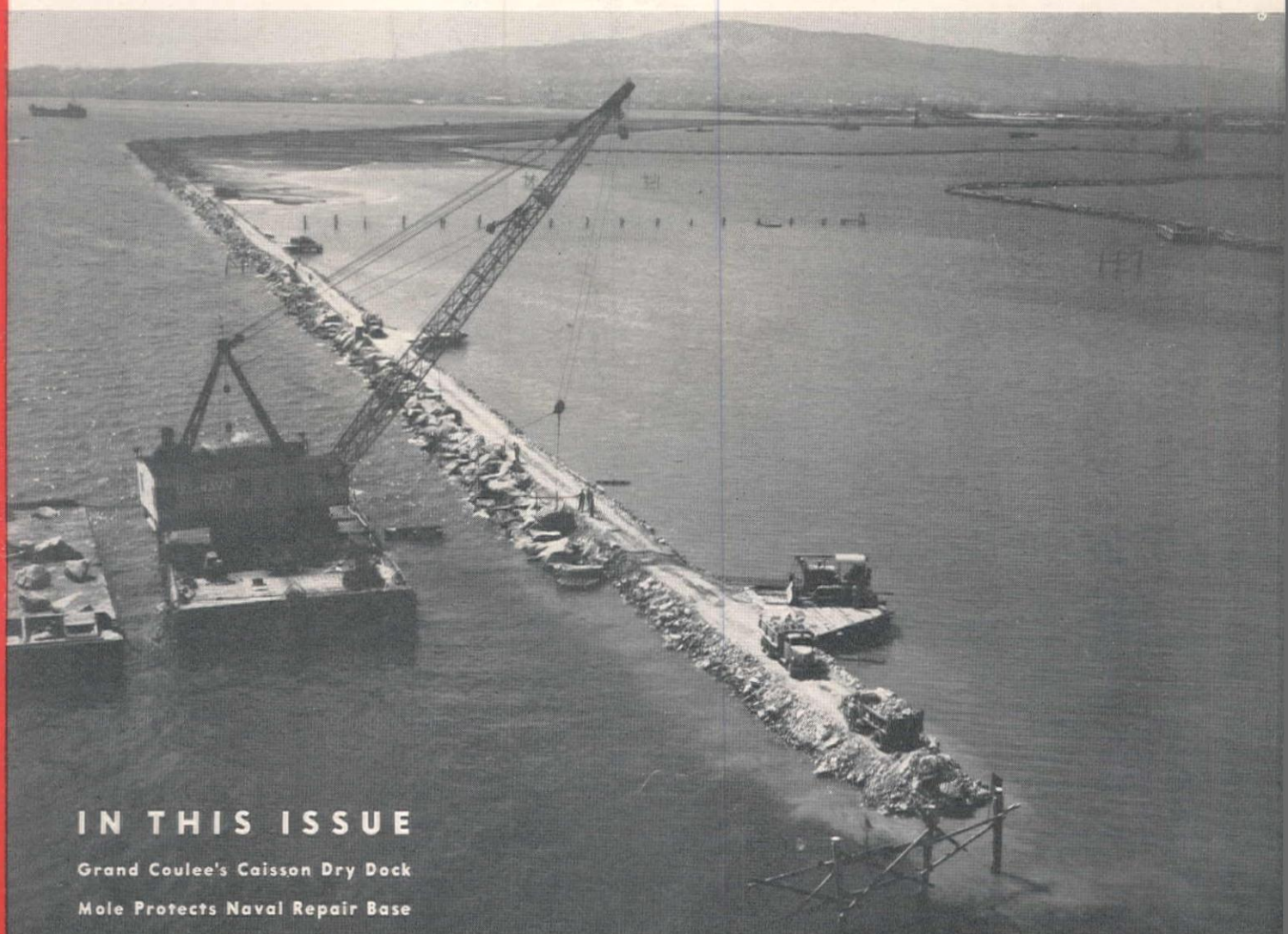
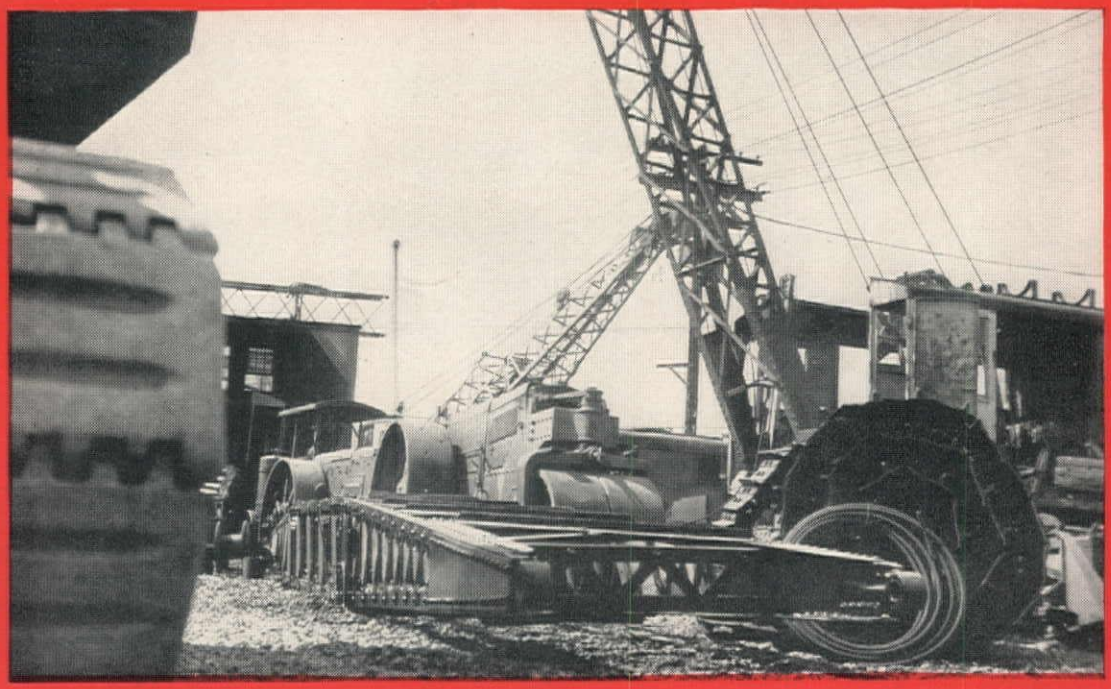


IN THIS ISSUE

PLACING ARMOR ROCK on west arm of the mole which protects Terminal Island Naval dry docks from the damaging surges and wave motion entering the harbor. The mole was constructed by placing two walls of mound rock and filling the core with sand pumped from hydraulic dredges.

IN STORAGE–IN USE...



ALL NEED RUST PROTECTION

GAS HOLDERS, water-works, sewage disposal plants and all types of equipment used by contractors, can be easily, quickly and economically rustproofed with *Texaco Rustproof Compound.* A single application is usually sufficient for year-round protection.

Texaco Rustproof Compound fights rust three ways:

1. It prevents rust formation on exposed metal
2. It penetrates existing rust, stops further rusting
3. It loosens existing rust, makes it easy to remove.

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

Because of its proved effectiveness and economy, *Texaco Rustproof Compound* is extensively 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.

Order *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.

Bucket Loaders
Concrete Mixers and Forms
Cranes, Ditchers
Draglines, Graders
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Scrapers
Screening Plants
Shovels, Steel Pipes
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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

WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED WESTERN HIGHWAYS BUILDER

Covering the Western Half of the National Construction Field

Contents for October, 1945

J. M. SERVER, JR.
Editor

SUBSCRIPTION RATES

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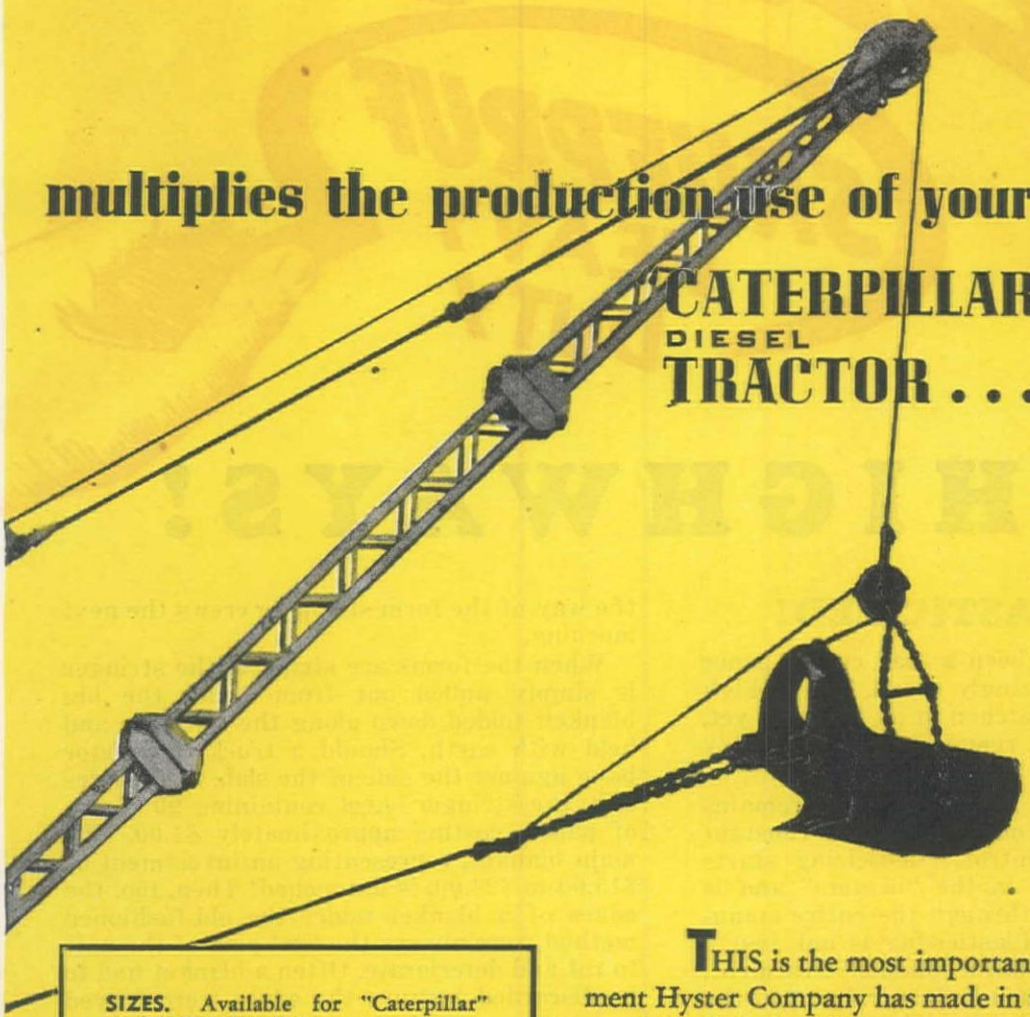
multiplies the production use of your "CATERPILLAR" DIESEL TRACTOR . . .



SIZES. Available for "Caterpillar" models D6, D7, D8.

DRAGLINE AND CLAMSHELL. Handles (on a D7) ½ cu. yd. dragline bucket; ⅜ cu. yd. digging clamshell or ½ yd. rehandling clamshell. Other models in proportionate capacities.

CRANE. Swinging live boom, with maximum lifting capacities in any position.

MOUNTING. On in 2 hours (with 2 men); off in 1 hour.

MOBILITY. Full tractor mobility is retained. Crawler track oscillation is not impeded. Tractor rigidity when desired is accomplished by crank control at masthead.

OPERATION. Conventional shovel and crane controls. 240° swing at speed of 4.5 RPM.

THIS is the most important product announcement Hyster Company has made in the 16 years we have specialized in building tractor equipment.

The addition of a Hystaway to a "Caterpillar" track-type tractor gives you *one piece* of production machinery that combines tractor — bulldozer — dragline, clamshell and crane.

Back of Hystaway lies the best engineering skill in the tractor equipment business . . . Years of field tests in various sections—under all working conditions—have proved Hystaway's performance, stamina and versatility.

READY FOR YOU...

A completely illustrated booklet on Hystaway—how it's built—what it does—how it does it. Write for your copy.

HYSTER COMPANY

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Richkraft

SKUFPRUF HEAVY DUTY

for HIGHWAYS!

IT'S PLASTICIZED!

There has never been a road curing paper like this! It is amazingly tough, has a "high wet strength" unmatched in its field and yet, for all its strength, remains pliable and easy to handle.

From pulp log to finished sheet it remains in one plant under our technicians' constant supervision and control. Plasticizing starts with the raw pulp in the "beaters" and is carefully extended through the entire manufacturing process. Plasticizing is not just a surface treatment—not a "puddle" treatment. Plasticizing is as much an integral part of the paper as the wood fibre itself!

STRINGER SHEETS!

Richkraft revolutionizes the old-fashioned methods of field handling! Richkraft introduces "Stringer Sheets!" Stringer Sheets are 18 in. wide and are separate from the main body of the blanket. On a 22 ft. road, for example, we will furnish a blanket 22 ft. x 60 ft. with two stringer sheets 18 in. x 60 ft. These stringers will be rolled under the outer edge of the blanket just inside the forms. The big blanket will be rolled out on the slab and secured with earth in the usual manner. There will be no overhanging paper to flop around while the forms are still in place—or to get in the way of the form stripping crews the next morning.

When the forms are stripped, the stringer is simply pulled out from under the big blanket, folded down along the slab side and held with earth. Should a truck or tractor bang against the side of the slab, it damages only the stringer sheet containing 90 sq. ft. of paper, costing approximately $1.00. The main blanket, representing an investment of $15.00 to $24.00, is untouched! Then, too, the edges of a blanket under the old-fashioned method were always the first part of the unit to rot and deteriorate. Often a blanket had to be discarded because the edges were frayed and worn, even though the rest of the cover was in excellent condition.

This won't happen "The Richkraft Way!" It's smooth — It's simple — It doubles the life of road curing blankets and offers a big savings to the contractor.

10 FT. WIDTHS!

Now for the first time in the history of construction, scuff proofed paper is available in 10 ft. widths. This means that on a 22 ft. road Richkraft will use only three rolls to make up a blanket instead of the usual four, reducing the labor of sealing laps by one-third and providing a smoother rolling blanket in the field.

The RICHKRAFT CO.

General Office: Builders Building, Chicago 1, Ill. **Eastern Office: Westport, Conn.**

Road Distributors: **Nelson Equipment Co., Portland, Spokane, Seattle, Boise, Idaho**

Richkraft

for BUILDING!

—and on the building side of the picture, when you call for Richkraft you will have available standard rolls—3, 4, 5, 6 and 7 ft. widths, and now for the first time in the history of construction, Skufpruf paper is available in

10 FT. WIDTHS IN RICHKRAFT

THINK WHAT THIS MEANS TO YOU!

In curing a large floor area you have a choice of 6 standard Richkraft roll sizes —3, 4, 5, 6, 7, 10 ft. widths.

Use the wide widths of Richkraft to reduce application time, save on lapping.

See the advantage:

10 ft. width covers over 40% more area than 7 ft. width.

10 ft. width covers over 65% more area than 6 ft. width.

10 ft. width covers 100% more area than 5 ft. width.

Protecting materials on the job 10 lineal feet cut from a 10 foot roll will give you 100 square feet of tough, Skufpruf, waterproof covering to keep out the weather.

Richkraft is manufactured entirely in one plant under the control and supervision of our technicians from pulp log to finished product. The result is a finished sheet unequalled in its field.

On those wall jobs, floor jobs, roofing jobs, concrete curing jobs—for lining buildings, protecting materials or partially completed work—for the countless jobs that a reinforced paper will do—call for Richkraft!

There is a brochure describing the Richkraft Skufpruf line. Ask your dealer for it.

The RICHKRAFT CO.

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Eastern Office: Westport, Conn.

General Distributors

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And now a Richkraft Western office under the management of Mr. C. A. Cook, Pacific Bldg. Oakland 12, California

A Richkraft PRODUCT

P&H

Added Values Mean Added Years of Service

True Rolling Crawlers — roller chain principle provides smoother travel and easier maneuvering. Here's longer life, too, with far less shoe replacement.

Planetary Transmission — faster reversal and more accurate control of bucket or dipper; lower maintenance costs.

Double-Safe Boom Hoist — enables you to raise or lower the boom quickly, safely. Even if cable should break, boom can't fall suddenly.

Hydraulic Control — for smoother, faster response and easier operation. This low-pressure system enables the operator to feel the load at all times.

All-Welded Construction — rolled alloy steels are tougher. Greater strength and rigidity mean longer life throughout.

Your Dollars Buy More When You Buy **P & H**

Look into P&H's added values *now* and profit by them in the years ahead. Get the facts about *all* of them. Write for literature.

P&H EXCAVATORS

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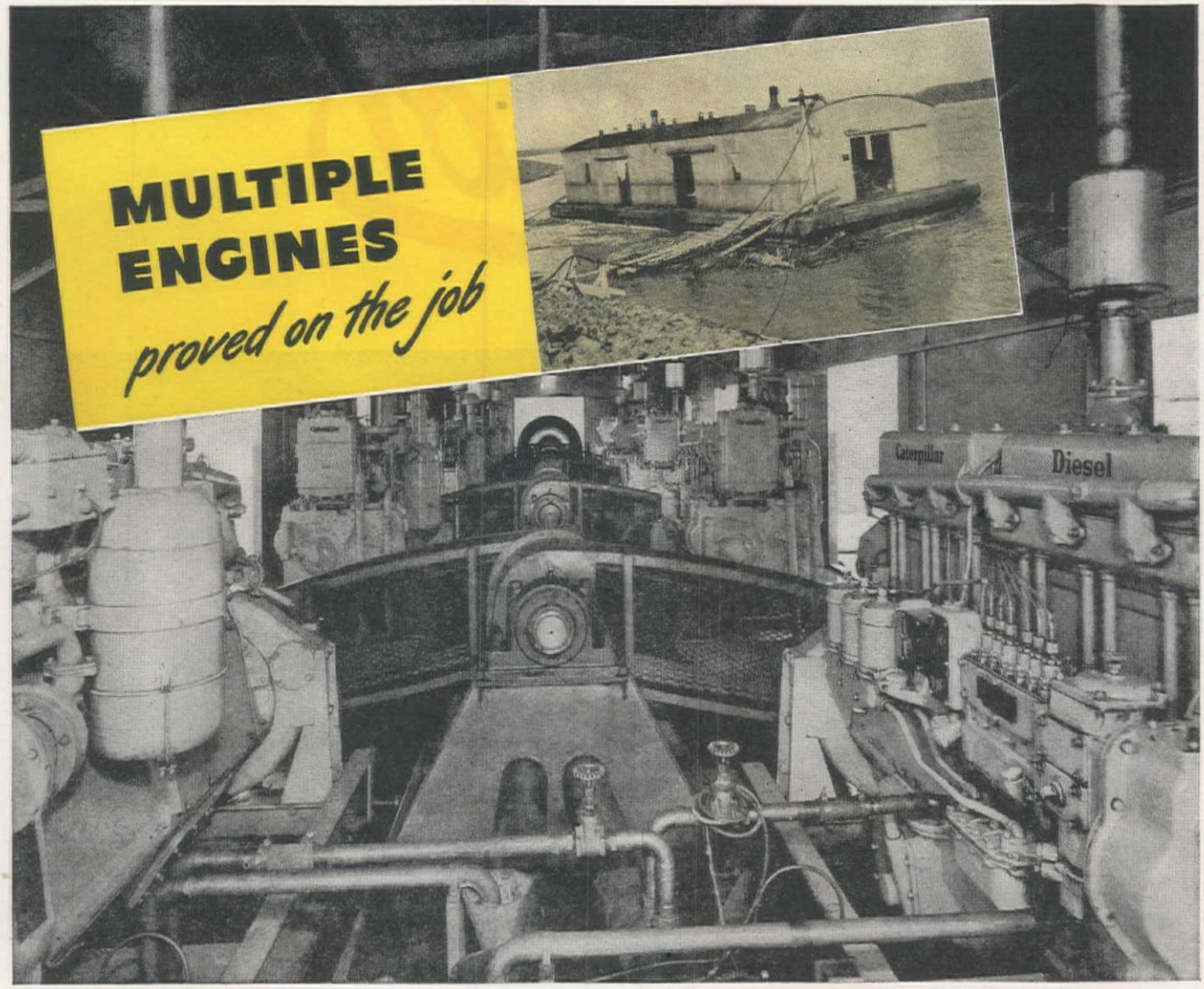


DIESEL POWER for variable loads, through multiple-engine hook-up, is nothing new with "Caterpillar." Fourteen years show hundreds of such "Caterpillar" Diesel installations, in all types of industries, where their advantages are being proved daily.

In the installation pictured here, TEN "Caterpillar" Diesel D13000 Engines are all belted to a single shaft to drive a 700 KVA generator supplying power for a 600-hp. motor generator in a tower machine used in levee building. Any eight of the engines can carry the full load—thus affording a high ratio of standby power. Partial loads are easily handled by cutting out any engines not needed. This "floating power house" can also supply emergency power to flood-stricken communities.

Economical power in multiple "packages" which in any combination or grouping can readily be matched to varying loads—that's what leads to greater production, steadier going, lower costs, better profits when "Caterpillar" Diesels are put on the job.

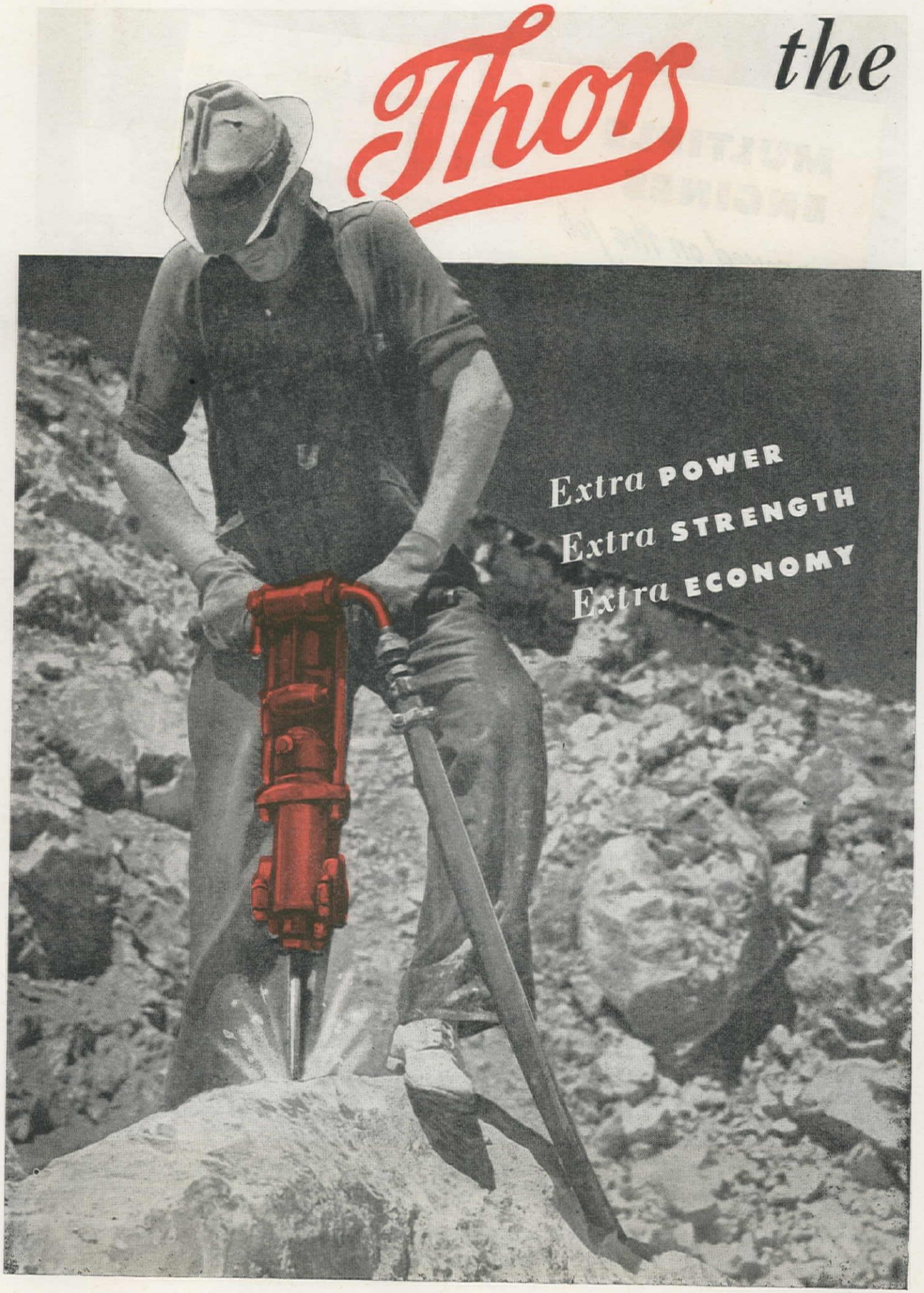
CATERPILLAR TRACTOR CO., San Leandro, Calif.; Peoria, Ill.

• SIX SIZES—34 to 190 hp.—applicable to multiple hook-ups of 2 to 20 units—*in many combinations of sizes.*

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.


Thor the
Extra POWER
Extra STRENGTH
Extra ECONOMY

ROCK DRILLS

with the Extras

The outstanding operating efficiency of Thor Rock Drills is the result of *exclusive* design and construction features that provide *extra* power, strength and economy. These major advantages mean more work, done faster at lower cost.

- Short-travel, tubular valve, self-seating and tubular-guided for longer wear without loss of efficiency.

  Sturdy, trunk-type piston.
- Piston, Valve and Cylinder in perfect balance.
- Rugged, easy-operating retainer with fully-enclosed springs
- Powerful, direct-line hole-blowing.
- Removable chuck in chuck driver, inexpensive to replace.

With a full range of sizes for light and heavy duty service in Sinkers, Drifters and Stopers, Thor has a Rock Drill for every job.

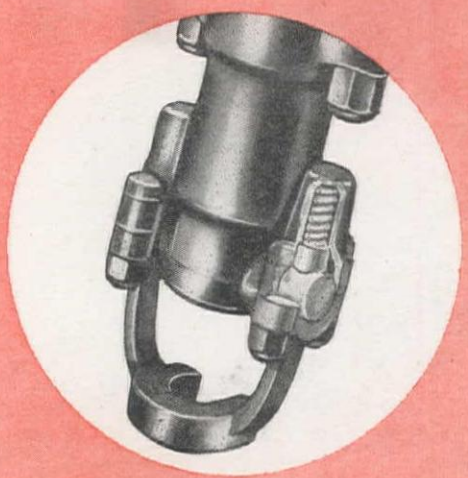
INDEPENDENT PNEUMATIC TOOL COMPANY

600 W. Jackson Boulevard, Chicago 6, Illinois

New York Los Angeles

YOU GET PERFORMANCE *EXTRAS*
IN *ALL* THOR CONTRACTORS AIR TOOLS

Paving Breakers	Sump Pumps
Sinker Rock Drills	Nail and Spike Drivers
Drifter Rock Drills	Sheeting Drivers
Stoper Rock Drills	Backfill Tampers
Clay Diggers	Concrete Grinders
Portable Saws	



THOR'S SPRING-CUSHIONED RETAINER

always works smoothly and easily, lasts longer. Fully-enclosed springs, protected from dirt and sealed at proper tension . . . cannot be overtightened, clogged or jammed. A push with a toe opens or closes the retainer . . . drill steel changes are faster and easier. Steady cushioning action and dirt-proof construction lengthens retainer life and cuts maintenance cost.

Thor

PORTABLE POWER TOOLS

PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS

JOB-PROVED

TOURNAPULLS

SPEED HANDLING FOR LEONARD &

? PROBLEM To handle 636,000 yards on 2½ mile section of U.S. 99 realignment north of Woodland, Washington. Dangerous mountain curves eliminated by widening and straightening. Material — earth and rock largely from a long sidehill cut. Long hauls — up to a mile round trip — had to be made over present highway without closing route to normal traffic. Fill area was across low lands and a swamp.

Manufacturers of Tournapulls*, Angledozers*, Bulldozers, Tiltdozers*, Carryall* Scrapers, Power Control Units, Rooters*, Tournatrailers*, Tournacranes*, Tournatrucks*, Sheep's Foot Rollers, Tournarope*, Tournaweld*, Tournalifts*. * Trade Mark Reg. U. S. Pat. Off.

LE TOURNEAU

PEORIA, ILLINOIS • STOCKTON, CALIFORNIA

...TOURNATRAILERS

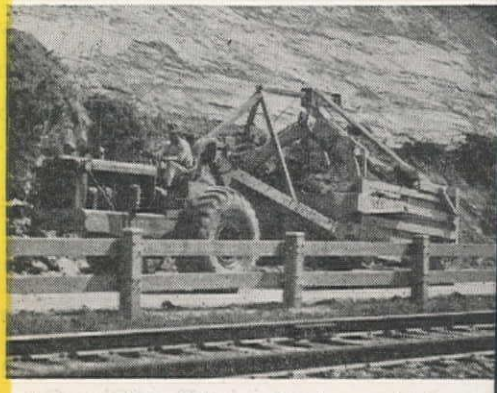
OF 636,000 YD. JOB SLATE ON U.S. 99

SOLUTION To profitably meet these difficult job conditions of steep grades, tough materials and open-traffic haul route, Contractors Leonard & Slate used 8 rubber-tired, fast-moving Tournapulls, with them moved most of the yardage. 5 Tournapulls with 15-yard Carryalls handled tough rocky scraper "dirt"; 3 with 17-yard Tournatrailers hauled shovel rock and slide material. These big rubber-tired rigs provided plenty of traction in the rough cuts and up steep grades, high hauling speed on the pavement and good flotation in the soft swampy fill. Rooting, clearing, pioneering and other specialized jobs were handled with supplementary LeTourneau tractor tools.

RESULTS Thus, Leonard & Slate moved about 95% of the total job yardage with their LeTourneau fleet. Typical production in tight, rocky hardpan, which had to be rooted, showed each Tournapull-Carryall rig averaged 55 pay yards per hour on a 4600' round trip haul. This, in spite of 18 to 20% return grades plus delays entering heavy traffic stream on main highway haul.

Profitably handling rugged jobs with Tournapulls is not new to Contractors Leonard & Slate. They originally used 6 smaller Tournapulls on some of the West's toughest jobs. C34X

Tough rocky hardpan was loosened by LeTourneau heavy duty Rooter using two teeth.

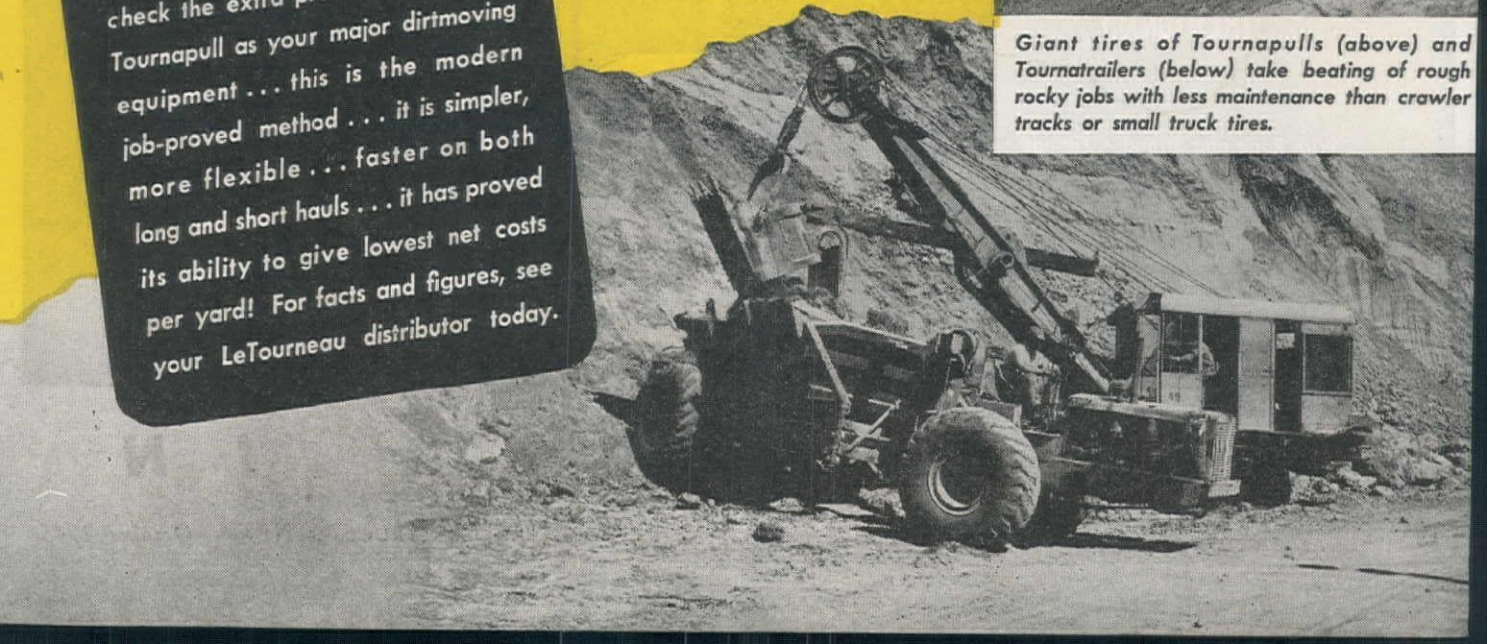


Tournapulls' ability to haul over highway without traffic interference or damage to pavement saves time, cuts haul road expense.

Giant tires of Tournapulls (above) and Tournatrailers (below) take beating of rough rocky jobs with less maintenance than crawler tracks or small truck tires.

INVESTIGATE

check the extra profit possibilities of Tournapull as your major dirtmoving equipment . . . this is the modern job-proved method . . . it is simpler, more flexible . . . faster on both long and short hauls . . . it has proved its ability to give lowest net costs per yard! For facts and figures, see your LeTourneau distributor today.



Is your ROPE-RIGGED for the big job ahead?

No time like *now* to check over your equipment's readiness . . . for the big competitive job ahead. And in checking your wire rope, include these points:

Are sheaves and drums regularly checked for excessive wear that would injure the rope operating over them? Does the rope get proper handling, lubrication, inspection, maintenance? Is it Roebling "Blue Center" Steel Wire Rope?

If the answers are "yes", bank on dependable, long-lasting, economical rope service . . . for today's toughest, tomorrow's biggest jobs. For "Blue Center", preformed or non-preformed, combines smooth-running flexibility with high abrasion-and-fatigue resistance . . . and extra strength for extra duty!

It's the result of fine Roebling steel, exceptional equipment, a century-old tradition of sound workmanship. And whether *your* rope problem is one of selection, operation or maintenance, Roebling engineering service can help you solve it . . . to your advantage.

As government needs taper off, Roebling wire rope will again be available to non-priority users, in order of precedence. Why not place *your* order now?

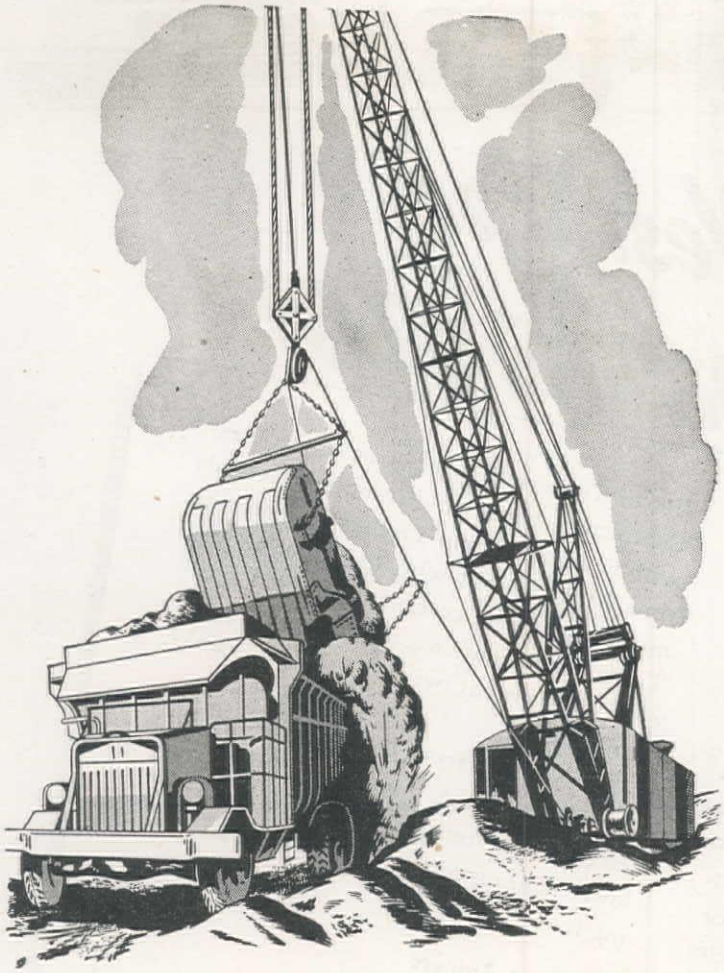
JOHN A. ROEBLING'S SONS COMPANY
OF CALIFORNIA
San Francisco • Los Angeles • Seattle • Portland

Wire Rope and Strand • Fittings • Slings • Cold Rolled Strip • Round and Shaped Wire • Wire Cloth and Netting • High and Low Carbon Acid and Basic Open Hearth Steels • Aircord, Swaged Terminals and Assemblies • Suspension Bridges and Cables • Electrical Wires and Cables • Aerial Wire Rope Systems

ROE

PACEMAKER IN

EQUIPMENT *ready...*



ROPE REMINDERS

Because sheaves play such an important part in wire rope life, we make it a point to stress their periodic, careful inspection.

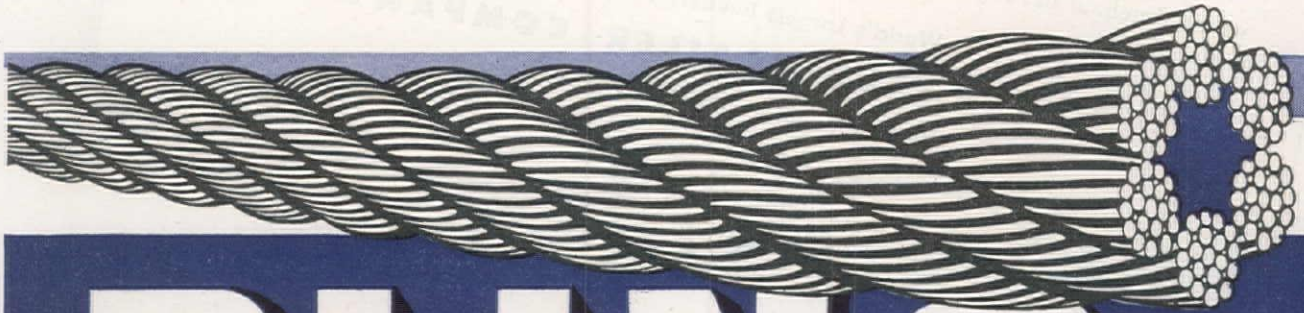
Take the matter of inspecting sheave grooves: At the start of service, the groove's diameter should bear the proper relation to the diameter of the rope to be used in it.

With constant passage of the rope over the sheave in normal operation, the groove is worn deeper, its diameter decreased. If a new rope is placed in this groove, it will be forced down and pinched out of shape. The result is an out-of-round, unbalanced rope, subject to severe abrasion against the sides of the groove.

Suppose the rope is placed in a sheave groove of too great diameter. Without proper side support, it will tend to flatten out.

Ideally, for the rope to have freedom of action with a maximum of support the sheave groove should support just less than half the rope's circumference.

Gages for measuring sheave grooves can be obtained from your Roebling representative. Use them, frequently. It will pay off in longer, more satisfactory rope life.



BLING

JR ROEBLING

WIRE PRODUCTS

Built in the West for Western Contractors

There are many important reasons why Fruehauf Trailers are the first choice of Contractors in the West. But the majority of operators, from Seattle to San Diego, prefer these Trailers because they are designed to fit conditions in this territory.

Equipment used on a dam at 8,000 feet altitude may move to the next job on a highway that runs below sea level. In one season a crew may work successively in heavy rainfall and a completely arid desert.

There are motor transport conditions for which Fruehauf has engineered a complete line of Trailers. In every part of the West, Contractors have set dirt-moving records with Fruehauf Dump-Trailers, lessened the time between jobs with Carryalls, moved materials at low cost on Semi and Full-Trailer combinations, and supplied powered equipment with Fruehauf Tank-Trailers.

Ask your nearest Fruehauf Branch to show you how they have helped other Contractors solve transportation problems and lower hauling costs. No obligation in talking it over.

World's Largest Builders of Truck-Trailers

FRUEHAUF TRAILER COMPANY

Western Manufacturing Plant — Los Angeles

ENGINEERED TRANSPORTATION

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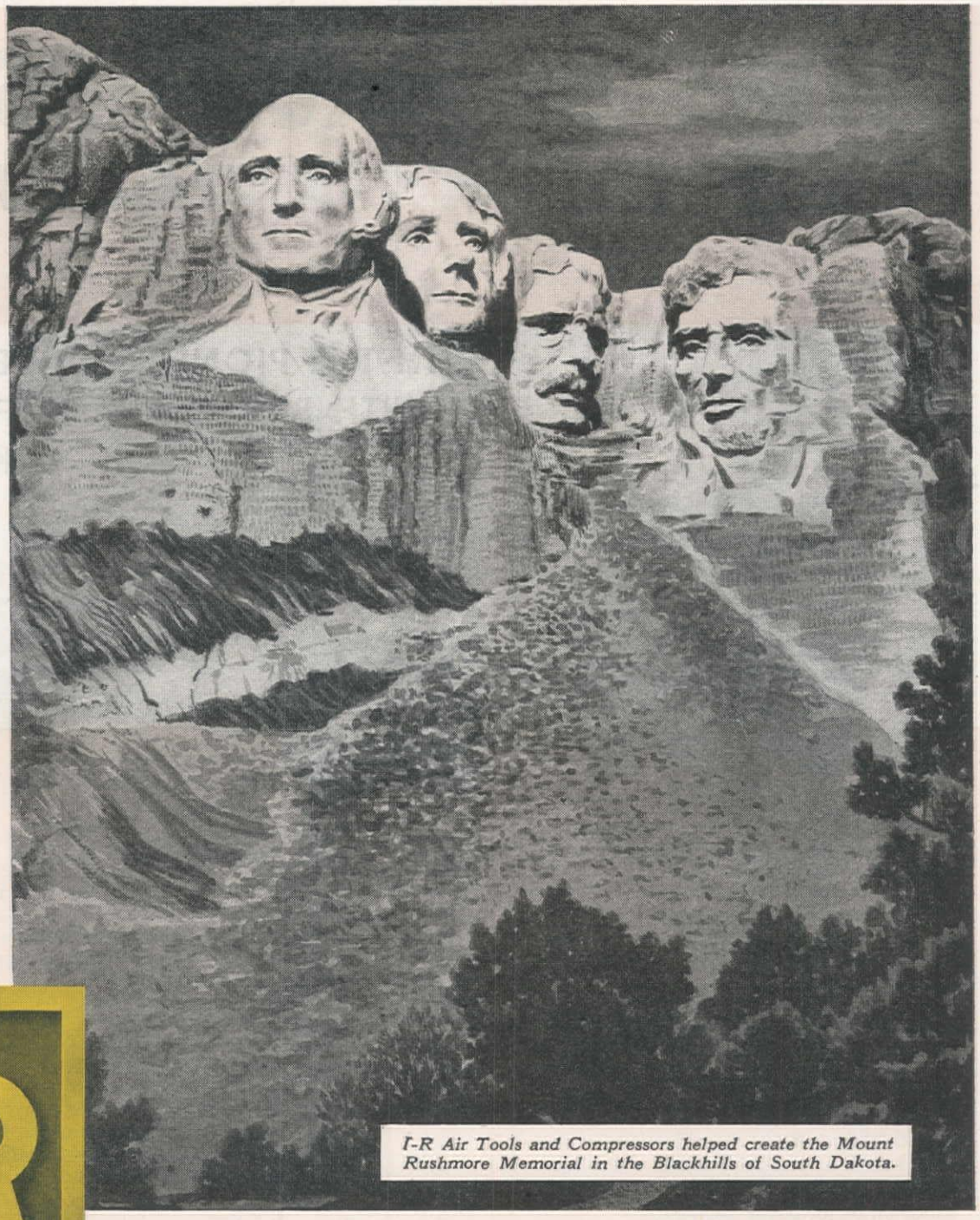
FRUEHAUF Trailers



I-R Air Tools and Compressors helped create the Mount Rushmore Memorial in the Blackhills of South Dakota.

CREATIVE ABILITY

By creating new and better equipment to meet ever-changing demands of industry, Ingersoll-Rand has contributed to our epic of national progress . . . machines that help increase production and decrease costs . . . labor-aiding machines and tools for the greater comfort of the builders of the nation.

COMPRESSORS
•
TURBO BLOWERS
•
AIR TOOLS
•
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CENTRIFUGAL PUMPS
•
CONDENSERS
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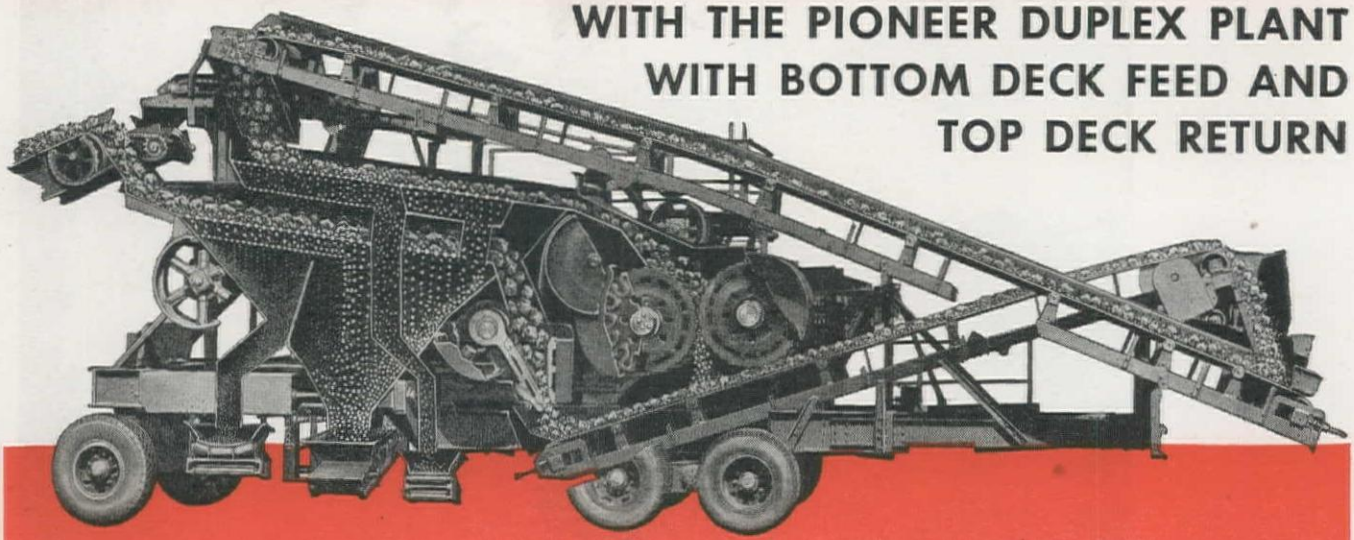
OIL & GAS ENGINES

Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y.

WINSTON BROTHERS...
Make The MATERIAL Meet

WITH THE PIONEER DUPLEX PLANT WITH BOTTOM DECK FEED AND TOP DECK RETURN



HERE'S WHAT THE PLANT HAD TO DO

The job called for the production of dense, graded surface coarse aggregates and cover aggregates from a pit that was short of acceptable sand and contained an excess of clay and fines.

Winston Brothers brought this data to Pioneer engineers. It was established that to make the pit produce the specification it was necessary for the gravel and screening plant to do the following jobs: Crush oversize over 1" • Reject excess quantities of No. 200 minus • Reject the No. 40 minus because it did not meet the specification as shown by the liquid limit or plasticity index • Produce the No. 10 material in the crushers • Produce and separate the stone chips for cover aggregate

THE SPECIFICATION

SURFACE COARSE		COVER AGGREGATE	
PASSING	%	PASSING	%
1"	100		
¾"	85—100	½"	100
No. 4	45—65	⅜"	90—100
No. 10	30—50	No. 10	0—5
No. 200	5—10	No. 200	0—2

Liquid Limit—Maximum allowance 25.
Plasticity Index—Maximum allowance 6.

THE TEST OF THE GRAVEL PIT

3" 69%	No. 4 . . . 32.4	Liquid Limit—test 35.	
1" 53.5	No. 10 . . . 28.9		
¾" 49.0	No. 40 . . . 25.0	Plasticity Index—test 17.	
	No. 200 . . 17.0		

HERE'S HOW THE PLANT DID THE JOB

To perform all these tasks efficiently and at low cost, a Pioneer Vibrator Duplex Plant was selected. It is the only standard gravel plant that could make the pit fit the specification because of its exclusive "Bottom Deck Feed."

In the Pioneer "Bottom Deck Feed" plant, the pit run material is screened on the bottom deck so the pit fines, of which there was an excess, were removed through the sand screen.

Crushed material is screened on the top deck so that by using a ⅜" opening in the first half of the top deck and a ⅛" opening in the middle deck it was possible to produce "stone chips" and save the crusher fines in the coarse aggregate.

To make this material meet these specifications, Winston Brothers selected a Pioneer 34-V Duplex Crushing Plant. They found it was the only standard gravel plant that could make the material meet the specifications—because of its exclusive "Bottom Deck Feed".

They fed the pit material onto the bottom deck and rejected the pit fines through the sand screen. Crushed material was returned to the top deck and crusher fines were mixed with the coarse aggregate. By using ⅜" screen in the first half of the top deck—and a ⅛" screen in the middle deck, it was possible to produce "stone chips".

Oversize from the bottom deck was crushed in the jaw crusher and returned to the top deck. Oversize from the top deck was crushed in the roll crusher.

Thus Winston Brothers were able, in one portable plant, to crush oversize . . . reject pit fines . . . and produce surface coarse aggregate . . . and cover aggregates.

a TOUGH SPECIFICATION

The experience of Winston Brothers is typical of the way Pioneer engineers work with you in selecting equipment that will meet your requirements. Pioneer equipment has extra margins of production efficiency to make the highest possible production and profits. There's no obligation in putting it up to Pioneer.

Here's the Pioneer plant that Winston Brothers used at Cucuta to make the Material Meet the Specifications.

WINSTON BROS. COMPANY
CONSTRUCTORS AND ENGINEERS
1470 NORTHWESTERN BANK BUILDING
MINNEAPOLIS 2, MINN.

May 14, 1945

Pioneer Engineering Works, Inc
1515 Central Avenue
Minneapolis, Minnesota

Attention Mr. Ellertson, Export Manager

Gentlemen

It is a pleasure to recount our South American experience with Pioneer Plants.

The Cucuta project in Colombia, called for the production of both surface and cover aggregates and the rejection of excess fines.

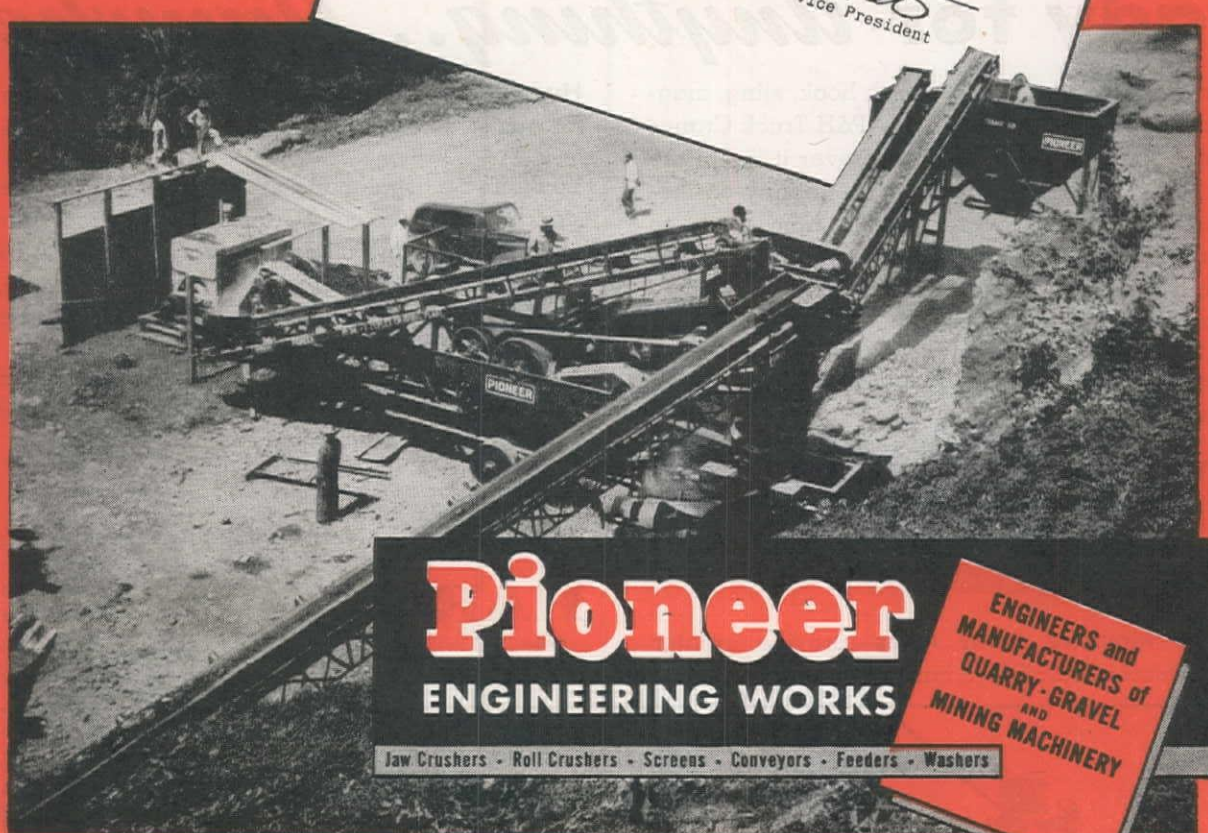
Our superintendent was so pleased with the work of this plant that we ordered a duplicate of the original set-up for our Cartagena job. with the addition of a Primary Crushing Unit

Four types of material had to be used on this job, namely lime rock, conglomerate. caliche. and loose gravel

In the lime quarry, and conglomerate, the Primary Plant and the Gravel Plant were used together. Then the caliche was processed by the Primary Plant while the Duplex Plant operated in the gravel pit

We are completely satisfied with the performance of these plants We appreciate the service of your engineers in recommending equipment that in every case has met our requirements Looking forward to working with you again on our next project, we reamin

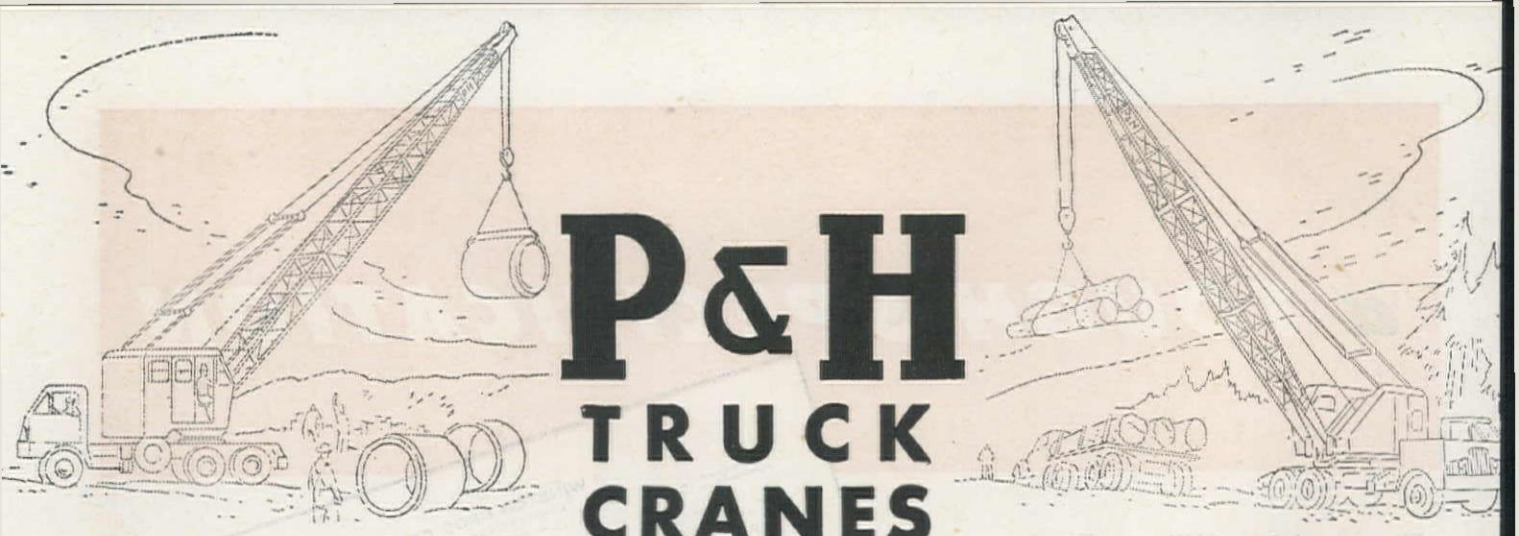
Yours very truly
WINSTON BROS. COMPANY
By C. S. Whitaker. Vice President



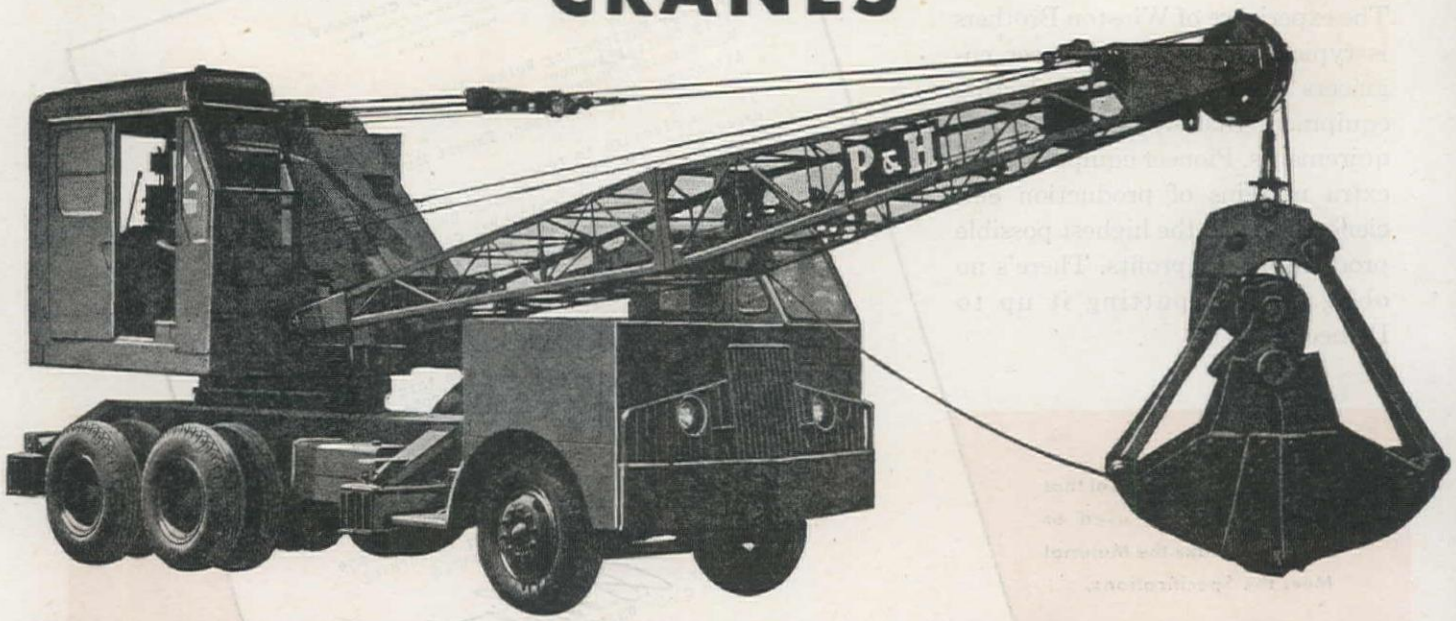
Pioneer
ENGINEERING WORKS

ENGINEERS and MANUFACTURERS of QUARRY-GRAVEL AND MINING MACHINERY

Jaw Crushers - Roll Crushers - Screens - Conveyors - Feeders - Washers



P&H TRUCK CRANES



Ready for *Anything...Anywhere*

Whatever you have to handle—with hook, sling, magnet, clamshell or single line bucket—P&H Truck Cranes make fast, easy work of it. And *wherever* it is—in the next block or the next county—they're "Johnny-on-the-Spot" with the ability to get quickly from place to place; through thick city traffic or over country roads. It's the kind of service that gets things done in a hurry—and cuts costs to the bone.

And here, too, you will find added values—exclusive operating advantages, such as:

Planetary Lowering—permits operator to "inch" loads accurately and safely, *under power!*

Planetary Boom Hoist—provides quick, safe raising and lowering of boom—*under power!*

Torsion-Bar Mounted Front Axles—provide greater stability—greater flexibility to handle all kinds of loads.

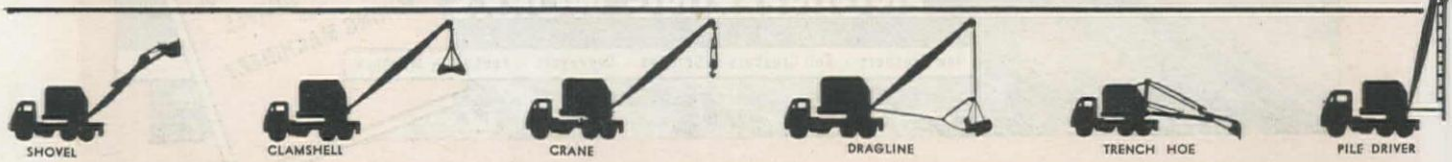
HydraulicControl—assures instant, positive response for easier, safer operation.

You'll find a great many other advantages in these outstanding P&H Truck Cranes—advantages that will save you time and money for years to come. All-welded construction of rolled alloy steels, for example, gives them greater strength to resist stresses and strains.

And you can bank on this: Size for size, no P&H Truck Crane has ever been outlifted. Why not get all the facts? Ask us to send you Bulletin TX-87.

General Offices:
4490 W. National Ave., Milwaukee 14, Wis.

HARNISCHFEGER
CORPORATION
EXCAVATORS • ELECTRIC CRANES • ARC WELDERS P&H HOISTS • WELDING ELECTRODES • MOTORS



HARNISCHFEGER CORPORATION: 82 Beale Street, San Francisco, California; *Warehouses Service Stations:* Seattle, Los Angeles, San Francisco. Portland, Oregon—Loggers & Contractors Machinery Co., 240 S. E. Clay Street; Willows, California—Willows Motor Sales Co.; Napa, California—Berglund Tractor & Equipment Co., 1224 Third Street; Salt Lake City, Utah—National Equipment Co., 101 West Second Street, So.; Boise, Idaho—Olson Manufacturing Company, 2223 Fairview Avenue; Spokane, Washington—F. M. Viles & Co., 1007 Second Avenue, West; Sacramento, California—Capital Tractor & Equip. Co., 235 W. 16th Street; Reno, Nevada—Dennison Tractor & Supply Company, 559 East Fourth Street.

How to make Better Time...

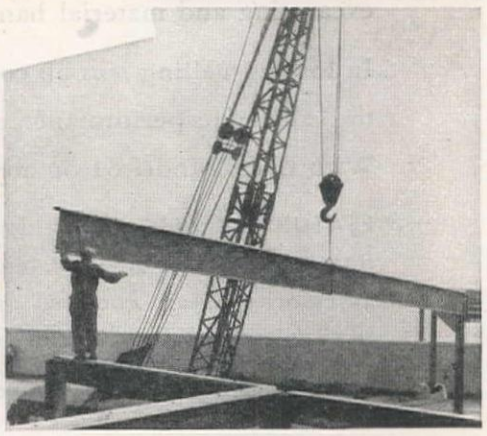
CABLE trouble can play the deuce with construction schedules. That's why wire rope performance is one of the most important factors in determining dirt-moving profits. The better the cable, the more efficient becomes your equipment . . . the faster your job moves along.

TIGER BRAND Excellay Preformed Wire Rope doesn't have to be broken in. You can put it to work at once. Its *preformed* construction gives it *greater* strength, *extra* flexibility. You get top production because each strand bears its full share of the load. This superior non-rotating cable runs true over the sheave; spools evenly at all speeds under light or heavy loads.

Important, too, is TIGER BRAND's safety advantage. Crown wires lie flat and in place even when broken . . . do not stick out to tear hands and clothes of your men.

Prepare now to use U·S·S American TIGER BRAND Wire Rope on your next job. Specify it for new equipment . . . re-rig your old equipment with it.

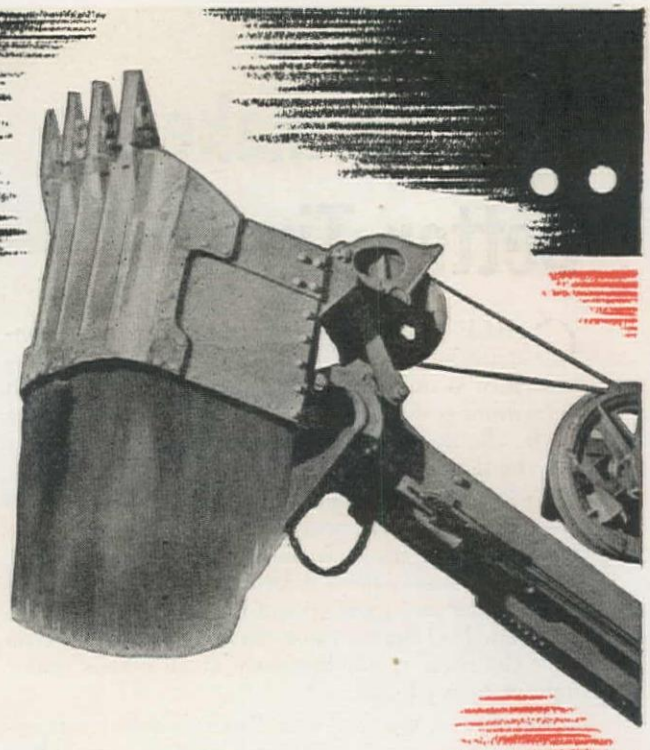
Excellay Preformed



COLUMBIA STEEL COMPANY
San Francisco · Los Angeles · Portland · Seattle · Salt Lake City
AMERICAN STEEL & WIRE COMPANY
Cleveland · Chicago · New York
United States Steel Export Company, New York
UNITED STATES STEEL

U·S·S AMERICAN
TIGER BRAND *Wire Rope*

TESTED...



BYERS MODEL 61

1/2 YD. POWER SHOVEL

...With New Improved Money Making Features for Excavating and Material Handling Contractors

Here's an excavator you can depend on to give you new high powered performance, speedy operation, ease of control and flexibility . . . in fact, it was designed for *today's* excavating and material handling requirements.

In long, gruelling *tests* on contractors' jobs, under contractors' supervision, it *proved* the value of its performance, speed, control and flexibility. It has contractors' *approval.* With Byers Model 61 on any half yard job, you can compete.

FEATURES: Sturdy unit welded rolled steel frames. Powerful 60 H. P. motor with all accessories. Gears enclosed and operating in circulating oil bath. Anti-friction bearings throughout. Airflex self-aligning, non-adjusting, long-lived clutches. Air brakes. New easy finger tip control. Independent operations. Convertible to all attachments.

For complete information see your nearest Byers distributor or write for new illustrated catalog.

THE BYERS MACHINE CO., RAVENNA, OHIO

Distributors throughout the world

***Your Local Byers Distributor Is:* EDWARD R. BACON CO., San Francisco; NELSON EQUIPMENT CO., Portland & Seattle; RAY CORSON, Denver; WILLARD EQUIPT. CO., Vancouver**

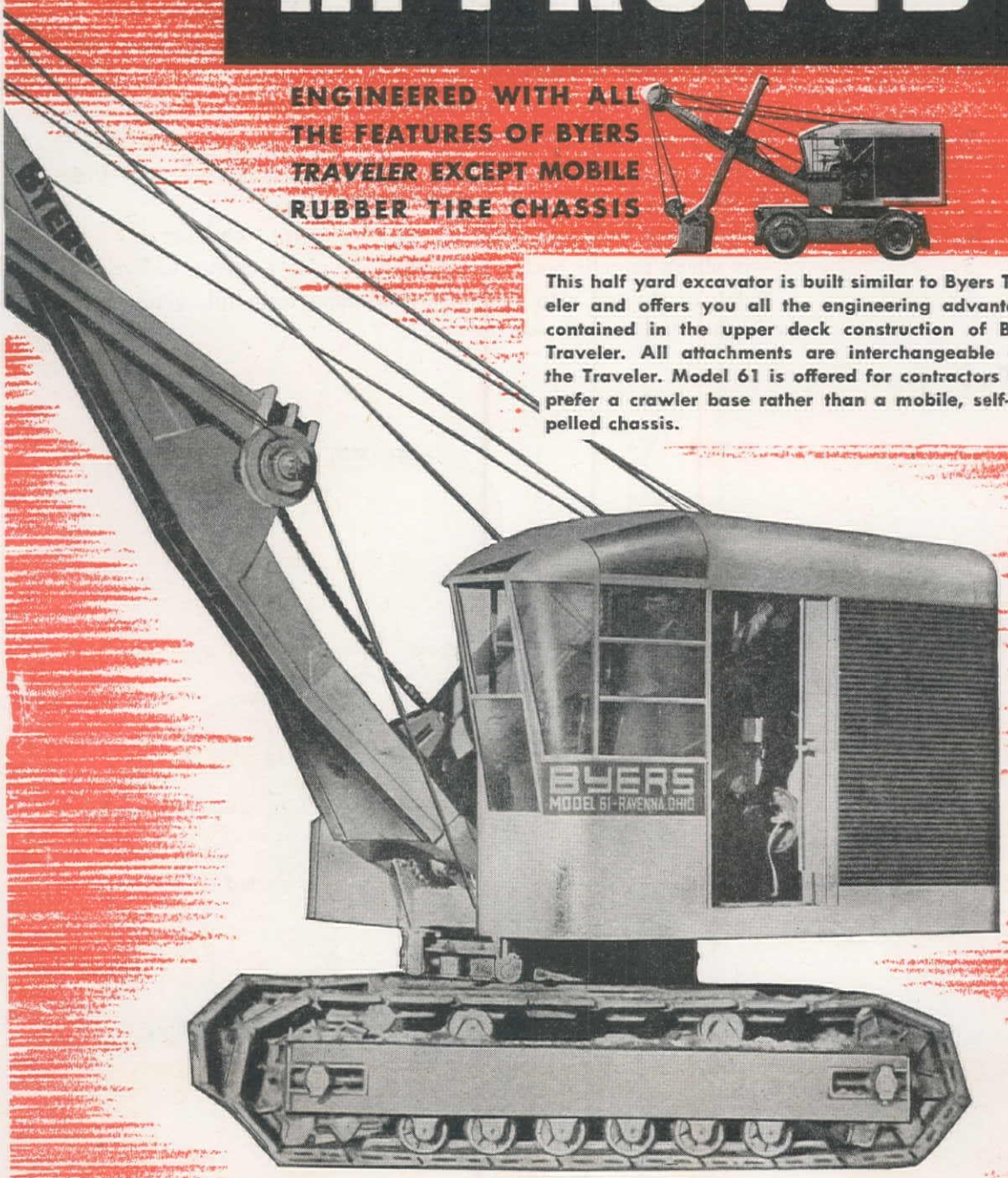
BYERS

Proved...

APPROVED !

ENGINEERED WITH ALL THE FEATURES OF BYERS *TRAVELER* EXCEPT MOBILE RUBBER TIRE CHASSIS

This half yard excavator is built similar to Byers Traveler and offers you all the engineering advantages contained in the upper deck construction of Byers Traveler. All attachments are interchangeable with the Traveler. Model 61 is offered for contractors who prefer a crawler base rather than a mobile, self-propelled chassis.



1/2 YD. MODEL 61

Then he said to himself

"No Joy–No Strength"

HIGH point in faith toward a losing technique was exhibited by "Herr Doktor" Ley . . .

—leader of Hitler's "Strength Through Joy" Youth Movement.

Sitting between two GI's who had frisked him of his cyanide vial, he unjoyfully maintained:

"Adolph Hitler was Germany's greatest man."

Which proves him to be a crumby leader . . .

—for any smart business man could have recognized a *losing* technique long before it was time for cyanide . . .

—and would have taken recourse to a *winning* technique . . .

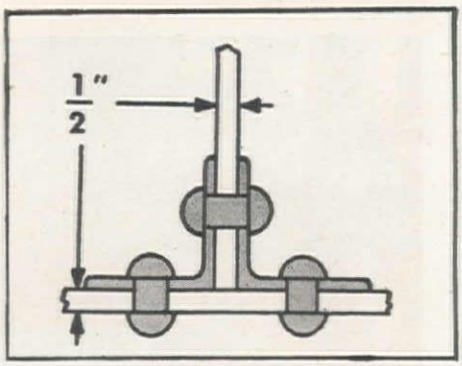
—in which there is both strength and joy plus a chance to live.

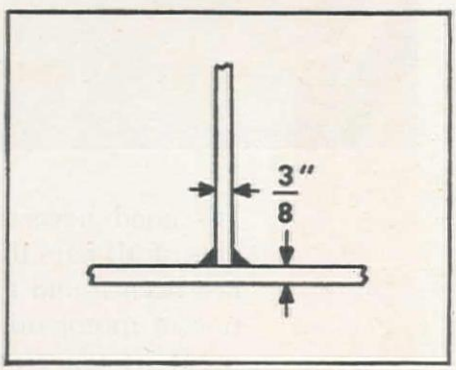
Think of the joy men get when a winning technique gives them leadership and success—such as . . .

LOOK, HERR DOKTOR, how to obtain

STRENGTH THROUGH WELDING

Competitive and Physical Strength. Lower costs and improved structures are obtainable through welded design. This riveted T connection, with ½" *plate* and *15 lbs.* of connecting material per ft., has a joint capacity of *96,000* lbs. per ft. . . . The welded connection, with ⅜" *plate* and 1 lb. of connecting material per ft., has a joint capacity of *102,000* lbs. per ft.





This rigid frame structure built for a large chemical company in Bay City, Mich., illustrates the strength and rigidity of welded construction. Makes possible prefabrication of large roof sections and speedy assembly in the field. Absence of conventional trusses improves appearance, lighting and maintenance of building. Designed, fabricated and built by the Austin Company, Cleveland, Ohio.

Lincoln Engineers will gladly help you apply this winning technique to the solution of your problems of design, fabrication and erection. Studies in Structural Arc Welding free on request. Ask for on your business letterhead.

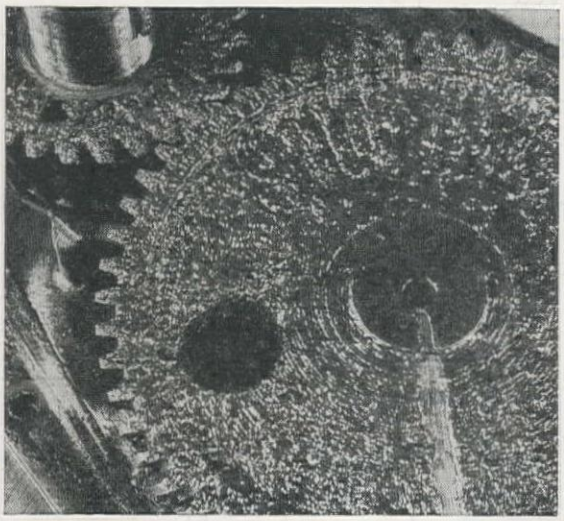
THE LINCOLN ELECTRIC COMPANY • DEPT. W-1 • CLEVELAND 1, OHIO

America's greatest natural **recourse**

ARC WELDING

Answering a critical need—

A war-born motor oil that fights OXIDATION

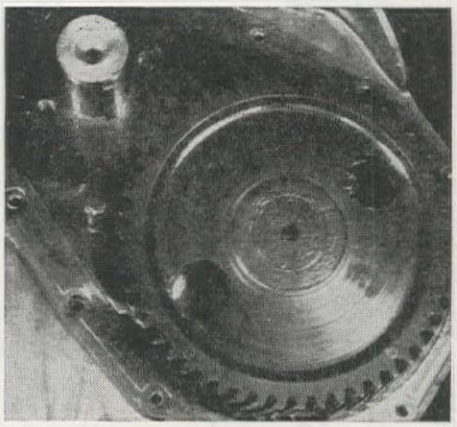


When the oil in your engine becomes badly oxidized, it's not only inferior as a lubricant —it's dangerous. ***Because oxidation leads to sludge, the grimy deposit that fouls pistons... plugs up oil lines... gums up gears, as shown at left. The result of sludge, of course, can be a big repair bill, plus out-of-service time.***

It's good news for trucks and cars of all ages that a way has at last been found to retard oxidation of motor oil. This achievement of wartime research is New Golden Shell Motor Oil with oxidation inhibitor.

The inhibitor, added during manufacture, keeps down the formation of sludge. This has been proved in exhaustive "Sludging Tests." It keeps the oil rich in texture . . . free flowing from one drain to the next.

Why put up with sludge's dirty work that can cost you big repair bills? You owe it to your equipment—new or old —to protect the mileage left in it by using Golden Shell Motor Oil with oxidation inhibitor.



Compare these timing gears with those in upper photo. They're the same gears—after the same kind of sludging test. Top photo shows sludge deposit resulting from test with a regular, good quality oil. Motor was desludged and again tested with New Golden Shell—which kept gears and other lubricated parts clean as shown here.

WITH OXIDATION INHIBITOR

Golden Shell MOTOR OIL

Shellengineered for the job

It's all wet—but it delivers the goods

THE main conveyor belt at one of the largest sand and gravel plants in Texas operates 10 hours a day — *and under the stock piles is exposed to dripping moisture 24 hours a day, every day.*

Working in a continuous shower bath like this is enough to make any conveyor belt give up — but this 985-foot-long Goodyear Style B belt has been carrying wet sand, gravel and rock up to four inches in size for more than twelve years. During that time, it has carried more than FOUR MILLION TONS of this wet material, without a single shutdown because of belt failure.

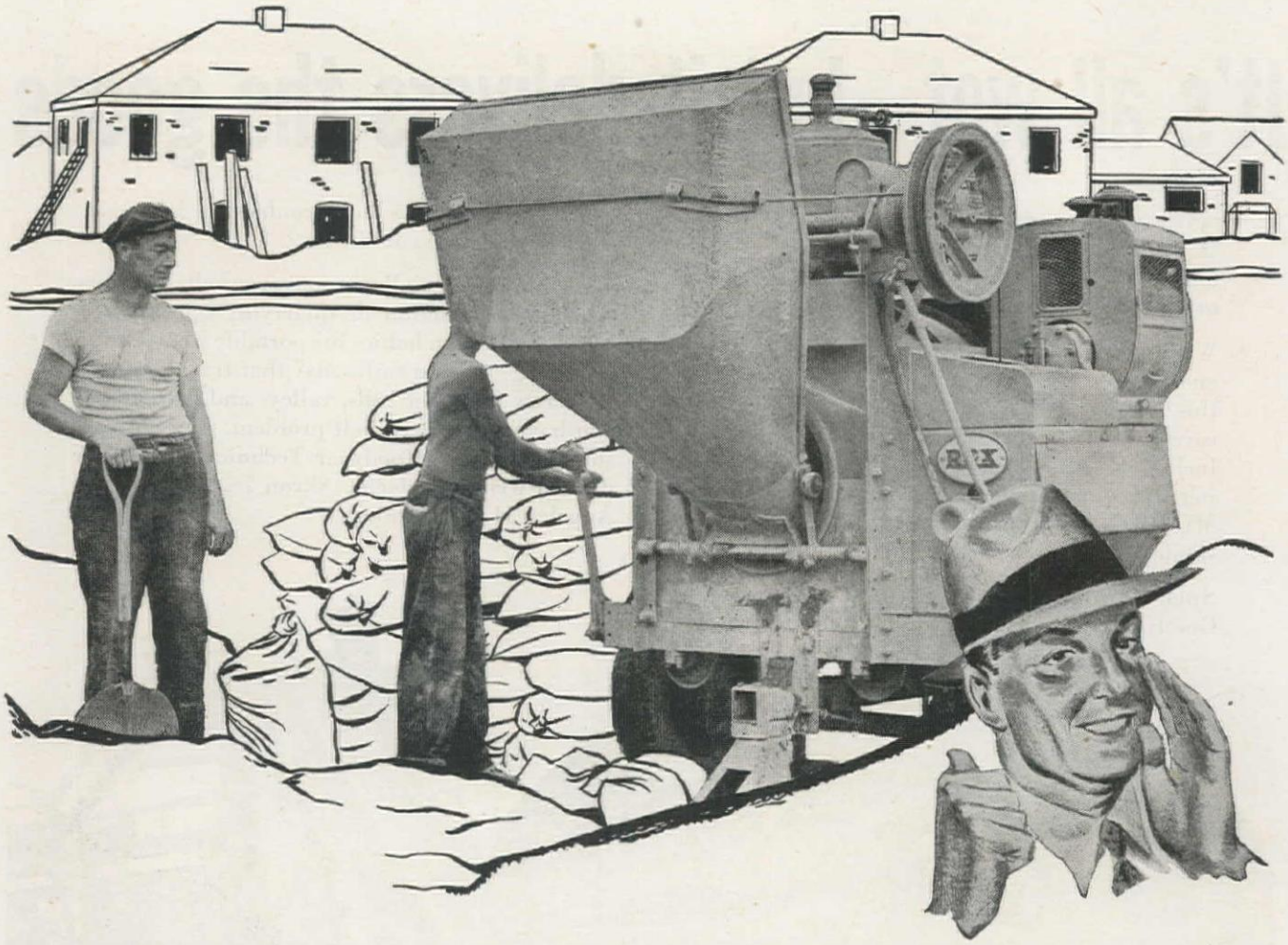
Such standout service attests the value of Goodyear's unique mildew-inhibited construction — a plus that assures long, trouble-free life under severest moisture conditions.

Goodyear is a specialist in conveyor belts for every type of construction or quarrying operation — builds belts from babies for portable plants to 10-mile-long "rubber railroads" that travel straight as a crow flies over hills, valleys and flatlands. If you have a conveyor belt problem, why not consult the G.T.M.—Goodyear Technical Man? For details, write Goodyear, Akron 16, Ohio, or Los Angeles 54, California.

***UNDER THIS STOCK PILE** the conveyor belt is in a continual shower bath — must withstand constant dampness plus constant abrasion.*

FOR HOSE, BELTING, PACKING, MOLDED GOODS AND TANK LININGS built to the highest quality standard in the world, phone your nearest Goodyear Industrial Rubber Products Distributor.

***ANGLING STEEPLY FROM STOCK PILE** to loading tipple, this Goodyear Style B Conveyor Belt has operated without interruption for more than 12 years, carried more than 4 million tons of highly abrasive materials.*



Pardon Us . . . YOUR SKIP IS SHOWING . . .

YOU BET it is! It's showing how a *good* skip can kick those batches into the drum *faster,* to save seconds that speed jobs.

And it's just another reason why we like Rex Mixers best. You don't have to pound the life out of a skip to get the batch into the drum. That's handled quickly and efficiently by the Rex "Shimmy Skip" which provides the right amount of snappy, shaking action to get *all* of the batch into the drum quicker and easier.

Believe me, that Rex Distributor wasn't fooling when he told us that the "Shimmy Skip" alone is worth the price of the Mixer. But look at the other features that you also get—Water Control that is practically 100% accurate—exclusive Chain Belt Drive that *cushions shock,* prolongs Mixer life—stronger design, reduced weight, perfect balance that makes transporting and spotting easier.

Yes, sir, Rex Mixers are our choice by a wide margin!

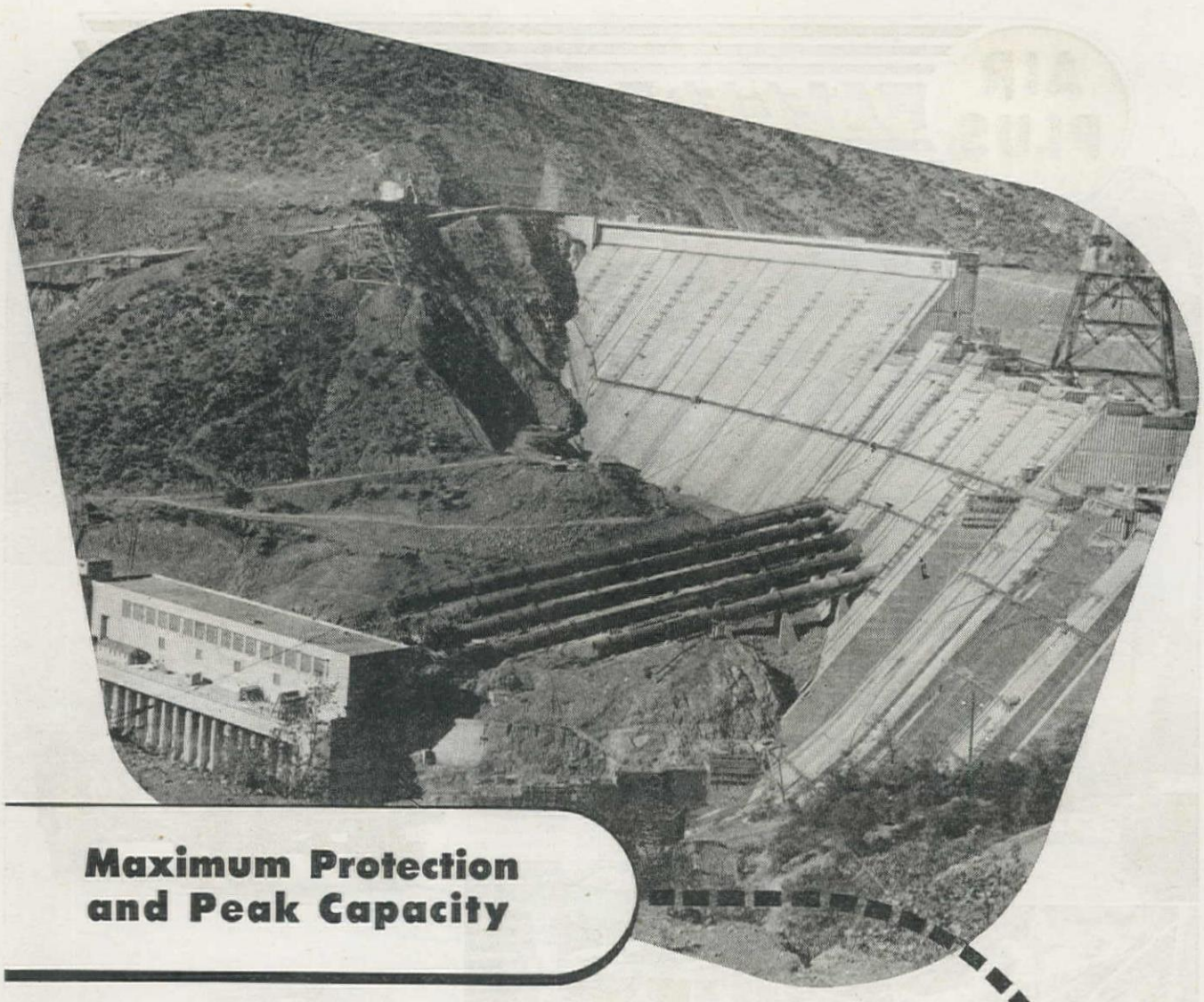
• • •

RELY ON YOUR Rex Distributor. *He handles the complete line of Rex equipment for speeding up the mixing, hauling and placing of concrete and the moving of water. See him for Pumps, Pavers, Pumpcretes, Moto-Mixers and Mixers. You'll find him always ready and willing to help you locate new and used equipment, and to help you keep your present equipment in top running order.*

Brown-Bevis Equipment Co., 4900 Santa Fe Ave., Los Angeles 11, Calif.; Brown-Bevis Equipment Co., 610 W. Jefferson, Phoenix, Arizona; Construction Equipment Co., 1119 Ide Avenue, Spokane, Washington; Contractors Equipment and Supply Co., Springer Bldg., Albuquerque, New Mexico; Ray Corson Machy. Co., 1646 Wazee Street, Denver, Colorado; Hall-Perry Machinery Co., 802 E. Iron St., Butte, Montana; Industrial Equipment Co., 155 Sansome Street, San Francisco, Calif. (administrative and sales work); Industrial Equipment Co., 10911 Russett St., Oakland 3, Calif. (service and repair parts); Intermountain Equipment Co., Broadway at Myrtle, Boise, Idaho; Loggers & Contractors Machinery Co., 240 S. E. Clay St., Portland, Oregon; Star Machinery Co., 1741 First Ave., S., Seattle, Washington; Arnold-Machinery Co., 153 W. 2nd South Street, Salt Lake City 1, Utah.

REX

CONSTRUCTION MACHINERY



Maximum Protection and Peak Capacity

SHASTA DAM

Time and again engineers specify Barrett Coal-tar Enamels.

They do so because they know from experience that Barrett Coal-tar Enamels prove their economic value.

They know too that pipe and penstocks lined with Barrett Coal-tar Enamel have smooth, mirror-like surfaces that increase the flow of water and maintain a peak capacity undiminished over a long period of years.

Barrett Coal-tar Enamels meet the American Water Works Association's Standard Specifications 7 A.5 and 7 A.6—1940.

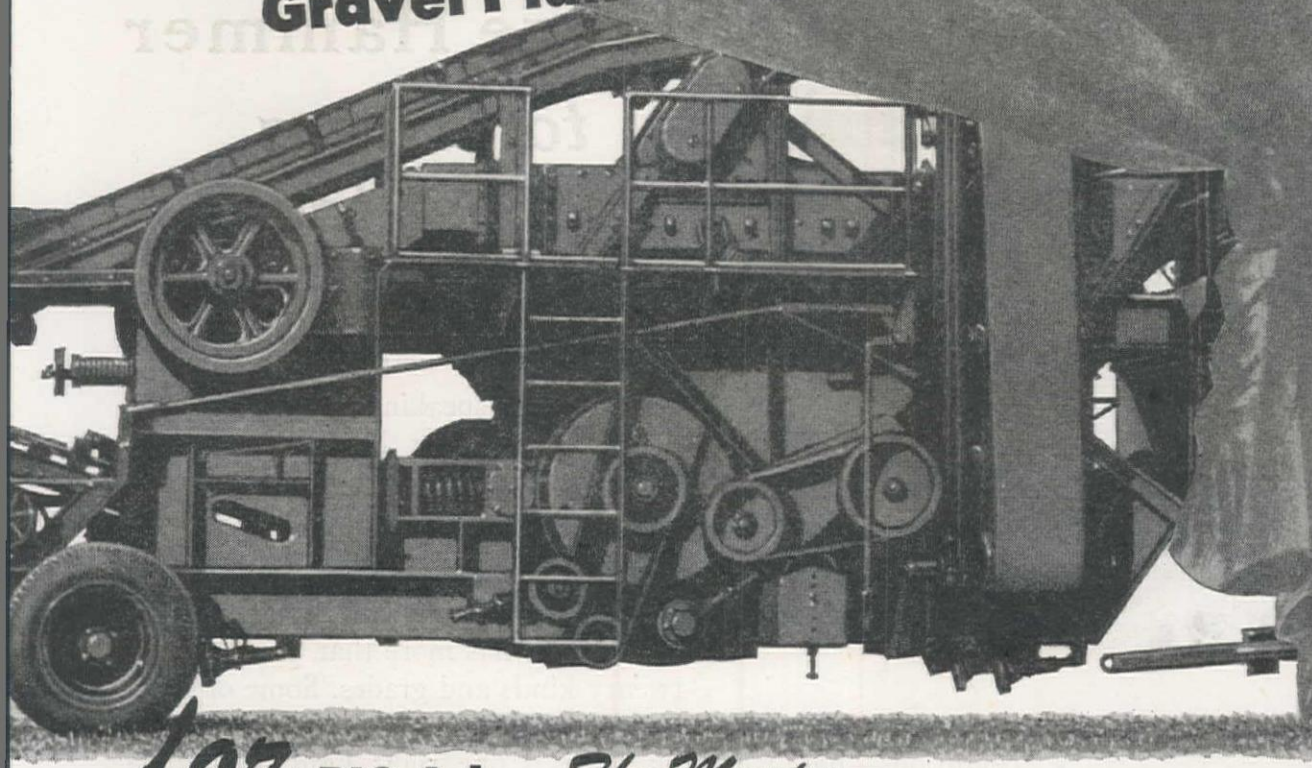
THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK 6, N. Y.

Barrett
COAL-TAR ENAMEL

FIELD SERVICE—
Our Pipeline Service Department and Staff of Field Service Men are equipped to provide both technical and on-the-job assistance to engineers and construction men in the use of Barrett Enamels.

...a peek into the future—

3 Great New Cedarapids Tandem Straightline Gravel Plants for Tomorrow's Jobs



for BIG Jobs—*The Master*
MEDIUM Jobs—*The Junior*
SMALL Jobs—*The Baby*

THREE new Cedarapids plants, differing only in size, will be ready for work on your 1946 contracts. Engineered and job-tested to rigid Cedarapids performance and economy standards, they will give you the production margin to make low-bid contracts show a good profit.

Check These Cedarapids Features:

Complete Single-Unit Portability. Fast set-up and take-down. On contractor's job tests, less than one-half hour to put the Junior Tandem into profit-making production!

Balanced High Capacities. Careful synchronization of conveyor speeds with screening, roll and jaw crusher capacities assures smooth, continuous operation at top efficiency.

Adaptability. Readily adaptable to any job conditions. Easy to convert into a complete Cedarapids Unitized Plant with primary crusher and washing and screening plant.

Extra Belt, Screen and Crusher Capacities for the tough jobs and hard-to-work materials.

Centralized Control. One man on control platform handles production.

Uniform Aggregate. Straightline Tandem design simplifies processing, insures aggregate to meet exacting specifications.

Low Maintenance. Rugged Cedarapids construction and easy access for greasing and adjustments keep maintenance costs at a minimum.

See your nearby Iowa distributor for complete details on these new Cedarapids Tandem Straightline Plants, or write direct.

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa

Cedarapids

Built by IOWA

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

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ARIZONA-CEDAR RAPIDS CO.
Phoenix, Arizona

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

SIERRA MACHINERY CO.
Reno, Nevada

You Don't Need a Sledge Hammer *to drive a carpet tack*

It isn't all force in driving a nail. Blasting is that way, too.

Figuratively speaking, explosives can deliver the heavy blow of a sledge hammer, or the light tap of a tack hammer. Blasting results depend on both the type of explosive and its use.

To enable you to pick the right explosive*, Atlas has more than one hundred twenty kinds and grades. Some of these give good results under a variety of conditions—but, we think there is one right kind and grade of explosive for each job.

ATLAS GELODYNS*

For example, examine the qualifications of Atlas Gelodyns. They combine some of the advantages of high count ammonia dynamites with some of the advantages of gelatin types. Gelodyns are sufficiently plastic to be retained in upward pitching bore holes. They are more moisture resistant than ammonia dynamites. They cost less per cartridge than gelatins of equivalent strength, and can frequently be substituted on a cartridge-for-cartridge basis. This affords attractive economies in highway and general construction blasting.

Atlas representatives can help you pick the right explosive. They have a specialized knowledge of explosives, which, when combined with your mastery of your own operation, can stretch equipment, save man power and cut job costs. Talk it over when the Atlas man calls.

GRADE	% Weight Strength	Velocity, feet per second, in the open 1¼" x 8"	Velocity, feet per second, confined in pipe. 1⅛" x 8"	MINIMUM NUMBER OF 8" CARTRIDGES PER 50 LBS. (MAXIMUM 5% MORE)						
				1⅛"	1¼"	1½"	1¾"	2"	4"	5"
Gelodyn No. 1	65	10000	14000	129	107	73	55	42	11	7
Gelodyn No. 3	65	11000	15000	146	120	82	61	47	13	8

Gelodyn: Reg. U.S. Pat. Off.

Offices in Principal Cities

ATLAS EXPLOSIVES

"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

SAN FRANCISCO 4, CAL. ATLAS POWDER COMPANY SEATTLE 1, WASH.

This O.K. Champion Sewer Cleaner depends on a Model VRP7, 2-cylinder Le Roi engine for constant, economical power.

For results that build your reputation for economical, reliable "on-time" performance depend on LE ROI ENGINES

Because today's construction schedules are fast-moving, it pays to make sure the equipment you buy is *"Le Roi-powered."* This fact is vouched for by men who are responsible for the operation of equipment, because they know Le Roi engines can take the punishment handed out to field equipment.

The greatest reason underlying this record for dependable performance is the fact that Le Roi engines are built by a manufacturer concentrating exclusively on the problems of the heavy-duty field. You get precision machining, advanced design, and the finest type of accessories — plus weight and stamina to stand up under all types of service.

When you specify Le Roi power, your choice is backed by more than a quarter-century of experience in the specialized power requirements of your particular field. Write for details.

LE ROI
MILWAUKEE

TURN THE PAGE

LE ROI Portable Air Compressors give you a full quota of productive hours . . . dependably

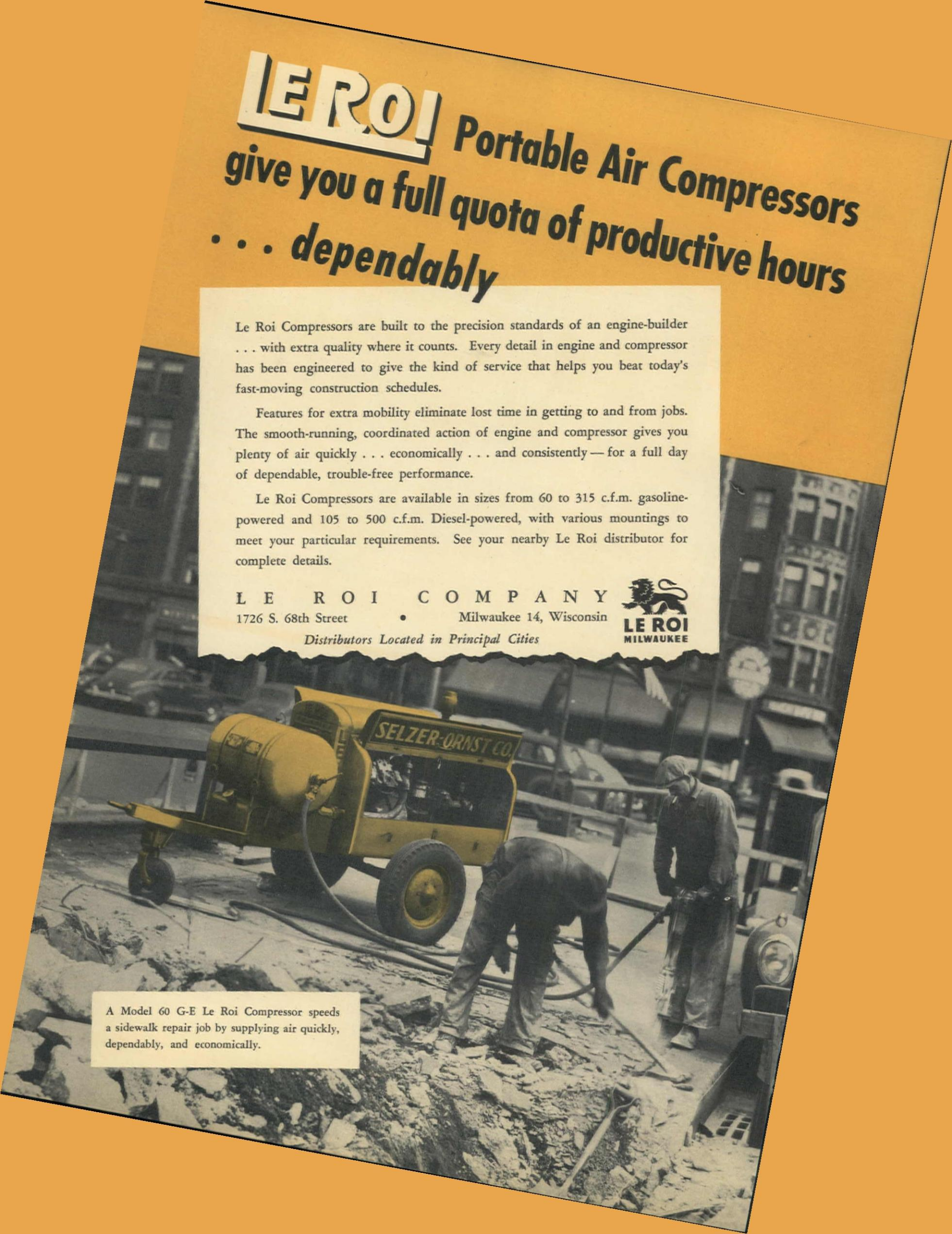
Le Roi Compressors are built to the precision standards of an engine-builder . . . with extra quality where it counts. Every detail in engine and compressor has been engineered to give the kind of service that helps you beat today's fast-moving construction schedules.

Features for extra mobility eliminate lost time in getting to and from jobs. The smooth-running, coordinated action of engine and compressor gives you plenty of air quickly . . . economically . . . and consistently — for a full day of dependable, trouble-free performance.

Le Roi Compressors are available in sizes from 60 to 315 c.f.m. gasoline-powered and 105 to 500 c.f.m. Diesel-powered, with various mountings to meet your particular requirements. See your nearby Le Roi distributor for complete details.

L E R O I C O M P A N Y
1726 S. 68th Street • Milwaukee 14, Wisconsin
Distributors Located in Principal Cities

LE ROI
MILWAUKEE



A Model 60 G-E Le Roi Compressor speeds a sidewalk repair job by supplying air quickly, dependably, and economically.

A New OUTPUT LEADER

The 1½ Yd. BUCYRUS ERIE 38-B

SHOVEL FEATURES: Strong, light boom with big point sheaves for effective application of digging force . . . independent, positive, twin rope crowd . . . high lip, curved door dipper for fast filling and dumping in rock and dirt.

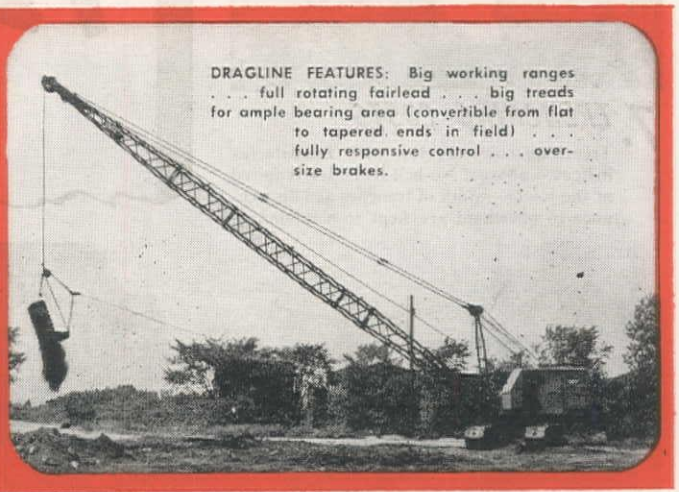
Remarkable balance of speed and power in crowd (or drag), hoist and swing gives the 38-B the smooth, fast operating cycle that spells big output on every job. Selection of the most modern materials, efficient weight placement and widespread use of selective hardening result in a machine with ample strength for continued tough digging, but without a pound of excess weight to slow it down. Anti-friction bearings and oil-enclosed gears add to smooth operation and long life. Big, simple machinery units are easily accessible, require minimum maintenance for top performance. Equally effective as shovel, dragline, clamshell, or crane, the 38-B is a real postwar excavator, thoroughly field tested.

★ ★ ★

It's new . . . it's fast . . . it's long-lived! It's just what you need in a 1½-yd. machine to put you in good position in the competitive peacetime years. Find out the full story on the 38-B from your Bucyrus-Erie Distributor.

37E45C

CRANE FEATURES: Long boom plus jib extension . . . mast type suspension available for long booms, combines low clearance with most effective support . . . independent boom hoist with full, accurate power control of raising and lowering . . . high stability . . . independent 2-speed propel available.



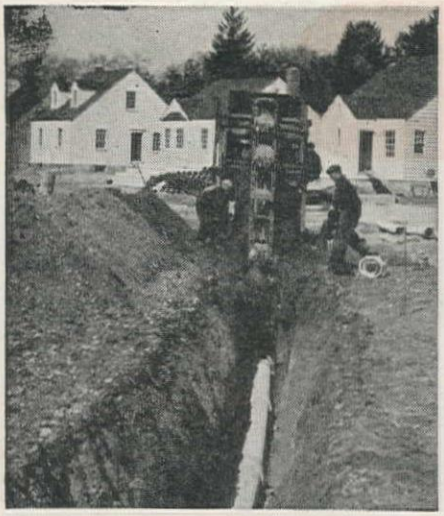
DRAGLINE FEATURES: Big working ranges . . . full rotating fairlead . . . big treads for ample bearing area (convertible from flat to tapered ends in field) . . . fully responsive control . . . oversize brakes.

SEE YOUR BUCYRUS ERIE DISTRIBUTOR

EXC-2

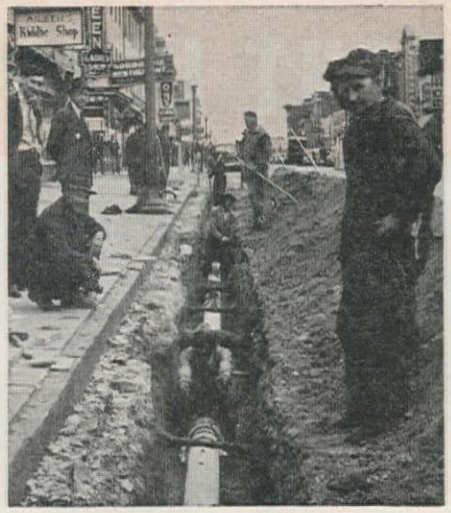
SOULÉ EQUIPMENT COMPANY	Oakland — Sacramento
CROOK COMPANY	Los Angeles
CLYDE EQUIPMENT COMPANY	Portland — Seattle
INTERMOUNTAIN EQUIPMENT CO.	Boise — Spokane — Walla Walla
THE LANG COMPANY	Salt Lake City
THE O. S. STAPLEY COMPANY	Phoenix
R. L. HARRISON COMPANY	Albuquerque

Shovels • Dragshovels • Draglines • Clamshells • Cranes • ⅜ to 2½-yd.



1. INTERNAL CORROSION

Asbestos-cement Transite Pipe cannot cause "red water." And its initial high flow rate is not affected by that most costly form of internal corrosion—tuberculation.

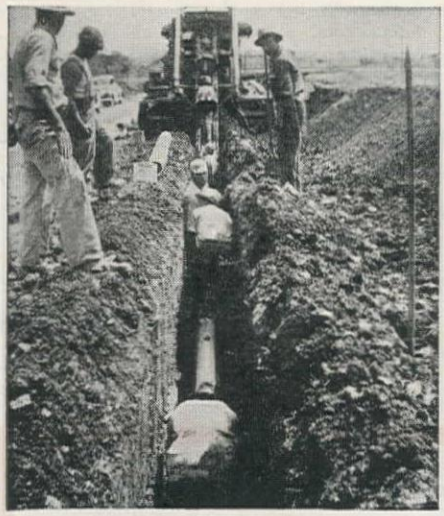


2. MAINTENANCE

In thousands of communities, Transite Pipe —with its advantages of tight joints, corrosion-resistance and immunity to tuberculation—provides low-cost water transportation.

3. HANDLING COSTS

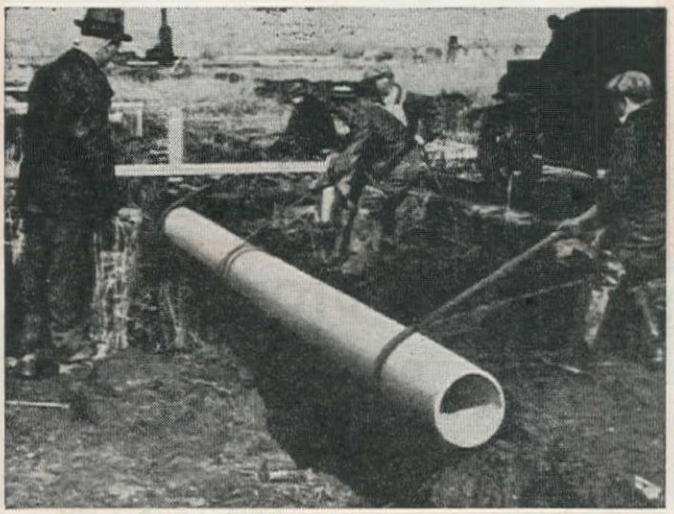
Transite's light weight means more footage per truckload . . . easier handling all around. Mechanical handling equipment is not necessary except for the larger sizes.



7. TRENCHING COSTS

Trenching costs are low with Transite (as indicated above)! No bell holes are required at the joints—width of trenches and disturbance to pavement are kept to a minimum.

Which of these 12 WATER PIPE PROBLEMS are you faced with?



9. SOIL CORROSION

Many a user has found Johns-Manville Transite Pipe the answer to this vexing problem. In numerous installations—many in highly aggressive soils—it has proved stubbornly resistant to corrosion.

10. DELIVERY CAPACITY

Because Transite is non-metallic, its initial high flow coefficient (C=140) is unaffected by tuberculating waters. Progressive reduction of delivery capacity due to tuberculation is never a problem in a Transite water line!

4. INSTALLATION COSTS

Fast assembly, with the Simplex Coupling, keeps installation costs low, minimizes traffic tie-ups. Transite can be tapped and drilled with standard waterworks equipment.

5. ELECTROLYSIS

Stray electric currents cannot damage this non-metallic pipe. As shown above, it can be laid near street railways and power lines with permanent freedom from electrolysis.

6. CURVES

Sweeps like that shown above present no problem with Transite Pipe. Flexible Simplex Couplings permit deflections up to 5° at each joint without use of fittings.

HERE are twelve problems frequently met in water transmission and distribution lines—twelve problems to which Johns-Manville Transite Pipe provides a practical answer. Check the list . . . and find out how this modern asbestos-cement pipe can help you get more efficient, more economical water transportation over the years.

For more complete information, write for Brochure TR-11A. Johns-Manville, 22 East 40th Street, New York 16, N. Y.

JOHNS-MANVILLE JM PRODUCTS

Johns-Manville TRANSITE PIPE

An Asbestos Product

8. JOINT LEAKAGE

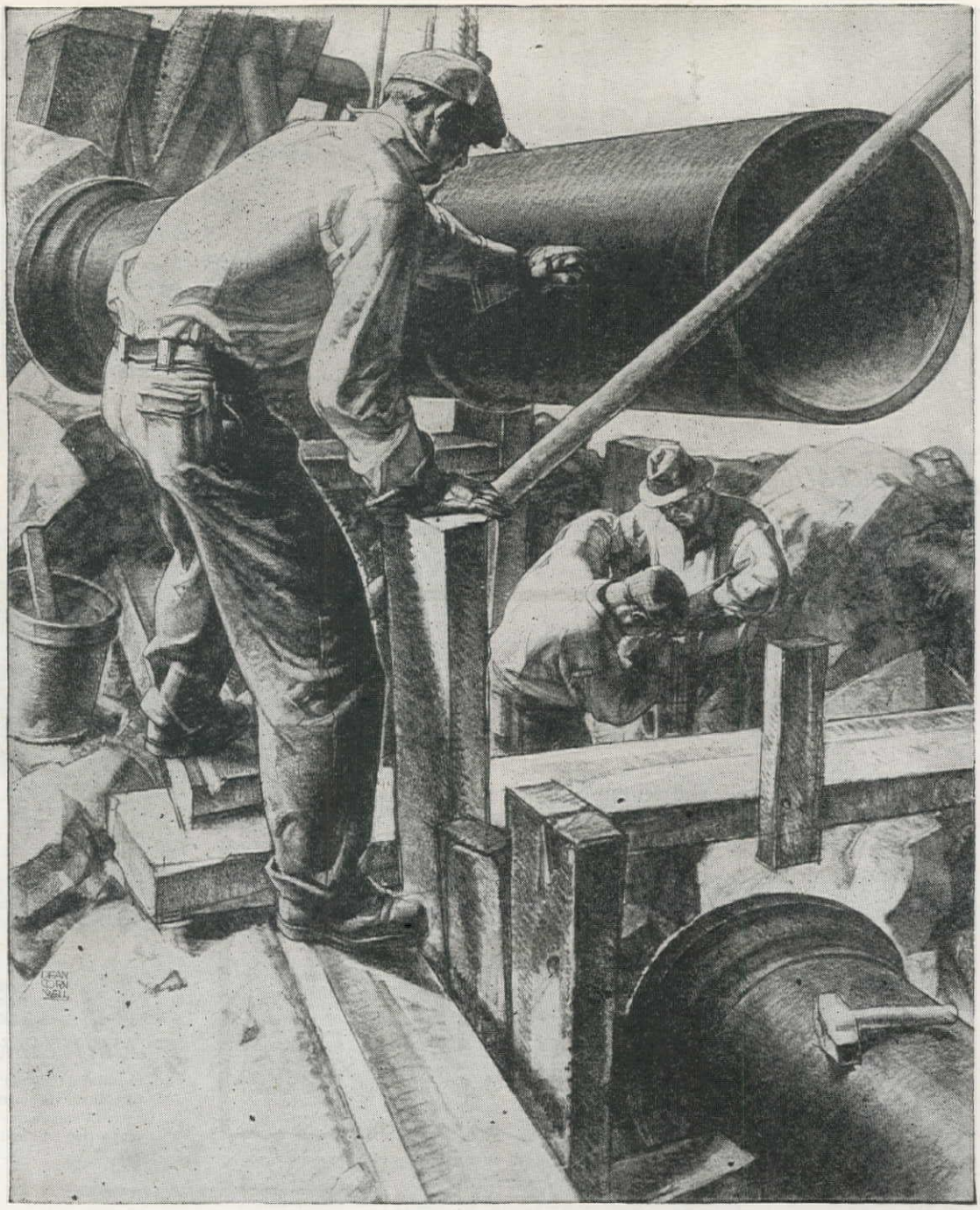
Forming a tight yet flexible joint, the Simplex Coupling cuts down costly underground leakage . . . safeguards against washing away of supporting soil and undermining of the pipe.

11. SOIL STRESSES

Three factors effectively guard against soil stresses in a Transite water line installation—the high, uniform strength of the pipe itself, its great resistance to corrosion, and the tight, flexible Simplex Couplings.

12. VIBRATION

Transite's flexible joints effectively absorb the vibration of heavy traffic—an especially important consideration wherever pipe is laid under busy streets and highways, or in the vicinity of railway and streetcar tracks.

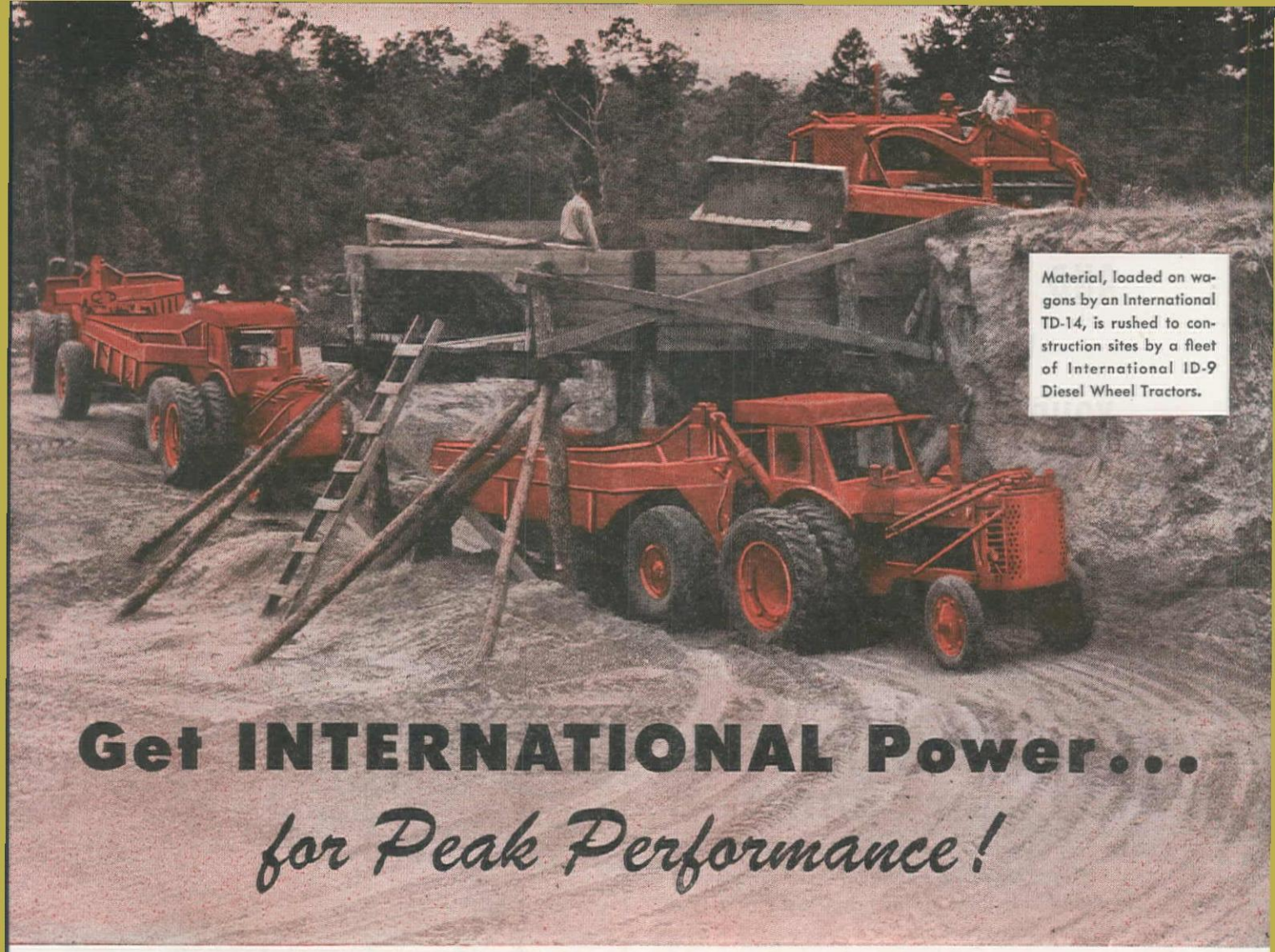


Drawn by Dean Cornwell

U.S. cast iron PIPE

U. S. PIPE & FOUNDRY CO.
General Offices: Burlington, N. J.
Plants and Sales Offices throughout the U. S. A.

If you need cast iron pipe now, or later, remember that our pipe foundries do not have to be reconverted, although current production is somewhat modified by limited manpower—that the combined facilities of our several plants represent the largest production capacity in the cast iron pipe industry—and that we can ship from plants and storage yards strategically located in various parts of the country. In the most commonly used sizes, U. S. cast iron pipe and fittings are readily available.



Material, loaded on wagons by an International TD-14, is rushed to construction sites by a fleet of International ID-9 Diesel Wheel Tractors.

Get INTERNATIONAL Power...

for Peak Performance!

• International TracTracTors for those tough, grubby jobs that require the power and sure-footed traction of a crawler. International Wheel Tractors for fast, heavy hauls. That's the right combination to reduce man-hours, speed up the work cycle and cut costs in material handling and construction.

Peak performance from Internationals is assured by their advanced design. For example: more of the engine horsepower is delivered to drawbar and power shaft because all working parts are positively and permanently aligned, and ball bearings are used generously in transmissions and drive shaft assemblies.

International's easy starting, *full* Diesel or carburetor-type engines power these tractors. They are designed and built for continuous, heavy-duty service—and operate smoothly, with plenty of reserve power to pull out of the tight spots.

On the basis of performance, Internationals have hung up a record of leadership in the industrial field. Any International Industrial Power Distributor can substantiate this with performance charts and other data which will help you choose the power and equipment for the jobs you're bidding on.

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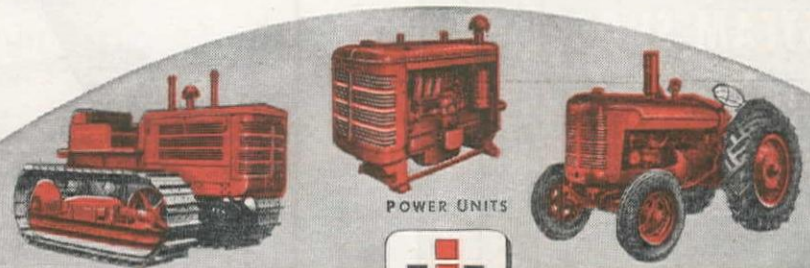
Industrial Power Division
INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue — Chicago 1, Illinois



INTERNATIONAL INTERNATIONAL HARVESTER **Industrial Power**

WHAT SIZE AND TYPE OF MACHINE WILL BEST FIT YOUR POSTWAR NEEDS?

MARION HAS IT!

NOW AVAILABLE FOR QUICK SHIPMENT

Fast, powerful, modern MARION shovels, draglines, cranes, pull-shovels, clamshells, and walking draglines of the right size and type for your postwar work.

Your **MARION DISTRIBUTOR** *knows the local problem.* **LET HIM HELP YOU.**

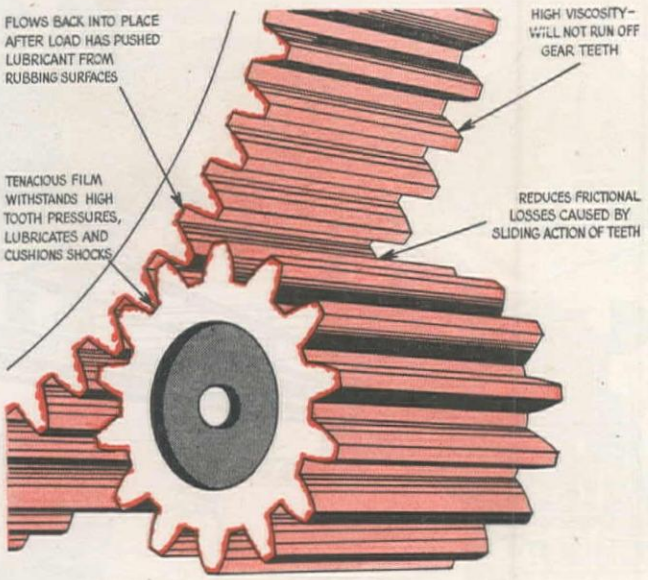
Edward R. Bacon Company, Folsom at 17th Street, San Francisco 10, Calif.; Geo. B. Brose, The Marion Steam Shovel Company, 571 Howard St., San Francisco 5, Calif.; Joseph O. Reed, 603 Terminal Sales Bldg., Portland 5, Ore.; Star Machinery Co., 1741 First Avenue, South, Seattle 4, Wash.; Shaw Sales Service Co., 2027 South Santa Fe Avenue, Los Angeles, Calif.; H. H. Nielson, 902 Boston Building, Salt Lake City, Utah.

THE MARION STEAM SHOVEL CO.
Marion, Ohio

OFFICES AND WAREHOUSES IN ALL PRINCIPAL CITIES

3/4 Cu. Yd. to 40 Cu. Yds.

STANDARD ENGINEERS NOTEBOOK



Adhesive greases cut gear wear

Constant protection against wear, frictional loss and metal fatigue on gears may be obtained by using Calol Pinion Greases. Recommended for open and encased spur, herringbone and worm-type gears, tenacious Calol Pinion Greases will not drip off. When pushed off in use, they flow sufficiently to recover gear teeth.

Calol Pinion Grease—0. For open or encased gears, but particularly adaptable for exposed high-speed gears in cold weather. May be used on wire rope.

Calol Pinion Grease—1. For medium-speed exposed gears. Much heavier and more adhesive than No. 0.

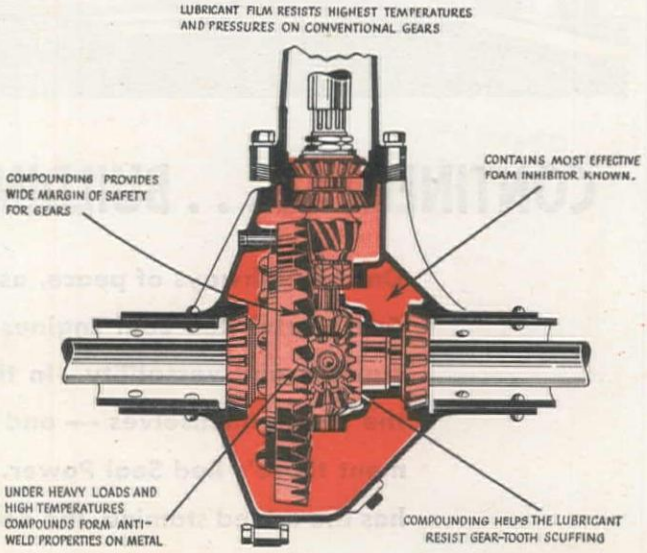
Calol Pinion Grease—2. For open spur gears in normal conditions. Requires heating for application.

Calol Pinion Grease—5. For open spur gears in severe pressure and temperature conditions. Very heavy and adhesive.

Inhibitor prevents excessive lubricant foaming

Because it contains the most effective foam inhibitor known, RPM Gear Lubricant (Compounded) will not foam excessively even when low atmospheric temperatures increase its viscosity. This outstanding characteristic relieves many operating problems that annoy truck and bus operators—loss of lubricant by leakage, damage to lubricant seals, brake lining contamination, sludging of lubricant due to oxidation, insufficient gear lubrication, etc.

RPM Gear Lubricant (Compounded) is highly stable and resists the highest operating pressures and temperatures on all automotive power-transmission gears, except hypoids. It is non-corrosive – an ideal lubricant for bronze worm gears. Comes in four grades: SAE 80, 90, 140, 250.

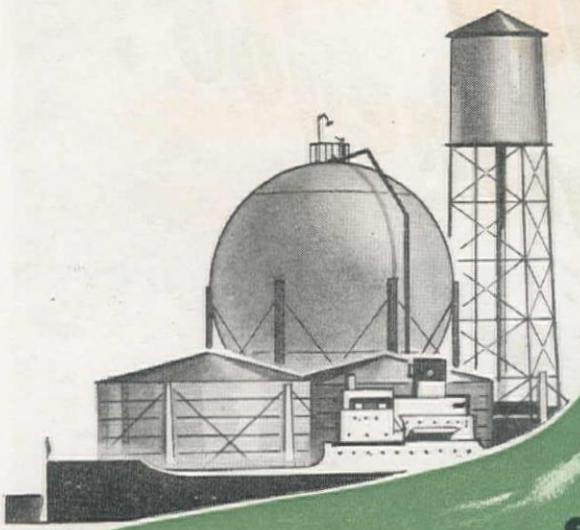


Standard Fuel and Lubricant Engineers are always at your service. They'll gladly give you expert help — make your maintenance job easier. Call your local Standard Representative or write Standard of California, 225 Bush St., San Francisco 20, California.

FOR EVERY JOB A STANDARD OF CALIFORNIA TEST-PROVED PRODUCT

NOW

the modern way to make metals last



Here is the METAL PRIMER

. . . that was developed, tested and proven by the United States Navy, Army and Maritime Commission. It was found to far excel any previous known type of metal primer for both ferrous and non-ferrous metals.

Here is WHAT IT IS...

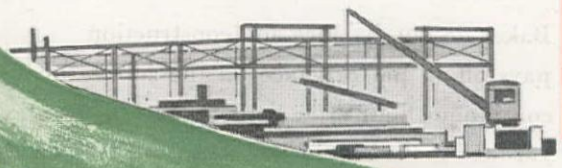
Syncro-Green is the modern zinc chromate primer made by Andrew Brown Company. Now released from high war priorities — available for the first time to all industry.

Its principal pigment is zinc chromate, the most rust inhibitive pigment. (Exposure tests and practical usage have proven its superior rust inhibitive qualities compared to red lead.)

Special Synflex — the vehicle in Syncro-Green is made and controlled by Andrew Brown Company. This synthetic plastic resin is what makes Syncro-Green unusually water resistant, extra adhesive, flexible and quick drying.

Here is WHAT IT DOES...

1. Syncro-Green gives better protection to all metals under all conditions than any other metal primer.
2. Syncro-Green dries very fast — can be handled in one hour — can be recoated in five hours.
3. Syncro-Green is easy to apply by either brush or spray. It is two-thirds lighter in weight, is non-settling, is non-sagging and has superior opacity.
4. Syncro-Green has no accumulative poisoning effects. It is safe, it is fast, it does a better job, a longer lasting job, for less money.



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METAL PRIMER

Manufactured by

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We are interested in learning more about Syncro-Green — the modern metal primer now released to industry.

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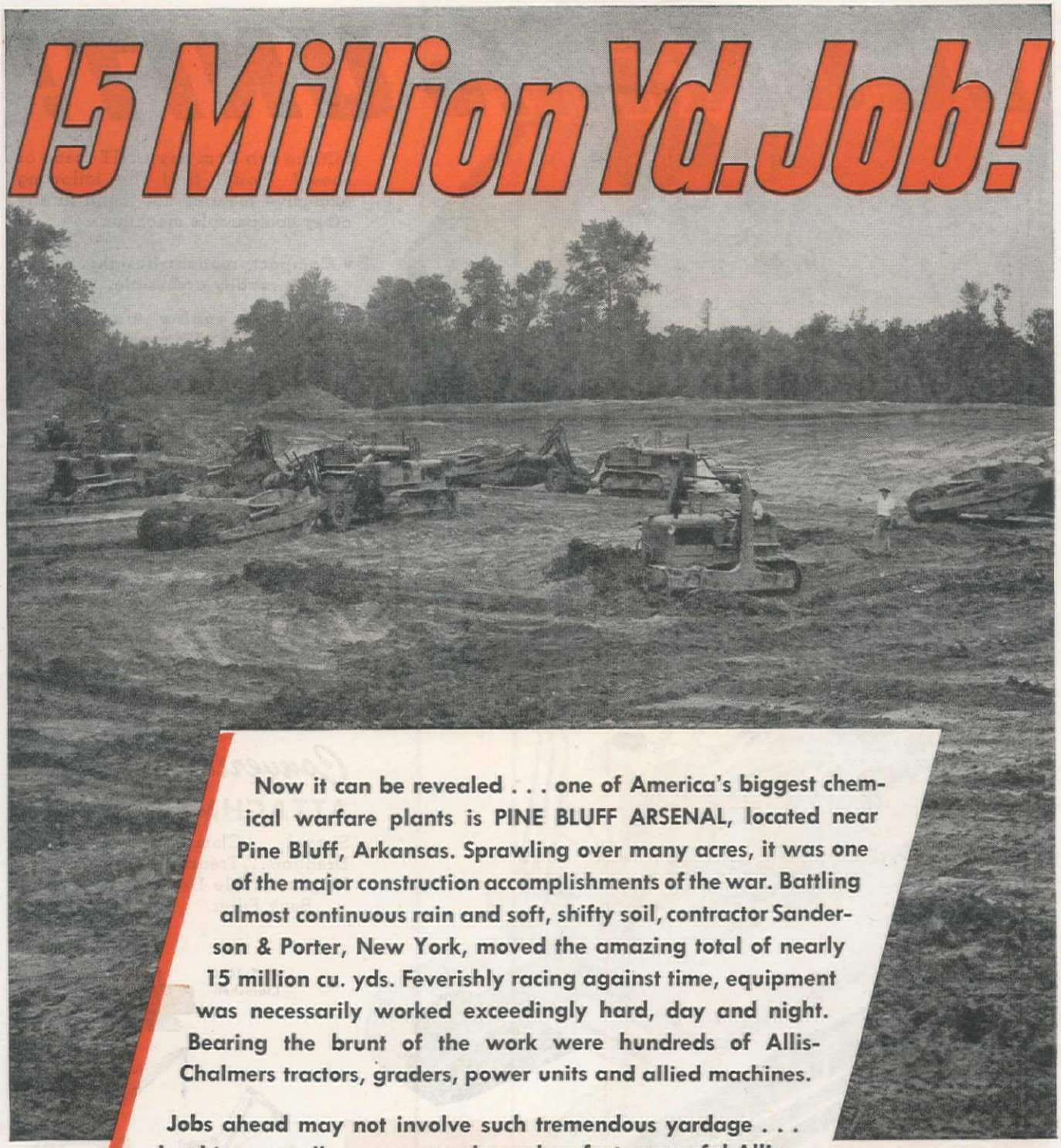
15 Million Yd. Job!



Now it can be revealed . . . one of America's biggest chemical warfare plants is PINE BLUFF ARSENAL, located near Pine Bluff, Arkansas. Sprawling over many acres, it was one of the major construction accomplishments of the war. Battling almost continuous rain and soft, shifty soil, contractor Sanderson & Porter, New York, moved the amazing total of nearly 15 million cu. yds. Feverishly racing against time, equipment was necessarily worked exceedingly hard, day and night. Bearing the brunt of the work were hundreds of Allis-Chalmers tractors, graders, power units and allied machines.

Jobs ahead may not involve such tremendous yardage . . . but big or small . . . you can depend on fast, powerful Allis-Chalmers Diesels to rush them to completion in less time, at greater profit to you. Improved by their experience on many tough war projects and campaigns, the new A-C tractors are ready to establish new records on peacetime operations. For early delivery . . . order NOW!

Part of the big fleet of A-C Diesels on the Pine Bluff Arsenal project. Nearly a hundred miles of roads and forty-five miles of railroads were built on the site of this plant.

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

LOOK into UNIT!

Lift the cab from any UNIT crane or shovel. You'll find the following exclusive features not found in any other comparable machine:

- **Compact, modern design . . . all parts readily accessible.**
- **Gasoline engine mounted in straight line with main machinery.**
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- **Automatic traction brakes . . . no manual control required.**
- **Disc type clutches, interchangeable with easy and foolproof adjustment.**
- **One-piece cast gear case...simple in design and built as carefully as the finest automotive transmission . . . dust-proof and oil tight.**

And that isn't all! A UNIT costs less . . . is more economical to operate . . . is built to endure. Investigate today.

STRAIGHT LINE ENGINE MOUNTING
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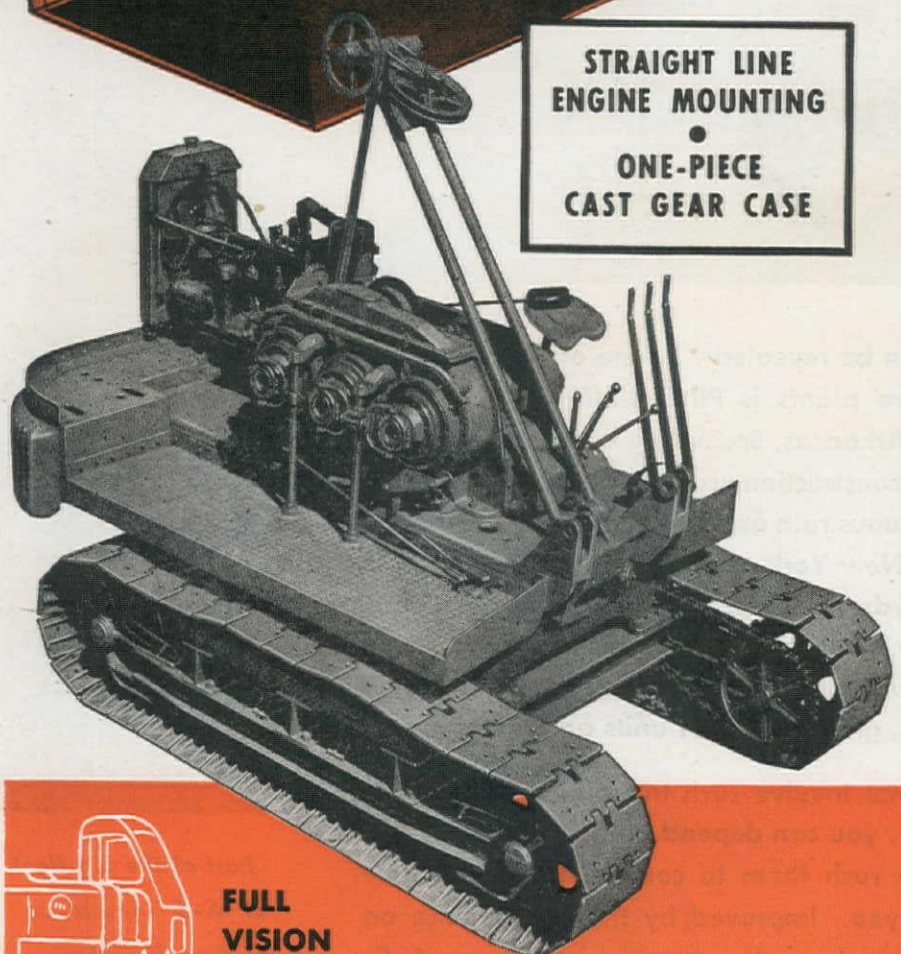
ONE-PIECE CAST GEAR CASE



Convertible TO ALL ATTACHMENTS

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FULL VISION CAB

Operator can see in ALL directions. No "blind spots". Promotes safety. Increases job efficiency.

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MAKE HIGHWAY FUNDS REACH FURTHER...

GET MORE WORK DONE *with*

MULTI-PURPOSE FWD TRUCKS

THE ONE TRUCK FOR MANY JOBS

FALL — Road patrolling; snow fence hauling.

WINTER — Snow clearing.

SPRING — Road conditioning and construction.

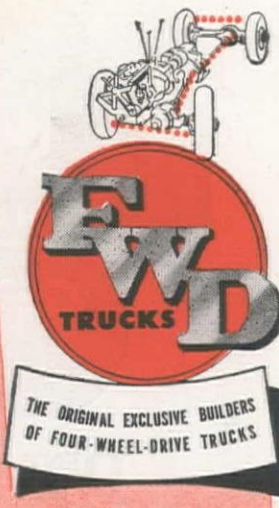
SUMMER — Earth-moving; material hauling.

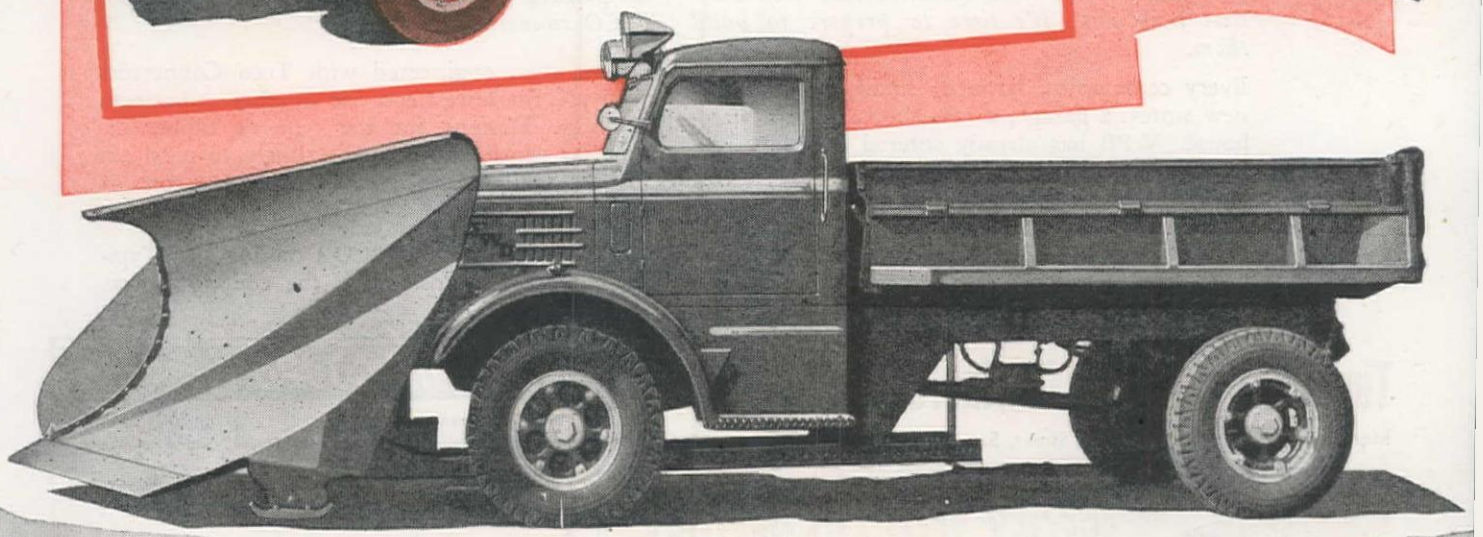
YOU get more than just a truck in every FWD you put into highway service . . . for FWDs are engineered to do many jobs beyond the limitations of "conventional drive" trucks.

Snow clearing is one of the scores of jobs FWDs do better, faster, more economically. And throughout the other seasons of the year, the same FWDs that are so superior in the toughest of snow-clearing problems, have that extra ruggedness, stamina and endurance needed for all-year highway duty . . . hauling heavy snow fence; leveling washboard surfaces, ruts and sinkholes; hauling crushed stone, gravel, sand, concrete, asphalt; pulling scarifiers, graders and other heavy equipment . . . using power on all wheels to do *more jobs*, to cover more mileage in all phases of road maintenance and construction, faster, safer, at less cost . . . to make highway funds go further. Write for bulletin.

THE FOUR WHEEL DRIVE AUTO CO., Clintonville, Wis.

Canadian Factory: KITCHENER, ONTARIO





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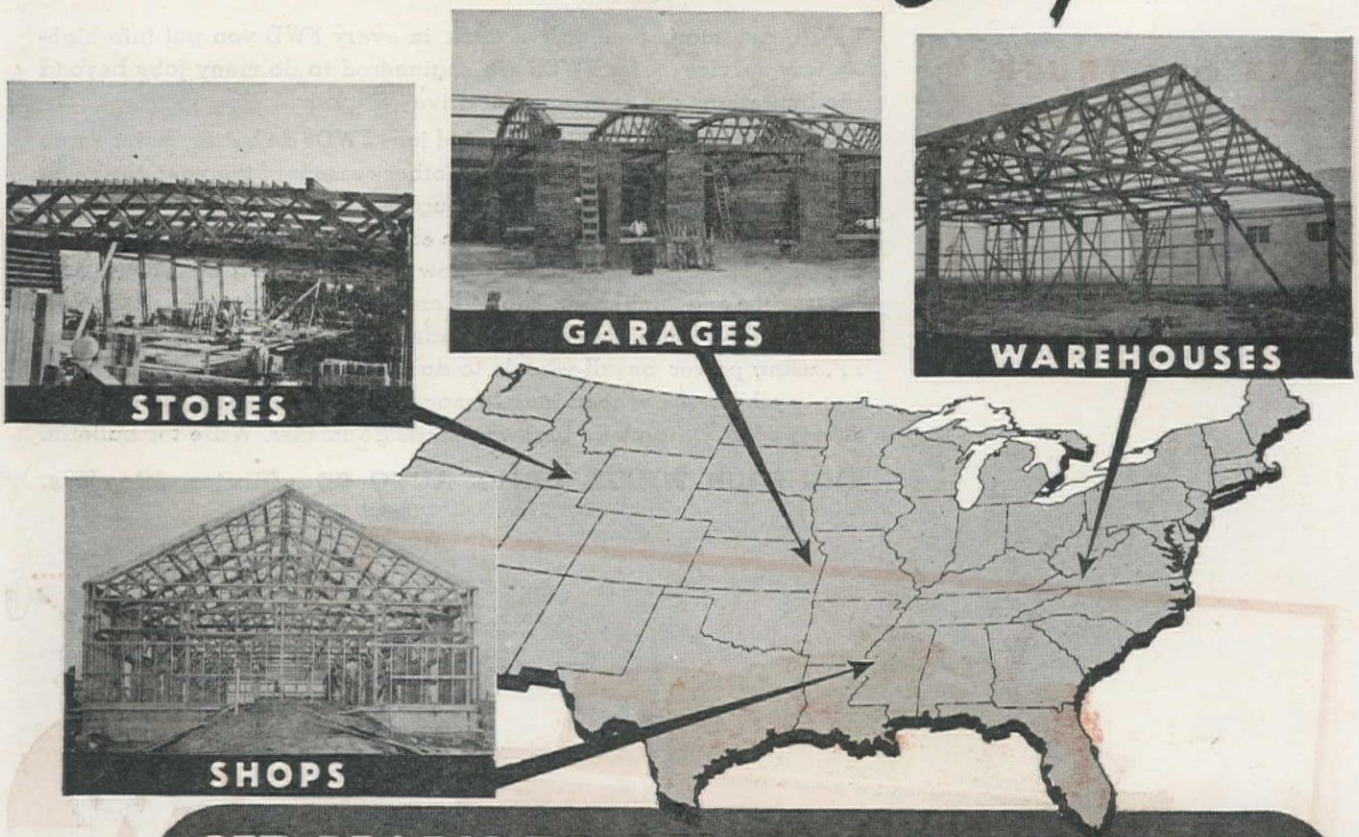

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PENT UP . . . all over America . . . is a great latent need for moderate-sized business buildings. *It's time to prepare to build them.*

Every community, large or small, needs a few new stores, a garage, a new shop . . . or a warehouse. WPB has already entered a cycle of relaxation which will probably continue until new business structures begin to appear everywhere. PREPARE FOR THIS PHASE IN THE COMING CONSTRUCTION REVIVAL. Examine your local market . . . prepare your designs now . . . but, be sure you are in the best possible competitive position *by planning in timber with TECO connections.*

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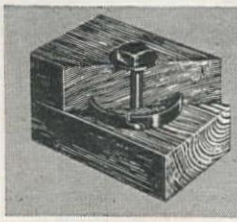

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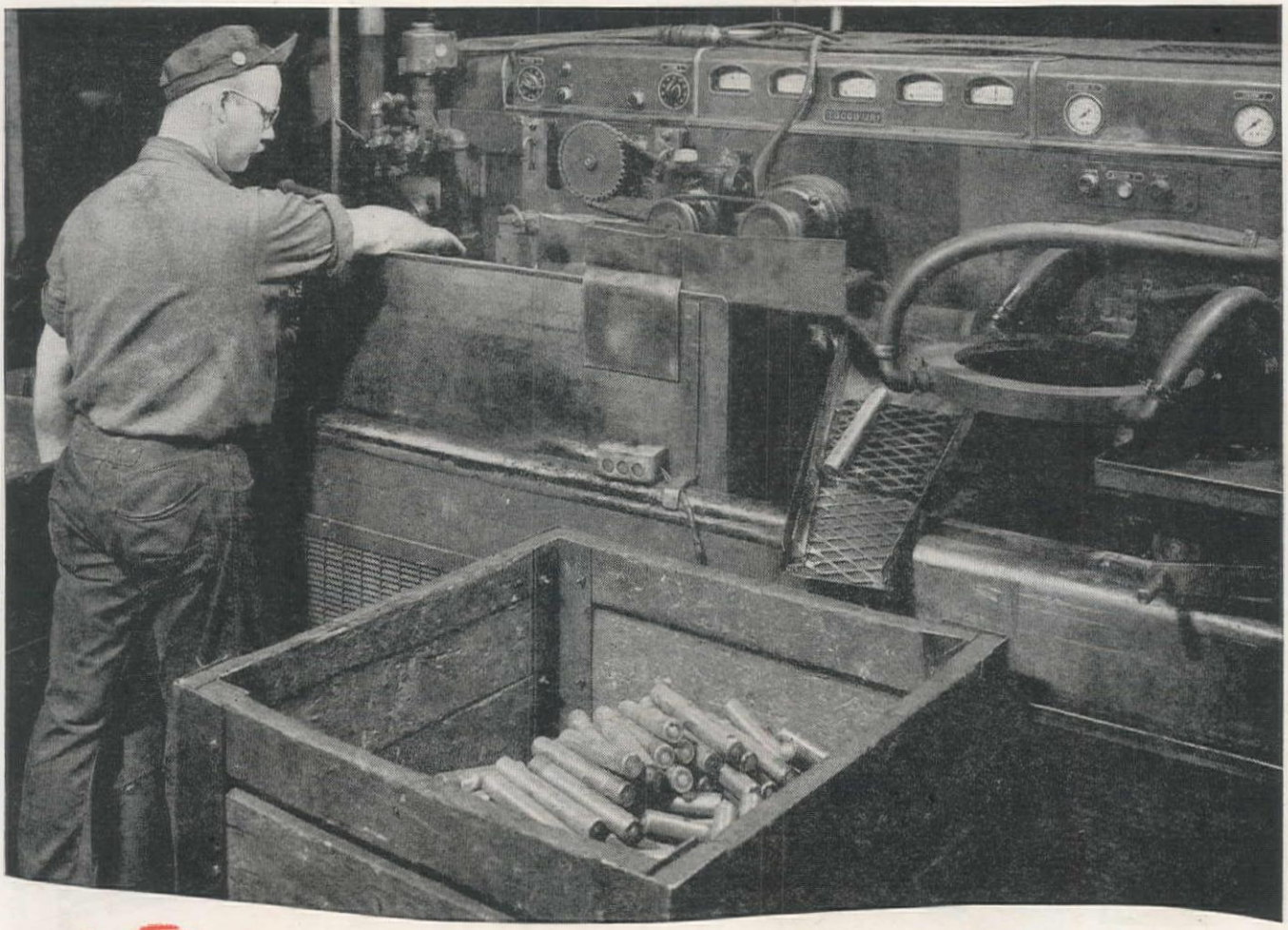

A Tocco induction heat-treating machine for hardening track shoe pins in the Oliver "Cletrac" plant.

It's our "treat"

On a crawler tractor, the track shoe pins are subjected to destructive abrasion shocks and strains. To resist these . . . to assure longer pin life, Oliver "Cletrac" tractors have hardened pins . . . electrically heat-treated to an exact depth by the most modern methods.

This *extra* quality is characteristic of every Oliver "Cletrac" tractor part . . . a basic feature of every manufacturing operation.

Quality is fundamental to every production step in the modern Oliver "Cletrac" plant . . . in materials, workmanship, and equipment.

Maintenance of that standard enables your Oliver "Cletrac" dealer to offer you the finest in crawler tractors . . . for your every need.

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THE OLIVER CORPORATION Cletrac

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"We averaged 141 tons per hour ... we crushed over 50,000 tons on this job ... very nicely accomplished with this unit"

On an Alaskan construction job, this Telsmith Dual Portable Crushing Plant is turning out top tonnage.

TELSMITH

Dual PORTABLE CRUSHING PLANT

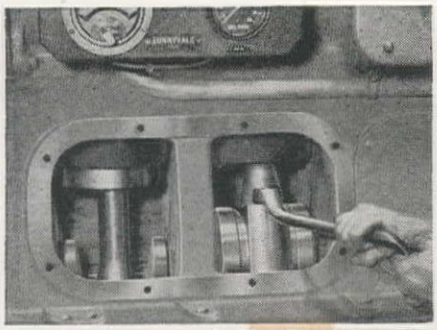
C. F. Lytle Company and Green Construction Co. of Des Moines, Iowa, had an airport job in Alaska. Every hour counted and they "needed a lot of tonnage per hour." They got it. This Telsmith Dual Portable Crushing-Screening Plant averaged 141 t.p.h.—with 30-35 per cent of the material requiring crushing. The job took over 50,000 tons—all of which had to pass a one-inch screen and be graded to U.S.E.B. specifications. A D-8800 Diesel engine supplied the power. On another Alaskan job the Telsmith Dual produced aggregate for inverted penetration seal-coat work—100 per cent of which had to pass the 3/8-inch screen. Find out about the flexibility of Telsmith Portable Plants and why they turn out aggregate *fast* and *economically*—get Bulletin P-30.

P-11

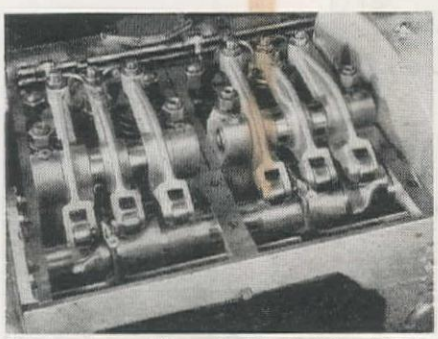
SMITH ENGINEERING WORKS, 4010 N. HOLTON STREET, MILWAUKEE 12, WISCONSIN

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

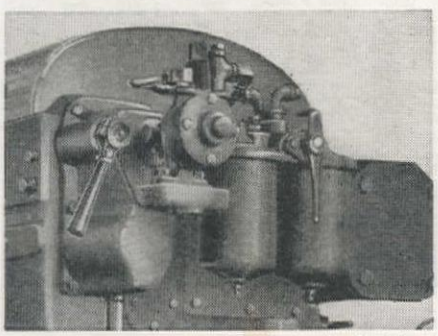
Clyde Equipment Co. Portland 9, Ore. | Clyde Equipment Co. Seattle 4, Wash. | General Machinery Co. Spokane 1, Wash. | Gordon Russell, Ltd. Vancouver, B.C. | Contractors' Eqpt. & Supply Co. Albuquerque, N.M. — El Paso, Tex.



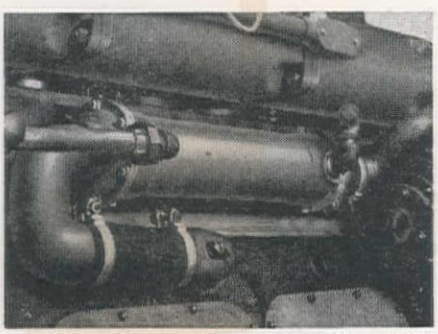
Inspection doors on each side of crankcase give ready access to main and crankpin bearings.



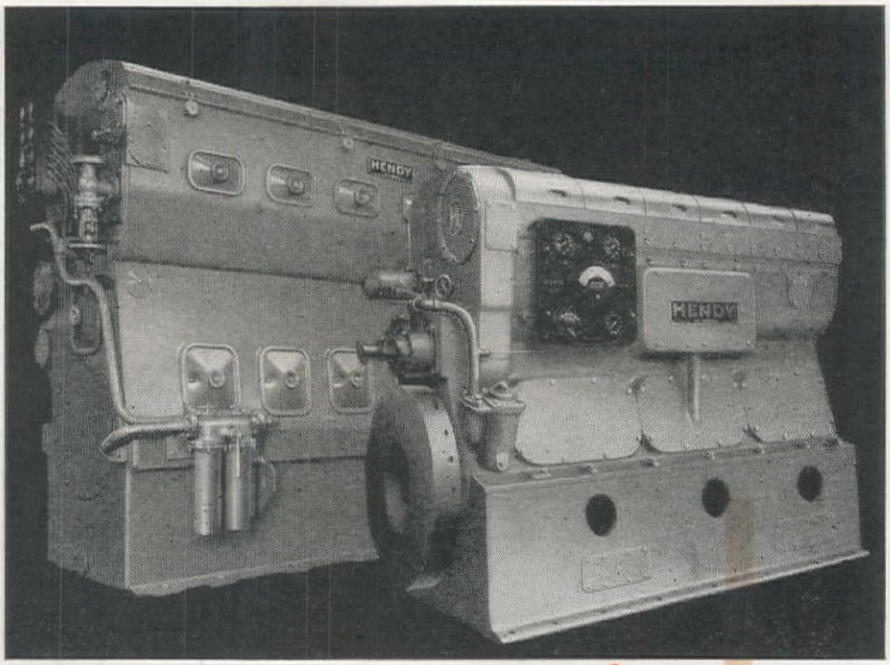
Overhead assemblies on both Series 20 and Series 50 Hendy Diesels are easily accessible.



Accessories may be individually serviced without disturbing any other assembly.



Inspection points on the engine itself may be reached without removing any of the accessories.



IN EVERY MODEL... ranging from 125 to 800 H.P.

Accessibility SIMPLIFIES OPERATION OF HENDY DIESELS

Hendy Diesels are designed to make inspection and servicing as simple as possible. Operators' problems were considered *first* in the design of all models of Hendy Diesels . . . with no concessions to the use of obsolete designs, practices, patterns, or tooling.

1. Large, easily removed inspection doors on each side of the engine give immediate access to all main and crankpin bearings for inspection or rapid servicing. Accessories need not be removed to open these doors.

2. Cylinder-head covers open conveniently, so the operator may easily inspect or service the overhead camshaft, rocker arms, valve mechanisms, and the modern unit-type fuel pumps and injectors.

3. Water and lubricating-oil pumps, governor, and other accessories are easy to reach without disturbing any other assembly . . . each is placed to allow ready access to any other vital part of the engine . . . yet all are placed to maintain the trim lines characteristic of all Hendy Diesels. Exposed piping has been eliminated wherever possible.

Every Hendy Diesel operator enjoys these time and money-saving features. Let Hendy Diesel power simplify your operating problems too. Clip and mail the coupon below today for complete details.

GENERAL SPECIFICATIONS—HENDY STATIONARY DIESELS

Air-starting. Optional equipment includes: Clutch power take-offs from either end; Engine-driven starting-air compressor; Closed-circuit cooling systems.

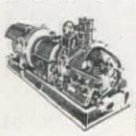
SERIES 20 & 30—125-265 hp; 600-900 rpm. **SERIES 50 & 60**—350-800 hp; 350-514 rpm.

Also available with generators from 75 to 500 kw.

JOSHUA HENDY IRON WORKS

ESTABLISHED 1856

SUNNYVALE, CALIFORNIA



HENDY TURBO-GENERATORS

HENDY STEAM TURBINES

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Please send illustrated catalog on Hendy Diesel engines. I am interested in models up to 300 hp ☐; over 300 hp ☐; Diesel-electric generating plants up to 225 kw ☐; over 225 kw ☐.

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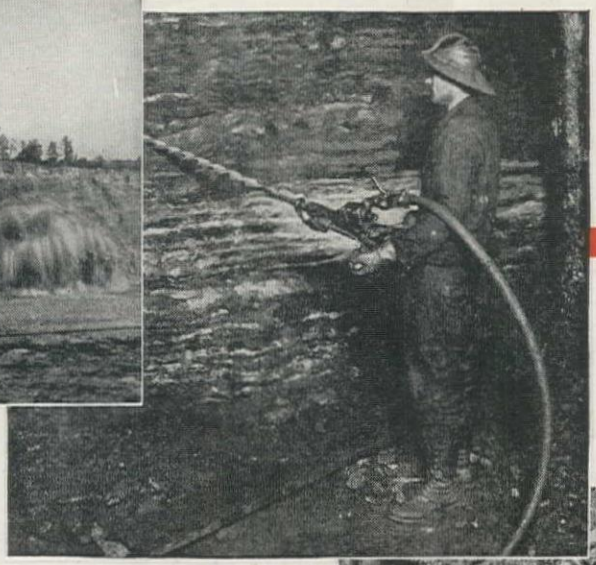

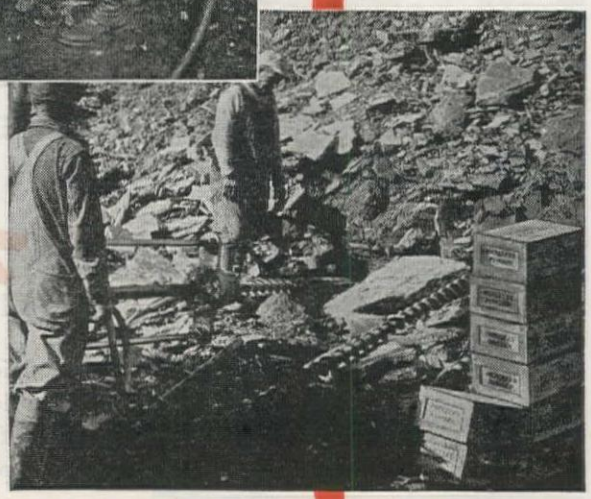

FOR MAXIMUM ECONOMY

in Quarrying, Metal Mining, Construction

Users of Hercomite* and Gelamite* report maximum breakage for every dollar's worth of explosives. Savings of 10% to 15% have been common, compared to the older types of explosives.

Hercomite and Gelamite are now more popular than ever before—the best proof of their efficiency. Yet they are but one example of many outstanding Hercules' developments in the field of explosives.

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EXPLOSIVES DEPARTMENT
HERCULES POWDER COMPANY
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*Reg. U. S. Pat. Off. by Hercules Powder Company

XR-54

STARTING IS NO PROBLEM... WITH ADAMS

● Whatever the weather—whether you are working in the frozen North or the torrid Tropics—your Adams Motor Grader starts quickly, easily—merely by pushing a button in the cab.

That's because low-compression gasoline starting equipment is an integral (not auxiliary) part of Adams' International Diesel engines. A minute or two of warm-up on gasoline, then the pull of a lever throws the engine into full Diesel power. So, for all practical purposes, the starting of an Adams Motor Grader is as simple and certain as that of an automobile.

Adams' International Diesel engines are famous, too, for rugged, long-life dependability. All over the world, under all kinds of conditions, they have hung up performance records that are second to none. And they're as economical as they are reliable—most Adams heavy-duty graders operate on two gallons or less of low-priced Diesel fuel per hour—even in hard going.

Let the Adams dealer near you show you the many outstanding features that make Adams Motor Graders your best buy—on every count!

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INDIANAPOLIS, INDIANA

SEE YOUR LOCAL ADAMS DEALER

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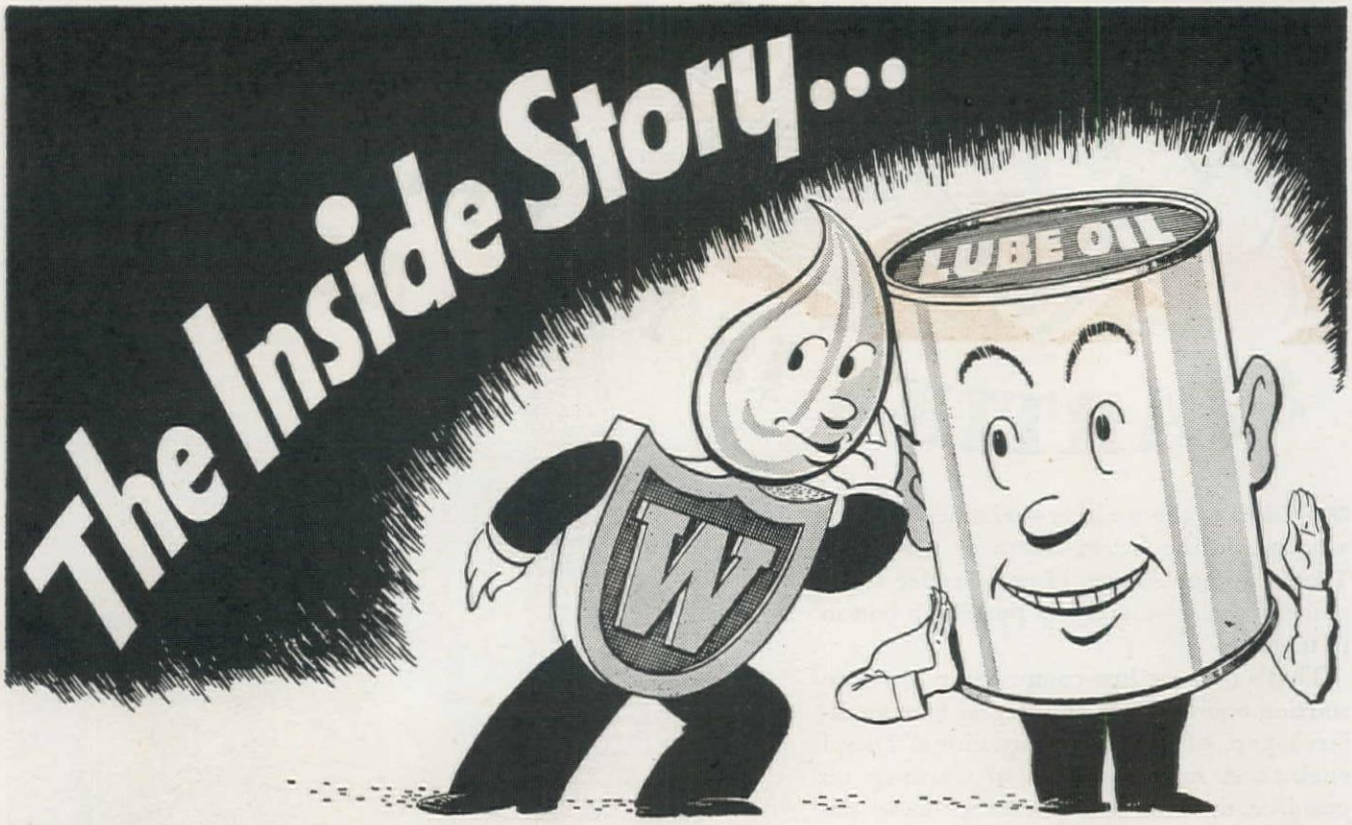
Adams
ROAD-BUILDING AND EARTH-MOVING EQUIPMENT

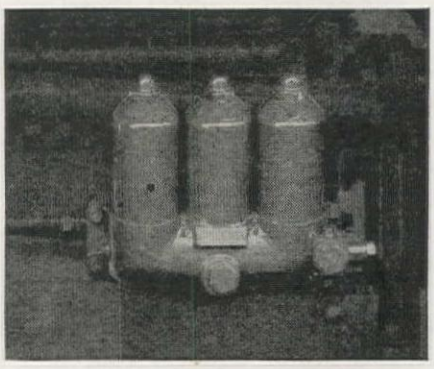


Clean oil is vital for efficient operation of those tough, rugged motors that power heavy construction machinery. Here's the *inside* story—for sustained efficiency the precision-machined parts of modern heavy-duty engines must be lubricated with *clean* oil—oil free of grit, acid and moisture. That's exactly the purpose for which Winslow Full-Flow *in line* Oil Conditioners and Winslow Free-Flo Replacement Elements were designed.

Winslow Replacement Elements—made in more than 130 different sizes to fit any standard make filter—embody exclusive, patented features. One of these features gives extra capacity to consistently pass and condition lube oil over a longer period of time . . . because the element *expands with use.* This means maximum porosity and oil cleaning ability long after ordinary filter elements become clogged.

In addition to the full line of lube oil Conditioners and Replacement Elements, Winslow also makes a wide range of fuel oil filters. Order from your jobber today.

PROOF IN USE



Winslow full-flow installation on Hall-Scott Model 400 heavy-duty truck motor.

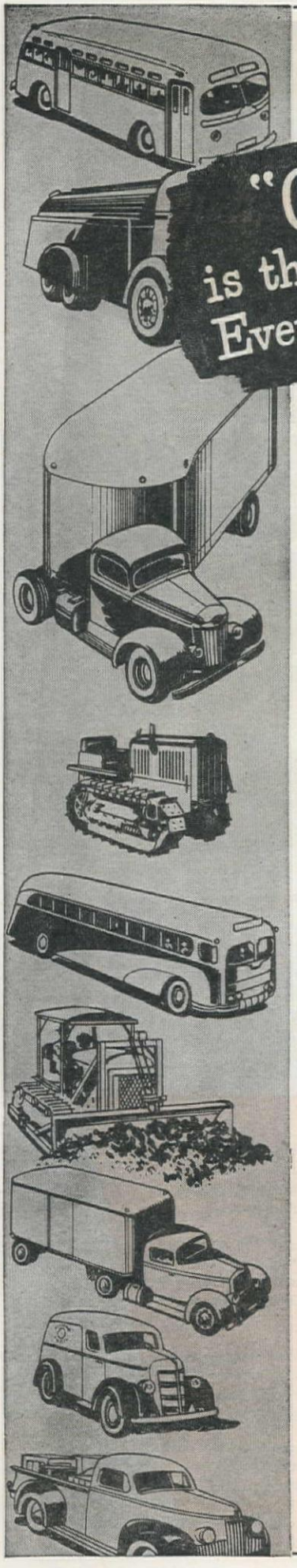
For sustained efficiency the precision-machined parts of modern heavy-duty engines must be lubricated with *clean* oil—oil free of grit, acid and moisture. 23-C-3

Distributors—Jackson Implement Co., Portland; Wait Motor Supply Co., San Francisco; Rodman Company, Los Angeles; Dewalt Disher Corporation, Ltd., Vancouver, B.C.

WINSLOW ENGINEERING COMPANY · OAKLAND 8 · CALIFORNIA

WINSLOW

FUEL FILTERS · OIL CONDITIONERS · ELEMENTS



"CADEL A.P. . . . is the Finest Motor Oil We Have Ever Used in Our Equipment" *

The above statement, from one user, expresses a *general* reaction to Cadel A. P. (all-purpose) Heavy Duty Lubricant. For this is the *one oil for all heavy duty engines*—both gasoline and diesel. Cadel A. P. reduces the lubrication problem down to one oil, one drum, one investment. More important, it is dispersive, detergent, inhibited—the remarkable advancement of Associated Automotive Laboratories. Cadel A. P. is ready for delivery. Ask your Associated Representative for proof of what it will do for *your* equipment.

CADEL A. P. GIVES YOU THESE ADVANTAGES:

1. Clean engines
2. Low engine wear
3. Free piston rings
4. Free valve stems
5. Clean oil passages
6. Long bearing life
7. Cleaner filter elements
8. Clean intake parts (2-cycle diesel engines)
9. Easier starting at low temperatures
10. Economical oil consumption
11. *One oil for all purposes*

NOW AVAILABLE FOR COMMERCIAL USE

*From a letter of L. R. Howard, owner of Montalvo Rock Co., Inc., Ventura, California. Montalvo uses Cadel A. P. exclusively in twelve gasoline powered trucks, and two Northwest power shovels. Copies of Mr. Howard's letter—and others—are available on request.

TIDE WATER ASSOCIATED OIL COMPANY

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20th YEAR ASSOCIATED FOOTBALL SPORTCASTS
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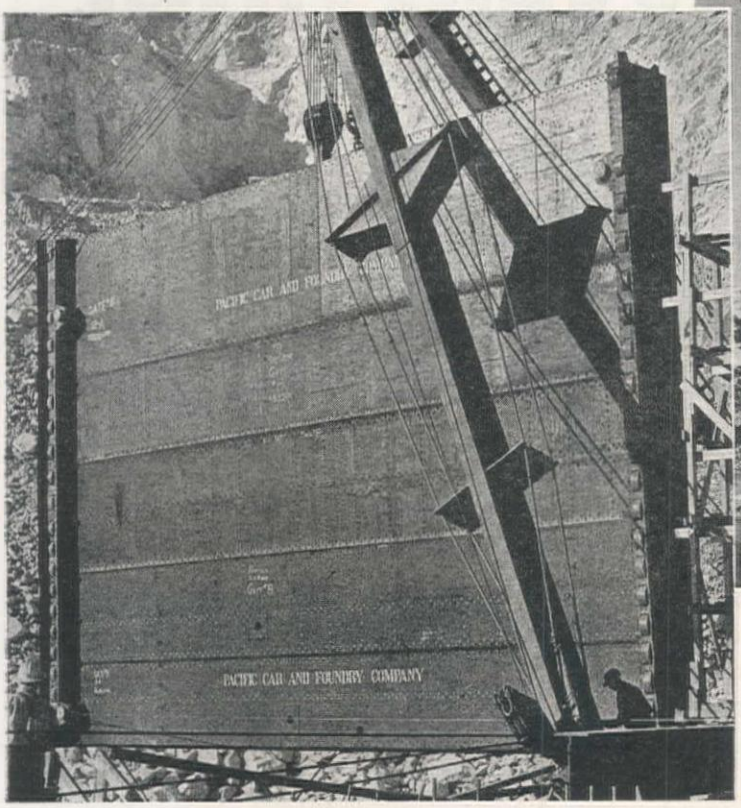
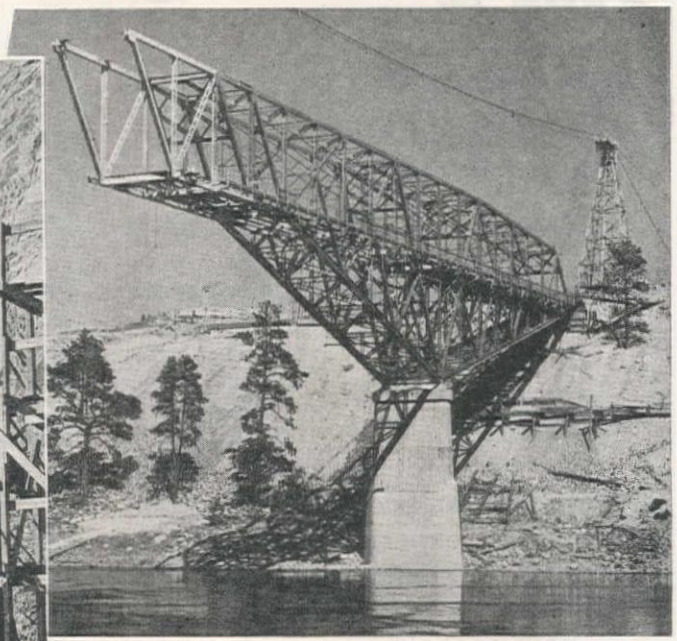
CARCO'S "Know How"

will save you time, money and materials in the fabrication of

Structural Steel





CARCO can handle them all — large jobs, small jobs, a single unit, or a production run. Whatever your structural steel requirements, CARCO has the facilities, experience and craftsmen for precision fabrication and rapid production. All types of heavy or light steel fabrication jobs—bridges, building construction, towers, tanks, subassemblies, frames — are right down CARCO'S alley.

Forty years of structural steel experience gives CARCO engineers and layout men the "know how" essential to turning out quality steel products in close cooperation with architects, engineers, contractors and erectors.

When you deal with CARCO you are assured of expert workmanship, maintenance of delivery schedules, and intelligent handling of your job from start to finish. Send us your plans and specifications. We will quote on your requirements — fairly and promptly.

PACIFIC CAR AND FOUNDRY COMPANY

CARCO

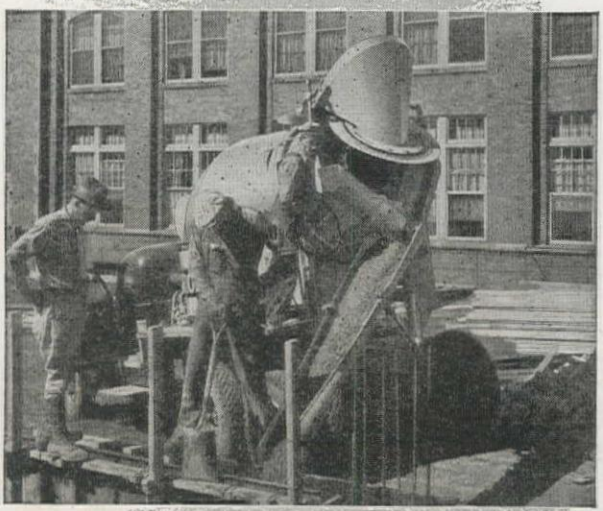
SEATTLE AND RENTON, WASHINGTON, U. S. A.

Yes Sir- MY SMITH-MOBILE GIVES ME EVERYTHING I WANT!

"Why should I take unnecessary chances with UNTRIED truck mixers, when Smith-Mobile is a TRIED and PROVEN Product?"

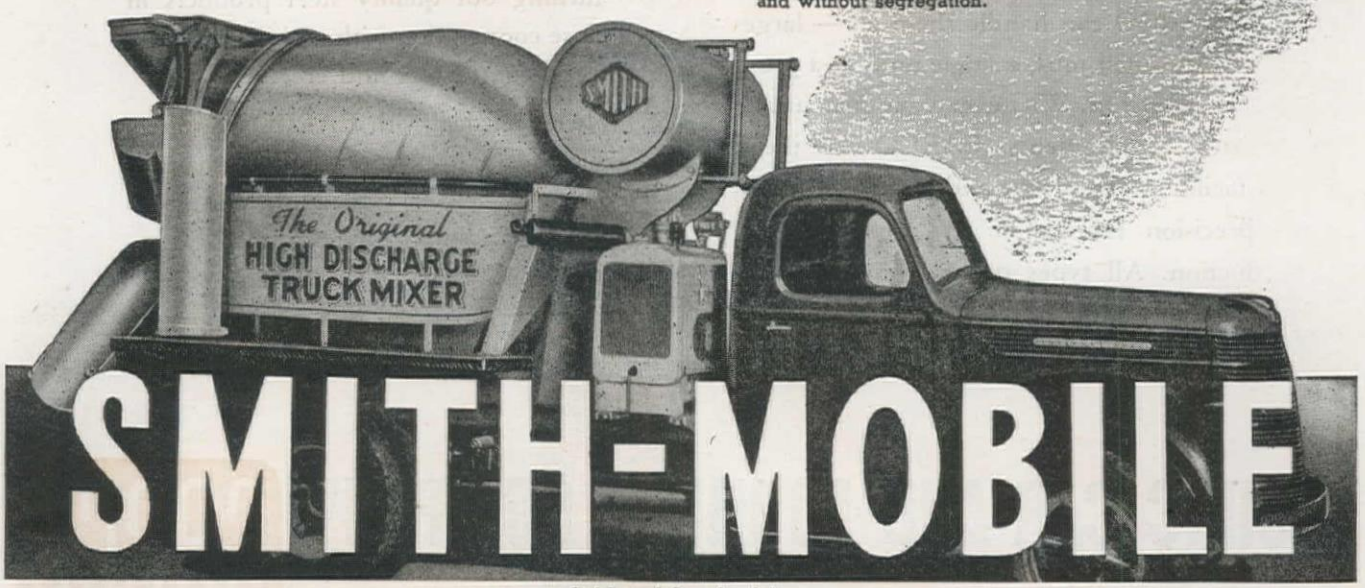
Ready-mixed concrete operators everywhere are playing safe by using dependable, job-tested Smith-Mobile Truck Mixers and Agitators. They KNOW Smith-Mobile fills the bill. They like its many time-saving, cost-reducing features. Backed by almost a half-century of specialized mixer building experience, Smith-Mobile is now entering its 8th year of quantity production. Instead of periodically introducing "new models", Smith has always been committed to a policy of constant improvements and refinements. That's why Smith-Mobile is today the LAST WORD in truck mixer design. Get the facts! Ask for Catalog No. 198-C.

The T. L. SMITH COMPANY
2871 N. 32nd Street Milwaukee 10, Wisconsin, U. S. A.



CONTROLLED DISCHARGE

Just one of Smith-Mobile's many job-tested features. The illustration above shows a Smith-Mobile discharging directly into forms. Operator is getting just what he needs for this particular job — discharge, fast or slow, under perfect control and without segregation.



SMITH-MOBILE

Sold and Serviced by:

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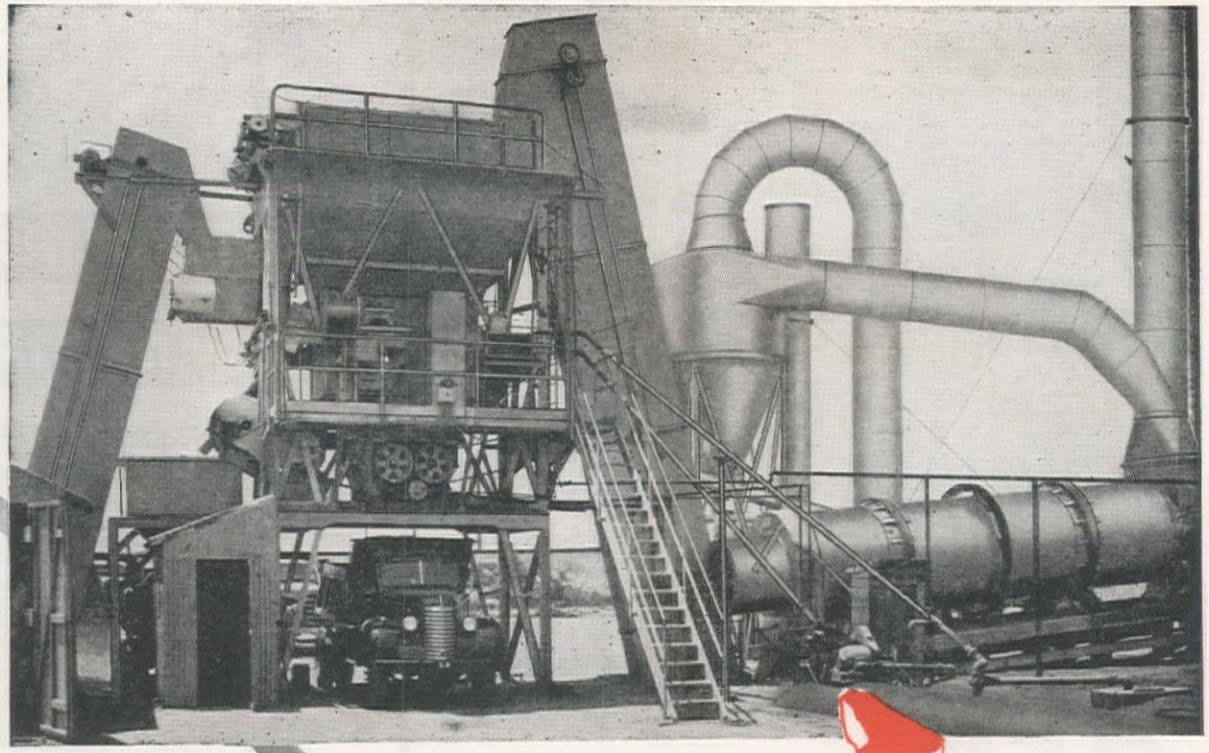


Ready for the Nations Highways

TOUGH WAR EXPERIENCE CONDITIONS EQUIPMENT FOR THE PEACE

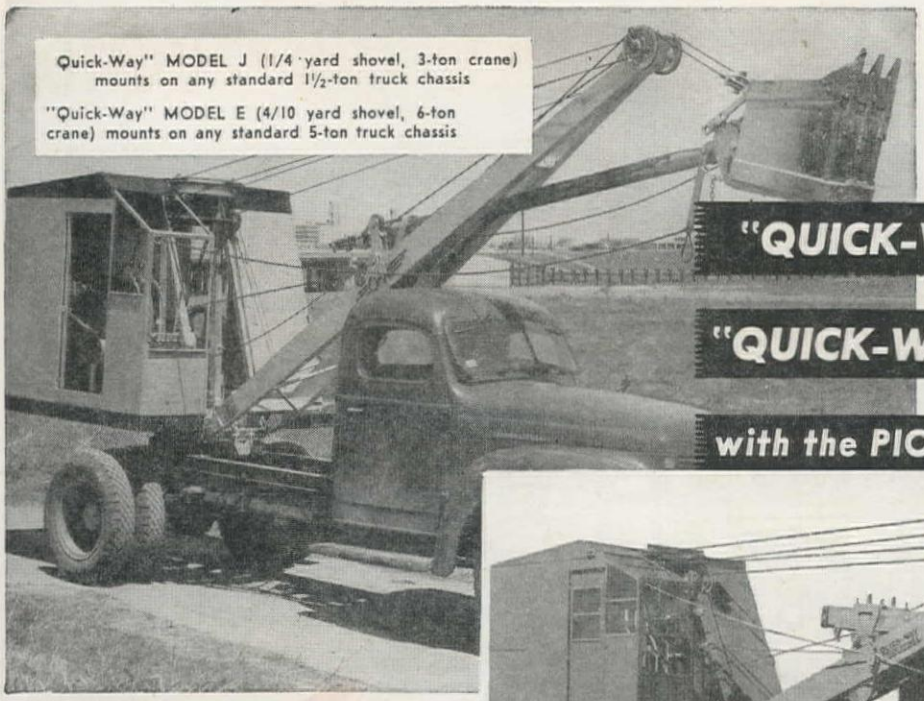
Before the war, Standard Steel's Paving Plants made outstanding production records throughout the country in bituminous road construction. With war, this equipment has played and is playing an important role in the building of many, many airports, both at home and abroad. Performance under the toughest kind of operating conditions has proved the efficiency of this equipment. Not satisfied, however, Standard Steel engineers have plans, already past the drawing board stage, for increasing even more the effectiveness of these great paving plants. It will behoove contractors to keep an eye out for Standard Steel's post-war line of road machinery.

OTHER STANDARD ROAD CONSTRUCTION EQUIPMENT: ROLLERS, SUBGRADERS, BATCHING PLANTS, DRYERS, FINISHERS, BROOMS

STANDARD

STEEL CORPORATION

General Offices and Plant: 5001 South Boyle Avenue
Los Angeles 11, California



Quick-Way" MODEL J (1/4 yard shovel, 3-ton crane) mounts on any standard 1½-ton truck chassis

"Quick-Way" MODEL E (4/10 yard shovel, 6-ton crane) mounts on any standard 5-ton truck chassis

"QUICK-WAY" TO THE JOB

"QUICK-WAY" THRU THE JOB

with the PIONEER of truck shovels!

MODEL E

GET THERE

AT STANDARD TRUCK SPEED!

Portability in excavating and materials handling equipment means bigger profits. "Quick-Way" Truck Shovels get there as fast as the truck can travel and you don't lose time and money loading and unloading the unit. Gets in and out of more difficult places.

Fast convertibility is another time and money saver! Change over on the job—to crane, trench hoe, clamshell, dragline, or pile driver—takes less than two hours. All attachments fasten to a universal boom footing. Also these important time and money saving advantages: all parts easily accessible. Simplicity of design. All clutches interchangeable.

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"QUICK-WAY" TRUCK SHOVEL CO.

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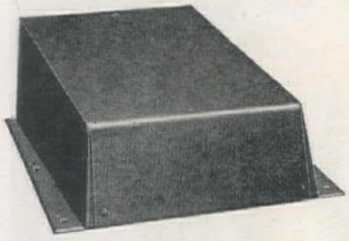
Ask for Bulletins

CONCRETE JOIST CONSTRUCTION

Preferred 2 to 1

Ceco never guesses. We have always known concrete joist construction had definite advantages, but we wanted to find out what builders everywhere thought. So we employed independent investigators on a nationwide census to get the whole story. The result was surprising even to us. Architects — contractors — engineers — all across America—those who know building best prefer concrete joist construction two to one. Here are their reasons:

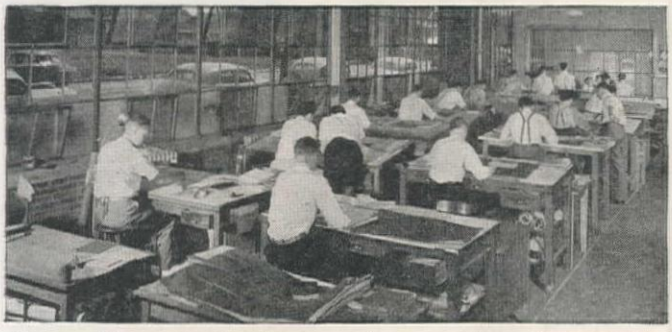
1. **Lower cost construction**
2. **Speeds up building**
3. **Provides rigid, strong, permanent, soundproof buildings**
4. **Assures fire-resistive construction**



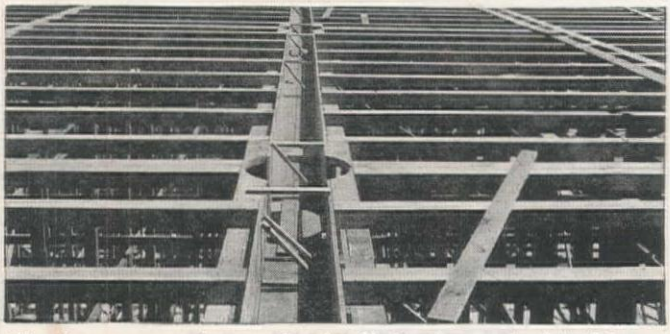
22 OFFICES TO SERVE YOU

Wherever you are in the United States, there's a Ceco office strategically located to serve you. That means Ceco Meyer Steelforms for concrete joist construction are quickly available with fast delivery from the closest warehouse. Just write Ceco at the address below—we will put you in touch with your regional Ceco service headquarters.

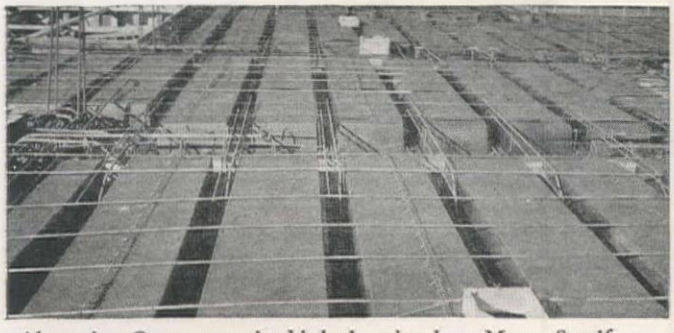
← *Typical Meyer Steelform shown at left.*



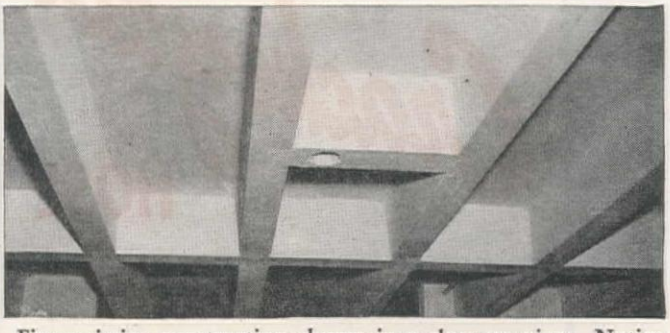
Ceco engineers in 22 offices are always ready to help you in the preparation of designs and estimates—to help you cut costs and save time. Feel free to call on the Ceco organization for service on your jobs.



Simple open wood centering is all that is required in Meyer Steelform construction. The centering may be re-used from one floor to another, as can Meyer Steelforms. This eliminates extra lumber costs, saves time.



Above is a Ceco supervised job showing how Meyer Steelforms are correctly placed to eliminate leakage of concrete and insure accurate execution of structural design. Ceco experts supervise placing of Steelforms.



Fire-resistive construction shown in a close-up view. Notice the finished character of ceiling joists built with Meyer Steelforms. Concrete joists can be left exposed or a flat ceiling can be attached.

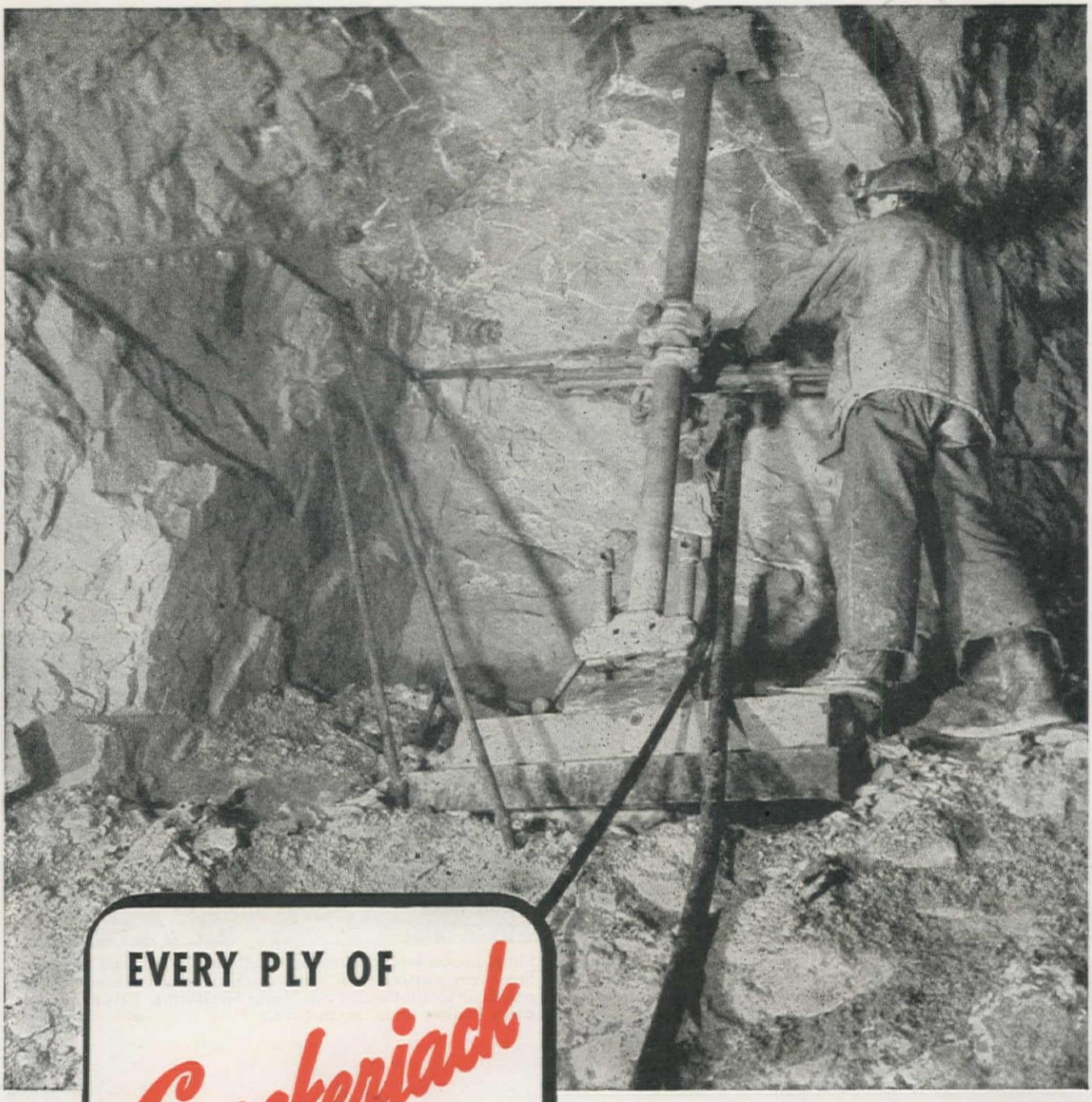
30 YEARS OF EXPERIENCE IN REINFORCED CONCRETE!

CECO STEEL PRODUCTS CORPORATION

Concrete Engineering Division—5701 W. 26th St., Chicago, Ill.

MANUFACTURING DIVISION, SHEET STEEL AND WIRE DIVISION, HIGHWAY PRODUCTS DIVISION

ENGINEERING MAKES THE BIG DIFFERENCE IN CECO CONSTRUCTION PRODUCTS



EVERY PLY OF *Crackerjack* HOSE IS PROTECTED AGAINST WEAR and TEAR

Abrasion and snagging hazards are minimized with *Crackerjack* air and water hose. Hose cover compounds have been developed that give unusually good service in underground or surface work. Adhesion is excellent. The plies hang together—and above all, *Crackerjack* is resistant to the effects of oil, grease and heat... both internally and externally. Built to withstand required pressures. Available in all sizes... either standard or special construction to fit the job.

The AMERICAN RUBBER *Mfg. Co.*

OAKLAND, CALIFORNIA

MANUFACTURERS OF RUBBER PRODUCTS FOR INDUSTRY

NO ZIG --NO ZAG

True directional steering of Wooldridge Terra Cobra, high-speed, self-propelled Earthmovers is unique in the field of two-wheeled units. At no time is one wheel required to pull the entire load, even on sharp turns or in soft earth. This results in less strain and wear on equipment and operators, insuring higher hourly averages throughout each daily shift. In a Wooldridge Terra-Cobra positive steering control is combined with positive two wheel power and speed at all times. Investigate fully. Get the full details.

WITH POWER MAINTAINED ON BOTH WHEELS AT ALL TIMES

WRITE TODAY *for twelve-page Bulletin No. TA-425.— And if you are also interested in Heavy-duty scrapers or other earth-moving equipment, ask for Bulletin No. W-210.*

WOOLDRIDGE MANUFACTURING CO.
SUNNYVALE • CALIFORNIA

WOOLDRIDGE
TERRA COBRA
SELF-PROPELLED EARTHMOVERS

ONE-PIECE TURNTABLE

KEEPS MACHINERY ALIGNED

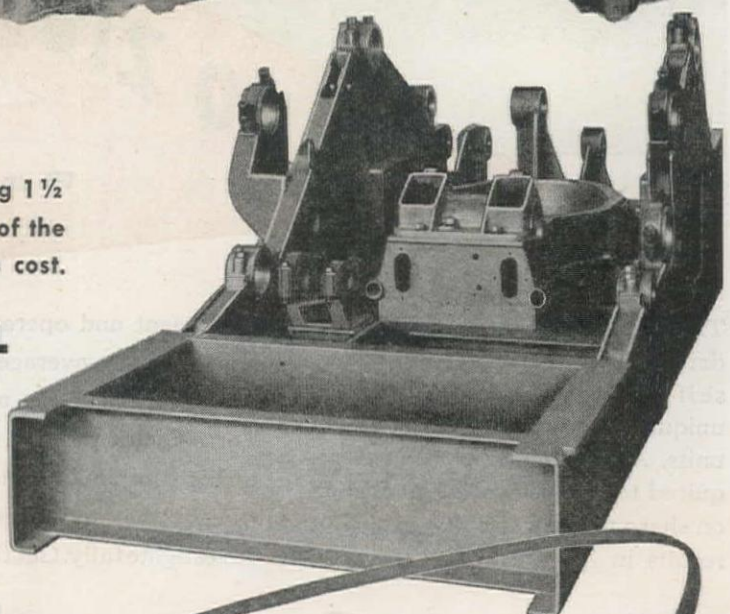
KOEHRING 605

ONE WELDED UNIT

Machinery stays aligned on the new Koehring 1½ yard shovel. Precise alignment prolongs life of the machine, prevents undue wear, cuts upkeep cost.

SIDESTANDS ARE INTEGRAL

Sidestands supporting the horizontal shafting on the new Koehring 605 are integral parts of the massive turntable, securely welded on, permanently joined to keep shafting in lasting alignment.



GEAR HOUSING WELDED IN

Because a separate, bolted-on housing might work loose to throw vertical shafting out of line, the bevel swing and traction gear case on the new Koehring 605 is welded directly into the turntable. No bolts used to join housing and turntable.

Ask For Your 605 Catalog Today

KOEHRING COMPANY
MILWAUKEE 10
WISCONSIN

HARRON, RICKARD & McCONE CO., San Francisco-Los Angeles • PACIFIC HOIST & DERRICK CO., Seattle, Wash. • WESTERN CONSTRUCTION EQUIPMENT CO., Billings • WESTERN CONSTRUCTION EQUIPMENT CO., Missoula • CONTRACTORS EQUIPMENT CORP., Portland • LUND MACHINERY CO., Salt Lake City • NEIL B. McGINNIS CO., Phoenix, Arizona • HARRY CORNELIUS CO., Albuquerque, New Mexico • KOEHRING COMPANY WEST COAST PARTS WAREHOUSE, Sacramento, California.

UNDERGROUND PLANNING BEGINS WITH STEEL

Miles upon miles of twisting, turning and winding pipe make up the underground water ways that bring the water you drink right into the kitchen, and the factory. From the water well casing to the cross-country 6 ft. diameter pipe, steel plays a most important part in making an adequate water supply available in modern cities.

Forty years' construction and "know how" in steel installations have helped Western Pipe and Steel Company's engineers build some of the largest water facilities in the West. If you have a steel construction problem, our consulting department will be glad to offer you their experience and knowledge gained through 40 years of practical building in the steel erection field.

Write or call our nearest office.

WESTERN PIPE AND STEEL COMPANY OF CALIFORNIA

Fabricators and Erectors

5715 Santa Fe Avenue
Box 2015 Terminal Annex
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WESTERN BUILT PRODUCTS INCLUDE:

Absorbers
Accumulators
Agitators
Boilers
Buildings
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Heat Exchangers
Joints, Expansion
Linings, Corrosion Resisting
Penstocks, Steel
Refinery Equipment
Stainless Steel
Tunnel Linings
Tanks
Bolted
Galvanized
Riveted
Welded
Towers
Bubble
Evaporator
Fractionating
Vessels
Pressure
Walkways
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PLANTS AND OFFICES: FRESNO, BAKERSFIELD, TAFT, CALIFORNIA AND PHOENIX, ARIZONA

FLUID PRESSURE COMPACTION

... with a BROS "WOBBLE WHEEL"* ROLLER

Road or air-field foundations must be evenly and thoroughly compacted to support surfaces that have a low-cost maintenance and lasting utility. They need the fluid pressure compaction of the Bros "Wobble Wheel"* Roller which works and kneads the material together, eliminating voids, and compacts them to a uniform density from top to bottom and from side to side. The rubber tire rollers, low-pressure inflated and with smooth treads, provide a firm and durable foundation—proving once again that "you get the most and only from Bros". Wm. Bros Boiler & Manufacturing Company, 1057 10th Avenue Southeast, Minneapolis 14, Minnesota.

BROS

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

THEY'RE WORTH MORE!

Over 500 tons of tungsten and antimony ore are taken daily from the biggest tungsten mine in North America. Here, 160 miles northeast of Boise, Idaho, 15 heavy-duty Autocar Trucks help the Bradley Mining Company operate the Yellow Pine Mine. . . . A fortunate few haulers of essential loads can get new Autocar Trucks today. Maybe you can qualify.

Pride of ownership means something to any man, and Autocar Trucks can make any man proud. But the buyer of heavy-duty trucks is little concerned with personal emotions. He knows that Autocar Trucks cost more *because they're worth more.* He knows that they are superbly engineered and precision-built *by Autocar* to stand the gaff of heavy hauling. . . . Follow the leaders, for they know the way!

AUTOCAR TRUCKS

Engineered BY AUTOCAR

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

*Lightweight**

MOVES MORE MATERIAL

.....FASTER

★ 20% TO 40% LIGHTER THAN OTHER BUCKETS, type for type.

★ ALL WELDED CONSTRUCTION for greater strength and durability.

★ MANGANESE STEEL chains, fittings, and reversible tooth points.

★ GETS FULL LOAD PAY MATERIAL EVERY TRIP —even in wet digging.

★ 3 TYPES—light, medium, and heavy duty—3/8 to 30 cubic yard size.

Also available* WITHOUT *perforations

WRITE FOR DESCRIPTIVE LITERATURE— OR ASK YOUR DEALER

HENDRIX *Lightweight* **DRAGLINE BUCKETS**

DESOTO FOUNDRY, INC. • MANSFIELD, LOUISIANA

THIN COAT WEATHERPROOFS EQUIPMENT FOR MONTHS!

1. During the winter months, much of your valuable machinery and equipment will be exposed to severe weather conditions. You'll want to protect it against rust and corrosion.

2. Many contractors have found Stop Rust D1 to be the answer for the weatherproofing of materials, equipment, machines, tools, etc., whether idle or in use.

3. Stop Rust D1 is the revolutionary weatherproofing product developed by Union Oil Company for military use and, since there is an ample supply, it is available to you *now*.

4. Stop Rust D1 is a liquid and is easily applied by brush, cloth, spray or by dipping, after which it dries quickly to a hard, tenacious film. It leaves a protective film even on vertical surfaces.

5. It is so effective that a coat 1/1000 of an inch thick will protect metal under the most severe conditions of sun, wind, rain, hail or snow for many months. One gallon covers several hundred square feet.

For more information as to how Stop Rust D1 can cheaply and quickly weatherproof your equipment, and to have a supply delivered, see your Union oilman or write to Union Oil Company, Los Angeles 14, California.

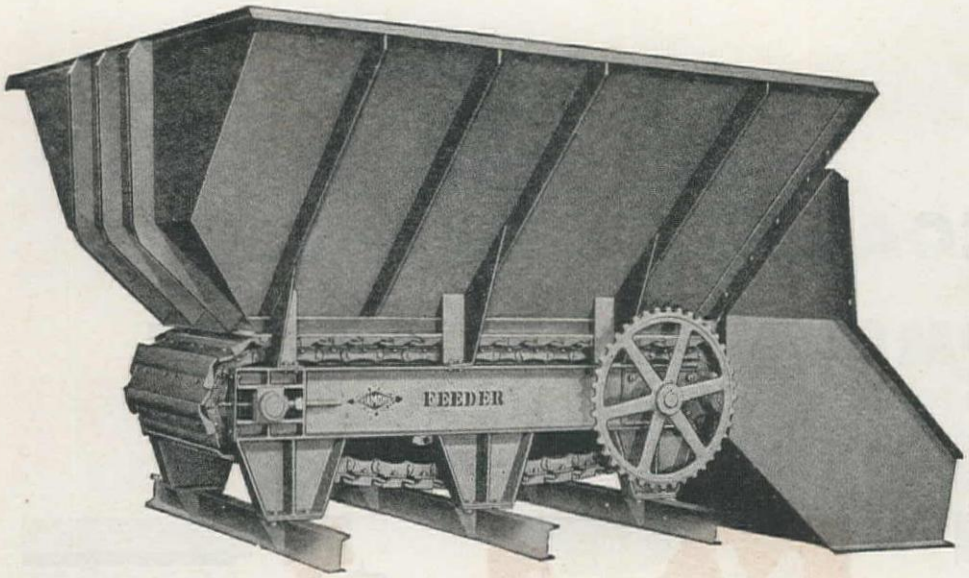
Affiliate Member, Associated General Contractors of America

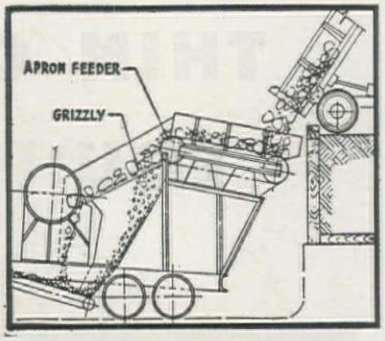
STOP RUST D1

Another UNION OIL *Success-Tested Product*

UNION 76

APRON FEEDER





Flow chart shows feeder operating on an upward incline with finger grizzly, scalping off large rock for primary breaker.

There's nothing tougher

THAN A DIAMOND FEEDER

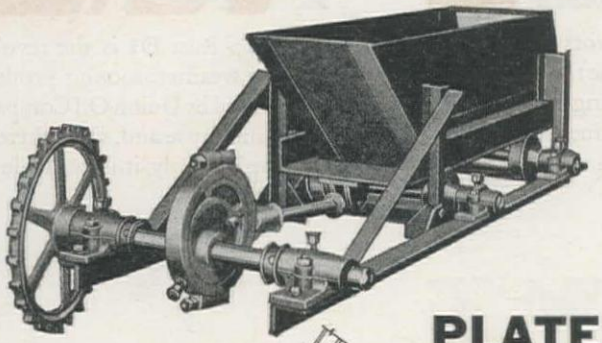
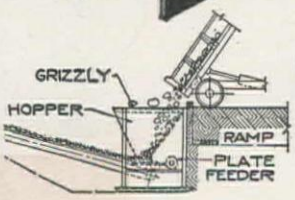


PLATE FEEDER



Illustrated is but one of many uses. Belt life is lengthened, and even flow maintained.

For feeding sand, gravel and lighter materials, the DIAMOND Plate Feeder is a versatile unit. Made in six widths with either single or double eccentric. Both types have an **adjustable throw** that provides exactly the correct flow of material for the job at hand.

There's nothing tougher than All these DIAMOND products: Jaw Crushers . . . Roll Crushers . . . "DUAL-ACTION" Crushers . . . Hammermills . . . Screens . . . Conveyors . . . Bins . . . Feeders . . . Portable and Stationary Plants. Ask for our Quarry Plant Bulletin D-45-A.

30 different sizes are available to match up with capacity of your trucks, shovels or bins. This heavy duty DIAMOND Apron Feeder handles stone, gravel, ore and similar "big chunk" materials in volume. Operating at a horizontal or inclined position, it may be used for feeding to a primary crusher or from under large bins to a belt conveyor. Please write us, stating your requirements, and we will be able to advise you as to width, length and capacity.

FREE: Write for Bulletin D-44-K on DIAMOND Feeders.

DIAMOND DEALERS

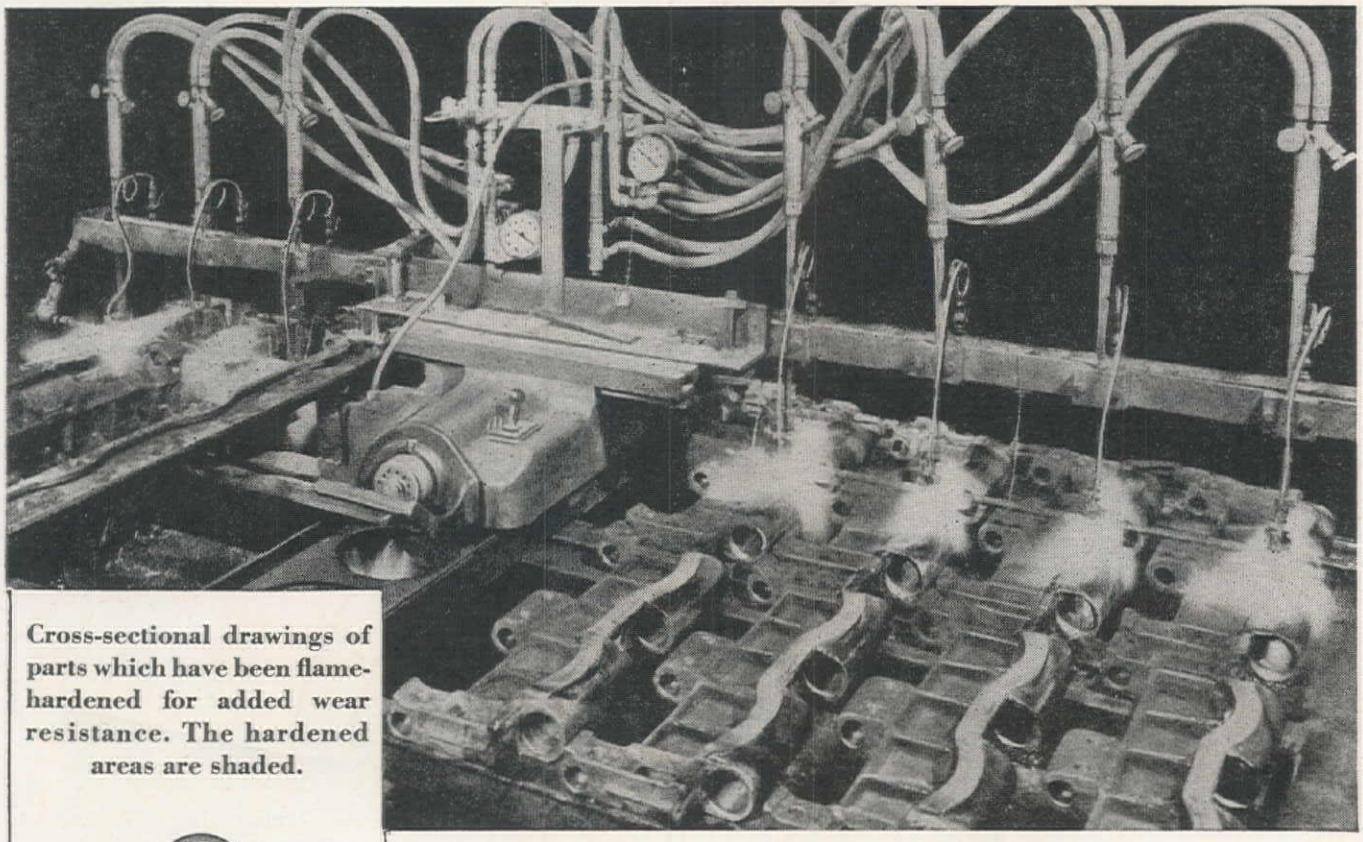
Oakland	SOULÈ EQUIP. CO.
Los Angeles	GARLINGHOUSE BROS.
Seattle	A. H. COX & CO.
Portland	LOGGERS & CONTRACT'S MACH. CO.
Boise and Spokane	WESTERN EQUIP. CO.
Salt Lake City	C. H. JONES EQUIP. CO.
Phoenix	O. S. STAPLEY CO.
Albuquerque	CONTRACTORS' EQUIP. & SUP. CO.

DIAMOND

DIAMOND IRON WORKS, INC.

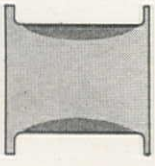
AND THE MAHR MANUFACTURING CO. DIVISION

1818 SECOND STREET NORTH MINNEAPOLIS 11, MINNESOTA

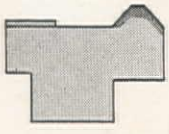


Cross-sectional drawings of parts which have been flame-hardened for added wear resistance. The hardened areas are shaded.

Shaft

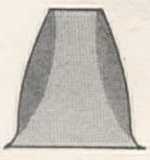


Crankshaft Bearing



Lathe Way

Sheave Wheel



Gear Tooth

You Get Greater Wear-Resistance Where Needed with Oxy-Acetylene Flame-Hardening

Oxy-acetylene flame-hardening as developed by Linde is a completely automatic process which can be applied at production-line speeds. In the picture above seven tank tread shoes are being flame-hardened simultaneously. The entire operation takes less than 4 minutes.

The oxy-acetylene flames, followed by a cold water quench, give the wearing surfaces of the treads a uniform hardness — controlled to a depth of 3/16 in. — without affecting the chemical composition, ductility, or toughness of the core or surrounding areas.

A variety of steel and cast iron parts can be hardened easily by Linde's method. Even parts too large to be hardened by other methods can be flame-hardened at exactly the points where wear occurs... and without distortion.

You can get the flame-hardening apparatus and supplies you need from Linde, and Linde can show you how to use them.

Write for the booklet, "Flame-Hardening," Form 4726.

BUY UNITED STATES WAR BONDS AND STAMPS

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

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

THE BIG CONSTRUCTION PROGRAM IS ON!

KABLE TRAC-DOZERS—are available in either 'Straight' or 'Angle' blade models and can be used with single or double drum, front or rear mounted, power units.

ISAACSON KABLE TRAC-DOZERS Will be on the job!

THE POST WAR ERA IS HERE. We are now entering a period marking the beginning of a five billion dollar construction program. Railroads, highways, airports and other large construction projects like the one pictured, are under way. These jobs will go to the contractor who has modern, quality built equipment with a reputation for low operating and low maintenance cost.

The Isaacson Kable Trac-Dozer has earned a wide reputation for continuous, profitable operation on rough, tough western jobs. Much of this reputation is the result of good *balance*. The Isaacson Kable Trac-Dozer is engineered for *balance* with your tractor. Load weight is properly distributed. This reduces wear . . . prolongs equipment life . . . and at the same time assures good traction. An Isaacson Kable Trac-Dozer gives you smooth, fast cable operation . . . powerful high lift . . . instant low drop . . . low cost yardage . . . fast dirt moving.

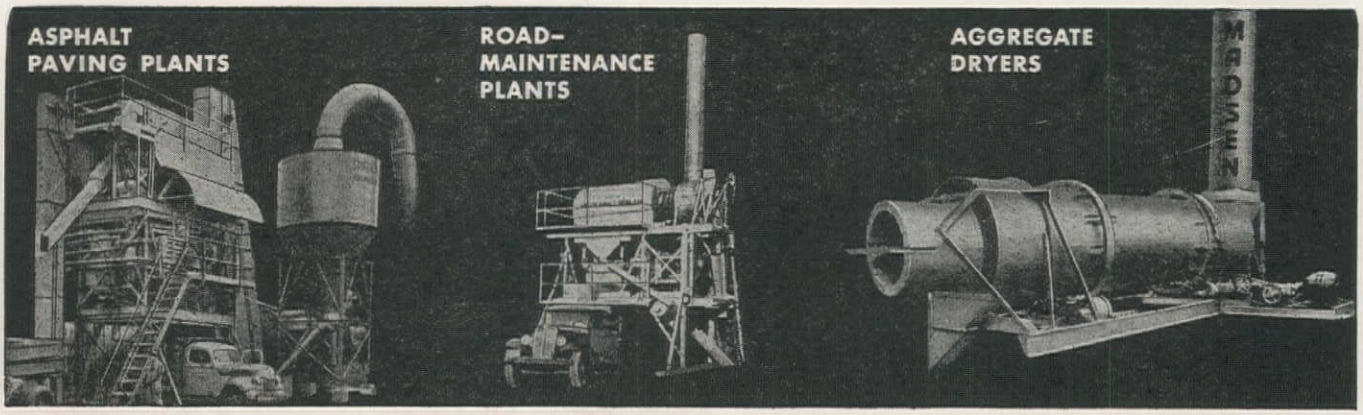
"Engineered for Balance"

Write direct today for complete descriptive literature—be equipped for big jobs ahead.

ISAACSON

Tractor Equipment

A PRODUCT OF THE ISAACSON IRON WORKS • SEATTLE

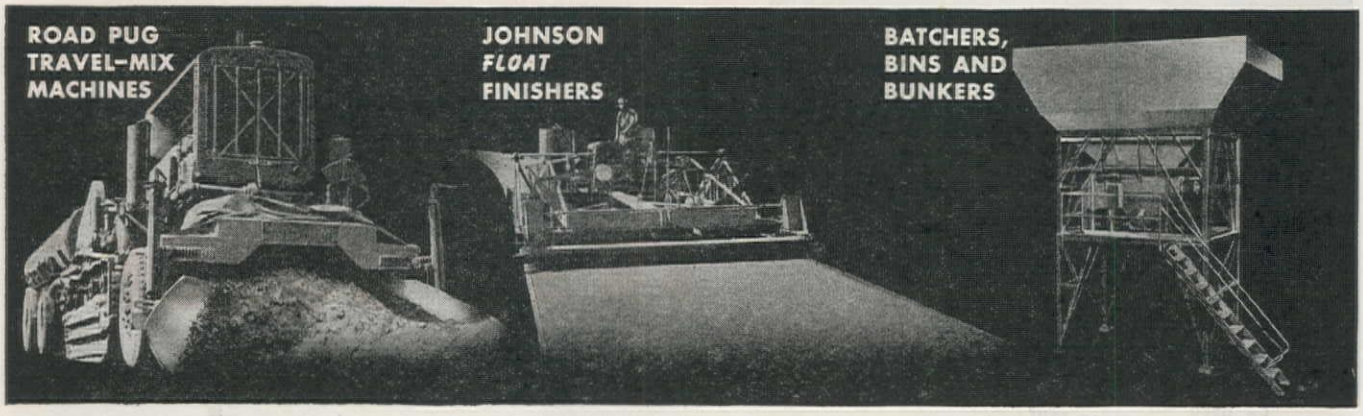


Record Breaking! MADSEN EQUIPMENT

BITUMINOUS MIXING PLANTS
BATCH CAPACITIES—500 to 6000 lbs.
RECORD (3000-lb. Plant)—2414 tons in 12 hours reported by Lewis Construction Co., on the Marine Base at El Toro, Calif.

BITUMINOUS MIXING PLANTS
BATCH CAPACITIES—500 and 1000 lbs.
MIXING SPEED—40-second cycle.
FEATURES—Jack Erection; Unit-Power Transmission; Asphalt Pressure-Injection.

COUNTER-FLOW TYPE DRYERS
SIZES—32- to 72-in. diam. All lengths.
FEATURES—Unit-Power Transmission; Flexible Ring-Sprocket Drive; Oversize Tires and Trunnions; All-Welded Shell.



FOR THE ROAD BUILDER—CONTRACTOR

FOR OIL-MIX, SOIL CEMENT & BASE
CAPACITY per hour—200 to 550 tons.
REPORTED by Phoenix Construction Co. 7920 tons in 20 hrs. to Calif. specifications.
METERED OIL—In ratio to travel speed.

FOR MECHANICAL *FLOAT* FINISHING
WIDTHS—convertible from 10 to18 feet.
SPEED—3065 lineal feet by Roy Houck, Oregon. Consistently finishes pavement to .05 inch, or less, variation in 10 feet.

TRUCK LOADING BATCHERS, ALSO Proportioner Plants; 1- to 6-unit Bins and Bunkers; Screening Plants; Central Mixing Plants; other batcher equipment.
CAPACITIES—From 25 to 400 tons.

Rubber-tired rollers have dual wheels with oscillating axle on walking beam. It kneads the soil as it compacts.

Pug Mill Mixers, weigh batchers, and all types of bin gates and feeders are available at Madsen Iron Works.

MADSEN IRON WORKS
HUNTINGTON PARK, CALIFORNIA

. . . FOR MORE INFORMATION

MADSEN IRON WORKS
HUNTINGTON PARK, CALIF.

Send information on the items checked.

- ☐ Asphalt Plants
- ☐ Maintenance Plants
- ☐ Float Finishers
- ☐ Aggregate Dryers
- ☐ Pug Mill Mixers
- ☐ Road Pugs
- ☐ Batchers
- ☐ Bins & Bunkers
- ☐ Compactors
- ☐ Weigh Batchers

NAME _____

COMPANY _____

ADDRESS _____

HOW TO CUT MAINTENANCE COSTS on Differentials and Transmissions

Proper lubrication cuts wear, chipping and broken teeth. Richfield Gear Oils are manufactured from the finest quality lubricating stocks and compounded to meet the most exacting requirements of the latest types of rear axles and transmissions as well as of all other designs still in service. Use All Purpose Richfield Gear Oils for dependable lubrication that insures longer gear life and maximum transmission of power.

Check these features—

- **Qualities unaffected by temperature. Will not thin out at high operating temperatures or congeal during cold weather.**
- **Long life. Specially compounded to withstand extreme pressures at high rubbing speeds. Extremely resistant to oxidation and sludging.**
- **Protects gears. Dissipates heat from gear surfaces rapidly. High film strength and adhesiveness plus anti-foaming characteristics provide positive lubrication.**

Recommended for all hypoid, spiral, bevel, worm and herringbone rear axle types and gears and free-wheeling units, helical, stub and constant mesh gears of the transmission type.

Available in

SAE grades 80, 90, 140 and 250.

INDUSTRIAL LUBRICANTS FOR ALL PURPOSES

RICHFIELD

America's most complete line of material handling buckets.

WE BUILD ALL 4 MATERIAL HANDLING BUCKETS

PMCO ALL PURPOSE

- SHOVEL
- PULLSHOVEL
- DRAGLINE
- CLAMSHELL

Clamshell
Sizes ⅜ to 2 yds.

We build a wider and more complete line of material handling buckets than any other manufacturer. Volume production methods enable us to build a better bucket with amazing economies in manufacturing.

FRONTS, BOTTOMS, SCOOPS, and TEETH, shown in red on buckets, are 14% manganese steel developing up to 120,000 tensile p.s.i. for long service life and hard abuse.

Experience Counts

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

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

Shovel
Sizes ⅜ to 18 yds.

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

Pullshovel
Sizes ⅜, ½ and ¾ yd.

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.

Introducing

ANDERSON-O'BRIEN CO.

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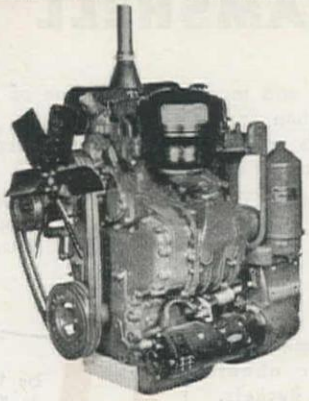
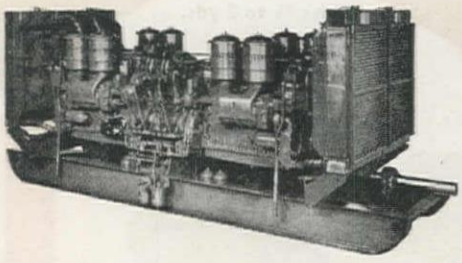
Telephone PRospect 2039

Now Representing the

DETROIT DIESEL ENGINE DIVISION OF GENERAL MOTORS CORP.



Two Cylinder Engine
30 to 50 Horsepower



Twenty-four Cylinder Engine
520 to 592 Horsepower

Engines for dirt-moving machinery.

Power units for construction equipment.

Generator sets for "off the line" power.

TWO CYLINDER
THREE CYLINDER
FOUR CYLINDER
SIX CYLINDER
Twelve Cylinder "Twin"
Twenty-four Cylinder "Quad"

The same wearing parts in all engines.

GM DIESEL POWER

ANDERSON-O'BRIEN CO.
746 East Washington Blvd.
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"MILT" O'BRIEN
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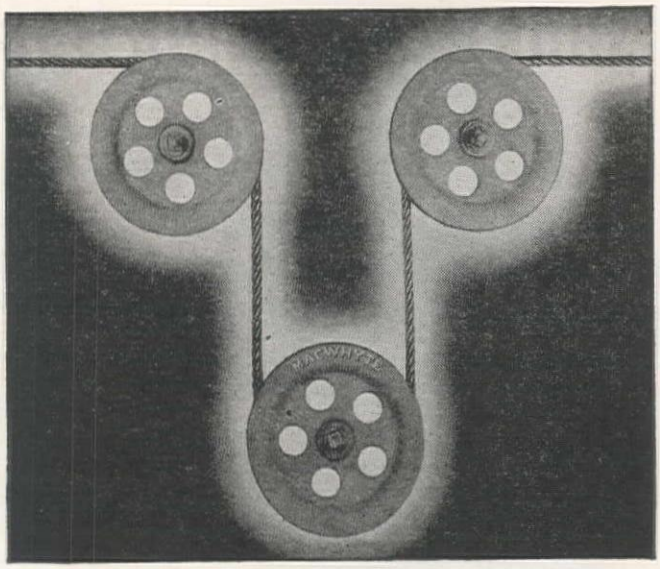
Tech Service Supervisor

Recommended for these extra-tough jobs!

MACWHYTE PREformed WIRE ROPE



Macwhyte PREformed Wire Rope gives excellent service on the following installations:

EXCAVATING:

Load Lines on all types of portable excavating machinery such as:
Shovels
Clamshell Cranes
Pull Stroke Shovels
Draglines
Backfillers
Pile Drivers
Scrapers—Scraper Loaders

MINING:

Hoist, Slope, or Incline Ropes
Mining machine ropes
Non-spinning ropes for shaft sinking and shaft hoists

DRILLING:

Rotary oil well drilling lines

QUARRYING:

Derrick Main Falls
Whip Ropes
Slings

LOGGING:

Choker Ropes
Haulback Lines
Main Lines
Skidding Lines
Receding Lines
Loading Lines

GENERAL:

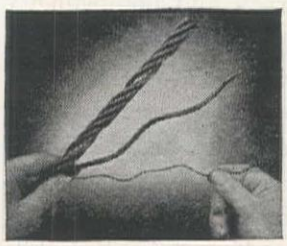
All Lang Lay Ropes
All 18 x 7 Kilindo Non-rotating Ropes
Elevator Ropes
Industrial Ropes

Send for booklet 43-85 "Wire Rope Conservation Bulletins" illustrating and describing many factors affecting wire rope service.

The correct rope for your equipment

Twenty years of service has proved that because it is more flexible, Macwhyte PREformed Wire Rope gives superior service on equipment requiring a great amount of bending over sheaves, particularly at high speeds. Macwhyte PREformed also stands up better under heavy loading and continuous operation.

Because it lasts longer, Macwhyte PREformed costs less in the long run.



HERE'S WHY Macwhyte PREformed lasts longer. Each wire and strand is PREformed to the exact helical shape it assumes in the finished rope. This reduces internal stresses, greatly increases flexibility.

Macwhyte PREformed is Internally Lubricated.

Every wire in every strand of Macwhyte PREformed Wire Rope is coated with Macwhyte Internal Lubricant to improve the sliding action of the wires as they move in bending around sheaves and drums.

MACWHYTE COMPANY

Wire Rope Manufacturers

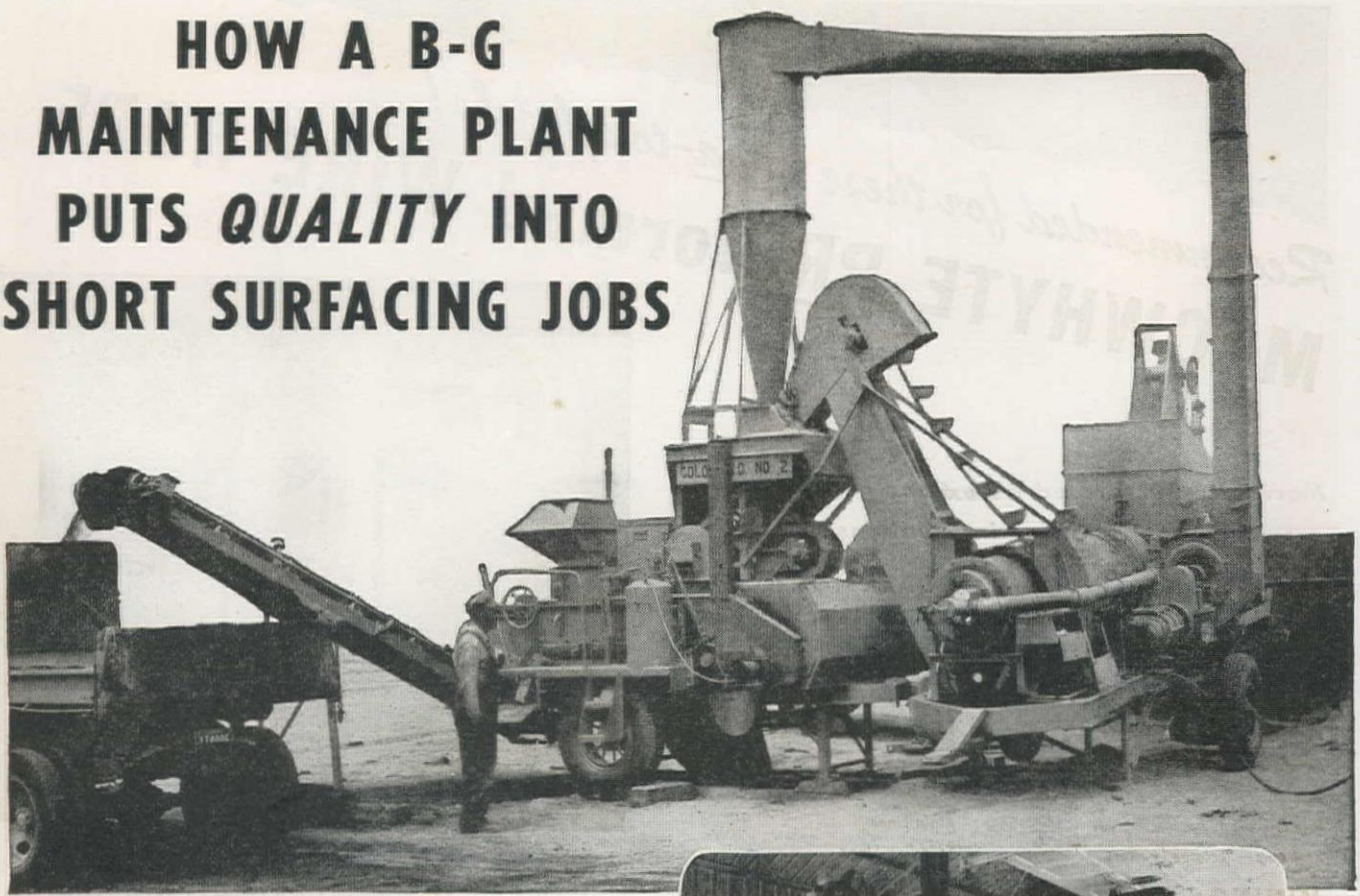
NO. 804

2909 FOURTEENTH AVENUE KENOSHA, WISCONSIN

Mill Depots: New York • Pittsburgh • Chicago • Fort Worth • Portland • Seattle • San Francisco. Distributors throughout the U.S.A.

MACWHYTE PREformed and Internally Lubricated Wire Rope
MONARCH WHYTE STRAND Wire Rope
MACWHYTE Special Traction Elevator Rope
MACWHYTE Braided Wire Rope Slings
MACWHYTE Aircraft Cables and Tie-Rods
MACWHYTE Stainless Steel Wire Rope
MACWHYTE Monel Metal Wire Rope

HOW A B-G MAINTENANCE PLANT PUTS *QUALITY* INTO SHORT SURFACING JOBS



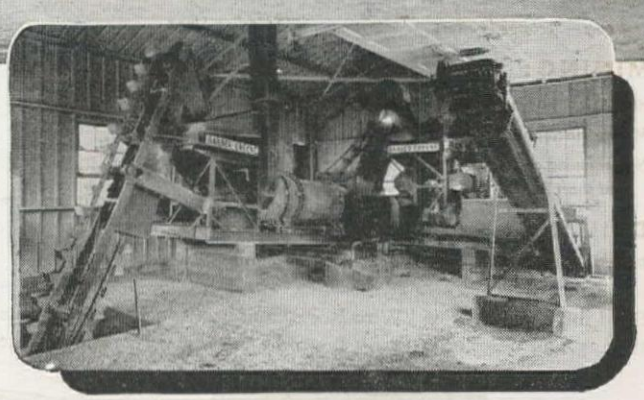
A B-G Portable Maintenance Plant with Dust Collector.

You get the same proportioning, mixing and drying control with this Barber-Greene Maintenance Mixer and Companion Dryer that has made the B-G Heavy Duty Asphalt Plant famous the country over for its accuracy and homogeneity of mix.

With the B-G Maintenance Plant you can economically produce the highest quality bituminous mix for short street and highway jobs, for patching, and for surfacing driveways, parking lots and other small areas.

Dryer and mixer are self-contained mobile units, quickly uncoupled and trailed from one location to another. Speedy, easy erection reduces unproductive hours when changing sites . . . steps up monthly tonnages . . . requires a minimum maintenance crew.

Add up the advantages of the B-G Maintenance Plant with its "continuous flow" capacity of 15 to 30 tons an hour . . . its thoroughly controlled mixing . . . its extreme portability and flexibility, and you'll find where huge savings are effected in time and money over the years in patching, putting down short stretches and handling small blacktop paving jobs. Barber-Greene Company, Aurora, Illinois.



Where a permanent set-up is desired, equipment is furnished without running gear. Mixer can be used as separate unit when desired. Plant produces all types of bituminous material—hot, cold, sand, sheet, powdered and emulsion mixtures.

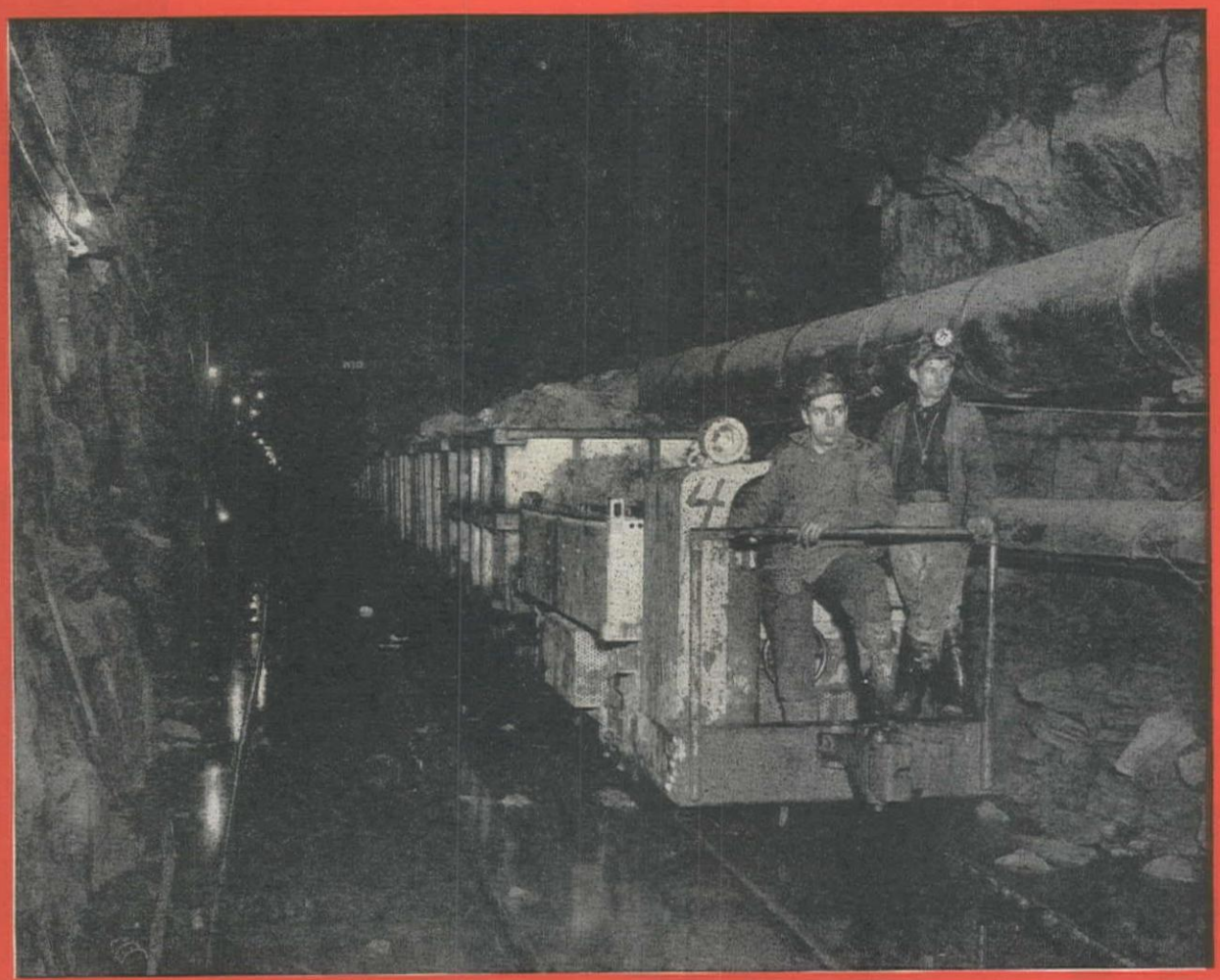
ARMY E NAVY

45-12

Barber-Greene B G *Constant Flow Equipment*

GOODMAN

Tunnel Locomotives



11165

Hauling muck, taking in supplies or concrete, serving the loader—Goodman tunnel locomotives provide high speed operation on a 24-hour basis without penalty of excessive cost or expensive breakdown.

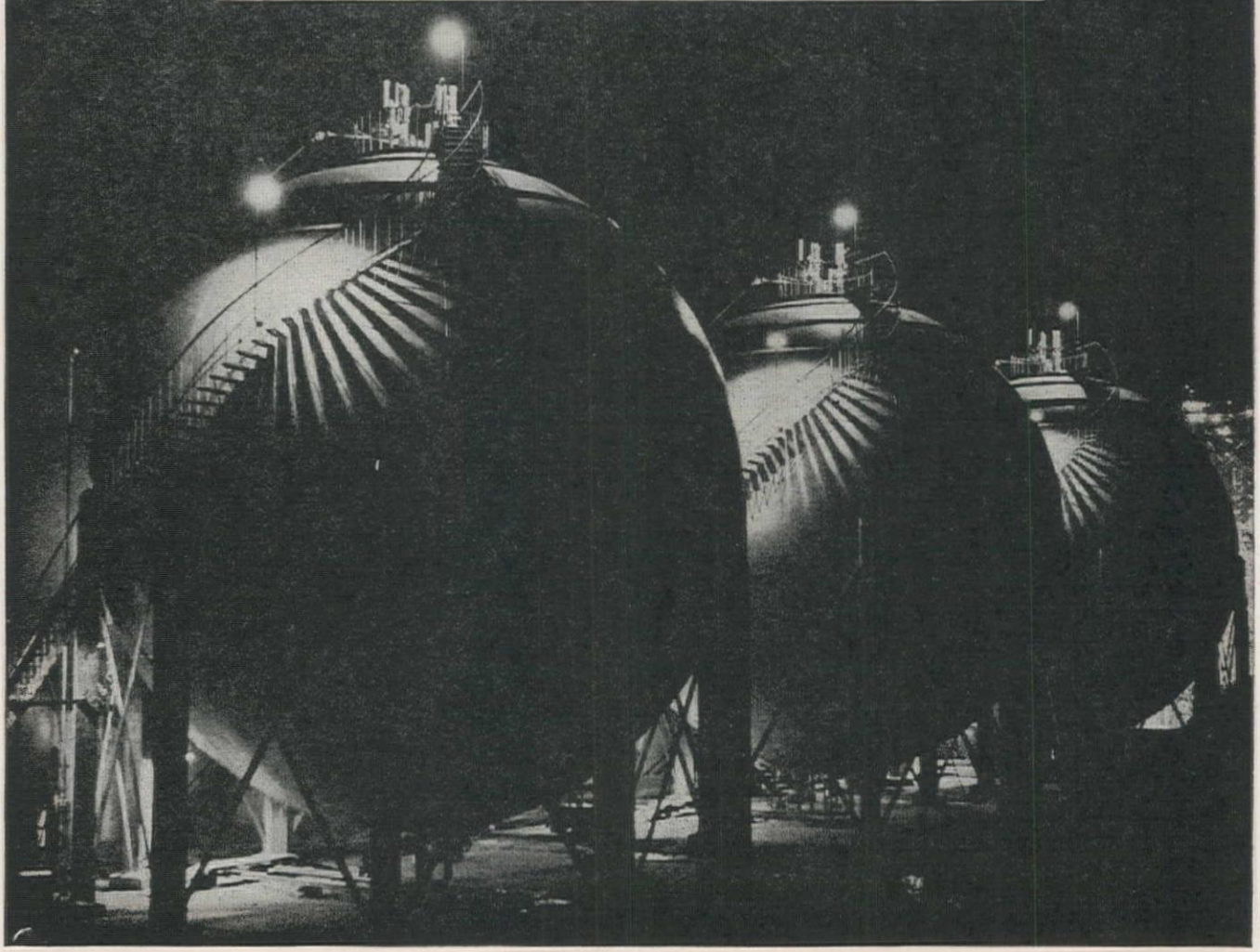
There is a Goodman locomotive in trolley, storage battery or combination type for any size tunnel.

GOODMAN MANUFACTURING COMPANY

HALSTED STREET AT 48TH • CHICAGO 9, ILLINOIS

HORTONSPHERE

...*the* pressure vessel for storing large volumes of highly volatile products.



THE striking view reproduced above shows some of the pressure storage tanks a California refinery uses daily in its operations. At this refinery, which produces aviation gasoline, there is a butane isomerization unit which converts normal butane into isobutane . . . a hydrofluoric acid alkylation unit which takes isobutane and other light hydrocarbon fractions and synthesizes them into alkylate; and distillation equipment for rejection of normal pentane. The Hortonspheres—because they are able to stop evaporation—provide pressure storage which is essential for maximum efficiency in the operation of these units.

The three Hortonspheres in the view store butane at 75 lbs. per sq. in. pressure. They are 48 ft. in diam. and hold 10,000 bbls. each. A fourth Hortonsphere holds 5,000 bbls., is 38 ft. in diam. and operates at 50 lbs. per sq. in. pressure.

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WESTERN CONSTRUCTION NEWS
WITH WHICH IS CONSOLIDATED WESTERN HIGHWAYS BUILDER
October, 1945 Vol. 20, No. 10

Authorities? No!!

THERE IS a feeling that a series of Regional Authorities similar in organization, scope and purpose to the Tennessee Valley Authority is inevitable in the United States. At the present time five Regional Authority proposals have been introduced into Congress. They are the Rankin Bill which creates nine such authorities, the Murray Bill creating a Missouri Valley Authority, the Mitchell setting up a Columbia Valley Authority, the Bender Bill covering an Ohio Valley Authority, and the Russell Bill which would establish a Savannah Authority. The nine covered by the Rankin Bill are as follows:

Authority	Area in Sq. Miles	Percent of U. S.	Population	Percent of U. S.
Atlantic Seaboard	304,000	10.2	42,600,000	32.3
Ohio Valley	362,000	12.2	38,300,000	29.1
Tennessee Valley	212,000	7.1	11,600,000	8.8
Missouri Valley	661,000	22.2	12,800,000	9.7
Arkansas Valley	618,000	20.8	14,600,000	11.1
Southwestern	194,000	6.5	700,000	0.5
Columbia Valley	255,000	8.6	3,400,000	2.6
California	112,000	3.7	6,800,000	5.2
Colorado Valley	259,000	8.7	900,000	0.7
	2,977,000	100.0	131,700,000	100.0

The feeling of inevitability comes about because legislation of this type is supported by the CIO and its farm affiliate, the Farmers' Union. Additional strength is given to the fears that one of the bills may be passed because the President recently gave his support to the proposals.

It would be unfortunate if any or all of these bills were to become law and we are heartened by the fact that hearings held before the Senate Commerce Committee last summer and others just closed before the Senate Irrigation Committee on Missouri Valley Authority have in both cases resulted in majority reports against the proposal. It was good to know that our Senators still have the backbone to stand up for the traditional American system of government and operation of the Nation's resources even though the tremendous power of the liberal elements of the country is arrayed against them.

It is most unfortunate that friction still exists between the Bureau of Reclamation and the Corps of Engineers, the two agencies presently responsible for construction along our waterways. We are continually assured that such friction does not exist and that on many streams the two agencies agree on the "physical plan" for development, yet such agreement is clearly not in evidence otherwise than in words. That it could be reached in all areas is apparent from the understanding that came about in the Missouri River Basin when it was ordered by Congress on an "or else" basis. Complete agreement *must* be reached and it must start from the top. The recent change in the position of Secretary of War and the much-hoped-for change in the head of the Interior Department could conceivably bring this about. Unless it comes, authorities are inevitable.

It is, of course, easy to punch holes in the Tennessee Valley Authority. It is, for instance, spoken of as a model for flood control, whereas actually the most destructive flood in the valley caused damages of only $2,600,000. Many western streams have been known to cause damage over this amount every year. The irony of the Tennessee Valley Authority flood control proposal is that the money was spent to protect 628,000 acres and when the protective reservoirs are filled 448,600 acres are completely inundated.

Tennessee Valley Authority was not instituted primarily for flood control or irrigation, the two problems which are paramount in western economy. It was first and foremost a power generation scheme and was called by the President a "yardstick" for regulating power prices. Were similar Authorities to be erected on the western stream areas, directed by David Lilienthal or others of his socialistic ilk, power would again inevitably be the primary objective. True, the West needs hydroelectric power and will need it increasingly as industrial expansion continues, but it has been proven through the operations of the Bureau of Reclamation that it can be very satisfactorily secured as an adjunct to irrigation projects and need not be considered the main objective. In the West, water is the greatest essential; in Lilienthal's philosophy power is preeminent.

Furthermore, valley authorities are undesirable in any event because they are responsible to no one, neither to the people of the region which they are alleged to serve nor to the Congress which instituted them. Congress has no control whatever over their activities except through the voting of appropriations, and once the Nation is committed to this program it is obvious that Congress dare not refuse financial support. The people in the authority's territory are utterly helpless, for the authority has power to condemn land, to build and operate whatever facilities it chooses in whatever locations it chooses, to exercise police powers, to fix rates for services and many other functions. The property of the authority is exempt from all federal, state and local taxes, and although "in lieu" payments are specified, statistics show that the local governments in the TVA area are losing approximately five million dollars annually under the system.

Lastly, the engineers of the Corps of Engineers and Bureau of Reclamation have proved through many years of faithful service to the Nation that they are outstanding in their technical ability. To supplant them with an untried organization which must be built up from scratch is at least a wasteful change and may, in fact, prove to be a disastrous one if unprincipled or inexperienced directors are chosen.

Western Construction News by no means defends the bickering between these two splendid engineering agencies nor undertakes to laud the abilities of one above the other. It recognizes that each has a place in the western water picture. It calls for an immediate reorganization HIGH UP which will bring about an immediate and complete cessation of the squabbles. But it emphatically goes on record in favor of their joint participation in construction of the necessary western water facilities rather than having them built by a socialistic and monopolistic unregulated authority with no regard for state lines or peoples' rights.

Helpful Wyoming

A WORD OF PRAISE is due the Wyoming State Highway Department for announcing at the present time certain highway construction projects which are to be let on contract early next spring. By informing interested contractors this far in advance, the prospective bidders are able to visit the site and study ground conditions before the surface is covered with snow and the soil becomes frozen. A good and helpful gesture on the Highway Department's part, and one which could be profitably imitated by other construction agencies. Helping the contractors is bound to be mutually beneficial.

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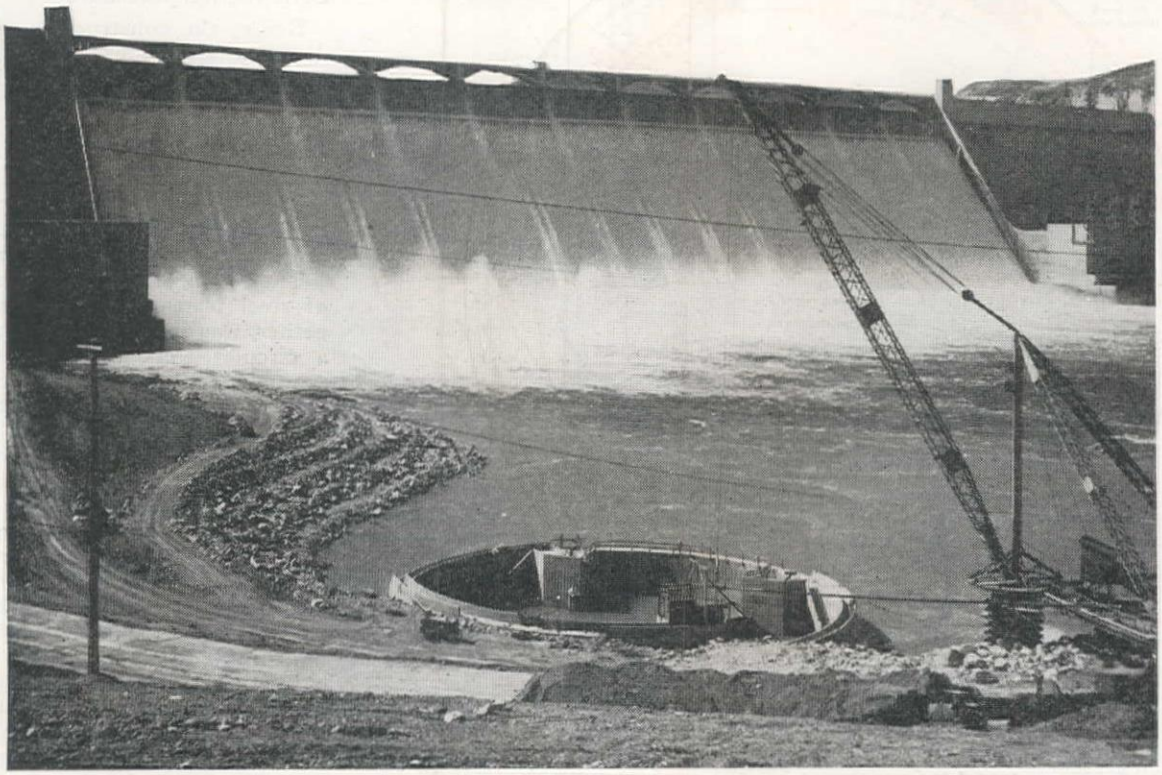
WESTERN CONSTRUCTION NEWS
OCTOBER • 1945



Concrete Drydock—
To House Repair Caisson at Coulee

Repairs to Grand Coulee overflow apron to be made in winter low water by means of steel caisson—Circular drydock sunk to bedrock by caisson method, using cutting edge on bottom and open-pit excavation — Heavy foundation and floor support shell in final position

A DRYDOCK of unusual shape, in an unusual location, and to be used for an unusual purpose is under construction by the Bureau of Reclamation on the right bank of the Columbia River, just below the Grand Coulee Dam. The greater part of the work, the building, and the sinking, by open-caisson methods, of a concrete cylinder 163 ft. in outside diameter and 80 ft. high, has been completed. The dredging of an access channel to the river and the mounting of steel drydock gates remain to be done after the 1945 high-water season. The drydock is to be used in building, storing, and maintaining a floating, submersible, steel caisson, which will be utilized in repairing eroded concrete areas in the "bucket" or apron at the bottom of the plunge-pool below the dam. Plan and cross section of the drydock are shown in the accompanying sketches.

Must dissipate energy

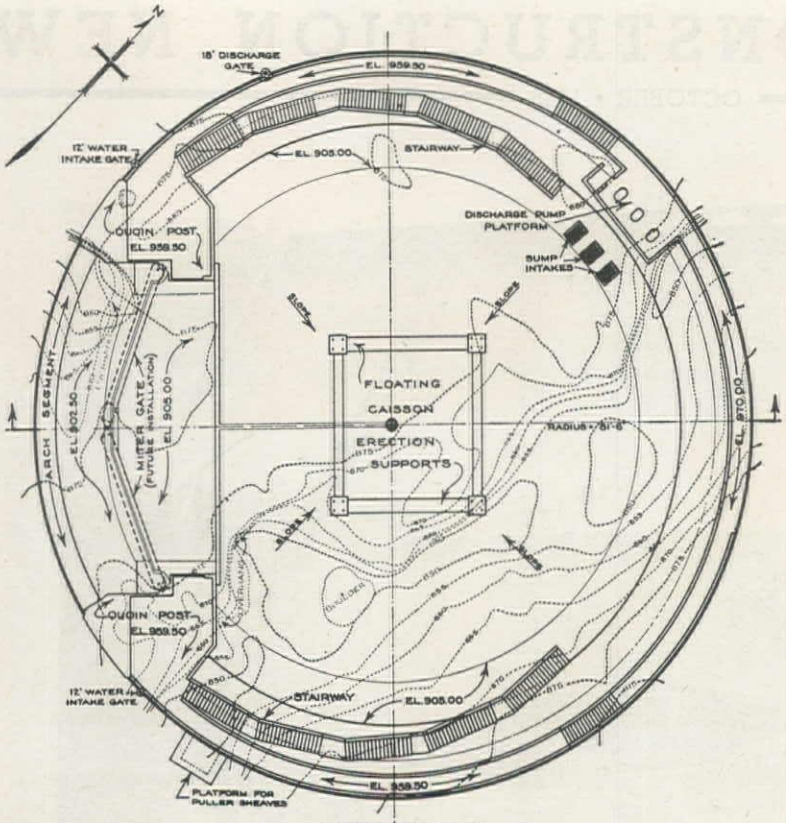
The Columbia River varies greatly in its flow from year to year, and throughout each year. Every year it passes through a low-water period in winter, and through a peak flow in summer, usually in June. The summer peak seldom falls below three times the ultimate maximum demand of the Grand Coulee power plant, and has exceeded five times that quantity; consequently, an enormous amount of energy must be dissipated below the waterfall.

Turbulence is not confined to the concrete trough at the foot of the spillway, but extends into the river channel downstream. During the construction period, the necessary shifting of the river's flow from one to another of the diversion channels over the uncompleted dam caused, in the pool below the dam, abnormal eddies, which swept sand and gravel into the bucket. Concrete removed by erosion during the construction period, and any that may be scoured out hereafter is to be replaced during winter low-water seasons by means of the floating, submersible caisson which is to be built in the new drydock.

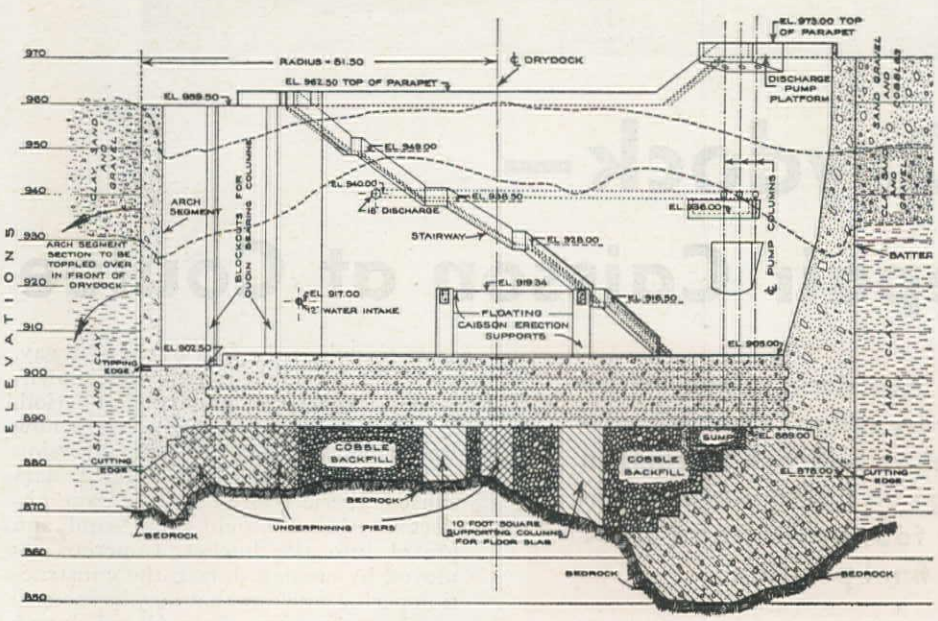
Parts for the caisson are expected to arrive at the project during the fall and winter, and the finished structure will probably be ready for service during the low-water period of 1946-47. During seasons of high water, the caisson will be stored in the drydock, which will be flooded at high river stages.

Drydock design

The drydock is circular in plan, 163 ft. in diameter, outside, and is 55 ft. deep. The wall varies in thickness from 5 ft. at the top to 16 ft. at the bottom. When finished, a 64-ft. opening fitted with heavy steel gates will connect the dock with the river, through an access chan-



DRYDOCK PLAN



SECTIONAL ELEVATION AT DRYDOCK CENTER LINE

PLAN AND CROSS-SECTION of the concrete drydock. The dock was sunk into place as a circular concrete shell, but after steel miter gates are set in place, the southwest wall, shown above as "arch section," will be removed to allow access through the gates. Extremely irregular bedrock, requiring special work, is shown below.

nel to be dredged after the 1945 high water season. After the channel is dredged, the miter gates in place, and the testing of the caisson completed, an 80-ft section of the concrete shell will be caused to fall outward into the bottom of the channel, to expose the gates. The dock will then be ready for use.

At the site selected for the drydock, irregular bedrock was covered with glacial deposits of clay, silt, sand, gravel, and cobbles. The character of the overburden and the general topography of the underlying bedrock were determined by drilling. Earlier experiences on the project had proved that the ground was not sufficiently stable for open-pit excavation and concrete construction; and, consequently, an open-caisson method of construction was necessary.

The plan provided for a circular concrete shell, to be fitted with a cutting edge around the bottom, to be sunk by open-pit caisson methods, to be supported on underpinning piers while excavation was completed, and, finally, to rest on a heavy concrete foundation, placed between it and the underlying bedrock, after the cylinder was in position.

Construction procedure

Before the construction of the drydock was started, extensive excavations at and near the site had provided stable slopes above a level working area at the drydock site, at elevation 960, which is above low water stages of the river but below usual summer peaks. Throughout the high water season, the area was protected from the river by an embankment of earth and rock at elevation 980.

The cutting edge of the caisson, made of steel plates and angles welded together, was set up on wood mudsills in a circular trench, at elevation 955.3, around a concrete-plastered earth mold, formed for the sloping surface inside the base of the concrete wall. An asphalt coating on the concrete face of the mold prevented its bonding with the permanent structure.

For the purpose of reducing skin friction, the outer wall of the drydock was battered one inch in 20 ft.; and in order to provide structural strength, and sufficient weight to sink the caisson, it was built up to a height of 33 ft. before excavation was begun. After the concrete had reached a minimum strength of 3,000 lb. per sq. in., both concrete placing and interior excavating were resumed and were then carried on concurrently until the cutting edge was near bedrock. Excavation was then suspended while underpinning piers were constructed in shafts sunk to bedrock.

After material had been removed from the terraced steps under the caisson wall, narrow excavations were made at numerous points under the sloping surface inside the cutting edge, and the plastered mold on which the concrete had been placed was broken with chipping guns. Then, additional material was removed from beneath the wall by means of bulldozers, and the mudsills were cut off outside the cutting edge. Rapid settlement of the caisson, with considerable penetration of the cutting edge into the overburden, followed.

Excavation within the caisson was carried on with clamshell and orange-peel types of buckets, handled by three derricks. After considerable work had been done with a skid rig with a 110-ft. boom and a stiff-leg crane with a 125-ft. boom, they were supplemented by a third derrick having a 167-ft. boom. It completed the construction and released the other two to be used on barges.

The derricks did not completely cover the interior of the shell, but material was moved within their reach by two bulldozers which were used to excavate material under the drydock wall and to aid in and to control the excavation within the shell.

Drydock settlement

Severe tensile strains were produced in the caisson during its initial movement by the outward reaction between the sloping surfaces inside the cutting edge; and numerous vertical cracks,

some as much as ⅛ in. wide, appeared in the shell. As penetration increased, however, the tension was relieved, and the cracks closed.

In sand, gravel, and undisturbed dense clay strata, the penetration of the cutting edge was approximately 3 ft., with excavation in the open pit at or a little below the level of the cutting edge. At lower levels, in less stable material such as plastic wet clay and silt, the overburden was forced out of place by the cutting edge and pushed up in a shoulder as much as 15 ft. above the excavation level inside the caisson.

Exploratory drilling had not revealed the complete topography of the bedrock, but it had shown that the bedrock was rough in profile and crossed by one or more ravines. When the caisson was within about 5 ft. of its final position, auger holes, spaced about 10 ft. apart, were put down over the areas of bedrock under the cutting edge. High points were found, and approximately 2 ft. of rock had to be removed at several places before the caisson could be sunk to its final position.

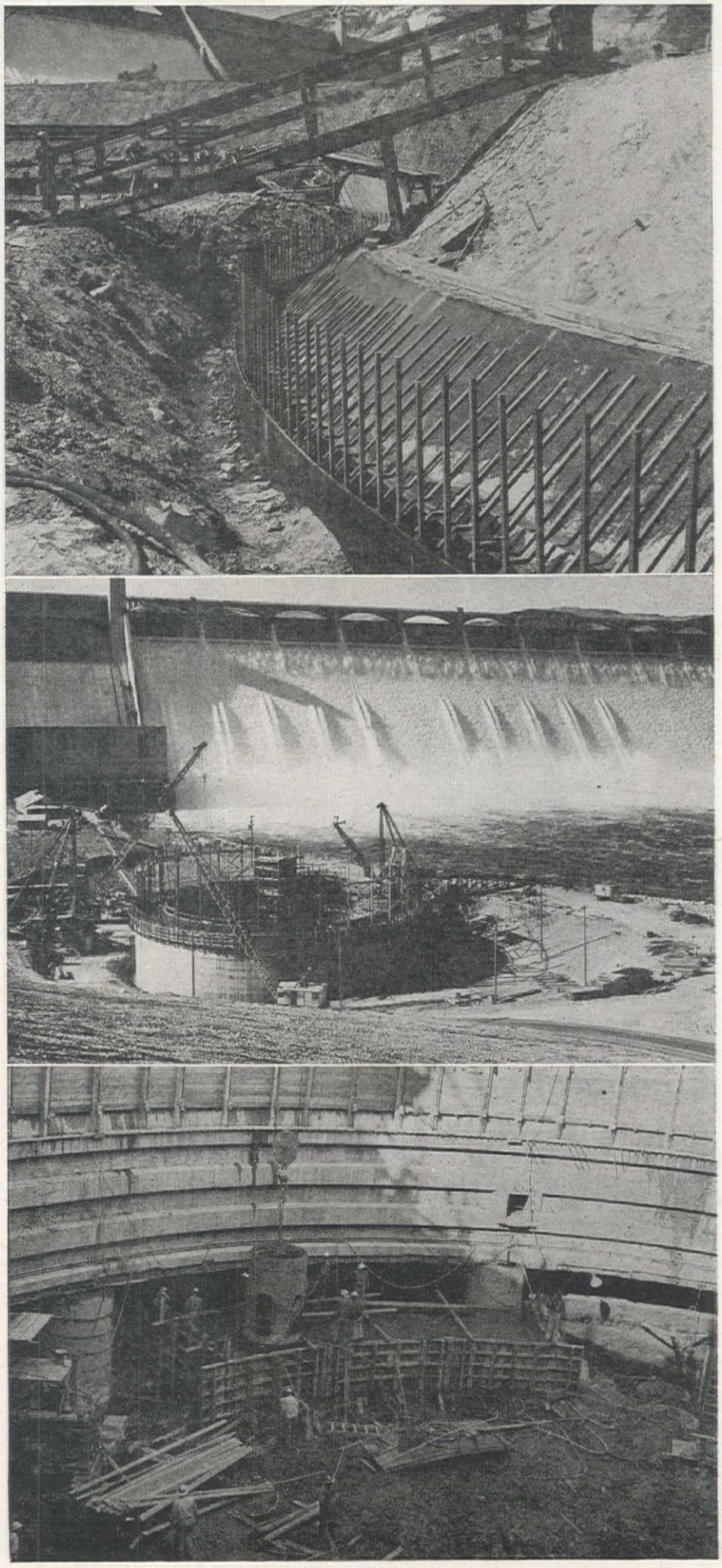
Temporary support was needed for the caisson shell to fix its cutting edge in its final position at elevation 878 and to carry the caisson while the excavation was completed and the foundation concrete placed under the shell. The support was provided by seven underpinning piers. Two of the piers were placed in timber-lined shafts, and five in open caissons. Two-foot lengths of reinforced concrete pipe, 6 ft. in diameter inside, were sunk as caissons to bedrock below the cutting edge, and were filled with concrete.

Similar concrete piers, secured to bedrock by steel anchors grouted into drill holes and to the cutting edge of the shell by welding, were used later in shoring up overburden exposed in the bedrock ravines below the cutting edge.

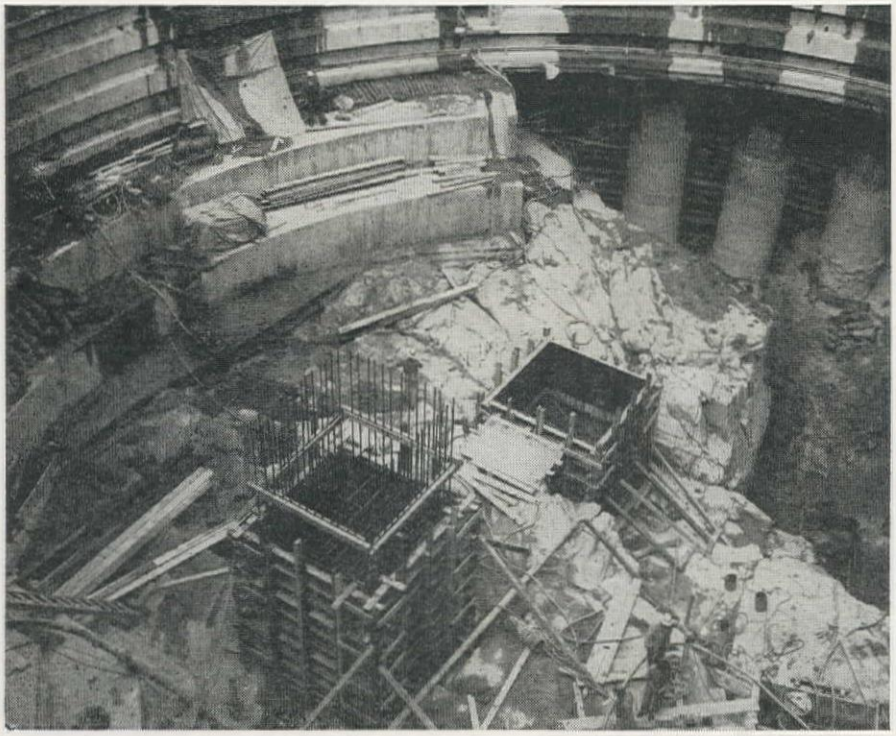
After the high points in the bedrock under the cutting edge had been removed and the underpinning piers had developed proper strength, excavation was resumed. The shell came to rest with a list of 1½ in., not bearing on all piers. After mortar had been placed between the pier tops and the shell, to distribute the load, the remaining overburden under the cutting edge, partially supporting the shell, was removed, and the bedrock was cleared for the foundation structure.

Construction factors

Seepage into the excavation area did not exceed 100 gal. per min., and that came chiefly not from the river but from



STEPS IN CONSTRUCTION of the concrete drydock. Top, the cutting edge, made of steel angles and plates in a circular trench, with a concrete-plastered earth mold for the bottom concrete portion of the shell. Center, excavation progressing from interior with derricks and buckets. Lower, with shell resting on piers, foundation concrete is poured. Support piers were also sunk as caissons, using 6-ft. concrete pipe shells.



TWO OF THE FOUR central piers upon which the floating steel caisson will be supported inside the drydock. The very rough bedrock is clearly shown, with one of the unexpected deep gullies at the right. Foundation completed along the left wall.

sand and gravel beds in the river terrace above the normal river bed. A sump below the general level of the pit and reserve pumping capacity were maintained throughout the excavation period. Permanent gravel drains were provided to carry seepage from the bedrock to the sump in the drydock to prevent the development of uplift pressure.

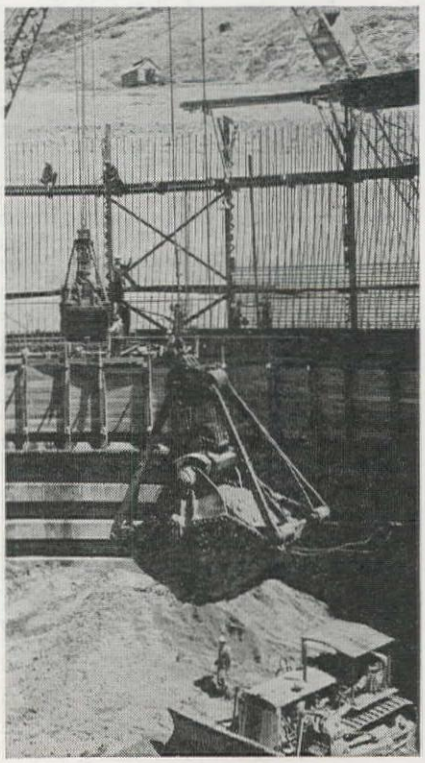
After the concrete foundation under the drydock shell had been placed, and four columns, each 10 ft. square, had been constructed near the center of the inclosed space, the remaining space below elevation 889 was backfilled with coarse gravel, topped with fine material. Resting on the four central 10-ft. piers, the foundation under the drydock shell, and the gravel backfill is the 16-ft. floor of the drydock, which is keyed into the shell. Over the heavy central piers are concrete supports on which the floating steel caisson will be erected.

Concrete was hauled from a mixing plant about a mile away in small dump trucks, and was placed by means of 4-cu. yd. buckets, most of it through elephant trunks, though some was placed by pumpcrete methods.

Excavation included 74,768 cu. yd. of common and 150 cu. yd. of rock. Of the 33,269 cu. yd. of concrete used, 14,768 cu. yd. are in the shell, 10,568 cu. yd. in the foundation, and 7,697 cu. yd. in the floor of the drydock. Steel in the structure includes 2,616,100 lb. of reinforcing bars, and 355,000 lb. of other shapes.

The construction work was done by forces employed by the Bureau of Reclamation, under the direction of Field Engineer B. A. Hall. The project is in charge of Regional Director Frank A. Banks. The design was made in the office of Chief Engineer Walker R. Young, at Denver. H. W. Bashore, Commissioner, is in charge of all activities of the Bureau of Reclamation.

EXCAVATION inside the concrete caisson was by buckets raised by derrick, but as they did not cover the entire floor, a bulldozer was used to pile the material in readily accessible spots.



Comparative Figures for War Years Relate Production to Construction

GOVERNMENT - FINANCED war construction, which reached its peak of $12,727,000,000 in 1942, has shown a steady and rapid decline in the following years despite the continuous rise in over-all government expenditures during the war years, according to the War Production Board.

The national construction figure, which includes industrial construction with machinery and equipment, non-industrial military, war housing and community facilities and service construction, started its climb in the last six months of 1940 with a modest total of $790,000,000. In 1941 this figure had jumped to $4,918,000,000. After the 1942 high mark had been reached, however, 1943 saw a decline to $8,457,000,000 and in 1944 there was a sharp drop of more than 65 per cent under 1943 to a total of $2,949,000,000.

In contrast to this, but largely because of the sharp rise in the construction curve before the end of 1942, production of war materials has shown a steady rise.

In 1941, with war construction work gathering momentum, the total munitions production figure was $8,399,000,000. In 1942, however, the country was beginning to hit its stride, and $31,229,000,000 worth of production poured from mill, factory and shipyard. This figure too was pushed into the discard when the 1943 results, $55,185,000,000, were made known, and in 1944, with war construction less than a fourth of what it had been in 1942, the country's productivity was $59,926,000,000.

Some comparisons in the breakdown of these figures between the years 1942, when war construction hit its peak, and 1944, when war production reached a ceiling, reveals how completely their dollar value curves reversed each other. Industrial construction (including machinery and equipment) in 1942 totaled $6,414,000,000 and in 1944 had tapered off to $1,723,000,000. Non-industrial (military), not far behind industrial, totaled $5,060,000,000 in 1942 and in 1944 was down to $720,000,000.

In contrast to these figures, in 1942, production of aircraft totaled $6,095,000,000, but in 1944 the production had risen to $16,046,000,000. The production of ships, which was $7,322,000,000 in 1942, had nearly doubled in 1944; production of ammunition, $2,998,000,000 in 1942, had more than doubled itself by 1944, and almost the same ratio held good in guns, fire control, and other categories.

Mole Calms Navy Base Tides

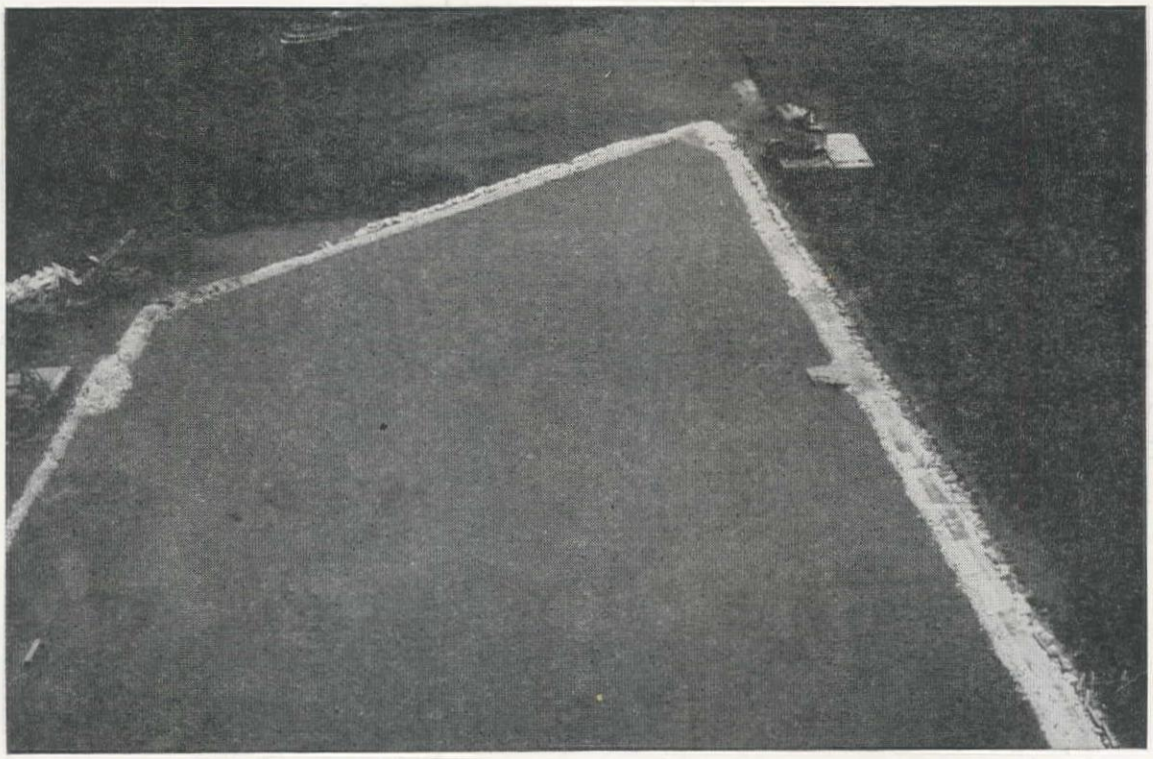


Photo courtesy U.S. Navy

Vital naval repair program at 60-million dollar operating base on Terminal Island, Los Angeles Harbor, endangered by unusual and complicated wave actions, so extensive breakwater construction was undertaken, using a rock-protected sand-fill mole, and entrance channels dredged

THE LOS ANGELES-Long Beach Harbor offers an adequate anchorage for naval vessels, and, from a security point of view, ease of dispersal for the fleet units. However, about November, 1942, it became obvious that certain unusual water movements within this harbor were interfering with the efficiency of the 60 million dollar Naval Operating Base at Terminal Island. The difficulties experienced at the base included unusual water movements which caused docked vessels to run on their mooring lines, breaking hawsers, damaging fender piles and interfering with ship repairs involving the use of dock cranes to place heavy pieces, such as guns or turrets on the vessels. Further difficulty was experienced at times of heavy wave motion in opening or closing the caisson gates at the graving docks. Waves of short period caused these gates to bob and drop unexpectedly, to damage the caisson gaskets and spall the concrete seats in the dock walls.

Field investigation revealed that waves of from 10-second to 1-hour periods exist in the harbor. Of these, 15-second and 3-minute waves are common. The existing breakwater damps the short period waves except where they advance unobstructed through the navigation gates.

To prevent this wave motion from reaching the inner harbor, and impairing the base's ship repair ability, was of paramount importance in view of impending battle damage to ships in the Pacific area. To accomplish this purpose the Bureau of Yards and Docks proposed to build a solid fill mole enclosing the critical ship repair center.

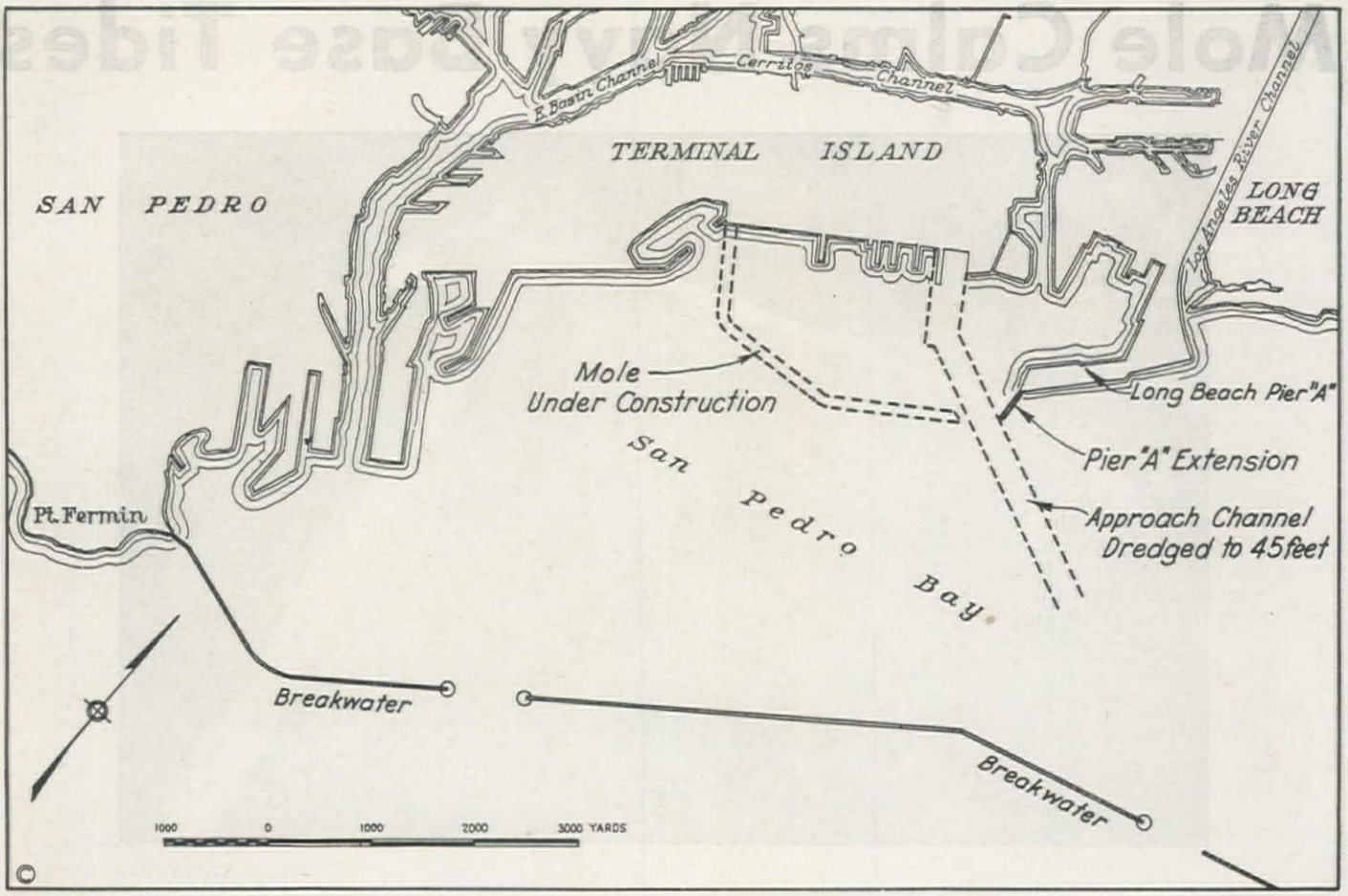
Model and field studies

An extensive research plan was started immediately to determine certain critical factors concerning the configuration of the basin and the position and size of navigation gate that would best attenuate the damaging wave motion entering the harbor. First, the Civil Engineer Corps of the Navy, in conjunction with the Hydraulic Structures Laboratory of the California Institute of Technology, Pasadena, Calif., conducted field tests to ascertain the nature and extent of the water movements in the harbor. Several tide and wave stations were established from which continuous marigrams were obained.

With these data as a premise the Hydraulic Laboratory staff started a series of model studies of the harbor in which the same wave motions as the ones entering the naval basin from outside sources were produced in the model. In this model of the harbor, the effect of various configurations of the mole and the shape of the opening were given intensive study under the various wave and surge conditions found to exist in the harbor. Not only were the dock and harbor features constructed to scale but the representative vessels were also built to scale in size and weight so that the wave-induced motion of these ships would be representative of actual conditions at the base. These studies were continued along with the actual construction of the mole and the results of the research applied to the project, as soon as they became available, because of the urgent need to push the work to completion in time to facilitate any emergency repair needed by the naval vessels.

Wave action observed

As previously indicated, waves of various frequency and amplitude were found to enter the harbor area through the two open gates and the open east end of the outer breakwater. Not only do the disturbing wave trains advance through the open gates, but observation from the air disclosed the passage of white water through the porous breakwater



PLAN OF THE surge-reducing harbor improvements at Naval Operating Base, Terminal Island, Calif. Ten million cubic yards of material was dredged and placed in the mole, and 1,500,000 cu. yd. of rock was placed as armor on the structure.

to the inshore side of the wall immediately following the arrival of a wave crest at the offshore side of supposed barrier. Attenuation of the short-period waves is appreciable, but the longer surges and tides apparently pass through the outer breakwater with considerable energy. The perfect barrier to these wave trains would be a lock-enclosed wet basin such as is commonly used in northern European harbors. However, in spite of the ability to create quiet harbors, the wet basin principle has many disadvantages, including their vulnerability to demolition, as recently demonstrated at Cherbourg, France. They also hinder the rapid dispersal of vessels within their confinement. In this respect the solid fill mole-protected basin with an open navigation gate is more practical, but requires greater skill in designing to obtain satisfactory results. It was for this reason that extensive model studies were undertaken to test the efficiency of the proposed mole design and to recommend improvements.

While the exact nature and cause of the surges were not known, it did not defeat the purpose of the research or the efficiency of the resulting construction project. Further research will be welcome on this interesting phenomenon, and engineers will find the results already obtained very interesting when such information can be made available to the public.

An interesting aspect of the model studies was the use of a camera house used to make photographic records of all model experiments. The camera and control was mounted on a boom which could carry the camera to any position above the set to simulate aerial photography. With this device and the use of floating reflector buttons, similar to those used in highway signs, a record was made of the drift and motion induced by the waves on these reflectors. A small light carried on the camera house illuminated the floats which, in turn, transmitted the light back to the camera for recording.

Considerable care was necessary to record the low amplitude surges. The actual surge in the field often had an amplitude of only a few tenths of a foot, but because of the long enduring wave length they could induce damaging motion to a ship in their influence.

A longer range study is also being conducted by the U. S. Army Engineers at their Waterways Experiment Station in Vicksburg, Miss., which will parallel the work conducted in Pasadena, but the model used is much larger. It is anticipated that this more extensive study will contribute more specific data on the nature and cause of the little understood low amplitude surges, which are not generally perceptible except through the use of marigrams or the damaging motion they impart to vessels or other floating equipment.

Necessary construction

The resulting construction made necessary by such unusual combinations of wave trains was let on a unit quantity basis and is estimated to cost approximately $8,000,000. The prime contractor placed approximately 1,500,000 tons of rock in the structure, using a total of 17 barges on the job, and an average fleet of 50 trucks on the Long Point quarry haul working a 24-hr. schedule. In addition to the barges and tugs, two 35-ton capacity whirley cranes and one 35-ton stiff-leg crane were used on the project to handle rock and equipment. The hydraulic dredge removed from the basin and pumped into the mole structure over 11 million cubic yards of sand fill.

Construction was started February 3, 1944, and was scheduled to be completed July 28, 1945. The work was 90 per cent complete early in June, and at that time afforded ample protection from the water movements which had formerly interfered with ship repair schedules. It is certainly a contributing factor in assisting U. S. Naval Drydocks to repair and rapidly return battle-damaged vessels to the Pacific Fleet.

Order of construction

Preliminary construction of the west arm of the mole was started in advance of conclusive results from the research studies. Since the proposed shape of the basin to be enclosed by the protective mole was to be roughly rectangular, the first leg of the mole was constructed perpendicular to the marginal wall. It was anticipated at the time that any special shape of basin dictated by the ensuing model studies could be applied as the construction progressed. In this way

the mole was advanced to gain construction time and also to obtain protection as soon as possible.

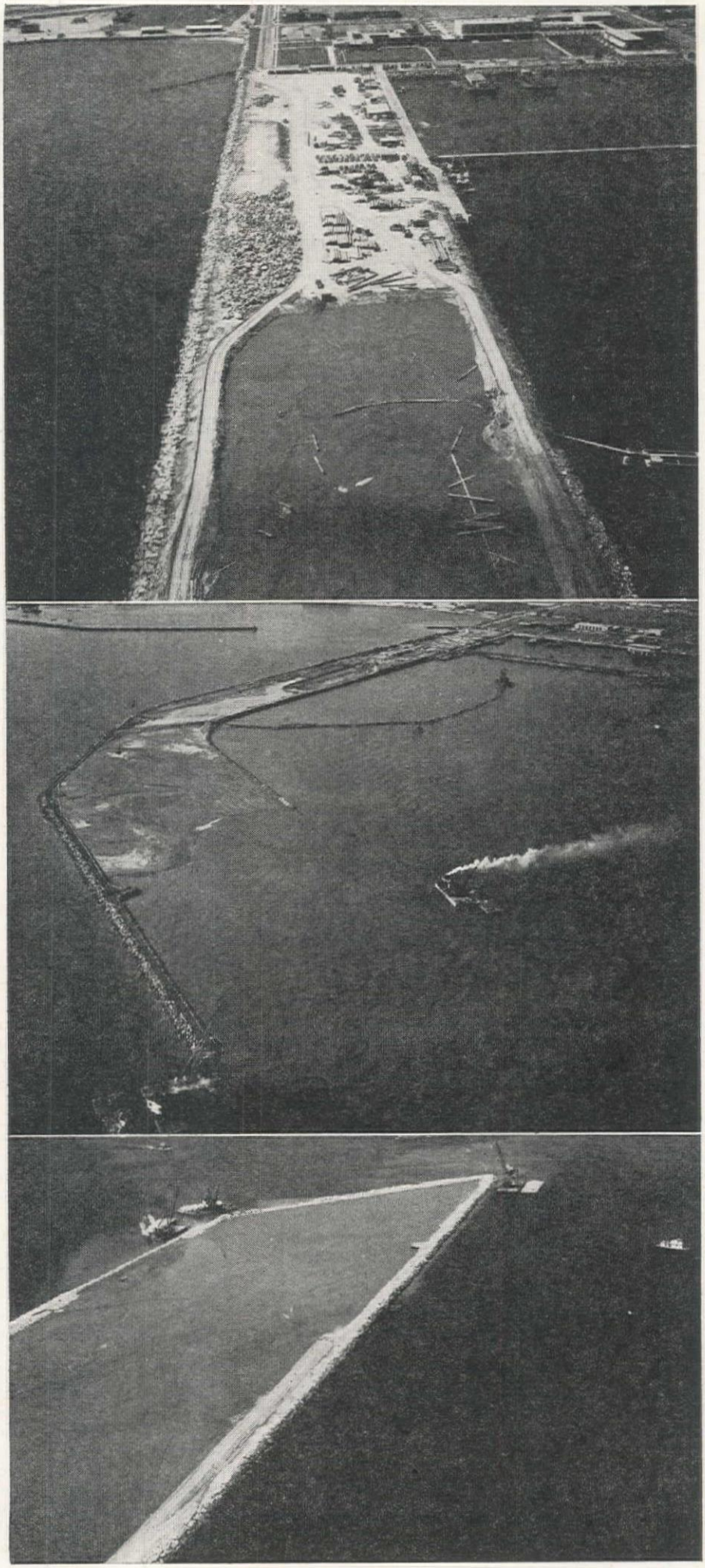
The construction work can be divided into two main projects; first, to provide adequate protection for the repair basin and graving docks from the disturbing water movements; and second, to deepen the basin adjacent to the base and provide a deep water channel leading through the navigation gate in the mole to the graving docks and piers. The entrance channel and the inner harbor will be dredged to –45 ft., so that any vessel may enter the repair basin unobstructed, even though it may be listing due to battle damage, or moving under deep draft from flooded compartments.

One of the first projects undertaken by the contractors, Guy F. Atkinson Co., of Long Beach, was the removal of an existing breakwater in the northwest portion of the basin, which had provided shelter for the small craft landing pier. The rock recovered from this structure was used in the initial lift on the shore end of the mole. This leg of the mole, built perpendicular to the shore line, continues straight for a distance of 2,400 ft. The first 950 ft. of this distance is adjacent to the small craft anchorage with an average depth of 15 ft. For the remaining distance along the initial leg of the west arm the bottom is dredged to –35 ft. east from the mole for a distance of approximately 2,200 ft. At this point the bottom drops on a 3 : 1 slope to a depth of –45 ft. and continues east at this depth to the entrance channel leading from the navigation gate in the mole.

From the south end of the initial leg, the mole is inclined 30 degrees to the marginal wall and connected to the west arm with a transitional radius of 750 ft. After traversing the initial 30 degrees, the outboard side of the mole continues on a tangent for approximately 700 ft. to increase the deck width of the mole from 287 ft. to 537 ft.

This increase of deck width was necessary to accommodate the disposal of a large amount of dredged sand provided by the deeper bottom level adjacent to this portion of the mole. The wider deck also provides additional room for storage and buildings on the mole. The inclined leg continues approximately 3,000 ft. southeasterly, thence parallel to the marginal wall for 4,000 ft. to the west side of the gate. The east arm consists of an extension to the solid fill Long Beach Pier A, from which it is built out a distance of 1,000 ft. southwest to a point opposite the west arm terminus. This establishes a 750-ft. opening from toe to toe of mole for a navigation gate.

This particular shape was designed as a result of the model studies, by which the inclined portion of the mole was found to diminish wave action within the basin by setting up reflected wave



CONSTRUCTION PROGRESS on the 9,400-ft. protective mole. Top, shore end, with fill progressing; center, armor and filling on the widened second section; lower, dressing up the rock at the gate end of the mole.

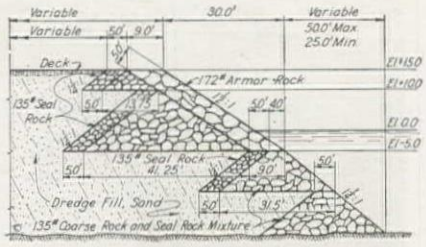
patterns that cancelled out the normal waves and their harmonics. The gate width is much less than normally used, but a larger opening would admit wave motion of sufficient force to cause damage within the basin. The narrowest part of the gate is presented to the advancing wave train so that no increase of energy can be funnelled into the harbor by rounded contours at the gate opening.

Rock placement

One of the interesting engineering problems of this project was the coordination of mound rock placement in progressive steps or lifts to accommodate the quantities of dredge sand used as core filling in the mole structure. This was accomplished by placing mounds of coarse and fine 135-lb. rock mixed at the toe of both inboard and outboard sides of the mole. These bottom footings were built up on a 1 : 1¼ slope from 30-ft. bases. As they were built out level from the shore end of the mole progressing to deeper water, the step height also increased. When a maximum depth of about 15 ft. was obtained, another lift would be started from the bottom. The space between the two retaining mounds was then filled by piping the sand tailing into the area until the fill equalled the height of the mounds. This fill was progressive, so that the next step of mound rock could be placed on the combination foundation of the top of the initial mound and enclosed sand fill. In this manner the slope of the wall was carried up with coarse 135 - lb. rock which was later backed with a layer of fine seal rock to prevent the sand fill from percolating through the mound of coarse rock.

Most of the initial rock placement was accomplished with 800-ton bottom dump hopper barges, used to make the water haul from Pebbly Beach quarry, located 3 mi. south of Avalon, Santa Catalina Island, source of the rock. This marine haul is approximately 25 mi. to the mainland. It also called for the closest co-operation between the contractors, the officer in charge of construction, and the port security officer in charge of the anti-submarine nets enclosing the harbor. As a result of this co-operation the rock haulage moved to the job with time-table regularity, without endangering the security of the naval installations in the area.

Other portions of the rock fill were delivered from anchored conventional barges from which the rock was placed by pushing it overboard with a tractor-operated bulldozer. More exacting fill and patching work was placed by floating whirley cranes handling the rock with clam-shell buckets. As the construction work advanced sufficiently to carry the mole above water, the contractor used a fleet of 50 trucks to complete the fill. The first truck haul was from Livingston quarry, about 20 mi. west of the project. This stone tended to develop objectional cleavage, so the quarry was abandoned in favor of a new one at nearby Long Point, approximately one mile east of Pt. Vicente lighthouse. The haul was through heavy



CROSS-SECTION of the mound rock placement for protective armor. Steps were set on 30-ft. bases, built to 15-ft. height, and sand backfilled. Then the next step was placed. These mounds were made of 135-lb. rock, but fine sealing rock added before sand was pumped into inclosure.

traffic conditions along Palos Verdes Drive, south around the harbor on Anaheim Avenue to Henry Ford Avenue, thence along this thoroughfare, across the Cerritos Channel, to the job on Terminal Island.

The outboard side of the mole was carried up to a –5-ft. elevation below low-low water level where a 9-ft. offset in the slope was made to place the armor rock. Dense 172-lb. granitic rock was used for this purpose. Part of it was recovered from the small breakwater and the remainder was shipped by rail from the Atkinson pit, near Riverside, Calif., to the project.

This armor rock was delivered to the construction area by switching the rock cars to a spur track built out over the water on a trestle. The trestle served both as a support for the cars and locomotive crane and as a mooring for the rock barges which were berthed alongside the trestle. This arrangement facilitated the rapid transfer of rock from trains to barges by the locomotive cranes and from the barges to the mole by floating whirley cranes. The rock was quarried in pieces ranging from 10 to 15 tons each, and covered the wall from –5 ft. to the top of the mole at +15 ft. Armoring of the mole adjacent to the gate was varied to extend down to –10 ft. elevation and was also placed on the inboard side for a distance of approximately 950 ft. The slope of the armored portion of the wall was also reduced from 1:1¼ to 1:1½ for increased stability of the mole.

Engineering control for the project was made difficult by both the dredged basin and initial rock fill being in submerged areas, so that all construction work had to be placed by referring to pile dolphins, anchored buoys and range targets on shore. A system of colored buoys or flags helped to designate the various stages of work. In addition to control work, it was necessary to maintain navigation lights for the various obstructions in this busy harbor.

The dredge discharge pipe had to be broken occasionally to let ships through the construction area. An ingenious underpass for the dredge pipe was constructed to allow small boats to pass over the pipe line and thus avoid excessive dredge shutdowns. The pipe was underslung from the usual pontoons with reinforcing stiffeners welded to the pipe to strengthen the span. The pass had a maximum clearance of 12 ft. for a width of 100 ft. As is usual, the discharge pipe was flushed with clear water before shutting down to avoid solids settling in this inverted syphon.

Hydraulic dredging

The dredge excavation work was subcontracted to Franks Dredge Co., operating the dredge "Seattle" with a 22-in. pipe and a 22,000-cu. yd. per day capacity; and the Case-American Dredge Company, operating the dredge "San Diego" with a daily capacity of 30,000 cu. yd. and a 30-in. discharge. Together, these two dredges moved over 10 million cu. yd. of material in deepening the basin and pumping sand into the mole construction. The bucket dredge "San Francisco" supplemented the two hydraulic dredges in removing the shallow breakwater adjacent to the small craft pier. A smaller clamshell dredge was used to prepare the subfooting at the toe of the mole walls particularly where the toe was undercut and backfilled with rock at the entrance channel to prevent possible undermining of the mole by future maintenance dredging.

The dredges experienced difficulty in cutting to grade due to the same basic wave motion of the harbor which cause them to charge and run on their anchor lines. Fortunately, the damaging action was not continuous, and some of the time little or no interference was experienced.

The average dredge discharge contained 14 per cent solids, and the effective fill varies from 85 to 90 per cent, leaving a loss from spill-wash and colloidal suspension of from 10 to 15 per cent.

Personnel

Vice Admiral E. L. Cochrane, U.S.N., is Chief of the Bureau of Ships, which sponsored the project, built for the U. S. Naval Drydocks of which Capt. Fred M. Earle, U.S.N., is commanding officer. Vice Admiral Ben Moreell, U.S.N., is Chief of the Bureau of Yards and Docks, which awarded the contract and administered both design and construction of the project. Capt. Kirby Smith, U.S.N.R., represented this Bureau as head of the construction department. Capt. John J. Gromfine, U.S.N., initiated the work as officer in charge of construction, but was relieved by Capt. Henry E. Wilson, U.S.N., who completed it. Resident officer in charge of construction at the beginning of the work was Lieut. Comdr. G. A. MacDonald, U.S.N., later relieved by Lieut. Comdr. A. S. Porter, U.S.N.R., who was in charge during the major portion of the construction work.

The model studies were conducted by Dr. Robert T. Knapp, director of the Hydraulic Structures Laboratory of the California Institute of Technology, Pasadena, Calif., assisted by Dr. Vito A. Vanoni, associate director, and Dr. H. A. Einstein.

The prime contractor, Guy F. Atkinson Co., was represented by David E. Root, general manager for the Long Beach region. He was assisted by Frank E. Nichol, later relieved by August E. Steiner, as project superintendent.

FIRST SAND BLANKET DRAIN in the Northwest is located under this 550 ft. fill on the Kalama-Woodland highway to facilitate rapid drainage of the boggy land underlying the fill. The sand drain empties into the ditch on the left which also diverts a small creek away from the highway. Engineers are closely watching the results of this experimental work.

Grading Washington Highway

Confined between the bluffs and the Columbia river, the Kalama-Woodland section of U. S. 99 highway involves heavy cut and fill sections of both earth and rock — Existing highway and railway on the same terrace add detour traffic and prevention of slide and blasting hazards to the contractors' operating problems

THE FIRST MAJOR postwar highway construction project for the State of Washington will see foundation courses for concrete paving between Woodland and the Kalama river largely ready for paving this fall.

The roadbed preparation of the 9.499-mi. section of U. S. Highway 99 is costing the state $1,396,432, or an average of about $14,000 per mile. It is a job of huge quantities, notably 1,824,440 cu. yd. of rock, common, and unclassified fill, much of it borrowed.

Five contract sections

Work actually was divided into five parts, one of them solely an overhead crossing at the town of Kalama. The first section from Woodland to Martin's Bluff was taken by Leonard & Slate of Portland, Ore., for $439,571. The 2.376 mi. includes nearly 6,000 ft. of high bluff to be cut down with material being used in fills at both ends of the section. It includes 511,490 cu. yd. of unclassified excavation, 19,500 cu. yd. of common and 105,460 cu. yd. of solid rock. Bid price was 40c straight for the job instead of the usual separate classification bids. Freehaul of 600 ft. was allowed on all sections but one.

The second section from Martin's Bluff to Chicken Coop Inn was let to Erickson Paving Co. of Seattle for a bid price of $442,592. Its 3.445 mi. includes an extensive sand-drained fill and was bid at 48c per cu. yd. straight, including 225,150 cu. yd. of common, 270,520 cu. yd. solid rock and 14,590 cu. yd. unclassified material.

No. 3, a heavy rock section, was let to Strong & MacDonald, Inc., of Tacoma for $262,748 on 2.081 mi. The job included 296,220 cu. yd. of solid rock and 15,690 cu. yd. of common only. Bid was 50c for common excavation and 70c for rock.

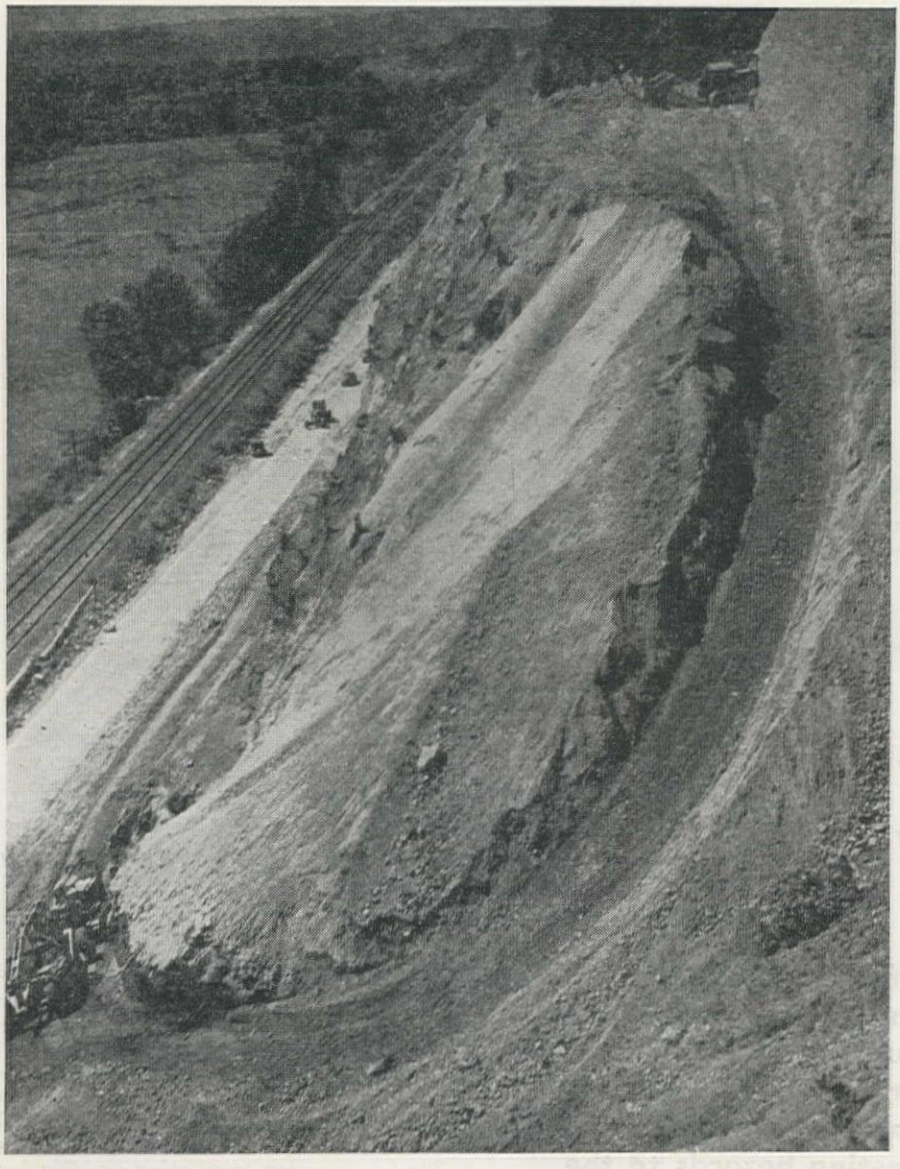
The fourth section from Kalama to the Kalama river, end of the new route, is 1.597 mi. in length and went to Parker-Schram Co. of Portland for $156,298. It is mostly borrow from a farm across the old highway and calls for 15,190 cu. yd. of common excavation at 30c, 2,920 cu. yd. of solid rock at $1, and 307,790 cu. yd. of embankment in place from borrow. There is no freehaul on this section and heavy equipment, rubber-tired throughout, will have carried loads up to two miles. It is arranged for mostly downhill load pull.

A fifth contract, including only the reinforced concrete overhead at Kalama (Elm Street overcrossing), was let to M. P. Munter Co. of Seattle for $45,223. The structure rests on steel H-beam piling sunk to solid material, which is from 10 to 60 ft. down from the level of the adjacent Columbia river. When completed it will accommodate four lanes of traffic, is 48 ft. curb-to-curb, and 124 ft. 8 in. approach-to-approach.

Sand underdrainage

Of major interest to engineers and construction men is the outcome of the large-scale sand drain experiment conducted on one of the deepest fills on the

WITH A POSTWAR program totaling many millions of dollars ready to begin in the next few weeks in every state of the West, Congress having recently approved start of work in advance of appropriations, much interest has been evidenced in this $1,392,432 project of the State of Washington, the first major road job to be undertaken since cessation of hostilities. It is a difficult and interesting job, but it is particularly noteworthy as the forerunner of a huge construction program.



A HIGH CUT on the Leonard & Slate contract at Martins Bluff, showing heavy equipment removing rock for a fill in the background. A berm is usually carried on the outside of the cuts to prevent rock being accidentally precipitated on the road or railroad below. The conglomerate material in this cut forms a stable slope.

project, a part of the Erickson contract.

The entire roadway is constructed along the base of the bluff bordering the Columbia river on the east, and the foundation is very stable for most of its length. However, at one spot, it is necessary to cross a marshy creek bed and swamp at a point where a meandering tributary creek enters the river, and the bluff has been eroded back. On completion, the fill across the bog will be 550 ft. long, 30 ft. high and have a base width of 180 ft. Most of the material is from adjacent cuts, largely rock, and ungraded.

The first act in crossing this marshy area was to dig a new channel for the stream, directing its flow in a single straight course.

Next, several hundred holes, each 18 to 24 in. in diameter, and sunk on a pattern of 12 x 12-ft. squares, were driven down to solid material, which varied from 11 to 18 ft. below the unstable ground surface. These holes were then filled with clean sand, and a blanket of the same material 2½ ft. in depth was spread over the entire area of the base of the fill.

As the fill material was then spread on the surface, its mass commenced to exert a pressure on the saturated alluvium, and settlement began almost with the first deposition. As the pressure increased, the water was forced out and up through the vertical drains. As it reaches the surface, it trickles through the sand blanket and is drained into ditches which conduct it to the creek for disposal.

This vertical sand drainage system is the first installation of its kind in the Northwest rain belt, it is believed. The plan has previously been used successfully by the California Division of Highways. It is being carefully watched by Washington engineers to determine whether the greater flow of water in this wet region will have a tendency to seal the pores in the sand with colloidal or suspended silt.

At either end of the fill is a set of two vertical pipes resting on solid steel sheets at the sand blanket level. One pipe, extended in five-foot lengths as the fill progresses, measures settlement. The second provides pressure readings through a hydrostatic pressure valve to check moisture reaction as the potential mounts under added filling. State engineers, operating separately from contractors, are compiling scientific data for use on other highway jobs.

Settlement and subsurface drainage has been much faster than expected, and Highway Department engineers expect that the area will be sufficiently dried out and the fill so well stabilized that it will be possible to pave with safety next spring.

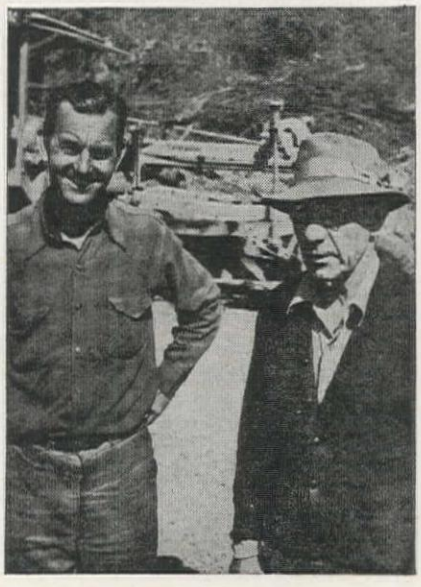
Traffic kept moving

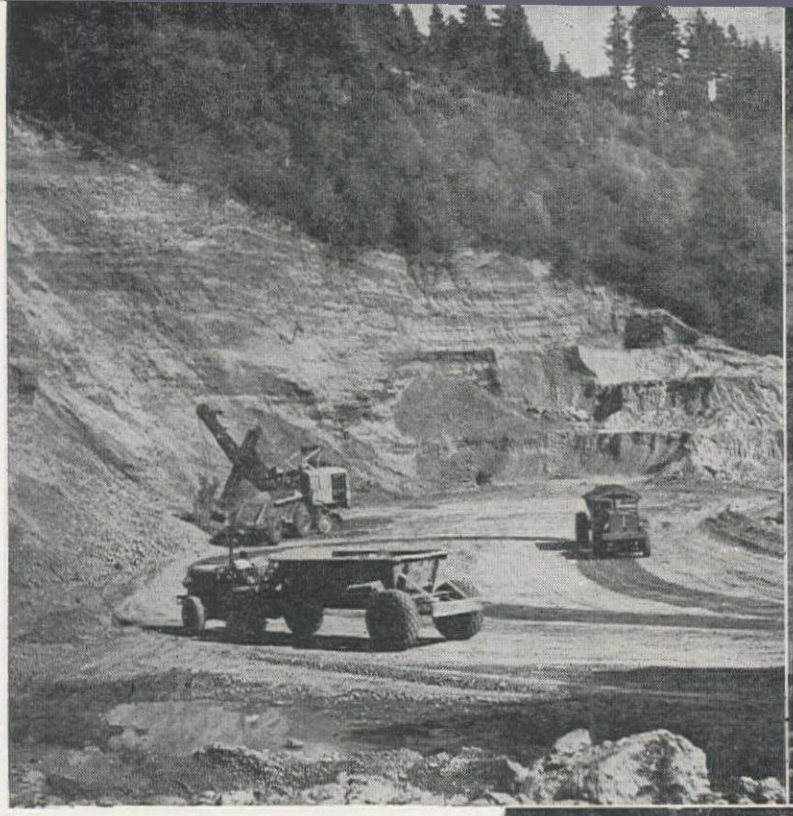
Since the new route crosses the present highway in several places and for a considerable distance is directly bordering on it, the work had to be carried on with the severe handicap of maintaining the heavy Portland-Seattle motor traffic, this being the only main highway artery between the two important centers. At one spot, heavy earth movers crossed the highway every two minutes during rush times, but highway traffic was allowed to pass with virtually no tie-ups.

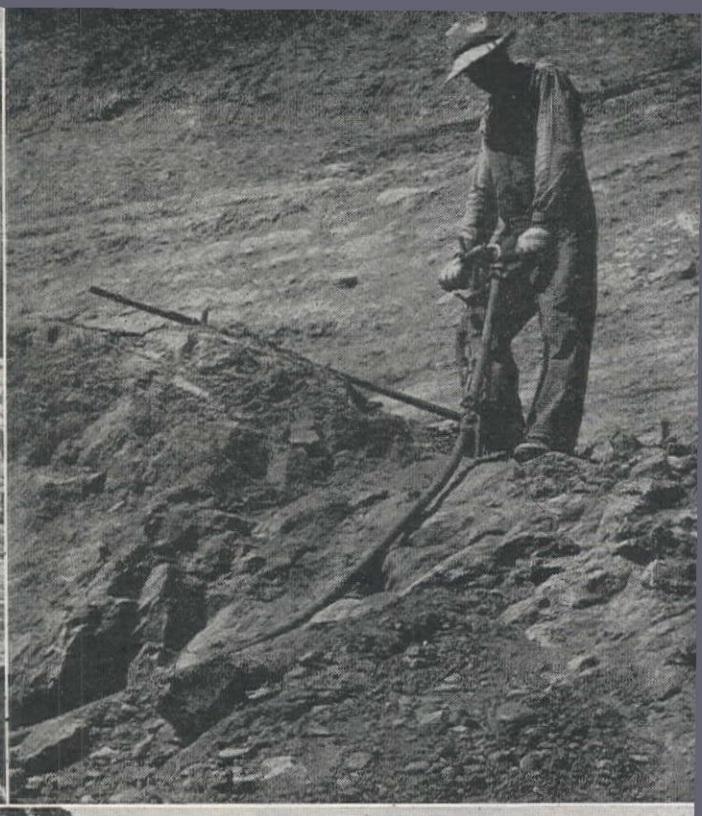
The grade of the new highway, however, is frequently considerably changed from the existing road, sometimes being higher, and at other points beneath the present thoroughfare. At some places, excavation proceeded high on the bluff above the existing highway and it was necessary to employ unusual caution to prevent boulders or slides from falling onto passing vehicles. In such cases, berms were generally maintained along the outward side of the cut, and material was carried down in carryalls or other conveyances instead of being pushed over the edge.

At another section nearly a quarter-

CARL W. ERICKSON, left, of the Erickson Paving Company, Seattle, Washington, discusses the project with M. P. BRISLAWN, highway department construction engineer.







BORROW AREA will furnish 307,790 cu. yd. of fill material which is secured by coyote-hole blasting, power shovel and Euclids. Jack-hammer being operated (upper right) on Woodland-Martins Bluff section of the new highway near Woodland, Wash. At right is shown the difficulty of widening Highway 99 near Woodland, when loaded trucks must cross the roadway without interfering with normal traffic.

mile long, excavation at the new level was some 30 ft. below the old highway which caused sloughing and cracking of the pavement. Motor traffic was crowded close to the sidehill in this case and allowed to continue with no stoppage.

For much of the length of the project, the double-track mainline of the Northern Pacific Railroad, one of the busiest sections of railway in the Northwest, closely parallels the highway route, and it was additionally important to avoid any slides or other accidental stoppage of traffic on that route. The tracks were also a handicap in the matter of furnishing highway detours, by bottlenecking the present road between themselves and the bluff.

Pavement

Pavement of none of the sections graded is included in the present contracts, but will be forthcoming as one of the state's first postwar projects after Congress appropriates funds to implement the projects authorized in the Highway bill of 1944.

With an eye to the future highway improvement, the entire roadbed is being graded for two 24-ft. concrete strips with a 4-ft. center strip and 10-ft. shoulders. However, only one 24-ft. strip will be laid under the first paving contracts, pending future widening of the entire Portland - Seattle route to four - lane width. The concrete being replaced is only 22 ft. in width with 8-ft. shoulders. Also changed are the specifications for concrete pavement. Instead of 10-7-10, the strip will be 9 in. thick shoulder-to-shoulder. the crown being 2 in. thicker to care for heavier traffic.

Pit-run material from a Lewis river bar four miles from Woodland is used for the pavement base course on all sections.

Organization

The design of the new highway was completed by engineers of the Washington Department of Highways, of which James A. Davis is Acting Director. E. C. Simpson is District Engineer, with offices at Vancouver, and M. P. Brislawn is construction engineer, in direct charge of the construction operations. J. H. Kline is resident engineer on sections 1 and 2, and E. J. Nettleton on sections 3 and 4. Kline's headquarters are in Vancouver, Nettleton's in Kelso.

For the contractors, Jack Ware is general superintendent for Leonard & Slate; Jack Jensen is general superintendent for Strong & MacDonald; Charles Strom is in charge of the work on the Erickson Paving Co. section; I. L. Waring is supervising the Parker-Schram job; and M. P. Munter is himself project manager on his firm's overpass contract, with Fred Moore as general superintendent.

PLACING THE SELECTED impervious clay fill at Conn Creek Dam. A bulldozer is spreading heavy gravel fill on left section, flanking the clay core. In the background a 64-in. outlet conduit is being formed for concrete casing.

Conn Creek Dam—
To Provide Napa Valley With Water

Earthfill dam will assure the city of Napa an ample future water supply — Half a million cubic yards of fill will be secured from readily available deposits of clay and gravel — Reservoir will impound 31,000 ac. ft., three times the creek's normal annual runoff

THE CITY OF NAPA, Calif., is expanding its water supply facilities by the construction of an earth and rock fill dam located on Conn Creek about 12 mi. north of the city and 5 mi. east of St. Helena. The water impounded in the reservoir created by this new dam will furnish an ample municipal supply for present requirements, as well as for future population growth and increased industrial use in the Napa valley.

Construction of the Conn Valley dam has been contemplated for a number of years by H. A. Harold, city engineer of Napa, and the present project was started because of the growing demand for more water to supplement the supply from Milliken reservoir. This reservoir was placed in service in 1925 with a capacity of 2,000 ac. ft. In recent years, Napa's water consumption has grown to 3,000 ac. ft. per year, making the city dependent upon the current flow of Milliken Creek to supplement the lack of reservoir capacity.

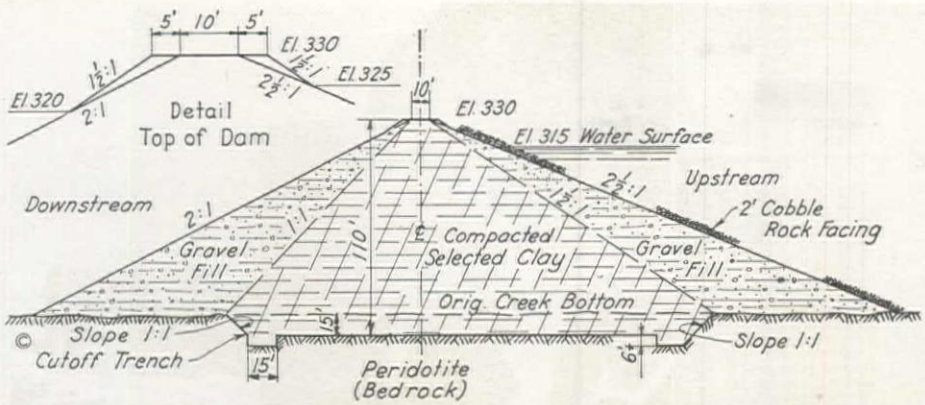
Conn Valley dam site was surveyed in 1928 by Augustus Kempkey, consulting engineer of San Francisco, and again by the California Division of Water Resources in 1938. Later, the U. S. Engineer Corps reviewed the project at a time when the city of Napa thought of accepting federal aid to build the dam as a combination water supply and flood control structure. The latter plan was not accepted and the present construction is completely financed by the city through a bond issue of $800,000. Of this amount, $235,000 has been expended to purchase land and surface rights involved in the dam and reservoir sites. The remaining funds guarantee the contract awarded by the Napa City Council to T. E. Connolly, Inc. on May 1st of this year.

Location

Conn Creek dam is favorably located at the lower end of Conn Valley, where the stream is confined to a narrow canyon by the jutting rocky ridge which forms the west boundary of the valley. The dam located at this point will impound 31,000 ac. ft. of water with a fill of 500,000 cu. yd. It will rise approximately 110 ft. above the original creek bed to an elevation of 330 ft. above sea level and the high water level in the reservoir will be at elevation 315 ft. Conn Creek has an average annual flow of 11,000 ac. ft. Usually the run-off occurs during the late winter months and continues through the spring and early summer, followed by a dry period of about four months. At this rate it will take about three years to fill the reservoir after the dam is completed. When this is accomplished it is believed Napa will have a surplus of water which can be distributed to nearby communties should they wish to avail themselves of the supply.

Design

Conn Creek dam was designed by Augustus Kempkey and approved by Wm. H. Holmes, supervisor of dams, Division of Water Resources, State of California. The dam is a compacted earth fill core



SECTION THROUGH Conn Creek Dam showing relationship of compacted clay filled center and the pervious rock fill on both upstream and downstream sides of dam. The dam rests on a heavy compact bedrock which on exposure weathers to soft serpentine.

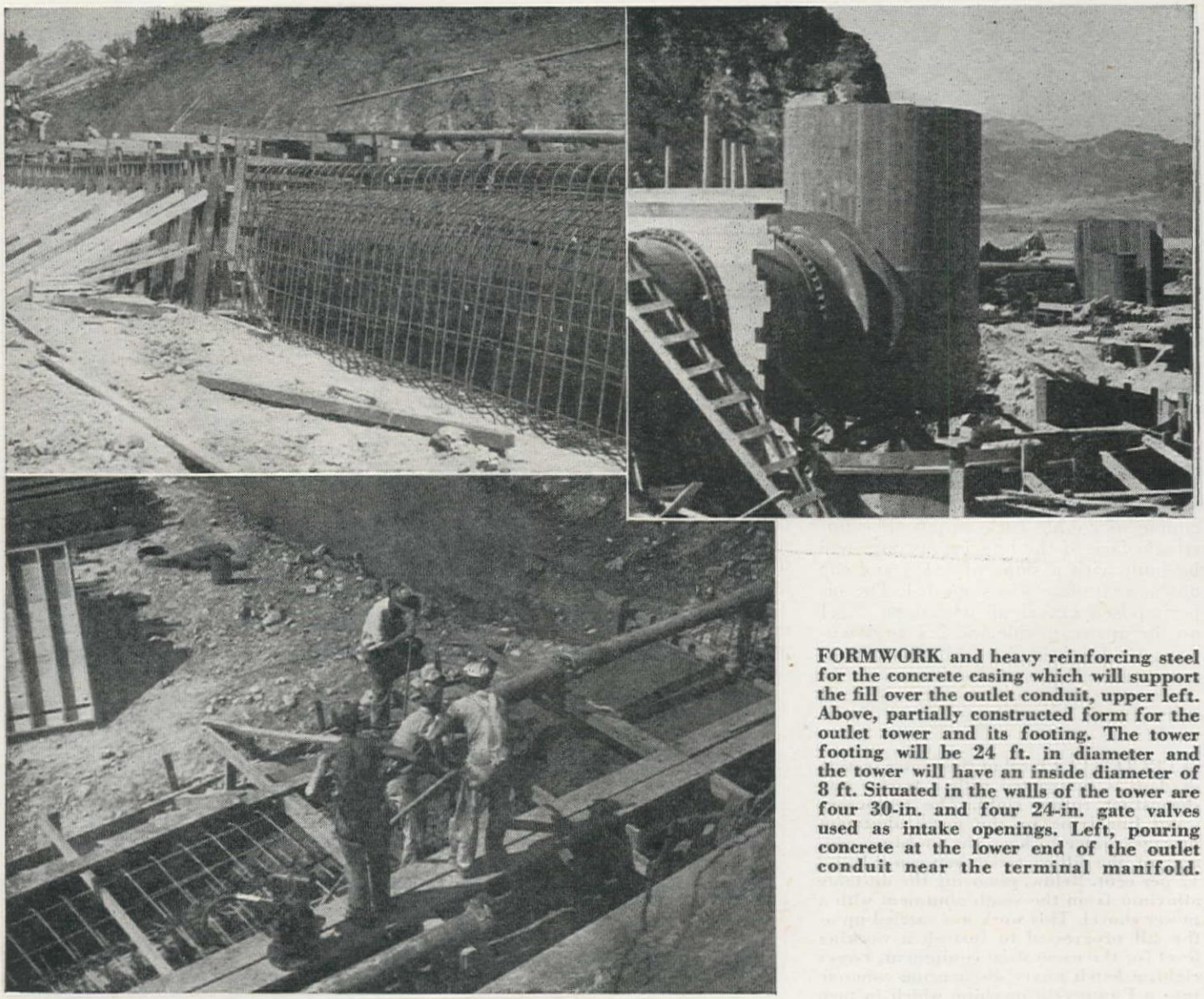
flanked on both upstream and downstream sides by heavy gravel fill. The upstream face will be protected by a 2-ft. course of cobble rock riprap. The upstream face of the impervious core will be built with a slope of 1:1½ and the downstream face will slope 1:1. The superimposed gravel fill will slope 2½:1 on the upstream side and 2:1 on downstream side of the dam. All alluvial material and decomposed bedrock was removed from that portion of the creek bed lying under the impervious section for an average depth of 12 ft. In addition to the general excavation a cutoff trench was excavated below both the upper and lower toes of the impervious fill section. These trenches are 15 ft. wide, dug to a minimum depth of 6 ft. Bedrock is composed of a heavy basic igneous rock, peridotite, which has been altered by local stressing and surface weathering to a form of serpentine.

The outlet conduit will be imbedded in heavy reinforced concrete near the toe of the north abutment slope which was cut perpendicular for a distance of about 8 ft. to form one wall of the forms used in placing the concrete around the conduit. Fabricated by welding 5/16-in. sheet into a steel conduit 64 in. in diameter, a 2-in. concrete lining reduces the ultimate inside diameter to 60 in. The upper end of the outlet tube is imbedded in the valve tower which rests on a circular reinforced concrete footing 24 ft. in diameter, and terminates 80 ft. below the downstream toe of the dam. The total length of the outlet conduit is 580 ft.

The outlet tower

Beginning 30 in. above the bottom of the outlet tower the foundation is reduced in a series of 12-in. steps from the maximum outside diameter of 24 ft. to an outside diameter of 12 ft. and an inside diameter of 8 ft. Outlet gates are spaced in a spiral around the tower 90 deg. apart and at elevation differences of 10 ft. Beginning at a position opposite

SELECTED CLAY fill of the center section of dam is compacted with a tractor and sheepsfoot roller, right. The temporary water line lying on the north abutment provides water to keep the moisture content of the fill material between 12 and 17 per cent. Below, removing the unstable alluvium from the south abutment with a power shovel. This work was carried up as the fill progressed to furnish a working level for the excavation equipment. Lower right, a batch mixer discharging concrete into a Pumpcrete machine which in turn delivers it to the outlet conduit form. Aggregates were delivered from a plant located about four miles below the dam.



FORMWORK and heavy reinforcing steel for the concrete casing which will support the fill over the outlet conduit, upper left. Above, partially constructed form for the outlet tower and its footing. The tower footing will be 24 ft. in diameter and the tower will have an inside diameter of 8 ft. Situated in the walls of the tower are four 30-in. and four 24-in. gate valves used as intake openings. Left, pouring concrete at the lower end of the outlet conduit near the terminal manifold.

the mouth of the 5-ft. outlet conduit the first of a series of 30-in. valves is centered at elevation 230. Three other 30-in. valves are set as above described, and four 24-in. valves are placed above them, the uppermost valve being set at elevation 300. The manual control wheels are mounted at the top of the tower at elevation 330. Each gate valve is mounted on a cast iron thimble reducer supporting a cast iron grill on the outside of the tower and the valve on the inside. Thimbles for the 30-in. valves are 42½x30 in. I.D. and those for the smaller size valves are 34x24 in. I.D.

The terminal control manifold is a tapered tube 17 ft. in length which reduces the conduit from 60 in. to 36 in. Upon it are mounted five 24-in. lateral gate valves and one 36-in. terminal valve. It is planned to use the large terminal valve as a service outlet and the lateral are to be used to waste water back into Conn Creek. These lateral valves will discharge through side openings in vertical pipes onto a concrete apron, which will prevent excessive erosion in the channel near the dam.

In order to meet the requirements of the Division of Water Resources, the specifications for the reinforced concrete protecting the outlet conduit were written so that it would withstand the total column weight of fill above the pipe without considering the strength of the conduit itself or the arching effect of the fill over the conduit.

Through the center of the dam, where the load on the outlet tube is maximum, the reinforcing steel placed around the conduit consists of an inner net of 1-in. deformed bars set 9 in. center to center. The whole net is supported at a distance of 2 in. from the conduit surface by the use of 2-in. square concrete blocks wired at intervals of 5 ft. to the reinforcing bars. Surrounding the circular steel is a square grid of 1-in. bars placed at 11-in. centers and supported 10 in. from the inner reinforcing. When poured the concrete casing enclosing the conduit will be 7 ft. 4 in. square.

Spillway

The spillway is located approximately 3,000 ft. northwest of the dam in a saddle of the ridge separating the reservoir from the lower Conn Creek channel. It will have a total strength of 800 ft. from the circular entrance lip to the lower erosion mat and an inside width of 40 ft. The cross section is a half octagon with reinforced concrete lining averaging 12 in. thick. The maximum rock cut is about 80 ft. at the center of the saddle. The slope of the cut walls will be ½:1 with 4-ft. berms spaced at vertical intervals of 20 ft. Elevation of the entrance lip is at lake level of 315 ft. and the lower erosion mat is at elevation 200 ft. or a total drop of 115 ft.

Construction

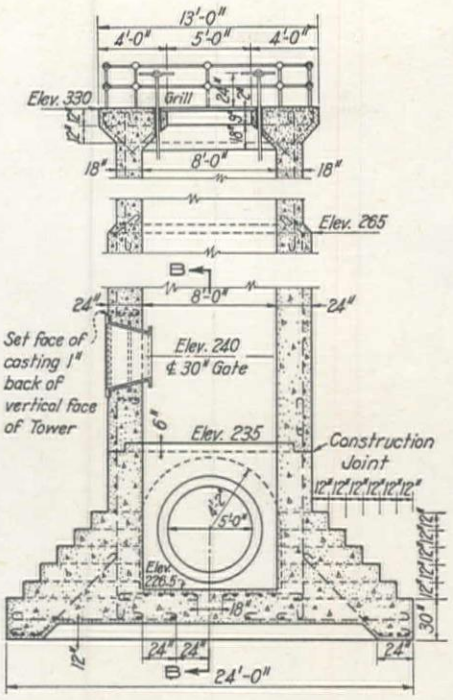
T. E. Connolly, Inc. of San Francisco, the contractor, started work on the construction of dam immediately after the contract was awarded on May 1st. Preliminary excavation to remove the alluvial material and decomposed bedrock lying under the impervious fill section required moving 24,000 cu. yd. of material, most of which was wasted in the creek bottom immediately below the dam site. An additional 11,000 cu. yd. of material was removed from the flanking areas under the pervious fill sections. This general excavation removed from 12 to 15 ft. of material from below the original creek bed level and the cutoff trenches were cut a minimum of 6 ft. below this excavation to insure solid footings from the start of the impervious clay fill. Considerable rock excava-

tion was necessary to dress the north abutment so the outlet conduit could be laid at the toe of the slope.

Selected clay fill was compacted in the mid-section of the dam up to the conduit grade. The conduit was then placed and the forms started for the protective casing of reinforced concrete to be poured around it. At the same time filling was continued on the south end of the dam. The stripping of the south abutment progressed as the fill was elevated to furnish a working level for the excavation equipment.

Material for the fill is favorably located close to the structure. The gravel for pervious sections is being obtained about 400 yd. east of the dam in the original creek bottom deposit. This gravel is free of organic substances and little silt is contained in it. Impervious fill material is selected from a waterlain deposit of clay situated in Conn Valley about ¼ mi. northeast of the dam.

Connolly is using a 3-cu. yd. dragline to load the gravel into 15-cu. yd. Euclid bottom dump semi-trailers. On the selected clay haul 13-cu. yd. Tournapulls are employed, with a tractor and pushdozer to facilitate loading in the pit. For scaling the abutment walls a 1½-cu. yd. shovel loads the top soil and decomposed rock into other bottom dump vehicles to be wasted just east of the dam. The fill is being spread with bulldozers and compacted with the usual sheepsfoot rollers. Sprinkler trucks add water to the fill to maintain a moisture content of between 12 and 17 per cent for satisfactory compaction.



VERTICAL SECTION through outlet tower in which the control valves are located. The reducer thimbles carry a cast iron grill on their outside faces to act as a trash rack. Controls are on top of tower.

Organization

Freethy-Kimball Co., San Francisco, has a subcontract for the concrete and form work, including approximately 3,100 cu. yd. of concrete. Aggregates are obtained from a screening and washing plant about 4 mi. below the job, and a batch mixer and pumpcrete outfit capable of pouring 150 cu. yd. per day is operating on the project.

Western Pipe & Steel Co. of California is installing the conduit pipe and accessory valves and control works. Soule Steel Co., San Francisco, was awarded a subcontract to place all the reinforcing steel.

Abbott A. Hanks, Inc., also of San Francisco, is in charge of all inspection work and testing for the project.

Augustus Kempkey made the original survey of the project and designed the dam. D. W. Albert is resident engineer for Kempkey. Hayward MacDonald, C. E., is field engineer for the city of Napa. W. Benham is in charge of all testing and sampling for Abbott A. Hanks of San Francisco. O. C. Steves is superintendent for T. E. Connolly, Inc., and H. Haggmann represents Freethy-Kimball Co.

Dr. Raver Advocates Vast Expansion For Aluminum Industry in Northwest

DEVELOPMENT of a completely integrated aluminum industry in the Pacific Northwest, based on the region's existing reduction capacity, would provide employment for 25,000 workers, or almost four times as many as at present, Bonneville Power Administrator Paul J. Raver testified before the Senate Mead committee, which is studying problems of disposal and peacetime operation of government-owned light metals plants.

Answering statements made by other witnesses to the effect that Pacific Northwest aluminum plants would need a substantially lower power rate in order to compete successfully with the Shipshaw plant in Canada, Raver pointed out that the Bonneville-Grand Coulee power administration's rate of $17.50 per kilowatt year is the lowest in the nation. He added that the rate was based on pay-out requirements on the government's power developments at Grand Coulee and Bonneville dams, and that no steps could be taken which would jeopardize the administration's revenue basis under the terms of the Bonneville act.

"If the competitive position of the Pacific Northwest aluminum reduction plants needs improvement, as for example to combat the Shipshaw situation, which is a result of past government financing policy, or because of adverse freight rates, some means must be found to assist or subsidize the light metals industry in the Northwest. It is not possible under existing law for Bonneville to provide the subsidy through power rates. Nevertheless, we are ready to sit down with any company and work out a new rate within our pay-out requirements.

"Now that the war is over, the primary objective of the Bonneville-Grand Coulee power administration is to assist in the utilization of Northwest resources for development of a well-rounded industrial economy that will provide maximum employment. The aluminum industry can, and should, be a major part of that development."

Competition to Continue As Reclamation Policy

COMPETITIVE BIDDING will continue to be the policy of the Bureau of Reclamation in awarding contracts for construction of multiple-purpose irrigation and power projects in the postwar period, Reclamation Commissioner Harry W. Bashore has announced. His statement was made in response to inquiries as to the procedures and policies of the Bureau in handling the large volume of construction work planned.

Commissioner Bashore listed seven points reiterating Bureau policy governing its relations with bidders on construction work:

1. Complete specifications for a job will be prepared by the Bureau of Reclamation.

2. Invitations to bid will be widely publicized.

3. All legitimate requests for copies of specifications will be serviced by any one of the offices named on the invitation.

4. The list of firms obtaining specifications from each issuing office will be available for public inspection at the respective office.

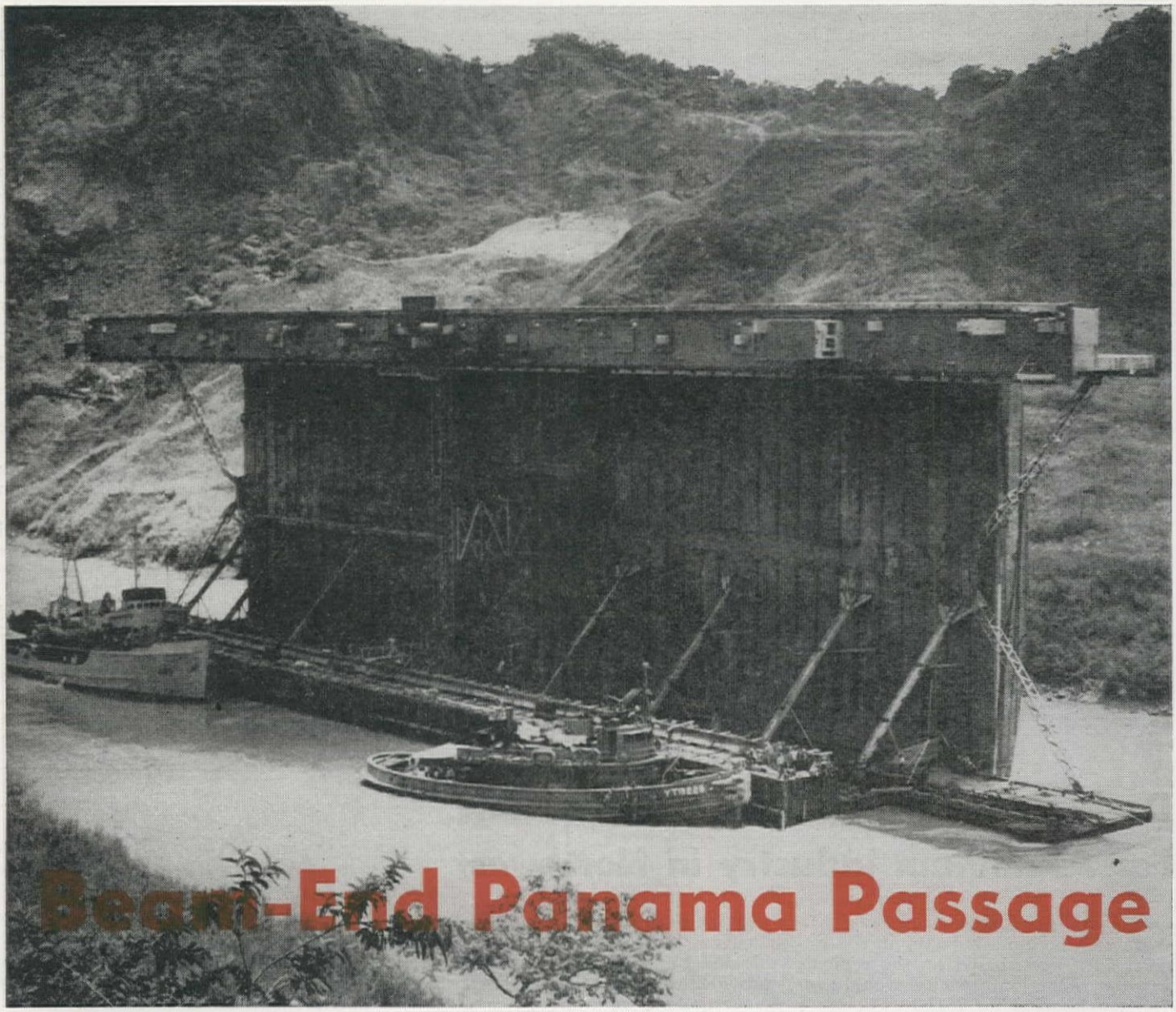
5. Public bid openings will be the rule, and the names of each bidder and the amount of his bid will be made public.

6. The Bureau will reserve the right to reject all bids.

7. Where unusual conditions warrant, the Bureau may elect to advance construction by force-account.

In planning construction of its projects, the Bureau prepares complete specifications covering the work to be done. These specifications are made available to contracting firms when a call for bids is advertised and announced in newspapers and technical magazines. A date is set for the opening of bids after which the Bureau takes all bids under advisement.

Under normal circumstances the low bidder is awarded the contract if investigation reveals satisfactory financial responsibility and adequate experience, and compliance is made with the bid requirements prescribed by the Bureau.



Beam-End Panama Passage

Giant drydock, required for repair of battle-damaged shipping in the Pacific, found too wide to pass through Panama Canal, so it was hoisted on its beam for the passage by adding pontoons to one side and ballasting them with water

MANY AND VARIED are the ships passing through the Panama Canal, but seldom is one hauled on its beam end in order to make the passage. In the days of small wooden vessels, the ships were occasionally hauled on their beam end to grave their bottoms with pitch, but it remained for the Seabees to careen a modern steel floating drydock on its beam to traverse the canal locks. Limited to 110-ft. lock width, the new 18,000-ton drydock, with a beam of 124 ft., could not normally be transfered through the canal from Gulf ports to the Pacific area. However, transference of these docks became a necessity with the end of hostilities in Europe and the subsequent transfer of more and more fighting and cargo vessels to the Pacific area, which created an increased demand for additional drydock facilities in the same area. Especially needed were the sectional three-piece floating drydocks with a mid section 400 ft. long.

Neither time nor the design of these heavy ungainly vessels would permit them to be towed around South America to enter the Pacific battle. The seemingly herculean task of transferring these docks to the Pacific through the Panama Canal was assigned to the Naval Civil Engineer Corps.

Up on the beam

Fulfilling the Seabee motto of "Can Do," the Navy personnel turned the drydock on its beam to reduce the width to 54 ft. in this new position. The dock was careened by the use of standard 5x5x7-ft. Seabee pontoons which were stacked on one wing wall and secured by welded attachments and shoring. Using only the regularly supplied connections of the pontoon gear, the vessel was caused to list by water ballasting and blowing the tanks with compressed air supplied by a battery of compressors working on a nearby barge.

The pontoons, assembled on the wing wall, and the bracing were designed to stabilize the vessel in a tropical gale, thus preventing its accidental capsizing should a storm occur while the dock was traversing the canal. The draft of the dock supported on its beam was 10.5 ft. while making the canal passage. After completing the trip through the canal the dock was returned to its normal position in two hours by blowing the water from the pontoons and admitting water to the bottom compartments of the dock structure. The superstructure of pontoons and bracing added to the wing wall caused the dock to list only 6 degrees from level before the pontoons were ballasted with water.

Accessory deck equipment and the gantry cranes that normally operate

THE 18,000-ton drydock with pontoons fastened to one side, top; the vessel lists as water is pumped into the pontoons, center; as it appeared when fully hoisted to beam-end position, lower. On the opposite page, the drydock as it was being towed through Culebra Cut, narrowest portion of the canal, by Navy tugs.

from the top of the wing wall were removed before attempting to rig the dock for its unusual passage. Diesel engines, which power the pumps and compressors ordinarly used to control the dock, remained in place, secured by shoring.

This unusual project was originated by the officers of the Bureau of Yards and Docks, and credit for the achievement is shared by Frederic R. Harris, Inc., designer of the dock, and the Pacific Bridge Co., both acting as consultants on the marine work and welding. A company of Seabees who were experienced in the use of Seabee pontoon gear did all the field work.

Construction Begins on Richmond Gypsum Plant

PRELIMINARY WORK has started on the new Richmond, Calif., plant of the Standard Gypsum Co. of California, and general construction will get under way within the next few weeks, officials disclosed in announcing that requests for bids are now being completed. Cost of the new plant will run into several hundred thousand dollars.

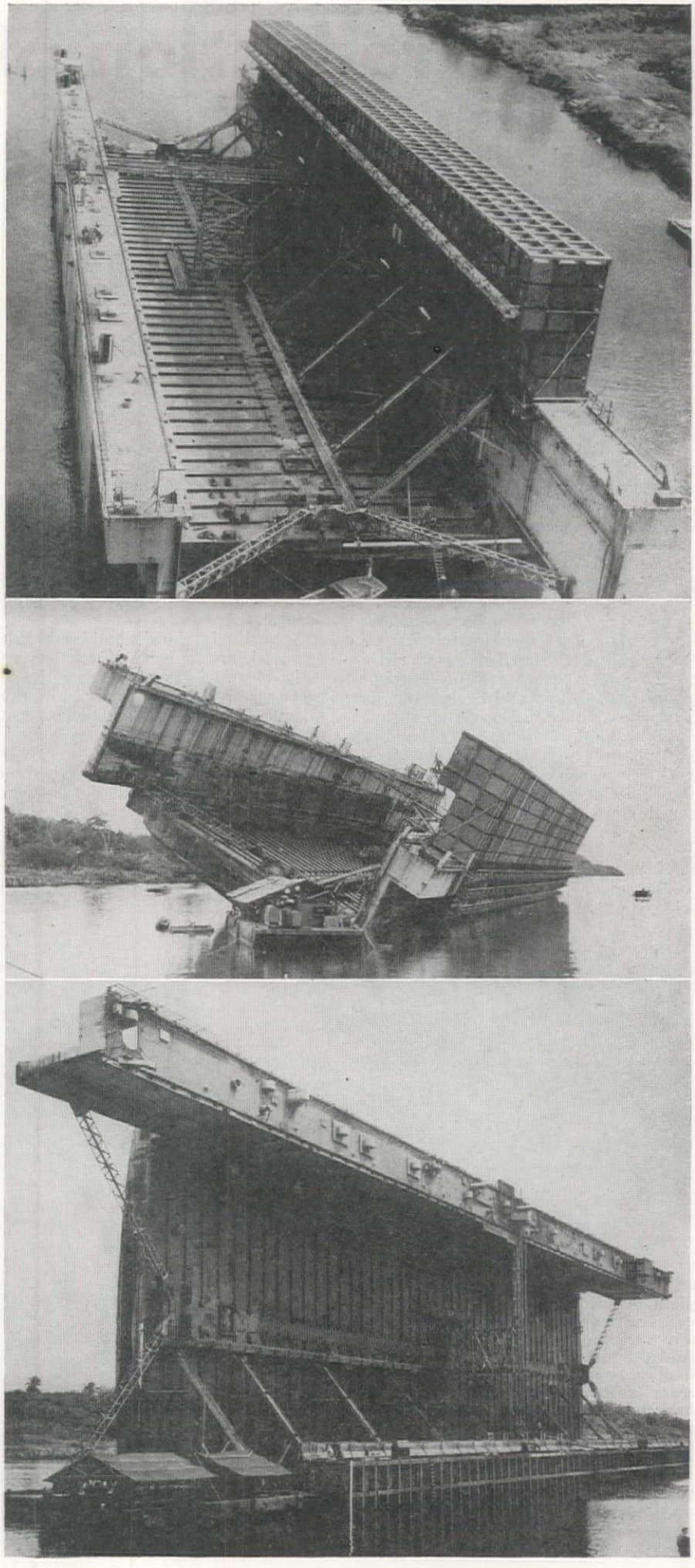
Major equipment for the plant has been ordered, and delivery is scheduled to coordinate with a six months' construction program. Piling is now being driven for plant foundations and deep-water docking facilities. The construction program also calls for a wallboard plant with a capacity of 200,000 sq. ft. per day, a calcining plant, steam plant, raw material storage space, and other buildings on the 13-ac. Richmond site.

The new development is an outgrowth of a deal consummated between Henry J. Kaiser and S. A. Perkins in July, 1944. At that time, Kaiser entered into a post-war agreement with Perkins, president of Standard Gypsum Co., to lease, develop, and expand the plants and the market for Standard Gypsum products.

The company's Long Beach facilities, curtailed during the war due to a lack of ocean shipping, will be reconditioned and expanded in the near future. In addition to the Long Beach plant and the newly-acquired Richmond site, the company owns property at Ludwig, Nev.

The processing plants will secure gypsum from deposits located on San Marcos Island in the Gulf of Lower California, Mexico. These deposits, estimated to contain 500,000,000 tons of gypsum, are operated through a long-term concession from Mexico.

The Richmond plant will start producing wallboard, gypsum lath, hardwall plaster, agricultural gypsum, pebble gypsum, tile and other gypsum products as soon as construction is completed.



Mass Production of Airport Base Rock

Exceptionally heavy airport construction at Fairfield-Suisun will require 1,250,000 cu. yd. of crushed rock — Morrison-Knudsen Co., Inc., set up production line scheme for furnishing the rock at 18,000 tons per day, using triple battery of crushers and private haul road 3½ mi. long

PRODUCTION-LINE output of crushed rock for the base of one of the heaviest airport runways ever to be constructed in the West, is the objective of the plant set up by Morrison-Knudsen Co., Inc., some distance from the Fairfield-Suisun, Calif., Army airport now being extended by the Sacramento District Engineer Office on the north shore of San Francisco Bay.

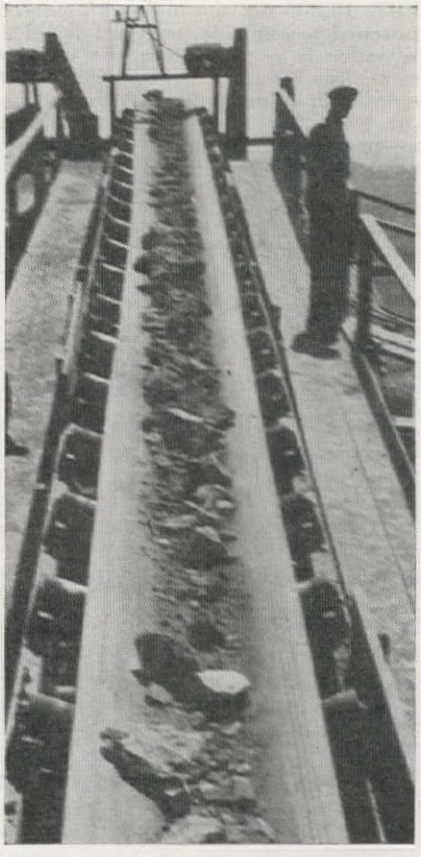
A contract for approximately $20,000,000 was awarded shortly before V-J Day to the joint venture firm of Morrison-Knudsen Co., Inc. and Stolte, Inc., for an 8,000-ft. runway, a warm-up apron, a base hospital, various other buildings and all necessary facilities. The work, with the possible exception of some of the buildings, is proceeding without termination, as the airport is designed as a permanent Army installation.

Runway construction

The runway, 8,000 ft. long and 200 ft. wide, is parallel with but offset from the extension of the existing strip. Excavation from the runway resembles a huge canal traversing the naturally level land. It is over 6 ft. in depth, through a silty, river-deposited soil in which are occasional irregular boulders varying in size up to 8 ft. in diameter. These boulders, if left in place, would result in a very irregular and unsatisfactory compaction pattern.

Accordingly, the silt and boulders are removed, and a base of crushed rock 60 in. deep, laid as support for the concrete runway. The latter is 18 in. thick, making, altogether, as stated earlier, one of the heaviest airport installations in the West.

To secure the necessary crushed rock, Morrison-Knudsen Co., Inc. has leased a hill about 3½ mi. west of the project. Here a suitable limestone, once used to supply a cement mill on the same spot, is available without too great excavating problems. A battery of 18 wagon drills, operated by a 5,000 cu. ft. per min. compressor, prepares the rock for shooting.



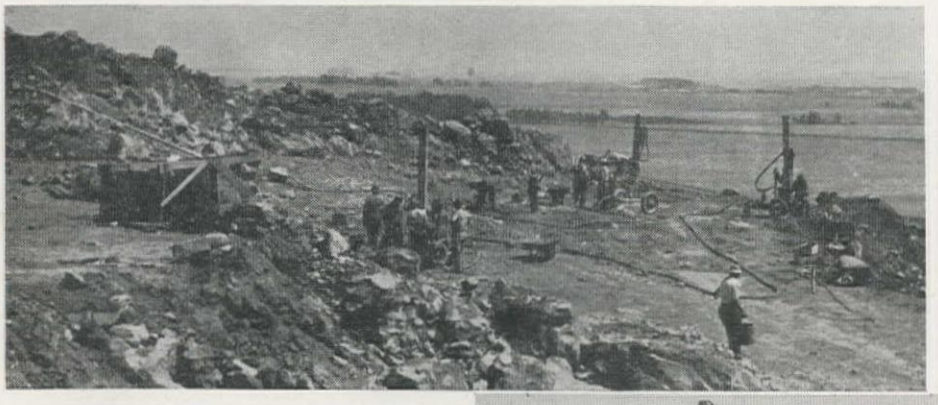
SEVENTEEN conveyor belts, totaling 1,600 ft. in length, are used in the crusher plant. Shown here is one of the belts carrying material from primary machine.

After this initial breakup, six 2½-cu. yd. shovels are employed to load the rock into 24-cu. yd. Maxi trucks, of which 18 are used. These transport the broken material to hoppers above the crushing plants, situated at the break of the lowest excavating bench.

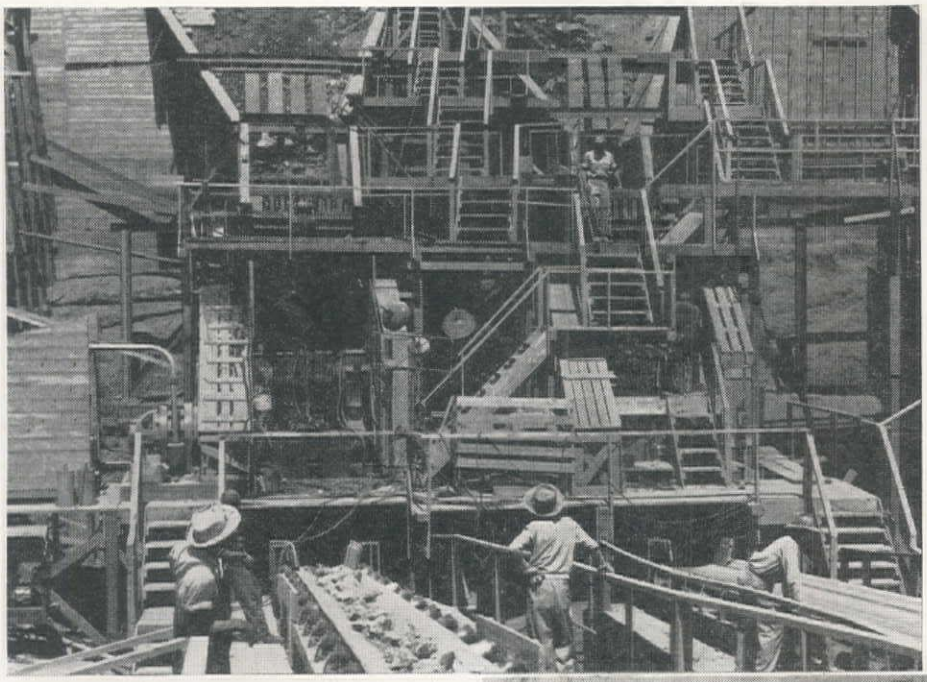
Rock not broken to a suitable size by blasting is pushed to one side by the shovels and further broken by dropping a heavy ball onto it from a crane boom.

Crushers and conveyors

The plant set up by the contractors is designed to give a maximum production of 18,000 tons per day, working two 10-hr. shifts, with three sets of crushers working in parallel, each set composed of a primary, secondary, and tertiary crusher. A total of 1,400 hp. in electric motors is used to supply operating pow-



OPERATIONS ABOVE the crusher plant, showing some of the blasting crews using wagon drills and compressed air, and the blasted material being loaded into 20-cu. yd. Maxi trucks for hauling to hoppers over the three primary crushers. The rock is an easily-broken limestone, which compacts well and is therefore quite suitable for the 60-in. runway base. It is not satisfactory, however, for concrete aggregate. In the background may be seen the broad Sacramento River delta land upon which the big permanent Army airport is being constructed.



TWO OF THE THREE primary crushers at the big rock plant, left. They crush rock to 12-in. diameter. Below, conveyor belts from the three primaries take the rock to the secondaries, where it is crushed to 4-in. size. Beyond are the radiating conveyors to stockpiles and truck loading bunkers.

er, and all crushers and conveyor belts are operated from a central control panel.

The material is dumped from the Maxi trucks at the quarry into hoppers above the primary crushers, which are jaw type Traylor machines, one 48x72-in., one 42x48 in. and one 42x40 in. in size. They break the material to 12-in. size and drop it onto conveyor belts which conduct it to the secondary crushers, also jaw type, which reduce it to 4-in. diameter. These discharge onto a single belt operating at right angles to the direct flow line of the plant so as to collect the material from all three. From this belt it is passed through the tertiary recrusher, a Symons cone type machine, which produces 3-in. minus material for the runway, and 1-in. minus rock for various roadways included in the contract and for the 3½-mi. haul road which was built to secure an uninterrupted flow of truck traffic from the rock plant to the field. About a million tons of the crushed rock will be required for the work at the field, and a quarter million tons for roads.

Below the tertiary crusher, a conveyor belt conducts the rock to a central hopper from which three delivery conveyors radiate to three stockpiles. From tunnels underneath the piles, still other conveyors transport it to loading hoppers, from which it is discharged into a fleet of bottom-dump Euclid trucks for conveyance to the airfield.

Altogether in the rock production plant there are employed in addition to the principal crushers, 17 conveyor belts, totaling 1,600 lin. ft. in length, 7 grizzlies, 3 shaker screens, and one scalping screen to remove dirt from the processed material. Experience at the rock plant so far indicates that about one pound of blasting powder is required per cubic yard of rock, and each cubic yard of quarry rock will produce one ton of finished product.

The plant will not furnish aggregates for the concrete work, these being shipped by railroad at the rate of 150 cars per day from Marysville, Calif., and batched in a double batching plant near the runway, which will be capable of producing about 200 cu. yd. of concrete per hour.

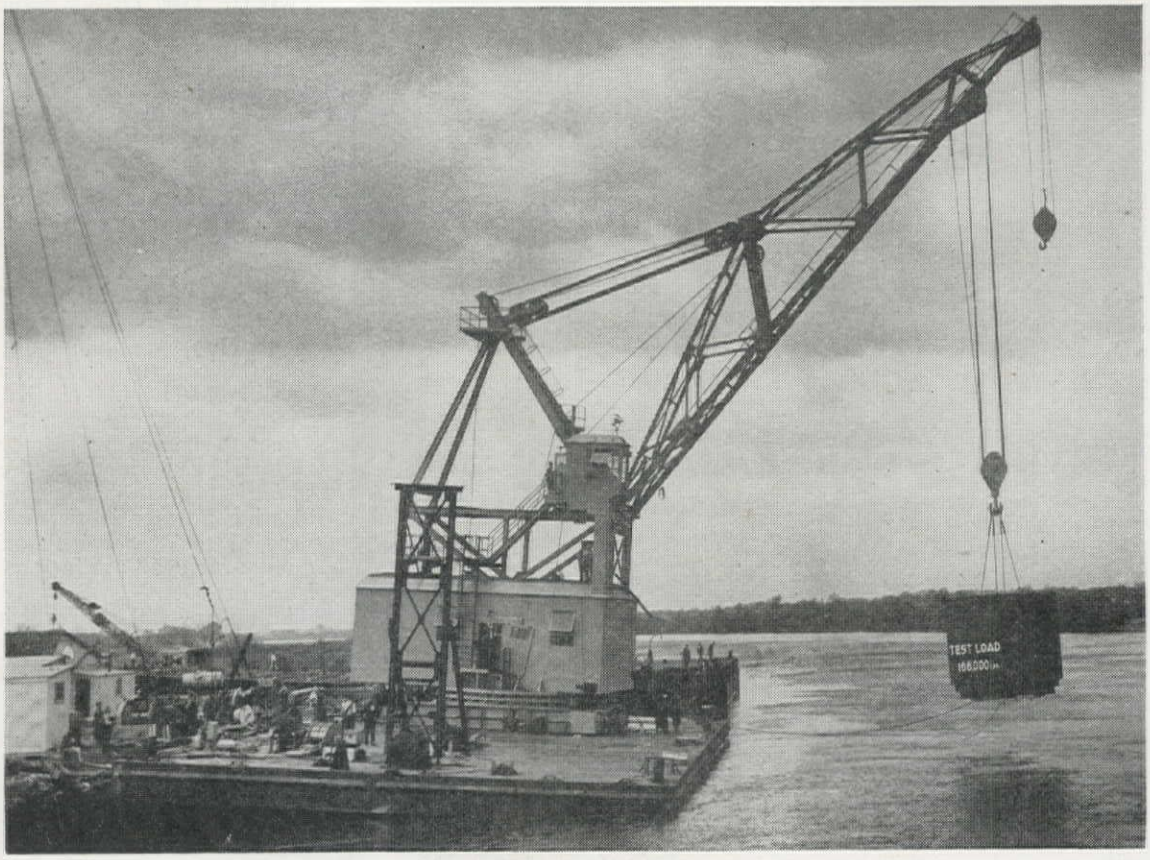
Construction operations on the site will be discussed in a later issue of *Western Construction News*.

FINAL STEP at the plant is loading of the crushed rock into Euclids for movement to the airfield. Three loading bunkers keep the fleet of trucks moving at high speed over the 3½-mi. specially built haul road.

Organization

The Fairfield-Suisun airport expansion is being constructed under the direction of the Sacramento District Office of the U. S. Engineer Department, Col. Lester F. Rhodes, District Engineer.

For the contractors, Morrison-Knudsen Co., Inc., J. N. Wells is project manager and H. L. Leventon is general superintendent. Adolf Haidlen is superintendent of the quarry and rock plant. H. J. Hjalmarson and Merle Smith are contractor's engineers on the project.



Fabrication and Test of Barge-Cranes

Washington firm pre-fabricates 60-ton floating derricks for rugged use in overseas ports by Army Transportation Corps — Cost data are tabulated to show the comparative labor cost for the construction of these barges by both welded and bolted methods

By A. E. NIEDERHOFF
Consulting Engineer
Bellingham, Wash.

UNDER A CONTRACT with the U. S. Army Transportation Corps, the Bellingham Iron Works, Marine Division, Bellingham, Wash., are constructing four 60-ton whirler derrick barges. Labor costs involved in erection and outfitting of these prefabricated barges from material furnished by the Government, plus a certain amount of contractor-furnished material to make the barges safe for overseas towage, is estimated at close to $400,000.

The original contract called for bolting together prefabricated sections of steel with gasket material in the joints for water tightness. When the first hull was 95 per cent completed, the contractor was ordered to dismantle the hull and weld all bolted connections. Separate costs were kept for bolting the hull, dismantling the hull, and for welding the hull, thus giving records that were invaluable in estimating subsequent work.

Description of hull

The sectional steel barge, designed to support a 60-ton crane, has the following principal dimensions:

Overall length	120 ft.
Beam	60 ft.
Depth	10 ft.
No. of longitudinal bulkheads	3
No. of transverse bulkheads	6
Rake angle with horizontal	49 deg.

Although originally designed as a bolted barge for use in sheltered waters, the plans were modified to incorporate certain welded stiffening trusses to give rigidity and integrity to the hull for overseas towage. The change from bolted hull construction to welded construction was dictated by experience which indicated that more rigid, water-tight joints were necessary to meet overseas service.

Twenty-eight water-tight compartments formed by transverse and longitudinal steel bulkheads make up the hull. Compartments are smallest under the rolling circle of the derrick where they average 14 by 14 ft. in deck area. At the opposite end of the barge from the position of the derrick, there is less need for deck support and the compartments are 26 and 34 ft. long and 14 ft. wide. The prefabricated steel sections were all plainly marked for identification and for matching, and the erection sequence was thoroughly described.

Additional stiffening trusses running fore and aft were welded into convenient lengths and fitted into the compartments. These members extended through the transverse bulkheads. In effect, they function as a continuous structural member running the complete length of the hull to prevent wracking, sagging, or hogging in a seaway.

Concrete ballast amounting to 100 cu. yd. was placed in two compartments, port and starboard, adjacent to the water ballast tank. Additional water ballast was also required to give stability to the hull under any position of the boom while lifting the rated loads.

Deck fittings consisted of six open chocks, four closed chocks, two anchor davits, and two anchor pads installed at the forward and after edges of the deck. A roller chock, rope stopper, hand winch, and four towing bitts at the corners of the barge were also installed. Along each side of the hull were mounted three kevels. A wire rope reel and compartment hatch covers completed the list of deck fittings. As part of the preparations for towage overseas, a 1¼-in. block steel cable was wrapped entirely around the hull and formed a towing bridle and towing hawser 450 ft. long.

Superstructure

The superstructure consists of a ma-

chinery house 40 by 24 ft., and about 15 ft. high, mounted above the 28-ft. roller circle for the derrick. Above this is mounted the operator's cab on the starboard side of the heel of the 95-ft. 6-in. boom. The boom is made up of two trusses of wide-flange beams welded together having a width of 12 ft. at the base and 3 ft. at the auxiliary hoist sheave pin, angle cross bracing, and heavy transverse channels to prevent the two trusses from twisting. A catwalk extends from the heel to the end of the boom. The weight of the boom with sheaves and rigging is 20 tons. Total weight of the crane structure and machine parts is 230 tons.

An "A" frame made up of wide-flange sections rises 29 ft. above the boom foot pin. Thus, with the boom in a horizontal position resting on the vertical support erected on the fore part of the barge, the total height above the waterline is about 70 ft.

The design of the boom, rotating trusses and "A" frame was based upon the most critical condition resulting from either of the following load conditions:

1. Dead load, live load, impact (20% DL + LL) and 7 lb. per sq. ft. wind pressure or lateral or longitudinal forces.

2. Dead load and 30 lb. per sq. ft. end wind.

Limiting stress in tension was 18,000 lb. per sq. in. and in compression 15,000—

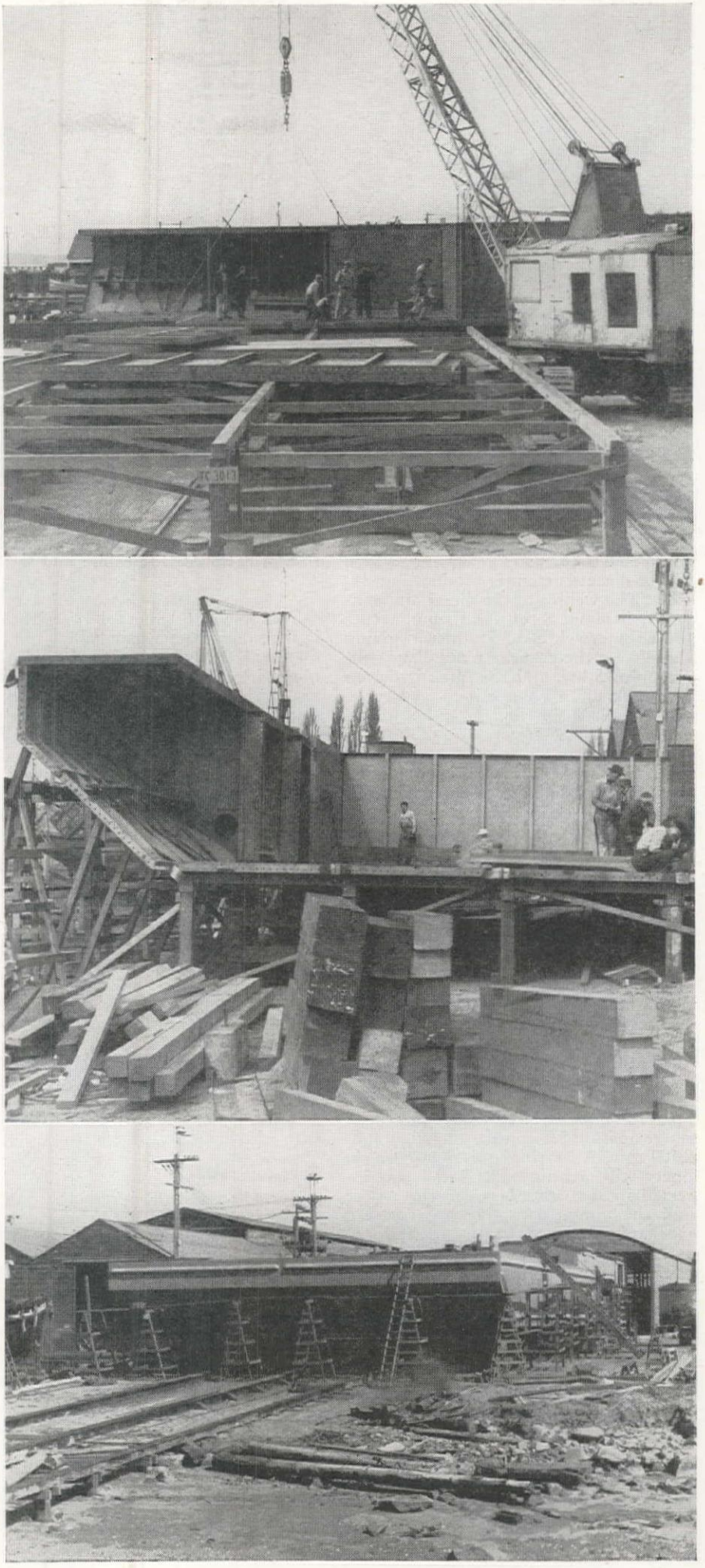
$\frac{1}{4}\left(\frac{L}{r}\right)^2$. The resulting members used in the bottom chords of the boom trusses were 10 WF 77 of alloy steel for ⅔ of the boom length and 10 WF 49 alloy steel and 10 WF 26 carbon steel for the top third of the boom. Maximum section of the upper chord was 16 WF 64 of alloy steel extending from the boom hoisting sheaves to the main load block. Nickel copper alloy steel conforming to ASTM specification A 242—42 was used where great strength was required.

The main load block itself was a ponderous heavy machine made up of 4 sheaves, 36 in. in diameter. From the bottom of the sister hook to the top of the block measured 9 ft. 1 9-16 in., and the weight was 3½ tons. Eight parts of 6x19—1⅛-in. round plow steel cable extended from the main boom block to the main load block.

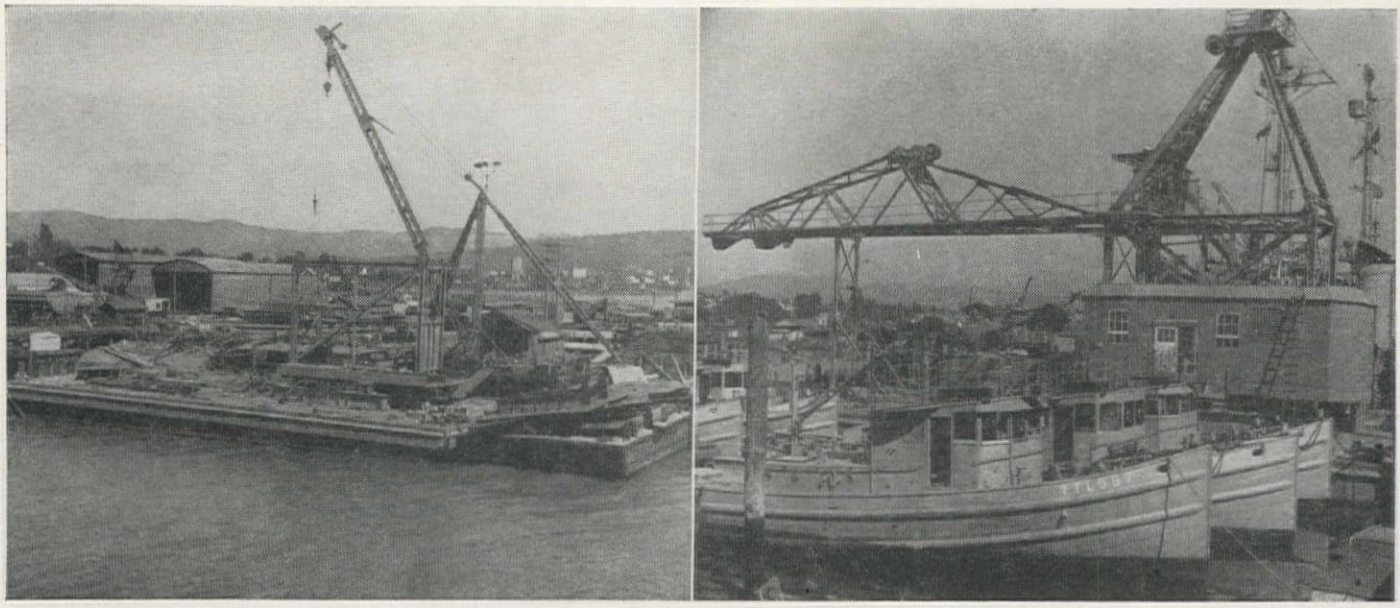
The boom is raised or lowered by means of 19 parts of 1⅛-in. round plow steel cable running through 18 sheaves, eight of which were 30 in. in diameter, the remainder being 36 in. in diameter. With this mechanical advantage, the boom hoisting motor of 135 hp. had no difficulty in lifting a load of 84 tons plus 30 tons of boom and rigging.

Power plant

The main power plant in the machinery house consists of a six cylinder, 4-cycle, diesel engine rated at 257 hp. at



CRAWLER-CRANE lowering bottom plates for steel barge, top. Construction of this initial barge was with bolted joints, center. Bolted hull complete on the ways before re-construction by welding, bottom.



ERECTING THE DERRICK on the barge with the aid of a 40-ton stiff leg crane on the outfitting dock, left. Completed derrick prior to reeving cables and testing.

600 rpm. The cylinder bore is 9 in. and the stroke 10½ in. The engine is directly connected to the main generator and 150 kw. of direct current is produced at 240 volts. The weight of the diesel and generator is about 8 tons and supplements the counterweight of 75 tons in giving stability to the crane. An auxiliary generator of 5 kw. at 1,200 rpm., is driven through a direct connection by a 4-cycle, water-cooled, 3-cylinder, 10-hp. diesel engine. This generator supplies electricity for lights.

All motors are direct current, 230 volts. The main hoist motor, which is geared to all three drums (boom hoist, main load and auxiliary load) is 135 hp., 495 amps, with a speed range through five points of control from 410 rpm. to a maximum of 1,500 rpm. All controls are, of course, placed in the operator's cab above the machinery house. Not only does the operator control the main hoist motor and the rotating motor, but he also controls the fuel intake to the main diesel engine. Thus, when the motors are drawing more current from the generator due to overload, the operator opens the throttle for the diesel engine so as to maintain a constant speed.

The motor for rotating the cab is 45 hp., 172 amps. It has a controlled speed range of from 525 rpm. to a maximum of 2,100 rpm. A herringbone type gear reducer with a ratio of 24.8 to 1 was inserted in the drive between the motor and the pinion actuating the rotating mechanism.

Test procedure

The first derrick barge was completely tested, electrically, mechanically, functionally and for stability. After the electrical installation had been checked, the boom was raised to give a 73-ft. radius from the center of rotation and swung through 360 deg. of horizontal circle in increments of 45 deg. At the end of each 45 deg. of travel, measurements at the four corners of the barge were taken down to the water surface from the deck of the barge. The amount of tipping was thus determined for this "no load" condition on the boom.

This initial test was followed by a test in the same manner using a five-ton load on the auxiliary hook of the boom. After observing the inclination of the barge, an overload of 20 tons was hoisted by the auxiliary hook with the boom athwartship off the starboard side. Tipping of the barge was again measured.

The most spectacular test consisted of the overload test. A flatcar piled high with steel plate and having a gross weight of 84 tons was lifted by the boom at a 73-ft. radius. In spite of this overload at right angles to the longitudinal centerline of the barge there still remained 20 in. of freeboard to the barge deck from the closest water surface.

Observed test results were in excellent agreement with prior calculations on stability indicating close adherence to plans by the contractor and excellent weight computations by the designer. Engineers from the Army Transportation Corps expressed satisfaction at the conclusion of the tests which were witnessed not only by official observers, but also by 300 or 400 workers in the yard who laid down their tools to watch.

Erection costs

The change in design of the hull afforded an excellent opportunity to get labor costs on both welded and bolted construction. In this connection it should be understood that the bolt holes were already in the prefabricated steel plates and angles. The labor involved consisted of getting the holes to line up after gasket material had been cemented in the joints. Very little reaming was required and no metal cutting or welding of additional plate or connection angles. Upon changing the method of fastening from bolts to welds there was considerable metal cutting, burning and welding before the sections were in proper shape to be welded together.

With these facts in mind, the costs given in the table below can be more truly evaluated. Some of the items marked "approximate" were not fully determined at the time of writing, but are probably within 5 per cent of the correct and final figure.

The above costs do not include material and yard overhead. Adding these items to the above figure the total cost of the first derrick barge, without profit, was $105,000.

The other three whirler derrick barges under contract did not include items 1, 2, and 5 in Table I. Preliminary costs and estimates indicate a reduction also in the amount of the remaining items in Table I, as the yard personnel becomes progressively more skilled in their jobs.

A breakdown of labor costs on the first hull may be of interest to show the relative importance of work done by the several crafts. Table II gives these approximate costs which are based upon the West Coast Master Agreement calling for skilled mechanics at $1.20 per hour.

Table II

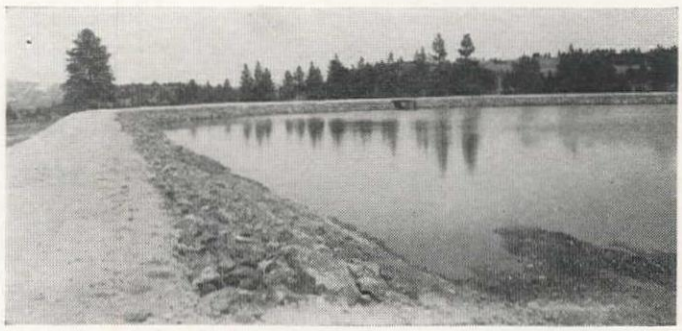
Steel workers, hull	$42,800
Electricians	2,500
Machinists	2,800
Riggers	4,700
Painters	1,800
Pipe fitters	1,900

Table I

1.	Bolted construction (6,900 man hours)	$ 9,310
2.	Dismantling and cleaning bolted hull (1,150 man hours)	1,560
3.	Welding hull, including structural changes (16,100 man hours)	21,700
4.	Crane and machinery erection (14,400 man hours)	19,479
5.	Testing (approximate)	2,500
6.	Processing for overseas shipment (approximate)	2,000
		$56,549

Nevada Fish Dam—
Hill Creek Waters Purified by Fire

Nevada Fish and Game Commission erects an earth-fill dam to impound fresh waters for the expansion of Verdi hatcheries—A blanket of bentonite at inner toe of dam prevents water escaping from the reservoir



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

ONE DAY a range fire swept through a patch of the Truckee River country in Nevada. When it got to Hill Creek, a tributary to the Truckee a few miles west of Verdi, the fire was so hot it killed every fish in the stream. Ordinarily, this would be considered pretty bad luck, but over Nevada way statistics show that for all the bad luck there is an equal amount of good luck. This is just as true at Hill Creek as it is in the Bank Club.

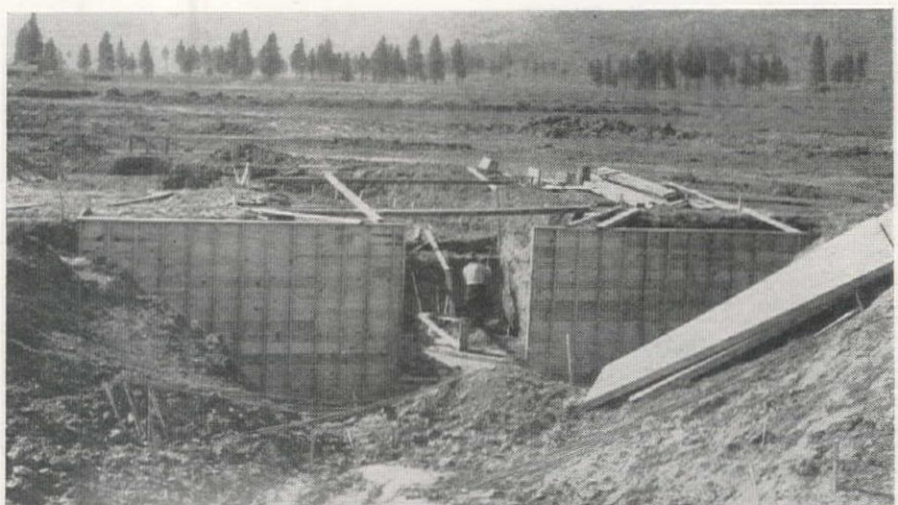
And this range fire gave the Nevada Fish and Game Commission something for which they had been looking for a long time: a source of pure water uninhabited by adult fish. Such a stream could be used to improve and expand hatchery operations at Verdi. The fire delivered to their door a practically pasteurized stream.

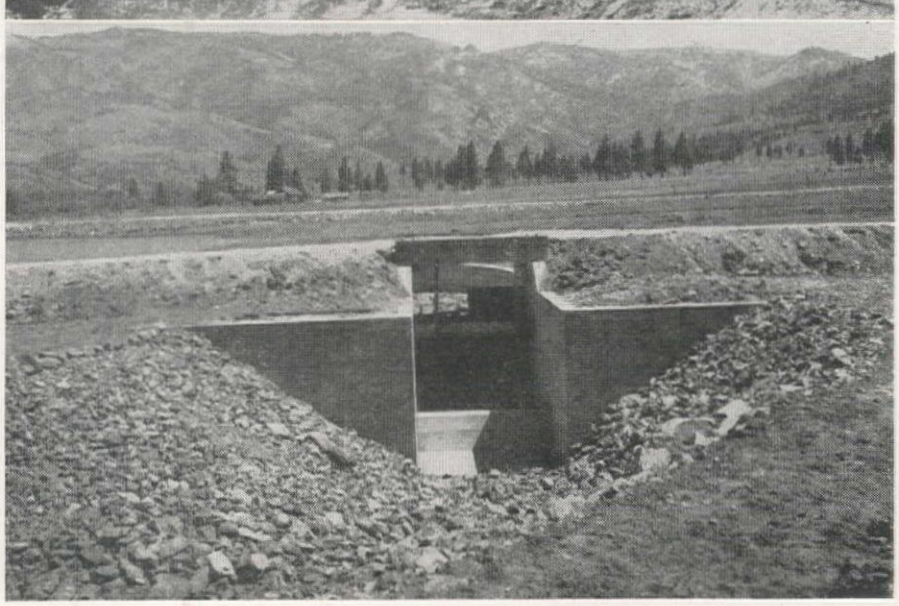
Fresh water requirements

First step was to screen off Hill Creek so that no bacteria-infected trout from the Truckee could enter this sanitary waterway. Trout, it seems, come from a great and ancient family, the Salmonidae, and while sober and competent observers have reported enormous sizes and weights, the infant mortality of the species is terrific. In fact, it takes longer to bring a trout to legal size than it does a deer. Until recently, the annual capacity of the Verdi hatchery was two million fish. Of these, nearly half died because of infections induced by the presence of older fish in the water source.

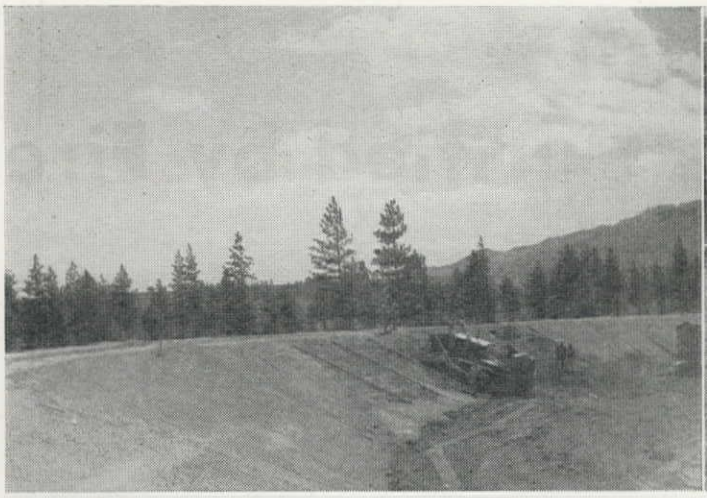
This does not mean that adult fish in the Truckee or any other stream are infected with deadly germs. The reference is to infections in a clinical sense. With a suitable water source, the fish and game men realized they could not only greatly lower the mortality but double the hatch to four million fish.

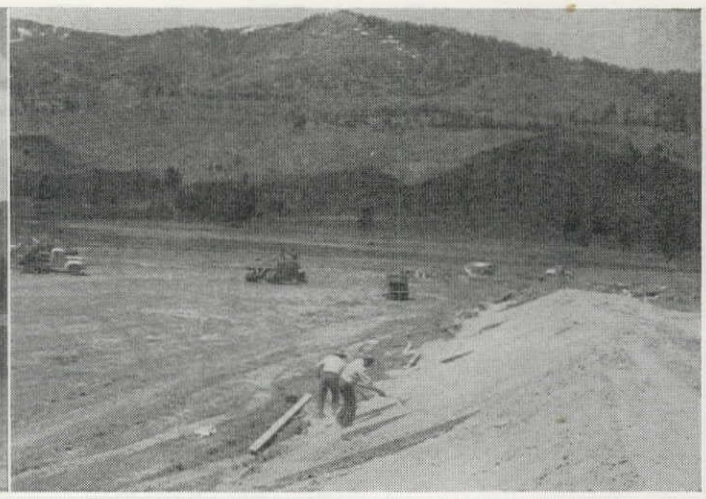
So with their eye on the purified water of Hill Creek, expansion plans were quickly adapted and brought up to specification for bidding. The war was still going on but not much critical material was needed, and members of the various war agencies who were possibly thinking of the days when they could go fishing again gave the project their OK. The Isbell Construction Company of Reno was awarded the job and prepared to dig in as soon as the ground was workable after the spring thaw. Supervision for the Commission was handled by Thomas R. King, of the Reno engi-



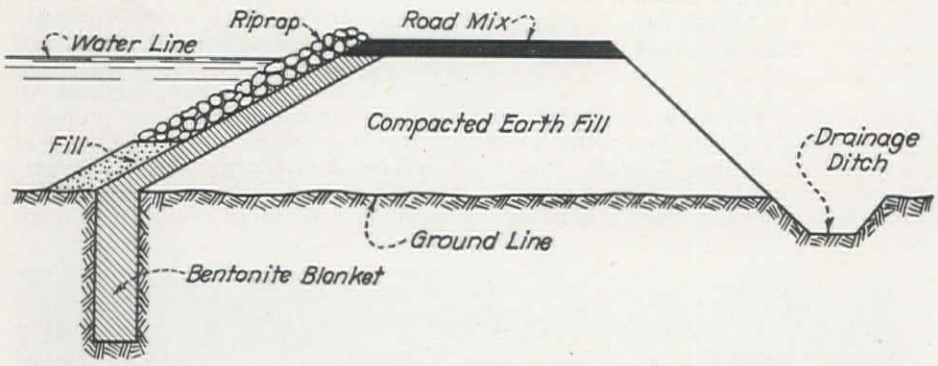


SPILLWAY FORMS for the new dam go into place. Critical materials were held to a minimum throughout construction. Outside of this reinforced concrete section, all other materials were at hand. Below is shown the completed spillway with the Truckee river canyon in the background.





THE BENTONITE BLANKET was spread over the upstream face of the embankment by a bulldozer, and later (right) the blanket is touched up with hand labor. Below, cross-section of dike showing deep Bentonite cutoff and rip-rap protection on upstream face.



neering firm of King and Malone. This firm also drew up the plans. What the job lacked in size (total cost something like $20,000) it made up in interest, and besides job foreman A. F. Adams, W. J. Isbell, and H. R. Noel, engineer, gave the fish business their personal attention.

Design and construction

What was done was to construct a small reservoir, run an intake pipe over to Hill Creek, a distance of about one mile, and an outlet pipe line from the reservoir to the hatchery, another half mile. A spillway and channel is provided for overflow waters. The reservoir itself is simply a U-shaped dike on gently sloping ground, with the storage area cleared and stripped, and with excavation and earthworks so arranged as to provide a maximum depth of twelve feet at the low end. The water feathers out to the ground line at the intake end, but not before a storage of 23 ac. ft. has been accomplished. Since this unit replaces an old reservoir of only 2 ac. ft. capacity and a maximum depth of 2 ft., it can be seen that things are looking up for baby trout at Verdi. Besides acting as a safeguard against a shortage or failure of a suitable water supply, the increased depth will furnish cooler water and permit hatchery operation during the summer. In the past, summer temperatures have forced early suspension of the hatch.

RIP-RAPPING WAS LAID over Bentonite to fortify the upper pool levels against wave action. This 12-in. rock emplacement is composed of native granite talus. At right, outside face of completed reservoir. Compacted earth fill remains exposed, although road-mix surface protects the crest.

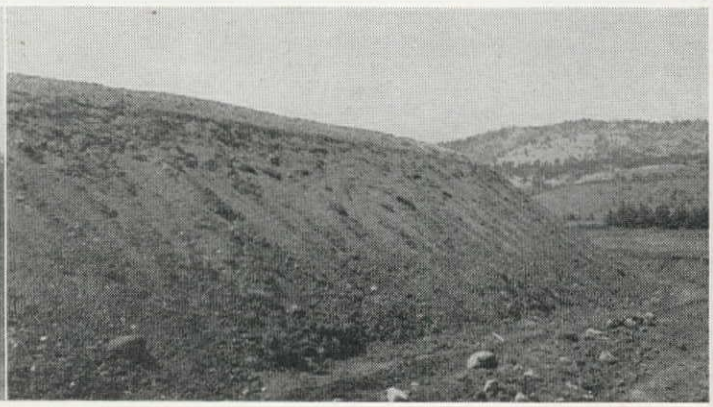
The design was simple and no unusual construction problems were encountered. The levee sections are a compacted earth fill with a Bentonite blanket toed in and spread over the upstream face. On this is laid a rubble surface of native granite rock to a depth of 12 in. The top of the structure is protected by a mat of ordinary road-mix material. The outlet pipe to the hatchery taps the cool water at the low end. The spillway is of reinforced concrete and is located at the shallow end opposite the intake. Pool elevation is regulated by flashboards.

Because quantity figures in wartime construction have sounded like the distance to the sun, it is something of a jolt to note that the largest item in the fish dam is 8,300 cu. yd. of Bentonite fill. Roadmix topping ran 700 cu. yd., stripping and excavation 4,000 cu. yd., rip-rap 900 cu. yd., and reinforced concrete 62 cu. yd. Nevertheless, for Nevada sport fishermen, it is big doings.

Purpose of the project

H. Shirl Coleman, member of the Commission, says, "The Verdi hatchery is the only one now operated by the Nevada Fish and Game Commission and will be the site of all future hatchery work." (Three Nevada counties also operate small independent hatcheries.) Coleman adds in summary:

"It is our feeling that the Verdi hatchery at its new size can produce sufficient fish for our needs if a system of rearing ponds is established throughout the



State. Fish hatched at Verdi would be transferred as 3-in. fingerlings and reared to 6-in. yearlings at various ponds. A substantial increase in outdoor activity is expected in the postwar years. This will greatly increase the 'fishing pressure' on our streams. This project is one of several aimed at readying the Commission for the expanded program we feel must be coming." These remarks are seconded by Lester E. Nichols, Superintendent of Hatcheries at Verdi, and S. S. Wheeler, Field Representative and director of activities.

Contractors may be interested in knowing that work of this sort in the conservation and recreational fields has more than a "make-work" justification in its value to any postwar program. For example, in computing the benefits of huge river development plans, such as current proposals of the U. S. Engineers and others, an amount of $1.00 per pound is allowed for sport-caught fish. The U. S. Fish and Wildlife Service also figures this a reasonable figure for what the average fisherman spends during his workouts with rod and reel. The new reservoir for the Verdi Hatchery thereby attains added significance as a pattern for the future in other spots around the West. W. H. Shelby, long culturist at the Shasta trout hatchery in California, says he raised a Dolly Varden to the age of 19 years. So it seems to be simply a matter of getting 'em started.

Airlines Order Large Fields For Latin American Capitals

VAST NEW AIRPORTS, capable of handling safely giant transport planes which have been ordered for use on inter-American air routes, are under construction or projected in many of the capitals of the other American Republics, according to reports reaching Washington.

The capital cities where new or enlarged airports are under construction or projected included Mexico City, Panama City, Caracas, Lima and Buenos Aires.

Construction of a $7,000,000 commercial airport, with runways more than 7,000 ft. in length, on the outskirts of Panama City, will begin soon, according to F. H. McGraw & Co. of New York, which recently was awarded a contract by the Republic of Panama for construction of the new airport. There will be a three-square-mile field and a terminal building capable of handling four major airlines in full operation. The airport is designed so that it may be expanded. The terminal building, two stories high and 625 ft. long, will have a central glass-walled observation and waiting room for 200 persons, with sloping floor so that the view of the field will be unobstructed. A corporation has been formed to construct a $3,000,000 hotel of 400 rooms near the airport.

The runways at the government-operated airport will be able to handle planes 50 per cent larger than the Boeing Superfortress military bomber plane.

Plans for the new airport at Buenos Aires are reported complete. The airport will be on a site covering more than 14,800 ac., near Ezeiza Station in the Esteban Echeverria district. The site borders the river Matanza and is 15½ mi. from the Plaza de Mayo in Buenos Aires.

Initial construction costs are estimated at from $19,000,000 to $25,000,000. It will be used by the international and national lines.

Construction of the Buenos Aires airport is proposed in two stages. Each stage when terminated will comprise a complete airport. Landing strips are planned in the form of two equilateral triangles; the 3,929-ft. space between the bases of the triangles is to be used for passenger stations and hangars. Each of the runways will be 8,200 ft. long, but may be extended to more than 16,400 ft. if desirable. The chief runway in the first stage of construction may be extended up to 9,186 ft.

The Secretariat of Aeronautics plans to complete construction of the first triangle of runways with a paved landing strip 246 ft. wide, and unpaved but graded lateral strips 262 ft. wide on each side. After this has been finished, the width of the runways will be increased to 492 ft. of paved strip and 1,148 ft. of auxiliary lateral strips.

Plans also are being completed for a new airport near Caracas, capital of Venezuela. It is estimated this airport will be completed within two years and will cost about $2,500,000. The main runway will be 5,900 ft. long. The airport will be located 11 mi. east of Caracas.

According to Mexican reports, the national airport at Mexico City is being converted into one of the largest and most modern on the continent. Two runways are being constructed. They will be from 4,100 ft. to 5,400 ft. long. The Mexican Department of Communications and Public Works, which is building the airport, also plans to construct an airport terminal to accommodate 700 passengers an hour.

At the Limatambo airport at Lima, capital of Peru, two asphalted runways, in the form of an "X" were built recently, and work is to begin shortly on a passenger terminal building. One of the newly-constructed runways is 6,544 ft. long and the other 6,006 ft. An extensive lighting system has been installed.

Idahoan Snowbound in Cascades Will Receive Winter Supplies by Plane

BIDS FOR AIRPLANE service during the coming winter season between Cascade, Idaho, and snowbound Deadwood Dam, situated 25 mi. away in the heart of the primitive area of the Cascade Mountains, were opened at the Boise office of the Bureau of Reclamation on September 25.

The plane will be called upon to deliver food, mail, and other supplies about twice a month to Ole Overlie, 62-year-old superintendent of Deadwood Reservoir, who is snowbound at least seven months of the year.

The low bidder will be required to land his plane, at times under adverse conditions, on a small air strip on the edge of the Bureau's man-made lake, or, with skis, on the lake itself when it is frozen over. In recent years the Johnson Flying Service has been awarded the contract. It employed Penn Stohr, famous "mercy flyer," to make the hazardous journey.

The pilot who delivers the goods required by Superintendent Overlie will find the lake an adequate runway. It is 4½ mi. long and 3 mi. wide and during the wintertime the ice is about two feet thick. Landing on the lake is particularly dangerous when slush and water cover the ice. At times in the past it has been impossible to set the plane down and on these occasions it has been the practice to drop the supplies by parachute.

Overlie is beginning his twelfth year as a "hermit." Except for occasional summertime trips for supplies to the community of Cascade, he has taken only one two-week vacation in 11 years. His only communication with the outside world during the winter season is by short-wave radio to the Bureau of Reclamation's Black Canyon Dam near Cascade and to its Boise Diversion Dam near Boise.

During the winter months, marked by temperatures as low as 48 deg. below zero, Overlie's major job is to keep the gatehouse for the 165-ft. concrete dam from freezing. During the summer he regulates the flow of the water from the reservoir to meet downstream irrigation needs.

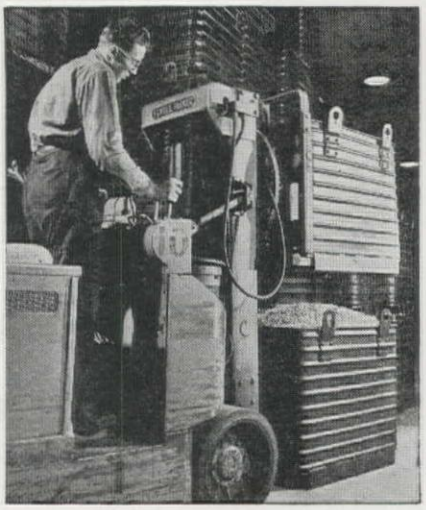
In the winter, Overlie also takes daily measurements of the depth and moisture content of the snow, which information he reports by short-wave radio to the Bureau, the Department of Agriculture and other agencies. The information must be transmitted by radio because heavy snowfall and winds of high velocity leave Overlie without telephone communication most of the winter.

Deadwood Dam is situated on Deadwood River, 150 mi. northeast of Boise, at elevation 5,340. The stream flows into the South Fork of the Payette River near Grimes Pass and Lowman.

HOW IT WAS DONE

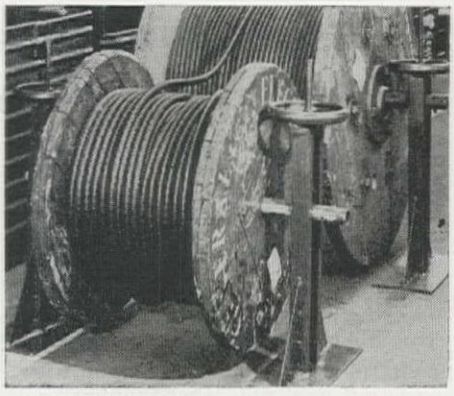
JOB AND SHOP TIPS FROM THE FIELD EDITOR'S NOTEBOOK

A PROGRESSIVE WESTERN manufacturing company has simplified handling of metal scrap from machining and cutting by combining pallet bases to conventional skid boxes of the type universally used to collect such material. With these attached pallets, electric power trucks with swivel forks are enabled to pick up the box easily and transport it to the loading platform, where it is elevated and upended into street trucks. Another interesting idea is the type of pallet used on the box bottoms. Instead of ordinary skids, a steel plate as long as the box is turned up at a 90-deg. angle on each side and welded to the lower edges of the box, forming a trough about 4 in. deep. In operation, the forks of the truck are inserted into this opening, and when the box is upended for dumping, it is held by the bottom plate.



Siphon In Dredge Pipe Makes Small Craft Pass

TO FACILITATE small craft movements in the anchorage at Roosevelt Naval Base, San Pedro, California, the floating siphon below was designed by Lieut.-Comdr. A. S. Porter, U. S. N. R., to form a boat pass in the discharge tail pipe leading from hydraulic dredges constructing the protective mole at the base. During the seventeen months construction period, when the naval base was crowded with repair and service work, this device helped to keep small craft traffic going smoothly without interference from the dredging operation. The pipe underpass provides a vertical clearance of 12 ft. and has a horizontal width of 80 ft. at the bottom. Equipped with a quick-breaking ball joint on both ends of the siphon, the line may be rapidly opened when necessary to pass a larger vessel through the line. The pass was equipped with flag markers by day and provided with oil-burning lights for night service. As the cutter head is normally raised and clear water pumped through the tail pipe to clear the line of sediment, the danger of clogging the siphon with settling mud and sand is eliminated.

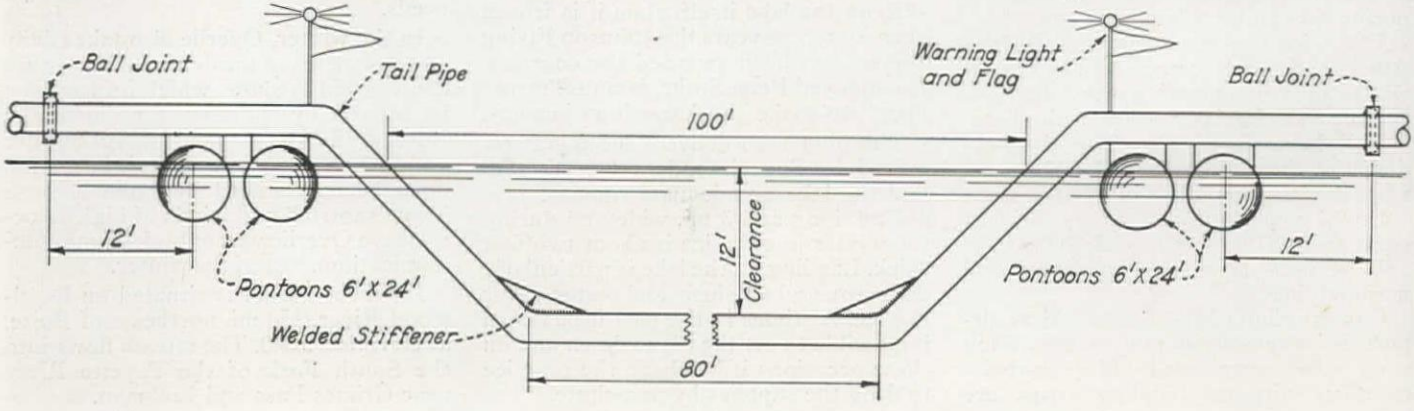


Cable Reels Lifted With Jacks Built From Scrap

MECHANICS in one of the shops of the General Electric Company have devised a simple jack which allows one man to easily handle heavy reels of cable with complete safety. A pair of the jacks can be made up in any shop from scrap materials always available. Two sets of jacks are shown in operation in the photo at the left.

The frame is composed of channel iron welded to a base plate to form the uprights. Suspended between the channels of the frame is a yoke which secures and lifts the reel on a pipe axis by the action of a threaded wheel. The wheel acts as a screw jack and can be rolled from a section of heavy pipe. The lifting jacks are equally valuable in handling either heavy reels of electrical cable or spools of wire rope. In either use the jacks are good insurance against the hazards of manual lifting of such heavy weights.

While the mechanics who devised this useful arrangement have employed it exclusively in the shop, similar jacks could be easily bolted to the floor of an ordinary truck for use in spinning cables of various types in the field.



Bridge-Laying Tanks Developed by British to Meet War Requirements

THE BRITISH ARMY evolved four ingenious tanks during the war capable of carrying and quickly setting up their own bridges. The bridges were designed to span medium obstructions up to 30 ft. in width, and were extensively used to cross small rivers, canals, anti-tank ditches and bomb craters. These tanks were widely used in the liberation of France and Belgium, and in the attack on Germany.

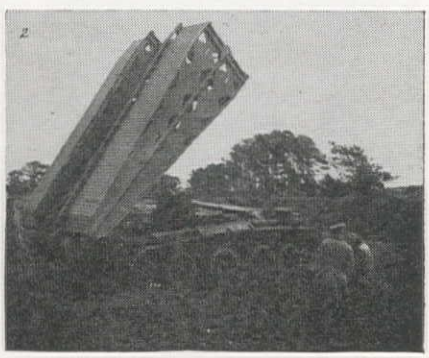
The drivers of the tanks are able to operate the placing mechanism from within the vehicle without undue danger to themselves. The four principal types were known as the "Scissor," "Churchill," "Ark," and "Twaby Ark."

The Scissors type bridge was carried on top of a Valentine tank and unfolded automatically. The successive stages in placing of one of these spans is seen in the pictures in the lower right-hand corner, which are self-explanatory. After the bridge has been set in place, the connecting pins may be removed, and the tank itself may proceed to cross the structure it has just erected.

The Churchill, illustrated in the upper left corner, carries a 30-ft. span steel trackway mounted on a Churchill tank hull. The span will carry up to 38 tons. The pictures show the sequence of placing a Churchill bridge during the assault on Roosendaal, Holland. The entire operation was completed in ten minutes, allowing a column of Churchill combat tanks to roll forward across what the Germans had hoped would be an impassable anti-tank ditch.

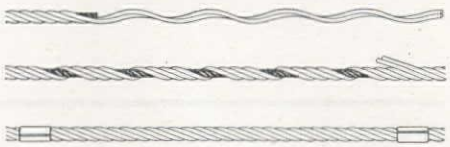
The Ark is also mounted on a Churchill tank hull and consists of two trackways made up of hornbeam sections of a small box girder bridge. They are fixed to form a bridge projecting in front of the tank and are held in place by steel wire rope.

The Twaby Ark is perhaps the most interesting of any, inasmuch as the tank itself becomes a part of the bridge across the opening. This vehicle carries two of the hornbeam sections of box girder, one extending out from each end of the tank, so that as the vehicle travels it forms a great moving V. When the gap to be bridged is reached, the tank itself drops into the hole and lowers the girders to the edges of the hole.



Wire Rope Spliced for Pulling Through Blocks

WHEN IT BECOMES necessary to replace an old and worn wire rope with a new one on any type of machine which requires reeving the new rope through blocks, over sheaves, and onto drums, the following suggested procedure will save time and money for the operator, as well as temper and profanity.



From the end of the old rope, unlay and remove four of the six strands to a distance of about two or three feet. In a similar manner, remove two of the six strands from the new rope to be installed.

Lay the two ends together in a short splice, pressing the two strands of the old rope into the groove left on the new. Then tape the ends to secure the bond and to prevent the strands from unraveling as the cable is bent. This scheme will permit the new cable to be easily, accurately, and rapidly pulled through the various sheaves, blocks, and pulleys of the machine as the old line is being removed.

The accompanying illustration indicates the method of removing two strands from one cable and four from the other, as well as the taping. The splice can of course be easily broken once the re-reeving is accomplished, and a clean new end established on the new rope.

This system of temporarily joining cables is applicable principally to preformed wire ropes, the strands of which are shaped so as to lie inert at all times.

NEWS OF WESTERN CONSTRUCTION

OCTOBER, 1945

Completion of Three Mexican Highway Links by End of '46

MEXICO'S SECTION of the Inter-American Highway from Laredo to Tapachula, on the border of Guatemala, a distance of 1,645 mi., will be completed by the end of 1946, reports Pedro Martinez Tornel, Mexican Minister of Communication and Public Works.

The Minister's statement, according to information received in Washington, reviewed construction progress on the highway.

The highway is now paved from Laredo to a point 60 miles south of Oaxaca. From that point to the Guatemalan border is a distance of 565 mi. of which 165 mi. in broken sections have been finished.

By the end of 1945, according to Minister Tornel, the highway should be completed as far as Las Cruces, leaving 263 mi. south to Tapachula to be completed in 1946. The Minister pointed out that the speed with which the program can be carried through will depend on financing, availability of materials, weather and other unpredictable factors. In any case, he said, at least 90 per cent of the Inter-American Highway in Mexico should be completed in the next 18 months.

Minister Tornel reported that work also was going forward on the Mazatlan-Durango link in the inter-ocean highway between Mazatlan and Matamores (opposite Brownsville, Tex.).

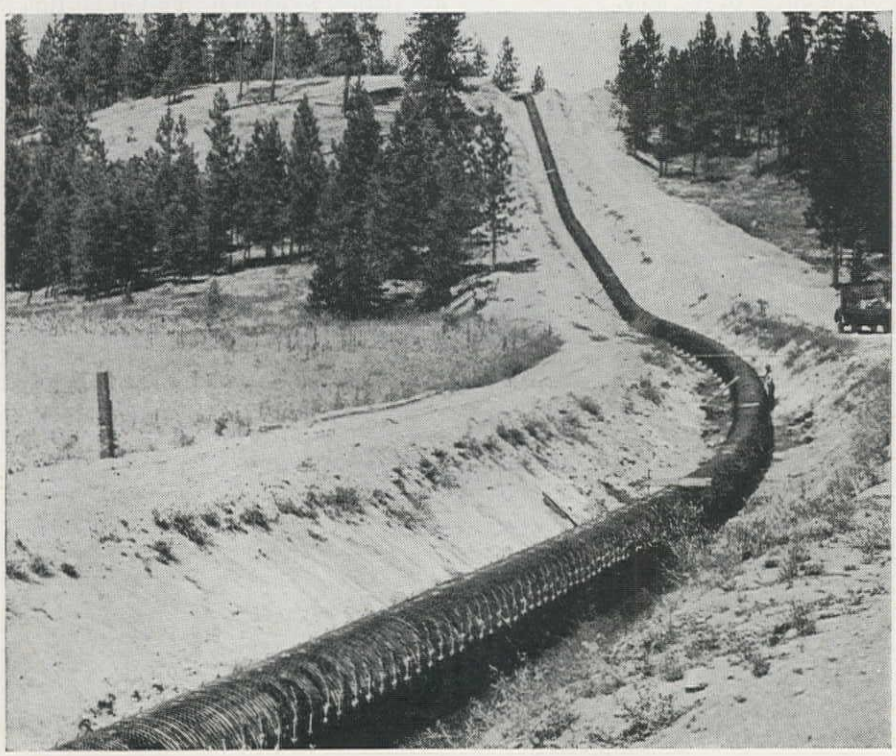
The Mexican Government, he said, would do everything possible to complete by 1946 the new overland rail connection with Yucatan and Campeche.

The new railroad in turn will be connected with the Inter-American Highway by a branch highway running from the rail line at Teapa to the highway at Tuxtla. This network of rail and highroad will bring the States of Tabasco and Chiapas in touch with through transportation routes.

The government hopes to complete soon the Sonora-Baja California line connecting Mexicali with the Southern Pacific of Mexico at Santa Ana, Sonora, and to push through work on the extension of the Kansas City, Mexico and Orient Railroad, all the way to the port of Topolobampo, Sinaloa.

IRRIGATION PIPE LINE FOR RATHDRUM PRAIRIE PROJECT

WOOD STAVE PIPE serves the Post Falls unit of the Rathdrum Prairie Project in northern Idaho. The Bureau of Reclamation installed this pipe to deliver water from the pumping plant situated on the Spokane river to 3,500 acres of project land. Ultimately this project will embrace 40,000 ac. of irrigable land. Two 30-c.f.s. electric driven pumps lift the water from the river to lands situated on a mesa.



New Sierra Laboratory Will Gather Snow Data

A SNOW LABORATORY will be established in Castle creek basin, near Donner Summit, on the California-Nevada boundary, under the direction of R. W. Gerdel, technical supervisor of cooperative snow research projects. When completed the laboratory will be staffed by a group of hydrologic engineers and meteorologists who will make studies of a number of pertinent problems relative to stream flow and forecasting flood control.

Of special interest will be the study of the ability of various types of snow to absorb and retain additional water content from rainfall; also a study of the effect of frozen ground surface prior to snowfall and water storage as it affects infiltration. The purpose of the studies is to accumulate data which will be beneficial to those interested in problems of water use and management.

Plans for the establishment of the laboratory were announced by Max D. Williamson, district forest ranger stationed at Big Bend, Calif., in whose district the laboratory will be located.

Many specialized instruments will be used in the Castle creek area to obtain

the critical snow and weather data. It is planned to use a number of self-recording gauges to determine temperatures of the snow and the underlying soil and rock during the varying atmospheric conditions.

Columbia Basin Report Transmitted to Capital

THE PRELIMINARY DRAFT of a comprehensive report on the potential development of land and water resources of the Columbia River drainage basin has been completed by the Pacific Northwest headquarters of the Bureau of Reclamation in Boise, Ida., and transmitted to the Washington, D. C., office for further study.

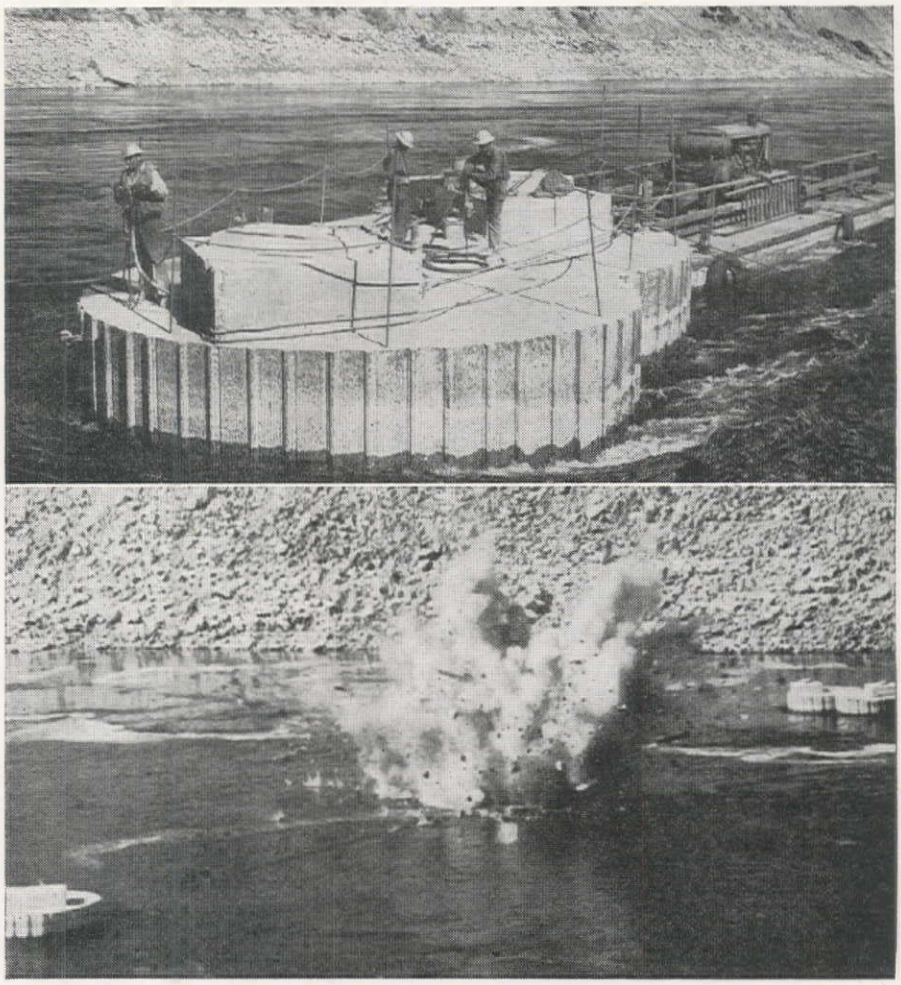
R. J. Newell, Acting Regional Director for the Bureau, said the report, subject to revisions and modifications until finally approved by Commissioner of Reclamation Harry W. Bashore and the Secretary of the Interior, will be made public when presented to Congress later this year.

The document will constitute the framework of a broad plan for the most beneficial use of water and other resources of the Columbia River and its vast network of tributary streams. It will list potential irrigation and multiple-purpose projects and outline their benefits, including the total area of new land which can be brought under irrigation, the acreage which can be furnished a supplemental supply of water, the production of additional blocks of hydroelectric power for new industries and farms, flood control, navigation and recreation improvements, and preservation of fish and wildlife.

Newell stressed that before the construction to be outlined in the completed report can be undertaken in its entirety, detailed studies must be made on many of the projects to determine their feasibility from an engineering and economic standpoint. A large number of these investigations are already in progress. The findings may result in new projects being added to the basin list and substitutions made for those initially included.

The drainage basin of the Columbia River covers a vast area. In the United States it embraces most of the states of Washington, Oregon, and Idaho, that part of Montana west of the Continental Divide, and small portions of Nevada, Utah, and Wyoming. In annual discharge, it is the second largest stream in the United States.

Similar basin reports have been made by other agencies. A program of development suggested by Bonneville Power Administration was outlined in *Western Construction News* for May, 1944. The National Resources Board also published a report on the area. The U. S. Engineer Department is making extensive studies of the Columbia watershed, as is the Northwest Development Association, an organization of the governors of the Northwest states.



BRIDGE PIER BLASTED FROM COLUMBIA CHANNEL AT COULEE

THE 480-TON CAP of an abandoned bridge pier below Grand Coulee dam was blasted out of the channel by Bureau of Reclamation engineers recently, to give tugs and barges unobstructed passage during dredging work. Above, drillers sink holes preparatory to placing 650 lb. of dynamite. Lower, the pier disintegrates under the detonation. Sheet piling driven around the cap was later pulled by barge derricks.

Rural Electrification Program Will Furnish Work for Many Contractors

BORROWERS OF REA loan funds in the Western states are resuming large scale rural power line construction, unfolding new opportunities for contractors during the reconversion period.

Rural Electrification Administration headquarters at St. Louis has announced that in September borrowers in these states had $18,421,637 in loan funds available to finance construction of new lines. This amount includes $11,561,596 which REA had allotted its borrowers prior to May 1, but had never advanced them, and $6,860,041 in new loans allotted 30 borrowers since that date from $200,000,000 authorized by Congress for REA loans during the current fiscal year. Additional loan applications are being received by REA and are being processed as rapidly as possible.

Total approved loan allotments currently available to borrowers in the area are: Arizona, $165,972; California, $640,488; Colorado, $4,153,108; Idaho, $810,870; Montana, $4,100,267; Nevada, $65,310; New Mexico, $1,742,956; Oregon, $3,391,112; Utah, $421,607; Washington, $1,503,307; and Wyoming, $1,426,640.

Loans allotted since May 1 provide for the construction of 4,609 mi. of distribution lines to serve 9,315 farms and other rural establishments in the 11 Western states. This is a start toward the goal of the REA borrowers to bring electricity to 86,700 rural consumers in this area within three years after materials and labor again are generally available. REA estimates that the three-year program in this region will involve an investment of $34,450,000 for construction of new lines, and $14,455,000 for improvements to existing power systems, construction of new generation and transmission facilities, and for relending to consumers for purchases of initial farm and household electric installations.

REA believes that the line construction work, including fabrication of materials, will create 17,000 man-years of

FIRST EXCAVATION MADE ON NEW FRIANT-KERN CANAL CONTRACT

HEAVY EQUIPMENT MOVES first dirt on a major postwar reclamation project which is part of the great Central Valley Project in California. The Friant-Kern canal, when completed, will be 160 miles long and will carry water from Friant Dam southward through the San Joaquin valley to Bakersfield. Peter Kiewit Sons, San Francisco, is the general contractor for the project. K. C. Wasson, superintendent, is an ex-Seabee and veteran of heavy construction on other Reclamation jobs.

labor. This does not include the labor that will be needed to install wiring systems, for which REA estimates each new farm consumer will spend an average of $145. Neither does it take into consideration the labor that will be required to install plumbing systems. It is estimated that 35 per cent of the new farm consumers will spend an average of $225 for this purpose.

The manufacture, sale, installation and maintenance of electrical equipment, for which REA believes each new farm consumer will spend an average of about $400, is still another source of employment in the program.

REA borrowers in Arizona are operating 632 mi. of lines serving 2,236 consumers; in California, 1,502 mi. serving 4,507; in Colorado, 7,045 mi. serving 20,343; in Idaho, 3,083 mi. serving 7,503; in Montana, 3,259 mi. serving 7,764; in Nevada, 121 mi. serving 461; in New Mexico, 1,362 mi. serving 3,645; in Oregon, 2,838 mi. serving 9,684; in Utah, 687 mi. serving 2,455; in Washington, 6,120 mi. serving 13,679; and in Wyoming, 2,280 mi. serving 5,893. This is a total of 28,929 mi. of REA-financed lines serving 78,170 consumers in the 11-state area.

Southern Plant Moves West to Open In Reno

A. L. KAERPER, general manager of Rocky Mount Manufacturing Company, Rocky Mount, Va., announces the construction of a new $500,000 sash and door plant to be erected at Reno, Nev. Preliminary work began September 20th, and the plant when complete will contain 120,000 sq. ft. of floor space. According to Kaerper the plant is expected to employ 400 skilled workmen, whose monthly payroll will total approximately $75,000.

The plant is strategically located to draw raw materials from California and Oregon lumber centers, including Susanville, Klamath Falls and Fall River Mills. It is expected the new plant will consume 30 million board feet of lumber per year in the manufacture of sash and door units. The Rocky Mount company makes a specialty of the R-O-W Spring Cushion windows, which it has manufactured in Virginia since 1939.

When the Reno plant is completed the company expects to move its entire manufacturing and machine facilities to the Western plant and retain only an assembling and distribution organization in the South.

Lumbermen's Group Moves to New Office

HEADQUARTERS of the West Coast Lumbermen's Association will be moved from Seattle to Portland sometime in 1946, according to Dean Johnson, Portland lumberman, president of the nation's largest lumber trade organization. The decision was reached at a directors' meeting of the lumber group on September 6.

Johnson pointed out that with the development and expansion of the lumber industry in Oregon in the past decade, Oregon now is the nation's largest producer of lumber and has led the nation since 1938, and Portland now is the center of the Douglas fir industry of western Oregon and Washington.

The action followed appointment of Harold V. Simpson, an Oregon man, to succeed Col. W. B. Greeley, resigned as secretary-manager.

At present there are 134 lumber firms located south of Portland and 78 north of the city, members of the West Coast organization, which represent about 80 per cent of the region's output, which in turn is approximately one-third of the nation's total lumber production. With the move toward stabilization of the industry and the trend toward cutting timber on a sustained yield basis, taking off the land each year only what it will grow, Portland will become the permanent headquarters of the West Coast industry.

The association has maintained offices at Portland, Eugene, Los Angeles and Washington, D. C., in addition to the Seattle headquarters. When Portland becomes the official home office the Washington, D. C., office will be closed and offices continued at Eugene, Seattle and Los Angeles. Present Portland offices are in the Yeon Building.

House Moving Contract Changed To Demolition

CONTRACTS FOR DISMANTLING and removal to new sites of 1,144 dwelling units of the Vanport, Ore., and Vancouver, Wash., housing projects have been changed to demolition contracts to be carried out by the same contractors.

Originally, Max Dudley of Roseburg, Ore., was to remove 60 units from Vancouver to Roseburg; Nettleton & Baldwin of Seattle had two contracts embracing a total of 924 units to be removed from Vanport and set up in Bremerton, Wash.; and Brady Construction Co. of Seattle was transferring 160 units to Poulsbo, Wash. With the termination of the war, however, the additional units were not needed in their new locations and the contractors are being allowed to keep all materials in the houses in exchange for their services in demolishing them.

It is anticipated by E. Stanton Foster, Assistant Regional Director of the Federal Public Housing Authority in Seattle, that additional war housing units will soon be demolished under similar no-expense contracts.

Stockton Engineers Ballot Collective Bargaining Issue

THE ENGINEERS CLUB of Stockton, Calif., has polled its membership concerning the proposed participation of the club in collective bargaining activites for its members. It had been proposed that the club become affiliated with the Engineers & Architects Association, an active Southern California group, as a local chapter. The vote was divided into three proposals: (1) Shall the club continue its present activities —yes 42, no 2; (2) Shall the club participate in collective bargaining—yes 7, no 33; (3) Shall the club join a state or national association, yes 9, no 31.

WASHINGTON NEWS
. . . for the Construction West

By ARNOLD KRUCKMAN

WASHINGTON, D. C.—Harry W. Bashore, the Commissioner, is definitely expected to resign from the Bureau of Reclamation by the year's end. There is much pressure from within the Department of the Interior to induce him to stay; it is difficult to find a man to succeed him who will command the support and confidence of the West. But there seems little doubt Bashore will quit. He has a strong will, is independent, and is doing exactly what he warned the Secretary he might do if the situation became impossible. Bashore obviously has felt that his code required he must go along without protesting outside against the actions and ideas in which he did not believe. Apparently he felt it was his duty to go along with a situation he did not approve so long as it did not threaten the fundamental essentials of the job as he conceived it. It appears to the outsider, however, that Bashore finally is convinced emotion rather than reason governs most of the administration of the Department of the Interior, and that the nervous wear and tear of the system is so corroding that any individual, no matter how he may try to armor-plate himself, can scarcely avoid a breakdown, similar to that which forced John Page to quit. Bashore undoubtedly reasons his health and his reputation as an engineer are more important than the effort to give his country service in an atmosphere of futility.

An inside job

Behind the scenes there are said to be feverish efforts to find some one who can take Bashore's place if he should go before a permanent successor can be found. Perpetual Harold, who has been Secretary of the Interior for almost fourteen years, and who appears to be good for at least another year, is now strutting his stuff in London, while Abe Fortas, classified as the Undersecretary, runs Interior officially. There are those in Washington who say he runs it unofficially when Ickes is on the job. Those in the know credit Fortas with the direction in which the Department is traveling. He is generally considered by the same people to be the core of the tight little group who used to be part of the Palace Guard, the shining lads who could go to see the Commander-in-Chief even when the Secretary could not get in. But there is no crystallized Palace Guard—yet; and it is probable that they reach this President by less direct means. But there seems little doubt that they reach him.

Truman is a grand person, the sort of man with whom you would leave the protection of your family with the absolute certainty they will be looked after as well as you would do it yourself. Truman is a man of intense loyalties. The quality is his strength and his weakness. His loyalties govern him. He is a Democrat, he regards his Administration as Democratic, and he honestly can see no claim to any part of this current Government by any other segment of the nation. If this were not true there would have been another Secretary of the Interior before this time.

What Western Democrat?

Whatever else the next Secretary may be, he must be a Democrat. And if you would like to test the resources of the West, try to find a Democrat who also is the type of man who has the qualifications to handle the job of running the Department of the Interior, and who has the added stature that would make him big enough to represent all the West, in the largest over-all sense. The West needs a great man of that calibre here now to save the $6,000,000,000 worth of assets created by the war, and to show Congress how to shape a policy that will enable the West to use those assets to preserve what it has gained, and to expand its opportunities into a firm grip on the future.

It seemed likely at one time that Sen. O'Mahoney of Wyoming might step into Ickes' office. But the medicine makers at the White House came to the conclusion it would not do because Wyoming was very apt to select a Republican as O'Mahoney's successor. It is likely that the party qualification may determine eventually who will become the next Commissioner of Reclamation. The name of Assistant Commissioner William E. Warne has often come up as a potential for the Commissionership. There is no doubt Bill would like it. The word hereabouts right now, is that Assistant Secretary Mike Straus may be chosen to succeed Bashore if he leaves before a permanent successor can be appointed. Straus has been at the right hand of Ickes almost since Ickes came into office. And, incidentally, this reporter has made a mistake. Straus is **not** the brother-in-law of William E. Warne. They are neither related by blood nor by marriage, although Warne makes clear he should be proud if it were so.

Valley Authority hearings

The Senate Committee for Irrigation and Reclamation held its Missouri Valley Authority hearings the last two weeks of September. There was much effort to make **the** star witness out of David Lilienthal, the head of TVA. The schedule included Assistant Secretary of the Interior Mike Straus, and Reclamation Commissioner Bashore. A number of CIO witnesses were marshalled by the Farmers' Union. They appeared on behalf of the establishment of the MVA. It was curiously obvious that the dynamos for both the champions of the MVA, and for those opposed, were located in Denver. There was emphasis on the apparent effort by foreign socialists to enshrine the TVA, and its prophets (such as Lilienthal) as milestones in the revolutionary history of human progress. In Europe as well as in Asia the liberals consider the Tennessee Valley Authority as a political and socio-economic form for government that will eventually supersede present units in the world's political structure, and will make possible the effective socialization of the globe.

The Central Valley affair

It is certain the collision between the Corps of Engineers and the Bureau of Reclamation in the Central Valley of California will shortly bring out of the White House a message to Congress recommending that a policy be established to prevent a similar embarrassment in the future. It is generally assumed the President will follow the formula provided in the amendment to the Flood Control Act of 1944, which made mandatory that under such circumstances the governor of the state must be consulted, and the Bureau of Reclamation and the Engineers jointly must present to the President and to Congress their recommendations for the solution of any controversy over the development of a project.

It is the word here that this Central Valley business should never have occurred. For the record, they will tell you Congress is at fault because it made authorizing laws which directed the two Federal agencies to do a duplicating job. Off the record, they will tell you that Mike Straus, on his recent California visit, discussed the Kings River project and unnecessarily implied there was a conflict with the Engineers. The people who talk to the people in the White House feel that if Straus had simply stated the Bureau of Reclamation would pick up the irrigation work where the Engineers left off, in building the dam, everything would have been smooth and unfrenzied. But after Straus talked, Gen. Robbins of the Engineers felt constrained to hurry to California; and when he heard a more or less first-hand report of the Straus speech, he apparently got mad and said in unconstrained terms that the Engineers would build the whole job, and what do you intend to do about it, or words to that effect. From the Kings River dam the argument spread to other Central Valley dams, and we here in Washington understand exploratory work by both agencies is going on in connection with practically every phase of the many millioned projects over which there are arguments. It sounds like a Gilbert and Sullivan opera bouffe, and it would be very fuuny, if it did not cost such a lot of money, and jeopardize some of the program of the Central Valley.

The other conspicuous phase of the Central Valley stew is the transmission line from Shasta Dam to Roseville, Calif., which Abe Fortas, in the name of Harold Ickes, will ask Congress to finance. We expect here that the request for this appropriation will be trigger for the

greatest fight over public and private power the country has ever witnessed in the Capital. It is generally assumed, judging by his strong support of the MVA and CVA, and of any and all other Authorities, by implication, the President will line up solidly behind Fortas and the project to build public transmission lines. Every one here understands clearly that success in putting this line over will mean public transmission lines wherever the Federal Government has power projects and no lines. Both the public power proponents and the private power interests are digging in for a big fight and a long siege.

The debates, ranging from Central Valley to swamp lands in the East, may develop unexpected ideas and bring out new champions who might be good timber for the Ickes job. The suggestion here is to keep an eye on Sen. Ernest W. McFarland, the junior Senator from Arizona. He is a specialist in irrigation and reclamation farming, as well as law; he has an attractive personality; he is credited with stature and solidity, and he is typical of the West in a large-spirited way. They say there is little he cannot discuss with amazing factual information and sound thought about all the West.

Highways

The Federal road appropriation will make available $500,000,000 each year for three years. The Public Roads Administration already has launched its postwar program, and the Federal Public Roads District Engineer, now assigned to each state, has been authorized to give the go-ahead signal. Cold and wet weather already having descended upon most of the country, the release is regarded as giving the states ample time to prepare for active beginnings next year, and as providing plenty of time for the contractors to repair machinery and equipment, and to arrange for new equipment.

Approximately $40,000,000 has been made legislatively available for postwar highway operations that were suspended in national parks and forests areas. Surveys and soil investigations for the enlarged program will proceed now as swiftly as practicable. Roughly $30,000,000 will be spent on highways in the parks and forests of the West, while $10,000,000 apparently is designed more particularly for the national parks in the East. The expenditures are to be spread over a period of three years. Meanwhile, $1,500,000 is available now to spend on the building of the forest roads, in the 1945-46 budget; the program is ready, the plans and specifications are prepared, and the work may go ahead.

The Public Roads people report that every state in the West has filed its proposals as required under the plan for the National Interstate Highway System, but that some states farther East have not made the necessary proposals.

PRA late in September announced $106,000,000 Federal-Aid funds for highways, which were frozen and piled up during the war years, may now be released by approval of the District PRA Engineers for immediate construction of projects which may be financed with these funds. The war froze $60,000,000 of Federal-Aid construction which was under way, and which has now been resumed.

Airport program

The Senate has voted (and the House is expected to concur) $375,000,000 to be spent in equal sums during the next five years to build 3,000 new airports and improve 1,600 in the states, cities and counties where the federal money is matched dollar for dollar. The bill enacted is S. 2, introduced by Sen. Pat McCarran. In the House it will be combined with HR 3615, the Lea bill. The President urged adoption of the legislation in his Message, which means he will sign the law as soon as it comes to him. There are now 3,505 airports and landing fields in the United States.

The several bills in the Congress which would provide a U. S. Military Academy and U. S. Naval Academy on the West Coast will be enacted if the President gives the word; and the President will give the word, if the Army and Navy brass hats say yes. The Navy apparently deems the program so likely that it sent a commission of five high-ranking officers to the West Coast to survey potential sites. Capt. H. A. Spanagel, head of the postgraduate school at Annapolis, is chairman. The report is that St. Mary's College, near San Francisco, is a preferred site.

The West Coast academy, when it comes into existence, is to be a post-graduate school. However, the majority of members of Congress wish it to be inclusive of all grades in Navy school training. If and when the issue reaches the floor of Congress, there will be division on this point. Los Angeles also has offered to provide a site for the Navy school. Still another site has been offered at Sausalito, Calif., now occupied by the Marin Shipbuilding Corp.; and still other sites at Whidby Island, on Puget Sound, and a site now occupied by the Washington Shipyards, Lake Washington, near Seattle. San Diego has not yet been heard from. Nor have many proffers been received for the Army Academy.

Miscellaneous

Revocation of controls over building materials and equipment and machinery, announced by OWMR John Snyder, was delayed for anxious weeks because the President and his advisers feared that relaxations would launch a tremendous break in the stabilization dam. They feared hoarding and speculation, and soaring prices, which might affect all other controlled prices. The present revocation is effective Oct. 15. The conditions provide strict regulations over inventories, as well as other controls to prevent the feared runaway market. It was not expected the controls would be liberalized until well into November or December.

The U. S. Geological Survey has funds to begin topographic surveys in the Columbia River Basin, and the Missouri River Basin. It also has the means to conduct with the state a postwar mapping program in California. Besides these funds, the Survey has $15,000,000 to investigate the chemical quality and the volume of surface and groundwater wherever the investigation is apparently necessary.

During the past year federal civilian employment in federal agencies increased: in California, 33,045; in Wash-

LATE WIRE

EARLY IN OCTOBER the entire California Congressional Delegation conferred with President Truman urging modification of the terms by which Kaiser may secure the Fontana steel mill from RFC. The action results from a conference between the Congressional delegations of California, Oregon, and Washington, Kaiser, and an international banker from the East who agreed to finance the Fontana enterprise under Kaiser's conditions. The banker represents a great financial institution which has fiscal relations with major iron and steel organizations in the East, not competitive with Kaiser. This banking house has no other western connections, this being its first adventure into the West.

Pacific Coast Congressmen are convinced that Kaiser should be placed in the same position as his competitors who have been allowed to write off certain war costs and charges. It is expected Truman may be persuaded to convince RFC to make necessary concessions.

Senate and House have enacted the concurrent resolution which enables states to contract highway construction in anticipation of federal funds to be available during the next three years.

The Senate Subcommittee on irrigation and reclamation held ten days of hearings on the Murray MVA bill and will report adversely to the bill. Sen. Langer of North Dakota in interest of the CIO Farmers' Union will present a minority report favoring MVA.

Approving a Judiciary Committee report, the House on Sept. 20 voted to quit-claim all right, title, and interest to lands beneath tidewaters and navigable streams within boundaries of individual states. The Senate Judiciary Committee is now considering the act. Ickes has raised a storm of objection, aided by Representative Sam Hobbs of Alabama, pressuring the Senate Committee for an adverse report and pointing to the "Washington Post's" editorial which calls such action affecting "United States last great petroleum reserves is a plunder of the national domain unequalled since Teapot Dome."

ington state, 10,117. The state-by-state table reveals the following figures of civilians employed by the Federal Government on the West slope: Arizona, 19,400; California, 313,400; Colorado, 27,600; Idaho, 9,100; Montana, 8,700; Nevada, 6,900; New Mexico, 15,900; Oregon, 17,700; Utah, 36,800; Washington, 98,100; Wyoming, 4,700. Total, 558,300 civilians are employed by the Federal Government in the 11 states of the West slope. The professional politician estimates this number of jobs may be translated into from 2,000,000 to 5,000,000 votes.

Personals

Lieut.-Gen. Raymond A. Wheeler, who commanded the Burma-India forces as Deputy Supreme Commander of Southeast Asia, will be the next Chief of Army Engineers. He succeeds Lieut.-Gen. Eugene Reybold, who retired on Sept. 30. Lieut.-Gen. Reybold is the first and only soldier not a graduate from West Point who ever became Chief of the Army Engineers. Gen. Wheeler is a West Pointer who came out of the Academy with a commission in the Engineers. He was an Engineer Colonel in World War I in France, served in the Panama Canal Zone, developed the supply line to Russia through the Persian Gulf, and has three awards of the Distinguished Service Medal. He is 60, and hails from Illinois.

Technical Sergeant Ladd Graham, Corps of Engineers, living at 1943 California St., Redding, Calif., was awarded the Soldier's Medal for heroism in kicking a smoking grenade out of the path of advancing troops, some of whom undoubtedly would have been injured or killed. Col. Thomas A. Lane, Corps of Engineers, living at 1020 16th St., Golden, Colo., was awarded the Distinguished Service Medal for services in the Southwest Pacific, where for two years, as an Engineer Officer, he took part in hazardous operations, among them the initial landing at Leyte.

Congressman Bertrand (Bud) Gearhart, of the San Joaquin Valley, in California, has been appointed as the Republican member on the committee of ten Congressional lawyers who will conduct the Pearl Harbor investigation.... W. S. Ingram, contractor and builder of San Francisco, formerly business manager of war training at the University of California, and recently head of the Industrial Manufacturing Section of the OPA in San Francisco, has been appointed national price executive of the Building Materials and Construction Price Branch, OPA, Washington, D. C.

OBITUARIES...

George D. Pessell, for 35 years an employee of the Los Angeles Department of Water and Power, died in that city on Aug. 20 at the age of 84.

* * *

Ralph D. Merrill, 51, died Aug. 4 at Missoula, Mont. He was the owner of the contracting firm known as R. D. Merrill Construction Co., of Helena, Mont., and had executed important contracts in all sections of the West.

* * *

Thomas C. Guyn, supervising engineer of the Indian Irrigation Service in San Francisco, Calif., died Aug. 19 in Salt Lake City, Utah. He was 59 years old.

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Maj. William A. Richardson, civil engineer on the staff of the Canadian Public Works Department successively at Courtenay, Nelson, and New Westminster, B. C., until joining the army in 1942, died in New York City Aug. 29, at the age of 55.

* * *

Harvey Debitt Heist, former civil and mining engineer and deputy surveyor for the U. S. Department of the Interior, died Sept. 8, at his home in Salt Lake City. He was 71 years old.

Speaking of Employment . . .

Plans Being Prepared For New Tacoma Bridge

PLANS FOR A NEW Tacoma Narrows bridge are being prepared by Charles E. Andrew, consulting engineer of the Washington State Toll Bridge Authority. Design of the new structure, which will replace the ill-fated bridge that failed November 7th, 1940, has already been passed by the consulting engineering board and it is expected the contract will be awarded soon after January first. Andrew states that the original piers and some part of the original structure can be used which will save $3,500,000. In addition to this amount the bridge will cost between $6,000,000 and $7,000,000.

Failure of the first Tacoma Narrows bridge occurred in a 42-mi. wind blowing transverse to its longitudinal axis, causing the deck to lift and pitch in an undulating motion. The new deck is designed to be 60 ft. wide as compared to the 39-ft. original bridge width. All of the new design features are in conformity with the comprehensive wind tunnel studies conducted at the University of Washington by Dr. F. D. Farquharson.

PERSONALLY SPEAKING

Ralph G. Wadsworth, widely-known consulting engineer, has been appointed city engineer for the City of San Francisco. He succeeds **John J. Casey,** who tendered his resignation because of illness. Wadsworth was at one time associated with Fred H. Tibbetts, civil engineer, and was a Captain in the Engineer Corps in World War I. He has served in numerous administrative posts, including that of deputy administrator of the WPA for the State of California from 1935 to 1941, and is a specialist in irrigation and reclamation projects. The date for him to assume his new duties has not been announced as yet.

* * *

Mills E. Bunger has been appointed head of the staff which will prepare the coordinated progress reports on engineering and economic surveys being made for a billion-and-a-half dollar development program in the Missouri River Basin. Bunger has been a member of the Bureau of Reclamation staff for 15 years. Prior to assuming his new position, with headquarters in Billings, Mont., he was Regional Planning engineer at the Denver office. Since joining the Bureau staff in 1930, he has assisted on the Yuma project as well as development in Utah, New Mexico, and Nevada. He also played a large role on the Colorado-Big Thompson Project and the Blue River-South Platte irrigation and power development project.

* * *

A. Middleton has been elected president of the newly-formed Victoria Contractors' Association. With the formation of this association, building contractors at Victoria, B. C., have followed the lead of the trade in Vancouver, New Westminster, Alberni and Port Alberni. Formation of similar groups throughout other B. C. cities is in progress, and it is hoped to weld all groups into a provincial body to be known as the British Columbia Contractors' Association. **A. Whiteman** has been named vice president of the Victoria association, **P. M. Townsend** is secretary-treasurer; **J. N. Finlay,** publicity chairman; and **H. R. Brown, H. Bradley, D. Donaldson, A. E. Evans, W. J. Drysdale** and **W. S. Bartlett** executive members.

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J. Ray Heath is president of the newly-organized General Engineering Co., Inc., Seattle, Wash. **G. H. Hammond,** vice president in charge of sanitation and waterworks, is now in Germany. The company is comprised of engineers of many fields, hence prepared to perform most kinds of engineering services, as well as architectural. Other members of the firm are: **H. J. Oliver,** secretary-treasurer, civil engineer, surveying and mapping; **C. Glen Smith,** civil engineer; **Lars Langloe,** hydraulic engineer; **A. J. Walters,** structural engineer; **A. W. Buell,** electrical engineer; **H. C. Thompson,** mechanical engineer; **T. M. Rowlands,** mechanical engineer; **R. R. Rudolph,** ventilation, heating and refrigeration engineer, and **Andrew McQuaker,** architect.

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Max W. King, McAllen, Texas, who was formerly with the Mexican Irrigation Commission on the Azucar Dam across the border from McAllen, and later as consultant on construction with offices in Mexico City, has been appointed project manager of the Ambursen Engineering Corp., New York City, on the construction of a highway between the Port of Manta and the inland town of Quevedo in Ecuador, South America. This road, when completed in 1946, will form the first highway link connecting the capital of Ecuador, Quito, with the Pacific Coast port, Manta.

JAMES H. TURNER has accepted the position of manager of Public Utilities for the City of San Francisco, Calif., where he has been chief engineer for some time. He replaces E. G. CAHILL who has resigned. Turner supervised construction of Pulgas tunnel, Hetch Hetchy aqueduct, and Bay crossing division. He also directed all phases of construction on contract work at Treasure Island, while preparing it for the Exposition.

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DeWitt C. Griffin and Associates, Portland, Ore., were chosen by the Kelso, Wash., City Council to prepare plans and specifications for a water system improvement program at Kelso, to involve an expenditure of approximately $400,000. The firm also has offices located in Seattle and Spokane, Wash. Simultaneously, the DeWitt firm announced the appointment of **Charles W. Finn** to the post of manager of their Seattle branch. Finn has been supervising mechanical engineer for the Boeing Aircraft Co. for the past two years. Prior to that he was connected with General Motors Corp., the Chrysler Corp., and Giffels & Vallet Inc.

W. DON SHAW, secretary-manager of the Mountain Pacific chapter of Associated General Contractors, Seattle, Wash., since 1941, has been appointed manager of the Southern California chapter succeeding FRANK J. CONNOLLY, who has been promoted to the post of executive vice president.

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Barney H. Stoutenburg and **George E. Miller,** formerly partners in the firm of Stoutenburg and Miller, have formed separate companies. Key men in the new Stoutenburg firm are **Carl Sund,** superintendent; **Hugh H. Clark,** office manager; **David Love,** engineer, and the organization is now sub-contracting on earthwork, roads and railroads at the naval ammunition depot, Hawthorne, Nev. Key men of the new Miller construction firm are **Arthur E. Larson,** office manager, and **Charles Burke,** pipe line foreman. The company is specializing in pipe lines, sewers and rock and sand.

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Winfield H. Arata, formerly senior civil engineer with the U. S. District Engineer Office in San Francisco, Calif.. has been named secretary-manager of the Northern California chapter of the Associated General Contractors of America, succeeding **Floyd O. Booe,** who resigned Aug. 1. Arata was formerly with the Golden Gate Bridge Authority and has been intimately connected with construction activity in the San Francisco Bay areas. He assumed his new duties on Sept. 24.

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George W. Howie, assistant city traffic engineer of Portland, Ore., and **Norman Kennedy,** of the Washington State Highway Department, were recently awarded a research fellowship in traffic engineering at Yale University. The Yale bureau of highway traffic was established in 1926 to conduct research in traffic engineering and provide professional training for men in that work. Awards are based on education and experience of candidates, with preference given those employed in street and highway engineering.

* * *

Captain James G. Gibbs has been transferred to the Seattle District U. S. Army Engineers as chief of the coordination section, supply division. Gibbs was formerly of Charleston, S. C., and was an engineer with the Shipyard River Terminal Co., Charleston, when called to active duty in 1942. After serving with the Army in the European theater for 2 years, he was returned to this country this year, being stationed at Ft. Belvoir, Va., until his transfer to Seattle.

* * *

L. Deming Tilton of San Francisco, Calif., and known throughout the nation as a planning expert, has agreed to make a survey and submit recommendations for a civic center at Reno, Nev. Tilton is now engaged as director of planning for the City

and County of San Francisco and was formerly director of the California State Planning Board.

* * *

Major C. C. Templeton, former Portland, Ore., man, has just been appointed chief of the supply division for the Seattle District U. S. Army Engineers. He was employed by Associated Oil Co. from 1927 to 1932, then served the Army Engineers as a civilian in the division office in Portland until joining the Army in 1942. There he served as chief of depot services for Seattle Army Engineer supply activities for Alaska and Pacific supply and went to the Seattle District when the North and South Pacific Divisions were consolidated.

* * *

Paul Tichenor, formerly general superintendent, **Merle F. Smith,** chief estimator, and **A. D. Stauffer,** chief engineer for the Ford J. Twaits Company of Los Angeles, Calif., which was dissolved recently with the retirement of Mr. Twaits, have entered into a partnership known as T-S Construction Engineers, Inc., and have offices at 1103 Security Title Insurance Bldg., Los Angeles. They will engage in building construction.

* * *

John S. Ward and **Paul Jarvis,** formerly partner-owners of the Puget Construction Co., Seattle, Wash., have dissolved that company and have formed two separate general contracting companies. The new organizations are: Cascade Contractors, Inc., 1200 West Ewing St., Seattle, John S. Ward, president; and Paul Jarvis, Inc., 3951 Sixth Ave., N. W., Seattle, under the direction of Paul Jarvis.

* * *

Lt. Col. J. Donald Kroeker is planning to reopen offices at Portland, Ore. Before joining the Army Corps of Engineers, Kroeker maintained offices at Portland as mechanical engineer, working and collaborating with architects on construction projects. While with the Army Engineers he was in charge of Post Engineers, Office of Engineers, Headquarters, Alaskan Dept., Anchorage. He will resume an interrupted practice in design and specifications for heating, air conditioning, steam power, plumbing and the equipment of buildings.

* * *

Robert A. Lowe, well-known figure of the heating and air-conditioning trade in California, has formed an association with **Robert M. Storms,** prominent consulting engineer of Los Angeles. The new organization of Storms and Lowe, with offices at 6359 Yucca St., Los Angeles, Calif., offer engineering and consulting services primarily in the fields of heating, ventilating, air-conditioning, refrigeration and plumbing.

* * *

The Dysart Engineering Co., a newly-organized firm of consulting, designing and constructing engineers, is opening offices in the Syndicate Bldg., Oakland, Calif., under the direction of **Ronald R. Dysart.** Dysart recently completed his work as head of the Electrical Power Branch of the Regional U. S. Maritime Commission, Oakland, and was before that a chief engineer for several Mid-West construction companies, and a testing executive for General Electric Corp., at Schenectady, N. Y.

* * *

Ernest P. Bryant has been named senior electrical engineer of steam generation of the Department of Water and Power of the City of Los Angeles. In 1920 Bryant joined the department. In 1940 he was advanced from assistant superintendent to superintendent of the Boulder power plant. When necessary, he assumed the duties of assistant electrical engineer of generation, and was recently appointed the senior electrical engineer in charge of steam generation, being transferred from Boulder to Los Angeles.

GLEN H. PHILPOT, assistant head of the San Francisco office of Donald R. Warren Co., is now designing the Fairfield-Suisun Army Air Base. He was also responsible for design of the Open Hearth Mill Building of Kaiser's steel plant at Fontana, California.

* * *

Herbert D. Fritz has accepted the position as city manager of Grand Junction, Colo. Prior to this appointment he was associate director of the American Public Works Association which he joined in 1942. Fritz is a graduate civil engineer of Iowa State College and has served local, state and federal agencies in administrative and technical capacities at Bettendorf and Burlington, Iowa; Urban, Ill.; Canton, Mo., and Omaha, Neb.

* * *

Eugene Zeiss, of San Diego, has been appointed registrar and executive secretary of the Contractors' State License Board, with headquarters in Sacramento, Calif. He assumed his new duties immediately upon appointment. Others elected to the board are **Jess Worthington** of San Diego, chairman, and **J. Philip Murphy,** engineering contractor of San Francisco, vice chairman.

* * *

Captain Roy A. W. Krows, former Seattle, Wash., engineer, was recently named assistant chief of the Supply Division and officer in charge of the transportation branch for the Seattle Dist. U. S. Army Engineers. While at Coulee Dam, Krows was called to active duty and sent to Ft. Belvoir, then to the China-India-Burma theater of operations. He was returned to the United States in 1944.

* * *

John C. Beebe, for the past several years regional engineer for the Federal Power Commission at San Francisco, has been named a special assistant to the Commission, with temporary headquarters at Coeur d'Alene, Idaho. He is succeeded at San Francisco by **Lesher S. Wing.**

* * *

Robert W. Hampton, formerly a superintendent at the atomic bomb plant, Hanford, Wash., and prior to that a superintendent at Hunters Point Dry Docks for Barrett and Hilp Construction Co., is now with the Empire Construction Co., Ltd., of San Francisco. In his new position he will supervise heavy industrial construction for the company.

* * *

Clarence B. Shain of Olympia, Wash., has been appointed Washington State Supervisor of Hydraulics. Shain replaces **Charles J. Batholet,** who will remain as office engineer. Before accepting his new post, Shain was Thurston County engineer at Olympia and city engineer for Centralia, Wash.

* * *

Arthur D. McVoy, director of the Portland, Ore., Planning Commission, has been appointed chief planning consultant for the city of Corvallis, Ore. McVoy will work directly with members of the commission, including City Engineer **V. L. Goodnight,** on all phases of civic planning for the city.

* * *

Megurdich Tanielian, civil engineer, is now associated with the Farm Security Administration, Dept. of Agriculture, at Lovelock, Nev. At present he is resident engineer on construction of Rodgers Dam at Lovelock, for which White Construction Co. of New York holds the contract.

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H. L. Blanton, Franklin County, Wash., engineer was elected president of the Washington State Association of County Engineers recently. **Hjalmar Walberg,** Skagit County engineer, was named vice president, and **A. G. Hanson,** Klickitat County engineer, secretary-treasurer.

* * *

Fred Nicholson, former structural designer in the Panama Canal Zone and in Balboa Heights, C. Z., is now engineer for the Haas Construction Co. of San Francisco, Calif., on its $218,467 contract to construct tent housing at Areas A and D, Oakland Army Base, Calif. **Don Weirick** is job superintendent of the project.

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J. M. Belle is now project engineer with the Montana Highway Dept. at Bozeman, Mont., and has been engaged in bridge construction at Bozeman. Prior to this assignment Belle was project engineer of bridges spanning the Fallon, Montana and Powder rivers.

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Walter T. Norris has resigned from the Bureau of Yards and Docks, and has reopened the office of the American Institute of Steel Construction in the Russ Bldg., San Francisco, Calif. He resumes his post of district engineer.

* * *

Jack Tabor, newly-appointed city engineer for Bend, Ore., has arrived there and assumed his routine duties. Tabor has been

employed full time by the city and will begin street, sewer system and airport surveys as part of Bend's program to get under way next year.

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Floyd Briggs is now engaged as heavy duty mechanic of Specialized Diesel Service for H. Houtman at Sacramento, Calif., who has been repairing and maintaining equipment for the U. S. Engineers.

* * *

Fred D. Hartford, bridge engineer for Public Roads Administration in San Francisco for the past year, is being transferred to Santa Fe, New Mexico, where he will be PRA bridge engineer for projects in that state.

* * *

John H. Vogt, superintendent of Division 2 of the San Diego County, Calif., road department, with headquarters in Ramona, has been appointed temporary county surveyor and ex-officio road commissioner.

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Sam V. Owen is now in Provo, Utah, with the state road commission. As chief drainage engineer with the commission, he is devoting his time to the design of drainage and securing right-of-way for postwar projects in the state.

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John A. Blume has opened offices at 68 Post St., San Francisco, Calif., and is now in the practice of consulting structural engineering.

* * *

W. M. Rawlings, Paul Lambert and **Ted Hill** have formed a new organization to engage in the manufacture of structural steel and tank fabrication. The new firm is located at 10036 Adella St., Southgate, Calif.

SUPERVISING THE JOBS

Ray Rasey is project manager for Winston-Utah-Vinnell on their contract covering a portion of the Lytle Creek project at San Bernardino, Calif. **Ben L. Richards** is general superintendent, **George Haensel** is assistant superintendent, **Vern Jeffers** equipment superintendent and master mechanic, **J. (Bill) Clark** equipment foreman and assistant master mechanic. **Ted Langan** is general foreman, and **Leonard Jones** excavation superintendent. Night superintendent is **Jack Robinson,** and **Martin Sheeran** night foreman. **Claude T. Crockett** is concrete superintendent, **Gust Carlson** quarry superintendent, **Oscar Benson** quarry foreman, **J. F. McCreight** office engineer, **S. A. Shappell** is in charge of personnel, **O. T. Bekken** office manager, and **Charles Peters** is purchasing agent. Grade foremen are: **J. J. (Woody) Wood, M. D. (Dale) Miller, Joe Clark, F. F. Smith** and **A. R. (Bob) Richardson.** Mechanical foremen are: **R. E. Caperton, B. J. Strobell** and **M. D. Murray. Emil Wikner** is in a similar capacity at the quarry.

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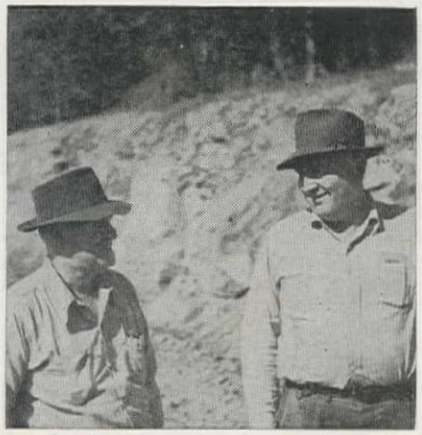
R. L. (Bob) Smiley is general superintendent of construction on two new housing projects at San Lorenzo Village, Calif., for David D. Bohannon Organization, Construction Division. **Sumner (Deck) Decker** is general foreman in charge of precutting operations. Other foremen on the job are: **Harry Brown,** in charge of grading for forms and concrete pouring; **George Dodson,** framing; **Howard Hall,** finish and hardware; **George Sherbourne,** foundations, and **Tom Foster,** painting. **Bob Shouse** is continuing in the capacity of personnel superintendent and **G. E. (Snuffy) Smith** has been transferred from G. W. Williams Co. to the Bohannon Organization and is acting in the capacity of general manager.

* * *

Morris P. Cushing is project manager, with **J. K. Halloran** assisting him, on the $3,868,196 contract held by J. A. Terteling & Sons of Boise, Ida., for the construction of additional storage facilities at the naval ammunition depot, Hawthorne, Nev. **H. B. McWaters** is construction superintendent, **John L. Moyer** chief engineer, and **L. C. Stenger** is office manager. **John R. Campbell** is truck superintendent and **Harold Lund** is master mechanic with **George O. Smith** assisting him. Foremen on the job are: **Wallace D. Rogers** and **Alfred Perry,** in charge of concrete; **L. F. Porter,** batcher plant; **Grayson L. Carl** and **Roy L. Clements,** excavations; **Helgard Olson** and **Van D. Jones,** general foremen, and general plant foreman is **Irvin Brashers. Eugene C. Hill, Paul Spletger, William Hellstern, Rod Tyler** and **Roy Willard** are area superintendents.

RAY JORGENSEN (left), office manager, and JACK JENSEN, superintendent, on the Strong & MacDonald section of the Kalama-Woodland highway being constructed by the Washington State Highway Department. An article covering this project can be found on page 95 in this issue of WCN.



George Waters is project manager for Stolte, Inc., on their contract for construction at the Fairfield-Suisun Air Base, Calif., **Elof Gustafson** is general superintendent and **Steve Miller** has been named general superintendent of the hospital area. **Fred Weiss** is chief office engineer, **Millard Hendricks** is in charge of purchasing, and **R. A. Adamson** is paymaster. Others holding important jobs on the project are: **Roy Copely,** superintendent of equipment; **Bob Davis,** concrete; **Bill House,** E. M. barracks area; **Vic Weidner,** B. O. quarters; **Pete Van der Haak,** administration area, and **Charlie Champion,** operations group area.

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W. A. Rohrer is general superintendent, **L. S. Rathbone** engineer, **E. G. McLellan** mechanical engineer, **Earl Comstock,** general carpenter foreman, and **Oscar Theisen** concrete foreman for Johnson Drake & Piper, Inc., Oakland, Calif., on their $1,099,900 contract to construct low cost housing at the Naval Ammunition Depot, Hawthorne, Nev. Others holding key positions on the project are: **George Thurman,** steamfitter foreman; **Jack Wahl, L. L. Brown, Ace Brasher** and **John Willbanks,** carpenter foremen, and **G. N. Dilworth,** paymaster.

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C. W. (Smoky) Wood is general superintendent of construction on Ross Dam, located in Whatcom County, Wash., on the Skagit River, for General Construction Co., J. F. Shea Co., Inc., and Morrison-Knudsen Co., Inc., holders of the general contract. Others in important positions are: **H. F. (Herb) Faulkner,** resident engineer for Seattle City Light; **T. H. Orme,** project manager; **Forest H. Jones,** assistant superintendent; **Rudy Salquist, T. R. (Ted) Harris, K. G. (Jack) Johnson** and **S. V. Jones,** foremen; **D. H. (Dave) Henderson,** office manager, and **C. D. Cook,** bookkeeper. Holders of other key jobs are **O. B. Ringe, A. D. Serener, J. L. (Jim) Wood** and **P. P. (Park) Patton.**

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B. C. Martin, for two years general superintendent for the Stronach Construction Co., Los Angeles, Calif., is now, among other projects, supervising the construction of a large store building at Adams and Broadway, Los Angeles, for that company. **Harold Lovold** is general foreman and **Ken Riesdorff,** office manager.

* * *

Al Meehleis is superintendent and **Bill Day** and **Bob Downing** are foremen for Anthony C. Meehleis, Los Angeles, Calif., on that company's contract for reinforcing steel placing on the Lytle Creek flood control project at San Bernardino, Calif.

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Edward L. Triem is job superintendent on the construction of a hotel, depot, power plant and residence facilities at Healy, Alaska. On the same job, **Glenn Best** is carpenter superintendent and **John Wood,** office manager. The $379,315 contract is held by C. F. Lytle Co., Green Construction Co., and Arthur F. Mathis, Fairbanks, Alaska.

* * *

Jack H. Hurley is job superintendent for Fredrickson & Watson Construction Co., Oakland, Calif., on their contract to construct an access road from Maitland Dr. to Oakland Airport, Oakland. Assisting Hurley on the job are foremen **Lee Jefford** and **Hop Farris. A. Fenske** is construction en-

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gineer, **Tom Brooks** office manager, and resident engineer for the State Division of Highways is **Fred Montell.**

* * *

Kenneth Lynch, former job superintendent for Sound Construction & Engineering Co., on the construction of runways at the Clatsop County, Wash., Airport, is now supervising a $1,888,925 construction project at Spokane, Wash., for Sound Construction & Engineering Co. and Peter Kiewit Sons Co., Seattle, Wash. Others on the project, which calls for five storehouses, concrete block sidewalks, an administration building, etc., are: **Don Boots,** grading superintendent; **Charles Ziegler,** building superintendent; **John Deffenbaugh,** utilities superintendent, and **Gordon Hammond,** office manager.

* * *

E. A. (Al) Smith is superintendent for J. A. Thompson & Son of Inglewood, Calif., on the coke storage plant, a part of the new work under way at the General Petroleum Co. plant at Torrance, Calif. **L. A. (Larry) Wood** is also a key man on the project, and **Thomas Burt Abrams** is in charge of the engineering for general Petroleum Co.

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O. C. Steves is superintendent for T. E. Connolly, San Francisco contractor, on the construction of the Conn Valley Dam at Napa, Calif. Others on the job for Connolly are: **William H. Hammond,** night superintendent; **John DeLuca,** in charge of spillway; **G. M. Newberry,** shifter; **C. E. Ramsey,** shifter; **Sam Fratto,** master mechanic; **Homer Schneider,** warehouse foreman, and **F. L. Kochler,** office manager.

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Ben Williams and **John Johnson** are general superintendents on the construction of additional magazines at the Bangor, Wash., Naval Ammunition Depot. Assisting superintendents are **Cecil Guinn** in charge of Area 1; **Clifford Larson,** Area 2; and **Charles Zeigler,** Area 3. **Charles E. Beaty** was named resident engineer of the project. Sound-Kiewit Co., Seattle, Wash., holds the $2,726,970 contract.

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R. M. Priebe, formerly job superintendent for A. Farnell Blair, Los Angeles, Calif., on the construction of homoja housing at Holtville, Calif., is acting as superintendent for that company again on its $615,973 contract for additional food storage buildings at Camp Pendleton, Oceanside, Calif. **O. W. Hensgen** is office manager, and **S. J. Curry** has control of purchasing.

* * *

R. S. Hardie, many-time superintendent of large Robert E. McKee, Los Angeles, Calif., jobs, is superintendent for that company again, in charge of constructing $4,040,850 maximum security disciplinary barracks at Camp Cooke, Calif. Chief engineer of the project is **Charles Kistenmacher** with **W. M. Edwards** assistant superintendent and **Vern Ragsdale** field office manager.

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Clarence Story is job superintendent for Earl Parker of Marysville, Calif., who holds a sub-contract for work at Conn Valley Dam, Napa, Calif. Working with Story as master mechanic is **George McBride.**

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.

A. D. Herman, foreman for Steelform Contracting Co. on jobs at Spokane, Wash., and Alameda, Calif., naval base, is now foreman for that company on its contract to install steelforms and steel pans at the naval ammunition depot, Hawthorne, Nev.

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Charles J. von Kampen, for many years a key man on the Coast in structural iron work, is superintendent of the iron work for Bressi-Bevanda & Macco on the Lytle & Cajon Creek project near San Bernardino, Calif. Rigger superintendent under von Kampen is **Walter Fortune. Ralph Nelson** is now master mechanic and **Joe Fink** shop foreman. In the field, **M. E. (Curly) Noble** is carpenter foreman of bridges and **Ross Phillips** of channel. **Charles O'Neil** is now cost engineer and **Al Clarke,** field engineer.

* * *

Louis Bodeen, well known job superintendent for Wick and Dahlgren of Seattle, Wash., is now supervising for that company a $717,480 contract involving the construction of 300 family dwelling units to be located at Tacoma, Wash. Others holding key positions on the project are: **A. Watten,** carpenter foreman; **H. E. Cooley,** grading foreman, and **Sig Ringstad,** in charge of dismantling buildings.

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Herbert Van Orden is job superintendent on one of the first large reconstruction projects to be launched at Honolulu. Others working with Van Orden on the $1,492,391 housing project for which James W. Glover of Honolulu holds the contract are: **R. T. Nakatani,** business manager; **Minoru Nakatani,** quantity estimator; **E. T. Oyama,** carpenter superintendent, and **Albert Kamm** and **Antone Vierra,** utilities superintendents.

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Don F. Micklethwaite, general superintendent for Atherton Construction Co. of Seattle, Wash., is in charge of the construction of a $125,000 dairy building at Seattle, for which the Atherton firm holds the contract. Working with Micklethwaite on the project are **Sam A. Berry,** concrete foreman, **W. C. Van Divort,** project manager, and **James B. Lewis,** purchasing agent.

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Charles Sheoling is assistant resident engineer, under **H. F. Faulkner,** for the city of Seattle, Dept. of Lighting, on the construction of Ross Dam. Some others on Faulkner's staff are: **Robert Sonntag,** office manager; **J. W. Conway, J. W. Bakfknecht, Roy Leith, Robert J. Loughlin,** and **Leo F. McCarty.**

Chester G. Nixon is job superintendent and **Don F. Micklethwaite** general superintendent for Atherton Construction Co., Seattle, Wash., on their $90,000 contract for extension to buildings at the Great Northern railroad terminal, Appleyard, Wash. **W. C. Van Divort** is project manager and **James B. Lewis** purchasing agent.

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G. L. Starbard is general superintendent for Beal & Roberts on their contract to construct a sludge oil reclamation plant at Manchester Navy Station, Wash. **Fred Gott** is resident engineer on the job. **W. P. Stroup** is superintendent for Lentz Plumbing and Heating Co., Inc., sub-contractors on oil lines, etc.

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Harold H. Root is coordinator and **Lloyd Johnson,** general superintendent with **Henry Lawson** assistant superintendent, on the Lytle & Cajon Creek Channel for Eggleston & Root, contractors, at San Bernardino, Calif. **Guy Bostwick** is engineer, **S. D. Weeks** office manager, and **John C. Beaver** master mechanic.

* * *

Adolph Bauer has been named job superintendent for A. Teichert & Co. and John C. Gist of Sacramento, Calif., on their $99,869 contract for repairing and reshaping existing shoulder and resurfacing the road between San Ardo and King City, Calif. Assisting Bauer on the project are **George Augusta,** master mechanic, and **Frank Algren,** plant foreman.

* * *

W. W. Cresswell is supervising the construction of roads, hard-surfaced loading facilities and utilities for a storage warehouse at San Antonio, Tex., for Judson H. Phelps, San Antonio, who is holder of the $58,000 contract. Working with Cresswell are **R. G. Halter,** field engineer, and **C. T. Gay,** field auditor.

* * *

Ed. S. Ferguson, who has supervised several jobs for J. K. Thomas & Beyer Construction Co., of Los Angeles, Calif., is now job superintendent for that company on the construction of a store and theater building at Long Beach, Calif., which is to cost $125,000. Project manager is **R. W. Beyer,** with **R. E. Abrahamson** in charge of project purchasing.

* * *

Daniel Peterson, job superintendent for Ross B. Hammond of Portland, Ore., is in charge of construction of a $75,000 reinforced concrete plant bldg. at Portland for which the Hammond firm holds the contract. General superintendent of the job is **H. M. Mason,** and **A. V. Peterson** is general superintendent of purchasing.

* * *

Edward Weaver, job superintendent for Noel M. Calhoun, Los Angeles, Calif., is in charge of the construction of a $125,000 storage building and addition to a cottage cheese plant at 1100 Goshen Ave., Visalia, Calif. **Sam B. Jones** is in charge of concrete and **Ted I. Swimmer** is purchasing agent for the project.

* * *

Harry E. Hatfield is general superintendent, **Tom West,** masonry foreman, **E. M. Huff** and **Roy Long,** carpenter foremen for Horace Shidler, Las Vegas, Nev., on that company's $123,000 contract to construct

three apartment buildings, containing a total of 24 units at Las Vegas.

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B. W. Riggs is job superintendent for the Century Construction Co. of Seattle, Wash., on their $82,057 contract to erect a Civil Engineering building on the campus at the University of Washington, Seattle.

* * *

C. R. O'Connor has been named job superintendent for the construction of an office building, cafeteria and boiler house at the A. A. F. Intransit Depot, Alameda, Calif., by J. D. O'Connor Construction Co. of San Francisco, who were awarded the $814,364 contract. Project engineer on the job is **J. D. LaRock.**

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J. Kenneth Boulware and **G. Patchin** are job superintendents at the naval ammunition depot, Hawthorne, Nev., for Soulé Steel Co., who are sub-contractors on the project. Foremen on the job are: **Tom Huntley, C. H. Boulware** and **E. Cademartare.** Office manager and paymaster is **Kenneth Riddle.**

* * *

Carl Edwards is superintendent for Thomas Beyer Construction Co. on expansion work at the U. S. Naval Hospital, Corona, Calif. Carpenter foremen are **Lawrence Ostberg, A. J. (Art) Henriksen** and **George O. Guss. Larry C. Baetz** is office manager. **Del Holloway** is superintendent for Arch Rib Truss Co., who have the steel on the project, the principal building of which is the new auditorium. **Ralph Hannibal** is superintendent for Drury Electric Co., also sub-contractors.

* * *

Jim Lynch, Jr., of the Lynch Construction Co., Los Angeles, is personally supervising construction of housing for workers of the Pacific Electric Railway Co. at Soto and Charlotte Sts., Los Angeles. **C. C. Neff** is the engineer representing the Pacific Electric Railway on the job.

* * *

T. J. Hawley has been named job superintendent for Guy F. Atkinson Company of San Francisco, Calif., on their $168,000 contract for site clearance and piledriving for an ordnance shop at the U. S. Naval Drydocks, Hunters Point, San Francisco, Calif.

* * *

A. L. Acton, job superintendent for Taggart Construction Co. of Cody, Wyo., is now in charge of construction for that company on its $84,483 Meeteese-Pitchfork oil access road job in Wyoming.

* * *

William Miller is supervising the construction of an eight-room school addition at Montebello Park School, Montebello, Calif., for R. J. Daum, Inglewood, Calif., who holds the $113,450 contract.

* * *

Leonard Patzer is job superintendent for Ed. R. Viesko, Salem, Ore., on that company's $80,000 contract to construct a battery manufacturing plant at Salem. Assisting Patzer as carpenter foreman is **Ray Lille.**

* * *

Bert C. Lee is equipment superintendent of the new yard just completed by Engineers Limited, which covers an area of 3½ ac. on Anaheim Telegraph Road, Los Angeles. **Bill Bell** is the new expediter.

* * *

Joe Pleasant is job superintendent for K. C. Wilson & Co., Phoenix, Ariz., on their $62,175 contract to construct a 7-classroom domestic science room and other additions at the Washington School, Phoenix, Ariz. Carpenter foreman is **Jack Wuorinen.**

* * *

Lyman Woods is superintendent for William Curlett, contractor, of Long Beach, Calif., on the new plant of the Lamb Transportation Co. being built at 223rd and Alameda Sts., Los Angeles, Calif.

* * *

J. B. Wideen, for many years in key positions with Myers Brothers of Los Angeles, Calif., is now foreman on various service stations under construction by that company.

* * *

W. J. Davis, formerly with the Braum Corp. in the East, and on foreign service, is now superintendent for Buttress & McClellan of Los Angeles, Calif., on the new building that company is erecting for Paul F. Wagner Co., at Los Angeles.

* * *

D. A. Bourne is general superintendent on all work for Burton F. Dinsmore of Los Angeles, Calif., and **John H. O'Brien** is superintendent on the new repair shop being built by that company for the Harbor Box Co. of Los Angeles.

* * *

George Montgomery is superintendent for William J. Moran Co. of Alhambra, Calif., on their contract to erect buildings at the Whiteman Air Park, Pacoima, Calif.

* * *

F. N. Guyton is job superintendent for Arch Munn of Dallas, Tex., on that company's contract to erect a warehouse addition of brick and reinforced concrete at Dallas to cost $70,000.

* * *

Henry L. Smith is master mechanic, **Dug Dribble** truck master foreman, and **Len Corree** transportation superintendent at the Stolte, Inc., shop at San Leandro Blvd., Oakland.

* * *

John C. Lee, formerly with the Ford J. Twaits Co., is supervising construction for Ted R. Cooper Co., Inc., on the addition to the Shepherd Tractor Co. building at Los Angeles.

* * *

Tom Finden was named job superintendent for Summit Construction Co., Rapid City, S. Dak., on its contract for gravel replenishment of state highways in North Dakota. **George P. Hurst** is field clerk.

* * *

Cecil Copeland, for several years with Walter Rudine Steel Co., is superintendent on its various jobs in Los Angeles County, Calif.

* * *

W. S. Kimble is now in San Bernardino with Bressi - Bevanda - Macco Co., where they are cutting a new channel for control of flood waters of Lytle Creek.

UNIT BID SUMMARY

Highway and Street...

Idaho—Lemhi County—State—Grade and Surf.

Duffy Reed Construction Co. made the low bid of $30,136 to the Idaho Bureau of Highways, Boise, for the construction of 9.3 mi. of SR No. 28 from Salmon to Baker and 25.3 mi. of U. S. No. 93 between Salmon and McKim Creek. Unit bids submitted are as follows:

(1) Duffy Reed Construction Co. $30,136
(2) Standard Asphalt Paving Co. 34,626
(3) Western Construction Co. 37,005
(4) A. D. Stanley 37,787
(5) Carl E. Nelson Co. $39,865
(6) Nic Burggraf 40,567
(7) H. A. Gardner 41,810
(8) Engineer's Estimate 39,092

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1,110	bbls. MC-3 liquid asph. seal coat	4.70	5.25	6.00	5.50	5.50	5.75	6.00	6.00
2,150	cu. yd. cover coat matl. Type "X"	1.35	1.50	1.50	1.80	2.00	2.00	2.50	1.75
1,300	cu. yd. cr. gr. surfacing	1.25	1.50	1.00	1.00	2.00	2.00	1.50	1.00
2.0	mi. mixing, finishing and rolling	500.00	$1,000	600.00	900.00	$1,000	$1,000	$1,000	$1,000
740	bbls. SC-3 liq. asph. for road mix	4.11	5.25	5.50	5.30	5.50	5.75	5.75	5.50
2,160	bbls. SC-3 liq. asph. seal coat	4.53	5.25	6.00	5.50	5.50	5.75	6.00	6.00
4,080	cu. yd. cover coat matl., Type "X"	1.60	1.55	1.75	2.00	2.00	2.00	2.00	1.75
1.5	mi. recondition exist. surfacing	25.00	50.00	300.00	500.00	500.00	300.00	300.00	800.00

California—Mendocino County—State—Grade and Surf.

John Burman & Sons, Eureka, submitted the low bid of $66,699 to the Division of Highways, Sacramento, for the construction of a concrete bridge and grade and surface approaches situated about 13 mi. north of Fort Bragg at Blue Slide Gulch. The following is a summary of the unit bids submitted:

(1) John Burman & Sons $66,699
(2) Fred J. Mauer & Son 69,996
(3) Guerin Bros. $74,559
(4) Fredrickson & Watson Construction Co. 83,457

		(1)	(2)	(3)	(4)
3	cu. yd. removing concrete	10.00	10.00	10.00	12.00
2.5	acre clearing and grubbing	300.00	200.00	50.00	70.00
33,000	cu. yd. roadway excavation	.77	.65	1.00	.65
490	cu. yd. structure excavation	2.00	4.00	1.50	3.00
240	cu. yd. ditch and channel excavation	2.00	2.00	2.00	3.00
1,550	cu. yd. trench excavation	1.00	1.00	1.00	2.00
155,000	sta. yd. overhaul	.01	.02	.01	.012
750	cu. yd. imported base material	3.00	2.70	2.00	4.75
Lump sum,	developing water supply and furn. watering equip.	400.00	300.00	$1,000	600.00
410	M. gal. applying water	2.00	2.00	3.00	2.40
10	sta. finishing roadway	12.00	15.00	15.00	12.00
4	ton liquid asphalt, MC-2 (prime coat)	50.00	50.00	100.00	50.00
20	cu. yd. sand (prime coat)	4.00	4.00	7.00	6.00
7	ton paving asphalt (seal coat)	50.00	50.00	100.00	35.00
60	cu. yd. screenings (seal coat)	7.00	7.00	7.00	6.00
331	cu. yd. Class "A" P.C.C. (structures)	34.00	45.00	45.00	70.00
25	cu. yd. Class "A" P.C.C. (pile encasement)	38.00	60.00	50.00	82.00
40	each, driving steel piles	82.00	150.00	100.00	70.00
72,220	lb. furnishing bar reinforcing steel	.0424	.05	.04	.05
72,220	lb. placing bar reinforcing steel	.0132	.02	.015	.04
5,150	lb. miscellaneous iron and steel	.32	.25	.35	.46
380	lin. ft. tee-rail bridge railing	3.158	3.00	1.50	4.75
22	each, monuments	4.00	4.00	5.00	3.50
24	each, culvert markers and guide posts	4.00	4.00	5.00	3.50
0.41	mile rem. and reconstr. existing prop. fences	$1,500	$2,000	$1,000	$1,160
111	lin. ft. 18-in. R.C.P.	3.50	3.50	4.00	4.75
93	lin. ft. 24-in. R.C.P.	5.50	5.00	5.00	7.00
24	lin. ft. installing 24-in. C.M.P.	1.00	2.50	2.00	2.40
230	lin. ft. salvaging C.M.P.	1.00	1.00	2.00	1.20
34	lin. ft. relaying salvaged C.M.P.	1.00	1.00	2.00	1.20
570	lin. ft. installing 6-in. P.M.P.	.50	.60	.50	.60
300	lin. ft. installing 8-in. P.M.P.	.60	.60	.50	.60
1,000	cu. yd. filter material	3.00	3.00	2.00	4.75
Lump sum,	removing bridge	$3,510	$1,000	500.00	$2,300

Montana—Gallatin, Park Counties—State—Grade and Surf.

Union Construction Co., Great Falls, made the low offer of $448,545 to the State Highway Commission, Helena, for the construction of 3.9 mi. of Bozeman Hill section of Livingston-Bozeman Highway. The following is a summary of the unit bids received:

(1) Union Construction Co., Inc. $448,545
(2) Northwestern Engineering Co. 464,538
(3) McNutt Bros. 466,814
(4) McLaughlin, Inc. $478,909
(5) Big Horn Construction Co. 520,243
(6) J. C. Boespflug Construction Co. 534,985

Commission's estimated cost, $280,336.

		(1)	(2)	(3)	(4)	(5)	(6)
511,886	cu. yd. unclass. excav. and borrow	.58	.53	.48	.58	.72	.65
1,893	cu. yd. culvert excavation	1.50	3.00	1.50	1.50	1.60	3.00
587,000	sta. yd. overhaul	.01	.015	.02	.01	.01	.005
107,664	mi. yd. overhaul	.15	.15	.30	.20	.20	.20
35,700	tons base course, cru. rock surf.	1.20	1.75	1.80	1.50	1.10	1.60
15,144	tons Type "A" top crse., cru. rock surf., Grade "A"	1.40	1.90	2.25	2.00	1.43	2.35
867	tons stone chips, grading "A"	5.00	4.50	4.00	5.00	3.25	6.00
2,100	cu. yd. binder	.30	.20	.50	.25	.50	.15
4,200	mi. yd. overhaul on binder	.15	.10	.25	.20	.10	.15
5,100	M. gal. watering	1.30	1.90	2.00	2.00	1.60	2.00
210	units rolling	6.00	4.25	10.00	6.00	6.50	8.00
80,841	gal. appl. of MC-3 cutb. asph.	.11	.11	.12	.10	.10	.16
3.987	mile processing	700.00	950.00	800.00	800.00	800.00	300.00
24,412	gal. seal coat oiling (150-200 asph.)	.10	.11	.12	.13	.10	.16
4,215	gal. prime coat oiling (MC-1 cutb. asph.)	.10	.12	.15	.15	.10	.16
244	lin. ft. 15-in. rein. conc. pipe culv.	2.00	2.25	2.10	2.50	2.25	2.35
76	lin. ft. 18-in. rein. conc. pipe culv.	3.50	3.00	2.70	3.00	3.00	2.75
740	lin. ft. 24-in. rein. conc. pipe culv.	4.00	4.20	4.60	4.50	4.50	4.50
168	lin. ft. 36-in. rein. conc. pipe culv.	9.00	9.00	9.50	9.00	9.00	9.00
184	lin. ft. 48-in. rein. conc. pipe culv.	15.00	16.00	15.00	16.00	15.00	18.00
360	lin. ft. 24-in. rein. conc. pipe culv., ex. str.	5.00	5.00	5.00	5.00	4.50	6.00
116	lin. ft. 36-in. rein. conc. pipe culv., ex. str.	10.00	10.00	11.00	11.00	10.50	11.00
184	lin. ft. 4-in. vitrified tile drain	1.00	1.25	2.00	1.00	.65	3.60
68	lin. ft. 18-in. corr. metal syphon pipe	3.00	4.00	4.00	2.50	3.75	5.80
440	lin. ft. 24-in. corr. metal syphon pipe	6.00	5.10	5.50	3.50	4.75	6.50

27,000 lb. reinforcing steel	.10	.07	.08	.10	.07	.14
248 cu. yd. Class "A" concrete	38.00	42.00	40.00	40.00	30.00	45.00
0.86 cu. yd. Class "B" concrete	40.00	42.00	50.00	40.00	32.50	45.00
14.86 M.F.B.M. treated lumber	200.00	175.00	200.00	200.00	175.00	180.00
0.36 M.F.B.M. untreated lumber	200.00	150.00	150.00	200.00	150.00	120.00
4 each, 10-ft. treated timber piles	20.00	25.00	30.00	15.00	25.00	25.00
26 each, 25-ft. treated timber piles	38.00	60.00	75.00	37.50	60.00	45.00
Lump sum, rev. exist. str. and maint. traff. (222-C)	500.00	$2,000	$2,500	$1,000	200.00	$2,000
Lump sum, rev. exist. str. and maint. traff. (166)	500.00	$3,000	$2,500	750.00	400.00	$2,000
550 lin. ft. No. 42 metal ditch lining	3.00	2.40	4.00	2.00	3.50	2.50
0.19 M.F.B.M. untr. lumber in headgate	200.00	175.00	150.00	200.00	200.00	120.00
106 each, concrete guide posts	5.00	12.00	8.00	8.00	12.00	8.00
2 each, concrete project marker	15.00	20.00	15.00	10.00	15.00	8.00
25 each, concrete station marker	3.00	5.00	5.00	4.00	7.50	5.00
104 each, concrete right of way monuments	3.00	4.50	3.00	3.00	3.00	3.50
600 ton, stock piled cru. rock	1.40	2.00	2.00	2.00	1.10	1.10

New Mexico—Lea County—State—Grade & Surface

Walter L. Denison & G. I. Martin, Albuquerque, were awarded the contract on the low bid of $307,516 to the State Highway Department, Santa Fe, for the construction of 19 miles of US No. 62 between Hobbs and Lovington. Summary of the unit bid follows:

(1) Walter L. Denison & G. I. Martin.....$307,516
(2) J. E. Skousen..... 374,724
(3) W. T. Bookout Construction Co..... 385,227
(4) Skousen Construction Co. $453,047
(5) Allison & Armstrong 466,620

	(1)	(2)	(3)	(4)	(5)
Lump sum, removal of old drainage structures	250.00	$1,000	$1,500	500.00	100.00
Lump sum, removal of obstructions	250.00	500.00	$1,000	500.00	200.00
197,854 cu. yd. excavation—unclassified	.53	.70	.60	1.00	1.15
775 cu. yd. excavation for pipe culverts	2.00	2.50	2.00	3.00	2.50
2,920 hour rolling—sheepsfoot roller	4.00	6.00	5.50	4.00	4.50
829 hour rolling—steel tired roller	5.00	6.00	6.00	5.00	6.00
5,863 M. gal. watering	2.00	3.00	2.50	3.00	2.50
2,200 lin. ft. std. reinf. conc. culv. pipe—24-in. diam.	5.00	5.00	7.00	5.00	5.75
132 lin. ft. std. reinf. conc. culv. pipe—30-in. diam.	8.00	8.00	9.00	6.50	8.00
560 lin. ft. std. reinf. conc. culv. pipe—36-in. diam.	10.00	10.00	12.00	9.50	10.50
2 ea., reinf. conc. monument and marker	50.00	100.00	50.00	50.00	50.00
92,230 lin. ft. galvanized barbed wire fence	.10	.10	.10	.12	.12
30 ea., gates (Texas type)	10.00	20.00	12.00	10.00	6.00
96 ea., bracing	3.00	5.00	3.00	3.00	4.00
120 ea., right of way and station markers	10.00	6.00	6.00	4.00	5.00
10,516 lin. ft. removing and rebuilding fence	.10	.10	.20	.10	.08
426 hour mechanical tamping	6.00	6.00	10.00	5.00	3.00
1 ea., removing and rebuilding cattle gaurds	250.00	500.00	250.00	500.00	300.00
67,343 ton leveling course	.91	1.07	1.30	1.25	1.15
1,763 bbl. cutback asphalt Type MC-1	4.25	4.50	5.00	5.00	5.00
20,538 ton top course surfacing	1.05	1.07	1.30	1.50	1.40
7,824 bbl. cutback asphalt Type MC-3	4.25	4.50	4.50	4.50	4.60
19.028 mi. mixing asphalt and aggregate	600.00	500.00	600.00	$1,000	600.00
19.028 mi. preparation of subgrade foundation	100.00	500.00	450.00	200.00	200.00
17.586 mi. finishing roadside ditch	200.00	200.00	450.00	200.00	200.00

California—San Diego, Orange Counties—State—Grade and Pave

N. M. Ball Sons, Berkeley, submitted the low bid of $637,799 to the Division of Highways, Sacramento, to widen about 9.5 mi. of existing highway between Las Flores Creek and San Clemente and to pave with portland cement concrete, also resurface portions with asphaltic concrete. Summary of the unit bids received follows:

(A) N. M. Ball Sons.....$637,799
(B) Matich Bros. 696,579
(C) Basich Bros. Const. Co. and Basich Bros. 709,282
(D) Griffith Co. 722,453
(E) Peter Kiewit Sons 786,586
(F) Tanner Construction Co.....$791,634
(G) Oswald Bros. 827,281
(H) Ralph A. Bell 836,489
(I) Macco Construction Co..... 889,810
(J) J. E. Haddock 898,543

(1) 65 cu. yd. removing conc.
(2) Lump sum, clearing and grubbing
(3) 176,000 cu. yd. roadway excav.
(4) 2,400 cu. yd. structure excav.
(5) 175 cu. yd. ditch and channel excav.
(6) 20,000 cu. yd. imported borrow
(7) 4,610,000 sta. yd. overhaul
(8) 133,000 sq. yd. recompacting subgrade
(9) 51,000 sq. yd. cem. treated base (6-in. thick)
(10) 73,000 sq. yd. cem. treated base (4-in. thick)
(11) 6,500 bbl. portland cem. (cement treated base)
(12) Lump sum, dvlpg. wtr. sply. & furn. wtg. eqpt.
(13) 5,500 M. gal. applying water
(14) 501 sta. finishing roadway
(15) 305 tons asph. emulsion
(16) 800 tons liq. asph. (bit. surf. tr.)
(17) 99,000 sq. yd. prep., mxg. & shpg. surf. (bit. surf. tr.)
(18) 31,500 tons asphalt concrete
(19) 325 lin. ft. raised bars
(20) 26,300 cu. yd. P.C.C. (pavement)
(21) 2,000 ea. tie bolt assemblies
(22) 290 cu. yd. Cl. "A" P.C.C. (structures)
(23) 32,000 lb. bar reinforcing steel
(24) 1,600 cu. yd. heavy stone riprap
(25) 95 cu. yd. Cl. "A" P.C.C. (curbs)
(26) 1,000 ea. curb dowels
(27) 20 ea. monuments
(28) 930 lin. ft. metal plate guard railing
(29) 3,320 lin. ft. moving and reconst. guard railing
(30) 115 ea. culv. mkrs. project mkrs. and gd. posts
(31) 1.6 mi. removing and reconst. property fences
(32) 82 lin. ft. 8-in. C.M.P. (16 gauge)
(33) 30 lin. ft. 12-in. C.M.P. (16 gauge)
(34) 98 lin. ft. 18-in. C.M.P. (16 gauge)
(35) 52 lin. ft. 18-in. C.M.P. siphon (16 gauge)
(36) 66 lin. ft. 24-in. C.M.P. (14 gauge)
(37) 26 lin. ft. 42-in. C.M.P. (12 gauge)
(38) 110 lin. ft. 48-in. C.M.P. (12 gauge)
(39) 5 ea. remov'g and resett'g headwalls
(40) 5 ea. spillway assemblies
(41) 1,350 lin. ft. salv'g exist. C.M.P. culverts
(42) 1,250 lin. ft. relaying salvg'd C.M.P. culverts
(43) 27 ea. salvaging spillway assemblies
(44) 27 ea. installing salvaged spillway assemblies
(45) Lump sum, engineer's offices

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
(1)	8.00	12.00	5.00	8.00	23.30	15.00	5.00	8.00	10.00	16.50
(2)	$7,500	$6,000	$3,000	$7,000	$1,560	$9,000	$4,000	$12,500	$5,000	$30,000
(3)	.39	.47	.45	.46	.49	.40	.32	.57	.60	.48
(4)	1.75	2.40	4.00	2.30	3.50	2.00	3.00	2.50	2.00	2.05
(5)	2.00	4.00	1.50	1.20	1.85	1.50	1.50	1.50	2.00	1.40
(6)	1.05	1.15	.65	1.10	1.70	.80	1.30	.85	1.00	1.30
(7)	.005	.005	.005	.003	.003	.005	.006	.006	.01	.005
(8)	.045	.06	.08	.035	.015	.03	.06	.06	.12	.10
(9)	.27	.32	.13	.20	.45	.65	.85	.40	.40	.30
(10)	.25	.25	.12	.18	.45	.45	.57	.35	.30	.28
(11)	2.30	2.54	3.00	2.80	2.50	2.60	3.60	3.00	2.50	4.70
(12)	$1,750	7,500	3,000	10,500	12,352	1,000	20,000	20,000	5,000	35,000
(13)	1.85	2.00	3.00	1.50	1.50	2.50	2.00	1.50	3.00	2.00
(14)	6.00	5.00	10.00	4.00	10.00	16.00	10.00	20.00	30.00	13.50
(15)	23.00	30.00	30.00	35.00	20.50	30.00	50.00	30.00	23.00	41.00
(16)	16.00	14.00	14.00	15.00	14.45	15.00	13.00	17.00	16.00	15.00
(17)	.055	.10	.07	.08	.09	.07	.09	.10	.20	.08
(18)	4.85	4.90	4.80	5.40	5.30	5.00	5.30	4.25	6.00	5.80
(19)	1.00	.50	.50	.50	.90	1.00	.60	.50	2.00	1.35
(20)	8.85	9.25	10.00	10.50	11.10	12.00	11.00	13.00	12.00	12.00

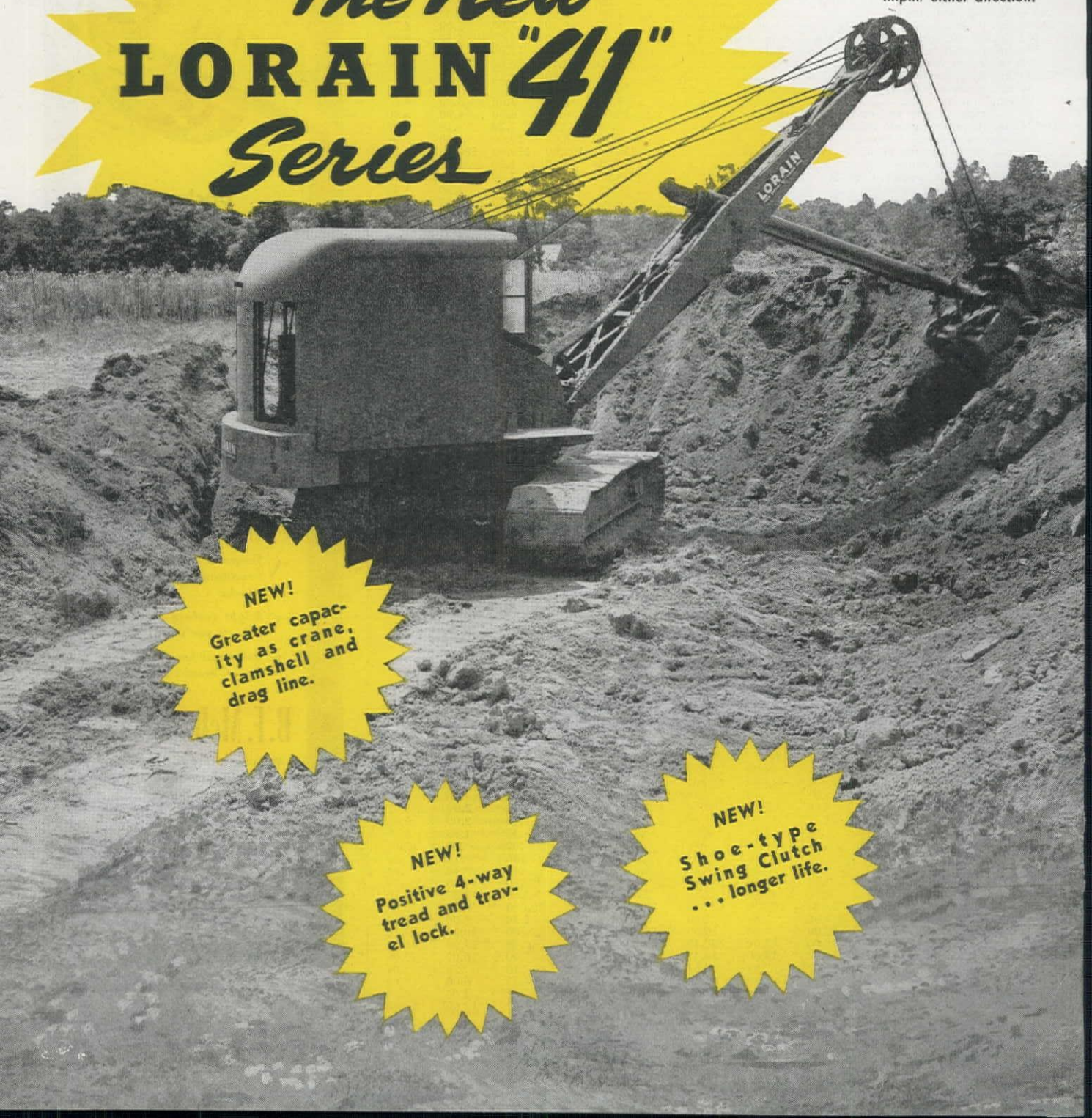
(Continued on next page)

Again LORAINS

The New LORAIN "41" Series

LORAIN L-41 CRAWLE

Chain drive, 2 speeds, 30
swamp type treads standard,
travel speeds — ¾ and 1½
m.p.h. either direction.



NEW!
Greater capacity as crane, clamshell and drag line.

NEW!
Positive 4-way tread and travel lock.

NEW!
Shoe-type Swing Clutch ... longer life.

(21)	.85	.50	2.00	.60	.95	2.00	2.00	.50	1.00	.80
(22)	31.00	30.00	85.00	41.00	52.60	40.00	36.00	50.00	60.00	80.00
(23)	.055	.07	.08	.07	.09	.07	.06	.07	.08	.07
(24)	4.20	7.00	7.50	8.50	7.00	9.00	14.00	6.50	6.00	7.00
(25)	25.00	28.00	25.00	25.00	64.60	35.00	40.00	26.00	60.00	72.00
(26)	.20	.25	.30	.40	.70	.40	.15	.20	.25	.27
(27)	3.50	5.00	5.00	5.00	6.10	6.00	5.00	7.00	5.00	10.00
(28)	1.60	3.00	1.50	2.20	2.50	2.50	2.50	3.00	2.00	3.15
(29)	.80	2.00	4.00	1.50	2.20	2.50	2.00	1.60	1.00	2.20
(30)	3.50	6.00	3.50	5.00	3.65	4.00	4.00	5.00	3.00	4.00
(31)	700.00	$1,000	500.00	$1,000	880.00	500.00	$1,800	$1,000	700.00	$1,000
(32)	1.40	2.00	1.25	1.50	1.45	2.20	1.75	2.00	1.50	1.50
(33)	2.00	2.50	2.00	2.00	2.00	2.60	2.00	2.50	2.00	2.00
(34)	2.60	3.50	2.50	3.00	2.80	3.30	2.50	3.00	2.50	3.00
(35)	3.50	4.50	3.50	4.00	5.10	6.50	3.85	6.00	3.00	4.45
(36)	4.00	5.00	3.75	4.50	4.25	6.00	3.85	5.00	3.50	4.25
(37)	7.75	11.00	8.00	10.00	8.40	10.00	8.50	10.50	7.50	9.35
(38)	10.00	12.00	9.00	11.00	10.00	12.00	8.50	12.50	8.50	11.00
(39)	25.00	25.00	100.00	30.00	40.00	150.00	20.00	50.00	20.00	30.00
(40)	25.00	20.00	25.00	23.00	22.00	25.00	20.00	25.00	20.00	25.00
(41)	.90	1.00	1.00	1.10	.60	1.00	1.00	1.30	1.00	.70
(42)	.90	1.00	1.00	.90	.60	.50	.50	1.30	1.00	.70
(43)	10.00	10.00	5.00	6.00	2.50	5.00	15.00	27.00	10.00	7.00
(44)	10.00	10.00	15.00	6.00	6.00	5.00	15.00	15.00	5.00	7.00
(45)	750.00	$2,500	$1,500	$1,800	$1,100	$2,000	$2,000	$3,000	$2,000	$2,500

Colorado—Grand, Jackson, Routt Counties—Public Roads Adm.—Grade and Surf.

Larson Construction Co., Denver, submitted the low offer of $289,499 to the Public Roads Administration, Denver, for the construction of 11 mi. of Rabbit Ears Pass Road. Unit bid summary follows:

(1) Larson Construction Co. $289,499
(2) Northwestern Engineering 338,753
(3) Lowdermilk Bros. 359,216
(4) Brown Construction Co. $368,979
(5) Western Paving Construction Co. 415,859
(6) Engineer's estimate 238,924

		(1)	(2)	(3)	(4)	(5)	(6)
6,000	cu. yd. unclassified excavation	1.50	1.90	1.00	1.00	1.50	1.00
900	cu. yd. unclass. excav. for structures	8.00	3.15	3.00	2.00	5.00	2.00
3,000	cu. yd. unclass. excav. for borrow (case 1)	1.50	1.05	.75	1.00	2.00	1.00
4,500	cu. yd. mi. special overhaul of borrow	.30	.20	.25	.20	.20	.25
6,500	cu. yd. spot subgrade reinforcement	1.50	1.95	3.00	3.00	4.50	1.00
21,000	ton new material for stab. base course	3.00	3.30	4.00	3.65	3.00	2.25
178,000	sq. yd. mixing stabilized base course	.05	.10	.05	.10	.11	.12
66,000	gal. MC cut-back asphalt, Grade 0, for prime coat	.12	.12	.12	.15	.16	.11
1,500	ton cover aggregate for Type 3 seal coat, grad. B	5.00	5.00	7.00	6.00	6.00	5.00
44,000	gal. asphalt, Grade (200-300) for seal coat	.12	.12	.12	.16	.17	.12
30,000	ton (Class F pavm't, Type F-1) plant mix., grad. D	4.10	5.15	5.60	5.35	7.00	2.75
341,000	gal. asphalt, grade (200-300) for Type F-1	.10	.11	.10	.14	.11	.12
20	cu. yd. concrete, Class A	50.00	75.00	50.00	50.00	60.00	30.00
2,000	lb. reinforcing steel	.10	.16	.15	.20	.12	.10
245	lb. structural steel—furnished, fabricated, erected	.20	.25	.25	.20	.20	.20
10	cu. yd. cement rubble masonry	40.00	16.00	40.00	40.00	60.00	25.00
200	lin. ft. 24-in. C.G.S.M. culvert pipe	4.00	6.00	5.25	8.00	4.00	4.00
1,800	lin. ft. 6-in. perf. C.G.S.M. pipe underdrain	2.50	1.90	2.50	2.00	2.75	3.00
60	ea. concrete maintenance marker posts	7.00	12.00	8.00	5.00	10.00	10.00
110	ea. timber guide posts with warning reflectors (tr.)	3.00	3.20	5.00	10.00	4.00	3.00
Lump sum,	removal of concr. wing walls and aprons	300.00	250.00	600.00	700.00	200.00	200.00

Wyoming—Sweetwater County—State—Surface

Woodward Construction Co., Rock Springs, was awarded the contract on the low bid of $99,852 by the Highway Department, Cheyenne, for the resurfacing of 10.8 mi. of Rock Springs-Pinedale road. Summary of unit bids and total amounts follow:

(1) Woodward Construction Co. ..... $ 99,852
(2) Big Horn Construction Co. 111,244
(3) Teton Construction Co. 113,809
(4) Wyoming Improvement Co. $119,631
(5) Engineer's estimate 94,531

		(1)	(2)	(3)	(4)	(5)
50,800	ton pit run sand or gravel base crse	.44	.69	.71	.75	.57
10,500	ton crushed gravel surfacing (¾-in. max.)	1.30	1.27	1.30	1.30	1.18
1,070	ton sand	4.00	3.00	2.70	4.00	2.50
2,010	M. gal. watering (emb. and base)	4.00	4.00	2.60	2.50	2.50
430	hr. roller operation (base)	5.00	5.00	4.50	4.50	4.50
310	ton base treatment MC-1	28.00	31.00	32.70	35.00	27.00
240	ton. seal coat RC-3	28.00	32.00	33.40	35.00	27.00
515	ton M.C. liquid asphalt distr. MC-3	29.00	25.00	30.00	35.00	24.00
146,780	sq. yd. processing roadway	.055	.055	.07	.06	.045
220	hr. sheepsfoot roller operation	4.00	5.00	3.70	5.00	3.00
220	hr. scraper operation	12.00	12.00	12.50	14.00	13.00
770	hr. patrol operation	8.25	8.00	7.00	7.00	6.50
110	hr. bulldozer operation	10.00	12.00	11.00	9.00	11.00

California—Alameda County—U. S. Navy—Paving

Chas. L. Harney, San Francisco, offered the low bid of $376,935 to the U. S. Navy, 12th Naval District in San Francisco, for regrading and paving the streets of the Oakland Naval Supply Depot. The work consists of removing existing pavement, regrading, leveling tracks, manholes, and raising curbs and storm drains within the area. The following is a summary of total and unit bids received on invitations to bid under Specification 16,549 NOy 12,320:

(1) Chas. L. Harney $376,935
(2) N. M. Ball Sons 408,738
(3) Lee J. Immel 440,398
(4) Independent Construction Co. 449,205
(5) Fredrickson & Watson Construction Co. $457,067
(6) Fredrickson Bros. 482,549
(7) Clements & Co. 487,518

		(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lump sum,	storm drain	$32,800	$40,000	$58,000	$44,618	$50,000	$53,357	$57,568
2,700	tons removal of soft spots	.90	1.80	1.50	1.20	1.50	1.75	1.25
30,500	sq. yd. removing paving over tracks	.36	.50	.60	.25	1.50	.58	.30
200	tons removing existing paving	.90	1.80	3.00	1.20	3.00	2.05	1.25
34,000	track ft. raising track	.87	1.37	1.21	1.93	2.10	1.17	2.00
8,800	tons track ballast	2.00	1.72	1.76	2.10	2.20	2.92	2.15
12,300	lin. ft. raising curbs	.62	.90	.60	1.20	1.20	1.46	1.25
800	lin. ft. new curbs	2.10	1.20	2.00	2.10	2.50	1.46	2.20
17	tons raising metal covers	320.00	365.00	370.00	316.00	230.00	350.00	320.00
12	ea. raising conc. grates	32.00	30.00	50.00	24.00	25.00	29.20	40.00
110	ea. raising valve boxes	19.00	1.70	20.00	14.40	25.00	11.70	15.00
60	M.B.M. wood rail guards	105.00	87.00	88.00	150.00	150.00	146.00	170.00
15,600	tons base course	2.70	2.25	2.30	2.40	2.35	2.31	2.50
62,500	gal. tack coat	.09	.10	.07	.10	.115	.105	.10
45,000	tons asph. conc.	4.70	4.90	5.30	5.17	4.20	5.83	5.55
100	ea. railroad ties	6.00	7.00	7.15	3.58	4.00	4.70	3.50

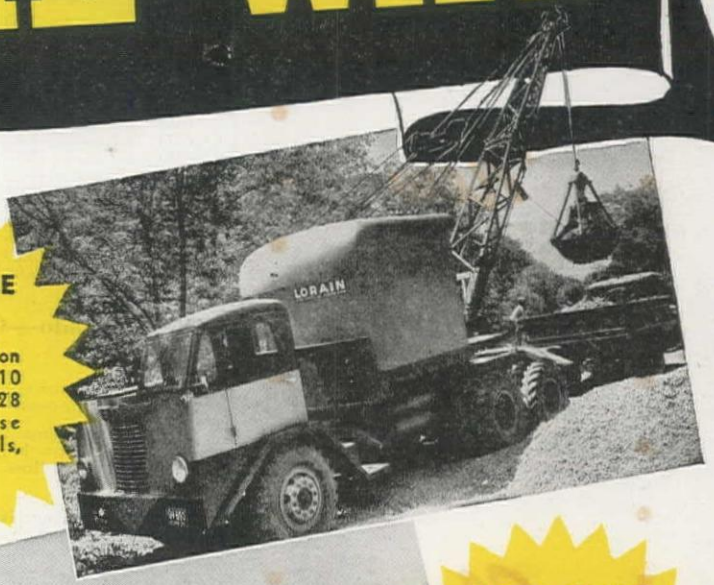
LEAD THE WAY

The new Lorain "41" series . . . the 41 Crawler, the Moto-Crane 414, the Moto-Crane 416 and the Self-Propelled Crane 414 . . . is ready to make money for you. New design features that mean bigger production and longer life have been combined with 50 years of shovel and crane engineering experience.

Here are a few of many new features . . . a faster, smoother-acting shoe type swing clutch that stays in adjustment longer . . . a new crawler tread and travel lock for sure-footed digging . . . wide treads for better cross country travel.

Lorain presents the new "41" series in a complete selection of mountings . . . crawler and rubber-tired types to fit any job requirement . . . all available with gasoline, electric or Diesel power. Your Lorain Dealer listed below has the complete facts . . . call him today.

Four new machines . . .
new in features . . .
new in performance . . .
new in profit-earning capacities.



MOTO-CRANE 414

4 wheel drive, 20 ton crane capacity, 10 speeds—1 to 28 m.p.h., 2 reverse speeds, 6 wheels, fully convertible.

MOTO-CRANE 416

6 wheel drive, U. S. Army model, 20 ton crane capacity, 8 speeds—1 to 31 m.p.h., 2 reverse speeds.

SELF-PROPELLED CRANE 414

20 ton capacity, single engine, single operator, 4 speeds in both directions—1 to 7 m.p.h.

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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

TEN 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.

Whether a pipe material is able to fulfill these requirements is a matter of experience rather than prediction. A page of history is worth a volume of sales claims. History proves that cast iron pipe has been meeting these ten requirements for generations.

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

CAST IRON PIPE
SERVES FOR CENTURIES

Bridge and Grade Separation . . .

Washington—Gray's Harbor County—State—Drawrest

Grays Harbor Construction Co., Aberdeen, was awarded the contract on the low bid of $20,791 to the Department of Highways, Olympia, for the construction of the west bridge drawrest for the city of Aberdeen. Summary of the unit bids received is as follows:

(1) Grays Harbor Construction Co. $20,791
(2) Cascade Contractors, Inc. $23,730

		(1)	2(2)
132	M.B.M. timber and lumber (untreated) in place	120.00	130.00
1,000	lin. ft. furnishing timber piling (untr.) at site	.31	.30
17	ea., driving timber piles in place	36.00	20.00
Lump sum,	navigation lighting complete in place	567.00	250.00
Lump sum,	removing portions of existing drawrest	$3,462	$5,680

Washington—Lewis County—State—Concrete

M. P. Munter Co., Seattle, was awarded the contract on the low bid of $23,955 to the Department of Highways, Olympia, for the construction of the Olequa Creek Bridge and structure excavation on secondary State Highway No. 12-E. The following is a summary of the quantities and unit bids received:

(1) M. P. Munter Co. $23,955
(2) David Nygren 25,430
(3) Henry Hagman $25,834
(4) Lockyear & White 31,292

		(1)	(2)	(3)	(4)
370	cu. yd. special excavation	.75	1.00	1.00	2.50
20	cu. yd. structure excavation	2.40	1.00	4.00	6.00
4	cu. yd. hand placed riprap in place	15.00	5.00	15.00	25.00
44	lin. ft. pl. conc. or V.C. dr. pipe, 6-in. diam., in place	1.00	1.00	3.00	1.50
	BRIDGE				
250	cu. yd. structure excavation	6.00	15.00	10.00	7.00
226	cu. yd. concrete Class "A" in place	50.00	48.00	40.00	57.00
42	cu. yd. concrete Class "F" in place	50.00	48.00	40.00	57.00
89	cu. yd. concrete Class "H" in place	15.00	20.00	30.00	57.00
67,500	lbs. steel reinforcing bars in place	.068	.06	.10	.08
2,900	lbs. structural steel in place	.38	.30	.30	.14
247	lin. ft. reinf. conc. br. railing in place	5.50	6.00	6.00	8.00
4	only, bridge drains complete in place	60.00	45.00	50.00	50.00

California—San Diego County—State—Concrete

Oberg Bros., Inglewood, submitted the low bid of $146,867 to the Division of Highways, Los Angeles, for the construction of a reinforced concrete girder bridge to be constructed across San Mateo Creek about 18 mi. north of Oceanside. The following is a summary of the work quantities and the unit bids received:

(A) Oberg Bros. $146,867
(B) J. E. Haddock, Ltd. 148,783
(C) Matich Bros. 149,438
(D) Guerin Bros. 172,554
(E) Carlo Bongiovanni 176,796
(F) Byerts & Dunn 193,216
(G) Contracting Engineers Co. $193,618
(H) H. M. Baruch Corp. 195,199
(I) Ralph A. Bell 196,845
(J) Guy F. Atkinson Co. 197,735
(K) Fred D. Kyle 205,224
(L) H. M. Golden Constr. Co. 219,492

(1) 3,700 cu. yd. structure excav.
(2) 1,250 cu. yd. structure backfill
(3) 2,240 cu. yd. Class "A" concrete (structs.)
(4) 655 cu. yd. Class "A" concrete, footing block
(5) 890 lin. ft. concrete railing
(6) 10,500 lb. misc. iron and steel
(7) 3,936 lin. ft. furnish steel piles
(8) 240 ea., driving steel piles
(9) 50 ea., pile splices
(10) 306,000 lb. furnish bar reinf. steel
(11) 306,000 lb. place bar reinf. steel
(12) Miscl. items.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)
(1)	4.00	7.75	8.25	7.00	8.25	7.50	10.00	9.90	10.00	2.50	13.00	1.50
(2)	1.50	.45	.75	3.00	1.50	2.00	2.00	.95	1.50	1.30	5.00	.75
(3)	33.00	31.00	28.85	38.00	36.40	40.00	38.50	42.20	38.00	54.00	40.00	49.50
(4)	22.00	17.00	21.30	25.00	36.40	20.00	30.00	20.15	38.00	27.00	25.00	85.00
(5)	6.00	3.00	3.50	5.00	2.70	2.50	3.50	4.85	4.00	8.00	4.00	4.00
(6)	.30	.30	.30	.40	.27	.30	.35	.0347	.40	.30	.15	.37
(7)	2.00	1.80	1.95	2.35	2.30	3.10	3.00	2.00	2.50	2.50	1.50	2.35
(8)	30.00	20.00	18.00	22.75	36.00	30.00	30.00	24.65	40.00	25.00	50.00	18.00
(9)	20.00	12.00	5.00	5.00	8.00	12.00	12.00	28.64	18.00	15.00	10.00	20.00
(10)	.04	.043	.045	.035	.037	.05	.04	.0437	.04	.04	.04	.05
(11)	.01	.018	.02	.015	.011	.015	.015	.0244	.02	.025	.02	.0276
(12)	$2,000	$2,000	$1,000	$2,500	$1,000	$14,000	$5,000	$3,905	$1,500	$1,465	$3,000	690.00

Irrigation . . .

California—Riverside County—Bureau of Reclamation—Earthwork and Structures

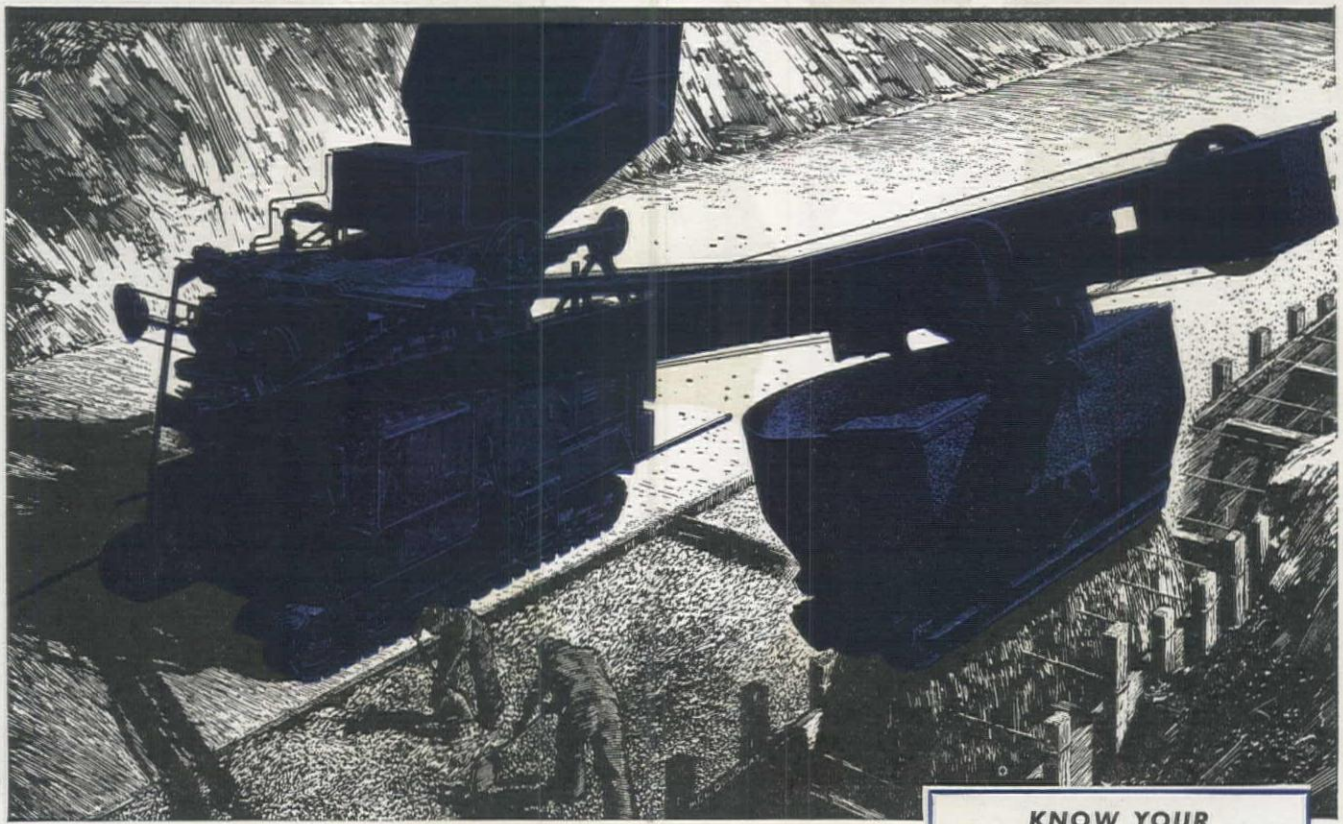
Ralph A. Bell, Monrovia, submitted the low bid of $298,472 to the U. S. Bureau of Reclamation, Yuma, Ariz. Office, for the construction of earthwork, concrete lining, and structures of Wasteway No. 1, Sta. 3 plus 96.5 to 176 plus 83, for the Coachella Canal as outlined in Specification No. 1102. The following is a summary of the unit bids received:

(1) Ralph A. Bell $298,472
(2) Fisher Contracting Co. 320,903
(3) M. H. Hasler 357,671
(4) Spencer Webb and Frank T. Hickey $392,840
(5) W. E. Kier Construction Co., and Bressi-Bevanda Const'rs., Inc. 441,148

		(1)	(2)	(3)	(4)	(5)
155,000	cu. yd. excavation for wasteway channel	.32	.34	.25	.30	.30
2,400	cu. yd. excavation for temporary railroad relocation	.40	.39	.50	.45	.50
1,400	cu. yd. excavation for structures	1.50	1.40	2.50	2.00	2.00
250	cu. yd. compacting embankments	1.50	2.00	1.00	.70	1.00
100	cu. yd. compacted subbase	1.50	.76	2.50	.70	2.00
57,500	sq. yd. trimming foundations for concrete wasteway lining	.33	.68	.60	.45	.45
9,000	cu. yd. backfill about wasteway-channel side walls	.40	.46	.30	.40	1.35
4,140	sta. cu. yd. backfill about structures	.40	.65	.40	.70	.25
1,140	cu. yd. compacting backfill	1.75	.78	3.00	2.00	3.00
800	cu. yd. rockfill	5.00	3.90	5.00	7.00	8.00
9,700	cu. yd. concrete in wasteway-channel lining	15.50	13.90	20.00	20.00	28.00
272	cu. yd. concrete in wasteway outlet structure	34.00	33.20	28.00	60.00	27.00
157	cu. yd. concrete in highway bridge	34.00	70.00	37.00	60.00	51.00
176	cu. yd. concrete in railroad bridge	34.00	37.10	28.00	60.00	43.00

(Continued on next page)

THIS "LIVE BOOM" PAVER LOWERS COSTS



Let's consider the unique advantages of the boom on a standard 34-E Ransome Blue Brute "Dual Drum" Paver to see why you can lay more yardage . . . more accurately . . . with less manpower . . . than with any other paver.

Because this boom is really a "live boom" just like your crawler crane, it can be power-elevated to allow 9 ft. clearance under the bucket. And the paver can be operated *continuously* with the boom in the elevated position.

Think what that means. Whenever you want, or as often as you want, you can concrete retaining walls, abutments, headwalls, etc. in one operation *at the same time you lay the slab.* You eliminate the extra expense of doing those operations separately.

Moreover, because this "live boom" *spreads as it swings* it covers wider area with each batch . . . cuts down on costly hand shoveling.

OTHER BLUE BRUTE PLUSSES

In addition, a Blue Brute "Dual Drum" Paver has the fastest-charging, self-cleaning skip . . . hydraulically-controlled bucket, eliminating split batches . . . metal-to-metal spiral cut-off for precise water measuring . . . mechanically-operated batchmeter for all-season accuracy. These and other features are described in detail in Bulletin 208. Write for it.

24R5-3

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.**

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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.

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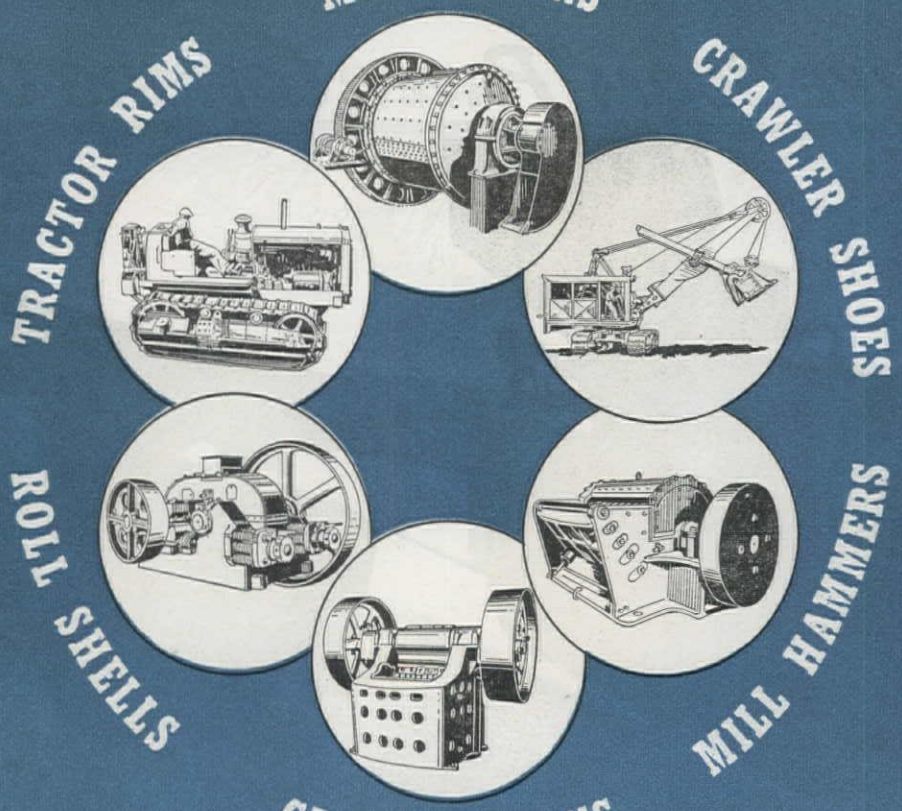
Worthington Pump and Machinery Corporation, Worthington-Ransome Construction Equipment Division
Holyoke, Mass.



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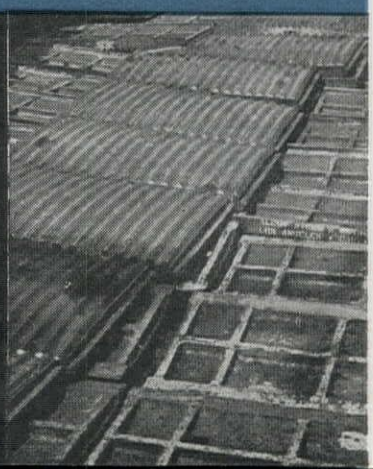


898,000 lbs. placing reinforcement bars	.03	.03	.04	.05	.03
37 sq. ft. placing elastic filler material in joints	2.00	1.20	1.00	1.00	1.00
50 lin. ft. placing rubber water stops in joints	2.00	1.00	2.00	2.00	1.00
16 ea., manufacturing and driving 30-ft. concrete piles	187.00	410.00	225.00	300.00	210.00
27 ea., manufacturing and driving 45-ft. concrete piles	280.00	440.00	330.00	400.00	315.00
2,450 lin. ft. driving structural steel bearing piles	1.50	2.36	1.25	2.00	1.75
52,000 lbs. erecting structural steel	.04	.02	.044	.10	.05
1,900 lbs. installing miscellaneous metalwork	.30	.35	.50	.40	.30
1.5 M.F.B.M. erecting timber in structures	100.00	300.00	150.00	110.00	300.00

Waterway Improvement . . .

California—Humboldt County—State—Jetty

Mercer, Fraser Company, Eureka, submitted the low bid of $40,751 to the Division of Highways, Sacramento, for the construction of 0.2 mi. of permeable pile jetties to be built at Shively Bluffs about 9 mi. south of Scotia. The following is a summary of the unit bids received:

(1) Mercer, Fraser Company $40,751
(2) Healy Tibbitts Construction Co. 56,975
(3) Fred J. Maurer & Son 59,970
(4) E. B. Bishop $64,072
(5) Case Construction Co. 66,016

	(1)	(2)	(3)	(4)	(5)
1,100 cu. yd. unclassified excavation	1.00	1.50	1.50	3.00	3.5125
2,500 cu. yd. heavy stone riprap	5.50	9.00	10.00	6.50	10.405
17,500 lin. ft. furnishing timber piles	.54	.35	.32	.68	.604
422 ea., driving piles	30.50	50.00	50.00	61.00	39.25
36 M.F.B.M. Douglas fir timber	95.00	150.00	175.00	180.00	233.75
8 cwt. barbed wire	20.00	25.00	40.00	50.00	74.00

California—Colusa County—U. S. Engineers—Levees

Morrison-Knudsen Co., Los Angeles, submitted the low bid of $198,451 to the U. S. Army Engineers Office, Sacramento, for the enlargement of the west levee, Sacramento River from Colusa to Packers. The following is a summary of the unit bids received on the work outlined in specification No. 1184:

(A) Morrison-Knudsen Co. $198,451
(B) Guy F. Atkinson Co. 219,246
(C) H. Earl Parker 220,739
(D) A. Teichert & Company 237,942
(E) E. B. Bishop 247,317
(F) Fredericksen Bros. 249,108
(G) Nathan A. Moore and A. C. Goerig $293,090
(H) Geo. R. Patterson 304,851
(I) Guerin Bros. 313,820
(J) Bressi-Bevanda 333,184
(K) Peter Kiewit & Son 334,997

(1) 560,000 cu. yd. excav.
(2) 22,000 M. gals. water, applied
(3) 11,000 tons bank run gravel
(4) 7,700 sq. yd. compacting road surf.
(5) 18 tons liquid asph., Type MC-3
(6) 650 cu. yd. Class A struct. conc.
(7) 32,000 lbs. reinf. steel
(8) 2,200 sq. yd. mesh reinf.
(9) 12 M.F.B.M. place govt. furn. lumber
(10) 80 lin. ft. 24-in. CMP, install only
(11) 8 lin. ft. 30-in. CMP, install only
(12) 400 lin. ft. 36-in. CMP, install only
(13) 110 lin. ft. 54-in. CMP, install only
(14) 16 lin. ft. 71-in. CMP, install only
(15) 1 24-in. gate, frame and riser, install only
(16) 5 ea., 36-in. gate, frame and riser, install only
(17) 1 ea., 54-in. gate, frame and riser, install only
(18) 1 ea., 18-in. gate and 2 ft. of 18-in. steel pipe, install only
(19) lump sum, furn. and install trash screens on double box culvert
(20) lump sum, remove conc. spillbox
(21) lump sum, remove conc. headwall
(22) lump sum, remove conc. spillbox
(23) 3 ea., remove wood irrigat'n diversion structs.
(24) lump sum, remove concrete spillbox
(25) lump sum, remove 2 36-in. wood gates and 116 lin. ft. 36-in. steel pipe, conc. headwalls and cutoff walls
(26) lump sum, remove 26 lin. ft. 54-in. and 50 lin. ft. 24-in. CMP, etc.
(27) lump sum, remove two 5x5-ft. wood gates and conc. headwall and wingwalls
(28) lump sum, remove and reinstall 30-in. gate and frame and remove conc. spillway
(29) lump sum, remove conc. headwalls, 30 lin. ft. 36-in. conc. pipe and 30 lin. ft. 36-in. CMP
(30) lump sum, remove 150 lin. ft. 18-in. steel pipe and plug pipe opening in pumphouse wall
(31) lump sum, remove conc. headwalls and 80 lin. ft. 36-in. CMP
(32) lump sum, remove conc. headwalls and 75 lin. ft. 3x3½-ft. reinf. conc. culvert
(33) lump sum, remove approx. 130 lin. ft. 18-in. CMP
(34) lump sum, remove conc. headwalls and wood gate, and approx. 25 lin. ft. 36-in. CMP
(35) lump sum, remove conc. headwall and wingwalls
(36) lump sum, remove conc. headwalls and remove and reinstall 60 lin. ft. 48 in. CMP
(37) lump sum, remove conc. headwall, inlet struc. and spillway, two 5x5-ft. wood gates, 25 lin. ft. 9-ft. semi-circular metal flume and gate stems
(38) lump sum, remove 18x40-ft. timber bridge
(39) lump sum, remove conc. ditch lining
(40) lump sum, remove conc. pillbox and headwall
(41) lump sum, remove approx. 110 lin. ft. 48-in. CMP and conc. headwalls
(42) lump sum, remove approx. 1,180 lin. ft. conc. ditch lining
(43) lump sum, remove and reinstall at 5 locations 30-ft. lengths of 6-in. steel pipe
(44) lump sum, remove and reinstall approx. 12 lin. ft. 24-in. CMP
(45) lump sum, remove and reinstall approx. 10 lin. ft. 18-in. CMP
(46) lump sum, remove and reinstall approx. 10 lin. ft. 15-in. CMP
(47) lump sum, remove two 7x7-ft. conc. spillbox, Sta. 472 plus 78
(48) lump sum, remove conc. headwall and 10 lin. ft. 15-in. CMP
(49) lump sum, remove concrete headwall and 10 lin. ft. 15-in. CMP
(50) lump sum, remove and reinstall 36-in. gate and frame and remove conc. headwall and flashboard.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
(1)	.23	.26	.245	.30	.31	.295	.34	.37	.37	.35	.45
(2)	.90	.80	1.00	.96	1.15	1.00	2.00	1.50	2.00	2.00	1.20
(3)	.52	1.80	1.60	.64	.65	1.25	1.50	2.00	1.25	1.25	1.75
(4)	.15	.11	.10	.10	.05	.06	.05	.10	.10	.40	.05
(5)	30.00	22.00	35.00	22.00	25.00	35.00	30.00	25.00	30.00	40.00	40.00
(6)	46.00	38.00	44.50	42.00	40.00	50.00	40.00	40.00	50.00	50.00	48.00
(7)	.08	.11	.07	.10	.07	.07	.10	.11	.06	.10	.07
(8)	.50	.45	.50	.50	1.10	.43	.50	.36	.30	.40	.50
(9)	60.00	90.00	75.00	80.00	100.00	60.00	50.00	650.00	75.00	100.00	125.00
(10)	1.75	1.35	2.00	1.80	2.50	6.20	2.00	3.00	3.50	6.00	2.25
(11)	2.00	2.00	3.00	2.40	3.00	4.00	5.00	3.00	5.00	8.00	3.20
(12)	2.50	2.25	4.00	2.40	4.50	8.25	5.00	3.00	5.00	10.00	3.25
(13)	5.50	3.20	7.00	3.00	7.50	14.50	7.50	5.00	10.00	12.00	8.50
(14)	10.00	4.50	10.00	4.10	13.00	12.00	10.00	5.00	25.00	15.00	11.00
(15)	25.00	30.00	50.00	60.00	30.00	20.00	100.00	20.00	25.00	200.00	25.00
(16)	35.00	40.00	75.00	60.00	50.00	35.00	100.00	20.00	25.00	200.00	30.00
(17)	100.00	55.00	100.00	90.00	75.00	50.00	150.00	25.00	50.00	300.00	40.00
(18)	150.00	30.00	50.00	48.00	30.00	10.00	100.00	20.00	50.00	100.00	25.00
(19)	150.00	100.00	200.00	140.00	200.00	75.00	200.00	100.00	200.00	400.00	130.00
(20)	75.00	35.00	50.00	98.00	30.00	25.00	100.00	50.00	100.00	200.00	45.00
(21)	50.00	65.00	25.00	22.00	30.00	15.00	100.00	50.00	25.00	100.00	20.00
(22)	75.00	65.00	30.00	98.00	20.00	25.00	100.00	50.00	100.00	200.00	20.00
(23)	15.00	35.00	25.00	6.00	5.00	10.00	100.00	10.00	20.00	100.00	20.00
(24)	25.00	65.00	25.00	75.00	20.00	25.00	100.00	50.00	100.00	200.00	30.00
(25)	200.00	215.00	400.00	310.00	350.00	150.00	500.00	300.00	500.00	$1,000	500.00
(26)	600.00	160.00	500.00	400.00	275.00	400.00	200.00	250.00	600.00	$1,000	500.00

(Continued on next page)

(27)	200.00	35.00	350.00	145.00	50.00	75.00	100.00	300.00	50.00	200.00	30.00
(28)	100.00	65.00	100.00	155.00	60.00	45.00	200.00	250.00	100.00	400.00	65.00
(29)	150.00	120.00	175.00	250.00	200.00	120.00	100.00	250.00	300.00	500.00	375.00
(30)	100.00	160.00	250.00	350.00	300.00	250.00	150.00	350.00	500.00	300.00	625.00
(31)	80.00	150.00	100.00	155.00	270.00	200.00	100.00	300.00	450.00	600.00	500.00
(32)	200.00	110.00	250.00	270.00	260.00	300.00	300.00	350.00	300.00	$1,200	500.00
(33)	150.00	80.00	130.00	280.00	210.00	250.00	200.00	300.00	500.00	350.00	625.00
(34)	75.00	55.00	125.00	150.00	175.00	50.00	100.00	250.00	125.00	200.00	100.00
(35)	150.00	65.00	50.00	55.00	25.00	50.00	100.00	250.00	25.00	200.00	30.00
(36)	400.00	220.00	500.00	460.00	500.00	750.00	300.00	350.00	500.00	700.00	450.00
(37)	750.00	325.00	$1,000	450.00	200.00	350.00	200.00	$1,000	225.00	$1,000	375.00
(38)	250.00	55.00	250.00	340.00	180.00	75.00	300.00	100.00	250.00	400.00	125.00
(39)	50.00	25.00	50.00	55.00	50.00	50.00	200.00	500.00	50.00	500.00	20.00
(40)	200.00	35.00	150.00	48.00	50.00	50.00	100.00	300.00	50.00	200.00	100.00
(41)	150.00	90.00	200.00	100.00	420.00	250.00	200.00	250.00	600.00	600.00	600.00
(42)	500.00	65.00	300.00	930.00	590.00	250.00	$1,000	$1,180	$1,000	$1,000	400.00
(43)	300.00	165.00	250.00	60.00	300.00	450.00	500.00	350.00	150.00	300.00	300.00
(44)	50.00	35.00	50.00	80.00	50.00	50.00	100.00	50.00	100.00	100.00	100.00
(45)	50.00	35.00	50.00	60.00	50.00	50.00	100.00	50.00	100.00	100.00	100.00
(46)	50.00	35.00	50.00	60.00	50.00	50.00	100.00	50.00	100.00	100.00	100.00
(47)	300.00	35.00	100.00	130.00	50.00	100.00	100.00	100.00	100.00	400.00	250.00
(48)	80.00	60.00	100.00	65.00	50.00	65.00	100.00	150.00	75.00	100.00	90.00
(49)	80.00	60.00	100.00	65.00	50.00	65.00	100.00	150.00	75.00	100.00	90.00
(50)	150.00	60.00	100.00	145.00	50.00	100.00	100.00	150.00	100.00	400.00	90.00

Water Supply . . .

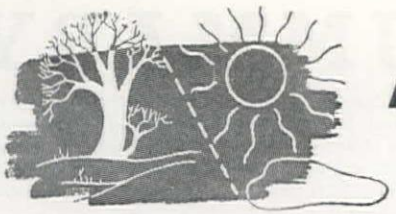
California—San Diego, Riverside Counties—Navy—Aqueduct

Guy F. Atkinson Co., Long Beach, submitted the low bid of $1,164,885 to the U. S. Navy, Public Works Office, 11th Naval District, San Diego, for the construction of earthworks, pipe line and structures from north station 0 plus 10 to N. Sta. 138 plus 86, San Diego Aqueduct. Summary of the quantities and the unit bids received by the Navy for specification NOy 12,498, follows:

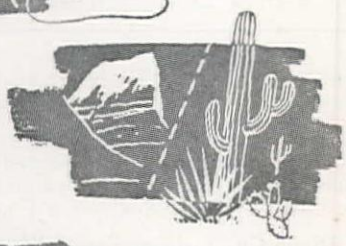
(A) Guy F. Atkinson $1,164,885
(B) United Concrete Pipe Corporation.. 1,184,230
(C) Clyde Wood, Inc..... 1,216,596
(D) Peter Kiewit Sons Co..... 1,227,374
(E) S. A. Healey 1,250,000
(F) L. E. Dixon and Rhodes Bros. & Shofner 1,260,230
(G) Bressi-Bevanda Constructors, Inc...$1,280,004
(H) Macco Construction Co. 1,290,910
(I) Morrison-Knudsen, Inc. 1,303,559
(J) Mark C. Walker & Sons..... 1,309,251
(K) Concrete Pipe Constructors..... 1,472,410
(L) Haddock-Engineers, Ltd. 1,519,421

(1) 4,000 cu. yd. excav., sta. 0-10 to sta. 2-42
(2) 70,000 cu. yd. excav., sta. 2-42 to sta. 108-33
(3) 1,700 cu. yd. excav. for reservoir outlet struct.
(4) 80,000 cu. yd. excav., stripping for reservoir area, embankment, and storm drain
(5) 18,000 cu. yd. excav., stripping borrow pits
(6) 300,000 cu. yd. excav. of sandy material in reservoir area and for storm drain, and trans. to embankment or reservoir blanket
(7) 400,000 cu. yd. excav. of impervious matl. in borrow pit and trans. to embankment or reservoir blanket
(8) 42,000 cu. yd. tunnel-muck fill
(9) 270,000 cu. yd. earth fill in embankment
(10) 230,000 cu. yd. impervious layer in reservoir blanket
(11) 80,000 cu. yd. 4-in. sandy layer in reservoir blanket
(12) 45,000 cu. yd. riprap
(13) 45,000 cu. yd. backfill
(14) 8,000 cu. yd. compacting backfill
(15) 6 wells capping water wells
(16) 35 cu. yd. removing conc. in exist. struct.
(17) 1,250 cu. yd. conc. in structs.
(18) 470 cu. yd. conc. in 90-in. monolithic pipe
(19) 230,000 lbs., furn. and placing reinf. bars
(20) 900 lin. ft. furn. and placing rubber wtr. stops
(21) 70 sq. ft. furn. and placing elastic joint filler
(22) 4,960 lin. ft. conc. pipe, symbol A-96NC50
(23) 4,250 lin. ft. conc. pipe, symbol B-96NC50
(24) 720 lin. ft. conc. pipe, symbol C-96NC50
(25) 12,000 lin. ft. furn. matls. and construct'g chain-link fence
(26) for the lump sum, furn. and installing doors, windows, roofing, and roof drains for operator houses
(27) 3,000 lbs. furn. and installing venturi meter rings.
(28) 20,000 lbs. furn. and installing miscl. metalwork
(29) 1,500 lbs. furn. and installing nozzles and covers
(30) 1,000 lbs. furn. and installing pipe and fitt'gs
(31) 7 valves furn. and install valves; valves
(32) Lump sum, furn. and installing two recording flowmeters
(33) Lump sum furn. and installing float gage
(34) 3 gates furn. and installing 6.4 ft. by 8-ft. motor-operated gates
(35) 1 gate furn. and installing 6.4-ft. by 8-ft. hand-operated gate
(36) 1 gate furn. and installing 5.6-ft. by 7-ft. motor-operated gate
(37) 750 lin. ft. furn. and installing elec. metal conduits, cabinet, boxes and fittings
(38) 80 lbs. furn. and installing elec. conductor and ground wires and fittings
(39) 14,000 bbl. furn. and handling cement.

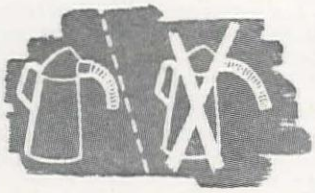
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)
(1)	.50	1.40	1.00	2.45	.50	1.90	1.00	1.30	.81	.80	2.75	1.31
(2)	.30	1.40	.45	.61	.45	.92	1.50	.90	1.33	.93	1.60	1.20
(3)	.50	1.40	.75	.48	.50	.90	1.25	1.00	.62	1.25	1.40	1.19
(4)	.22	.23	.23	.31	.25	.33	.24	.40	.20	.30	.30	.495
(5)	.25	.15	.20	.29	.22	.33	.15	.15	.17	.30	.22	.495
(6)	.25	.23	.23	.30	.22	.32	.35	.40	.22	.37	.30	.47
(7)	.45	.38	.37	.61	.50	.58	.45	.50	.55	.50	.48	.52
(8)	.90	.66	.82	.74	1.00	1.15	1.25	.90	1.60	1.00	2.00	.74
(9)	.15	.17	.19	.18	.15	.24	.17	.20	.13	.30	.16	.185
(10)	.17	.17	.26	.16	.20	.26	.20	.15	.18	.30	.27	.185
(11)	.18	.15	.10	.14	.20	.17	.12	.35	.06	.18	.35	.185
(12)	2.40	2.30	3.20	1.77	2.50	2.52	3.50	2.50	2.30	2.22	2.40	4.95
(13)	.40	.20	.40	.37	.50	.33	.35	.40	.30	.37	1.50	.78
(14)	2.25	2.60	2.50	.58	1.60	1.90	1.50	5.00	2.70	2.80	3.00	3.22
(15)	25.00	100.00	50.00	20.00	100.00	40.00	25.00	100.00	23.75	60.00	20.00	62.00
(16)	50.00	35.00	20.00	40.00	50.00	58.00	50.00	35.00	36.50	46.00	20.00	23.50
(17)	50.00	54.00	80.00	53.00	43.00	44.00	50.00	40.00	46.35	46.59	50.00	49.50
(18)	45.00	54.00	60.00	32.00	35.00	42.00	50.00	75.00	36.50	39.00	40.00	66.25
(19)	.07	.08	.12	.10	.07	.07	.09	.07	.08	.07	.08	.09
(20)	1.50	4.00	2.00	2.55	7.00	1.90	1.50	2.50	3.60	2.10	2.00	1.24
(21)	1.00	4.00	3.50	1.90	1.00	2.00	1.00	1.00	1.10	1.25	1.00	.40
(22)	37.00	34.50	33.50	35.75	39.00	28.90	31.25	33.00	40.00	33.09	38.00	36.00
(23)	39.40	35.50	34.70	37.10	40.00	30.20	32.30	34.00	41.40	34.33	40.00	37.35
(24)	40.00	37.00	36.25	38.80	43.00	31.90	33.70	35.00	43.30	35.96	43.00	39.10
(25)	1.15	1.30	1.20	1.20	4.00	1.35	1.00	1.00	1.28	1.30	1.50	1.32
(26)	$1,000	600.00	$1,000	$1,000	$2,150	$1,250	500.00	650.00	185.00	784.00	$1,000	655.00
(27)	1.90	1.75	2.25	1.75	1.00	1.45	1.40	1.50	1.70	1.60	2.50	2.35
(28)	.35	.27	.40	.33	.40	.42	.35	.30	.30	.30	.35	.36
(29)	.35	.50	.35	.43	.45	.40	.30	.30	.40	.50	.45	.37
(30)	.25	.50	.20	.38	.25	.45	.30	.30	.40	.45	.22	.32
(31)	10.00	60.00	8.00	9.00	45.00	50.00	10.00	10.00	8.60	20.00	5.00	4.95
(32)	$2,500	$3,500	$3,600	$2,494	$8,000	$2,400	$2,500	$3,400	$2,270	$8,000	$4,000	$4,675
(33)	500.00	250.00	450.00	335.00	500.00	400.00	350.00	300.00	400.00	550.00	600.00	500.00
(34)	$7,500	$9,200	$6,800	$7,700	$5,000	$7,230	$6,250	$8,100	$7,600	$9,500	$11,000	$10,575
(35)	$7,000	$7,000	$6,100	$6,650	$3,500	$6,560	$5,750	$6,200	$4,970	$7,500	$8,000	$6,800
(36)	$6,800	$7,000	$5,800	$6,600	$4,000	$6,405	$5,500	$6,200	$6,820	$7,500	$7,500	$8,040
(37)	3.00	4.00	4.00	4.15	2.00	1.50	4.00	3.50	3.10	2.90	3.00	4.02
(38)	5.00	8.00	9.00	8.75	1.00	2.60	10.00	8.00	12.00	8.65	2.00	8.86
(39)	2.50	2.50	2.55	2.78	3.50	2.60	2.50	2.50	3.00	2.65	2.75	2.86



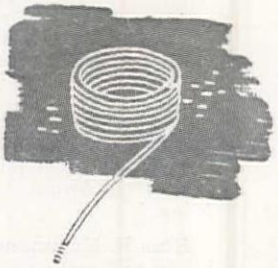
ALL-WEATHER OPERATION . . .



AT ANY ALTITUDE . . .



WITH LESS OIL CONSUMPTION



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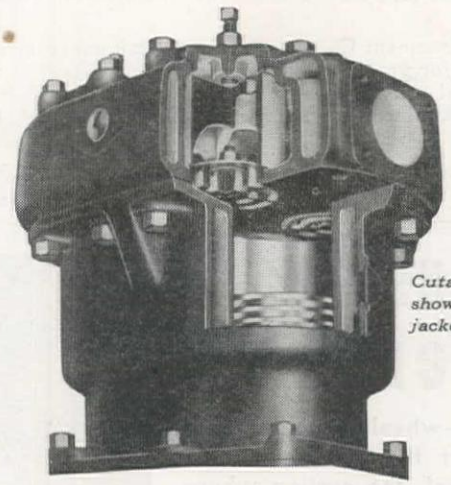

Cutaway of cylinder showing water jacketing

Water-cooling does it better! That's the secret of the exceptional operating efficiency of Gardner-Denver "all water-cooled" Two-Stage Portable Compressors. Hot weather . . . cold weather, high altitudes . . . low altitudes—they're all the same to these "weather-conditioned" portables.

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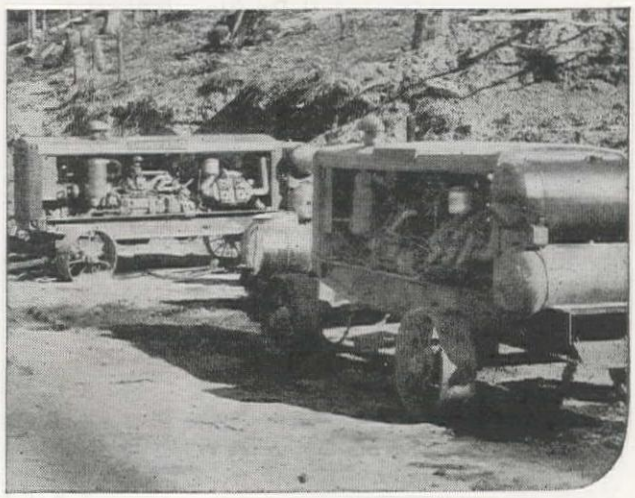

For complete information on "all water-cooled" portables, write for descriptive bulletin. Gardner-Denver Company, Quincy, Illinois.

Western Branch Offices: **Butte, Mont.; Denver, Colo.; Los Angeles, Calif.; Portland, Ore.; Salt Lake City, Utah; San Francisco, Calif.; Seattle, Wash.; Wallace, Idaho.**

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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 . . .

N. M. Ball Sons, Berkeley, Calif., received a $737,799 contract recently to widen existing highway, pave with Portland cement and resurface with asphalt concrete, portions of roadway between one mile north of Las Flores Creek and San Clemente, Calif., by State Division of Highways, Sacramento, Calif.

Larson Construction Co., Denver, Colo., on a low bid of $318,448 was awarded the contract to construct a highway over Rabbit Ears Pass, about 11.2 mi. in length, Grand Co., Colorado, by Public Roads Administration, Denver, Colo.

Stanley H. Arkwright, Inc., Billings, Mont., was awarded a contract amounting to $396,582 for highway improvements and construction of small drainage structures on the Billings-Pompey's Pilar Rd., Mont., by State Highway Commission, Helena, Mont.

Northern Improvement Co., Fargo, North Dakota, received a $505,214 contract for grading, stabilization base, bituminous surface and incidental construction on U. S. Highway No. 10, from Glenn Ullin, N. Dak., west, by State Highway Department, Bismarck, N. Dak.

Baruch Corporation, Los Angeles, Calif., on its bid of $1,500,000 received a contract to construct a new service building of reinforced concrete, at Jefferson St. and Grand Ave., Los Angeles, Calif., by May Co., Los Angeles, Calif.

L. E. Dixon Co. holds a contract for $525,000 calling for the construction of a two-story and basement addition and extensive alterations to a store building at Vermont and Slauson Ave., Los Angeles, Calif., by Sears-Roebuck & Co., Los Angeles, Calif.

L. E. Dixon Co., Los Angeles, Calif., was recently awarded a contract amounting to $1,500,000 for a new store building of reinforced concrete, with brick and plaster exterior, at Inglewood, Calif., by Sears-Roebuck & Co., Los Angeles, Calif.

C. L. Peck, Los Angeles, Calif., has been awarded a $1,500,000 (est.) contract for a reinforced concrete department store building at Los Angeles, Calif., by Broadway Department Store, Los Angeles, Calif.

The Austin Co., Oakland, Calif., has an $800,000 contract to construct the first unit of a can factory and warehouse building on the east side of 7th St., Sacramento, Calif., by Continental Can Co., San Francisco, Calif.

Al Johnson Construction Co., Minneapolis, Minn., received a $480,000 contract for a 16-stall roundhouse and 135-ft. turntable at Helena, Mont., by Northern Pacific Railroad Co., St. Paul, Minn.

Ross B. Hammond Construction Co., Portland, Ore., on a low bid of $500,000 was awarded a contract to erect a beverage plant at Portland, Ore. The building will cover an area 80 x 460 ft. and the roof will provide space for an autogyro and helicopter landing field, by Columbia Distributing Co., Portland, Ore.

Morrison-Knudsen Co., Boise, Ida., was awarded a $3,000,000 contract for a 16,500-kw. hydroelectric generating plant and the erection of 120 mi. of electrical transmission line from Hagerman Valley to Emmett and Boise, Ida., and rural electric transmission line extensions. The plant will be located in the Snake River Canyon, south of Hagerman, Ida., by Idaho Power Co., Boise, Ida.

Highway & Street...

California

ALAMEDA & CONTRA COSTA COS. —**Louis Biasotti & Son,** 40 West Clay St., Stockton—$36,589 for about 1.4 mi. resurfacing with asphalt concrete pavement between El Cerrito Hill overhead and Rte. 14 —by State Division of Highways, Sacramento. 9-20

CONTRA COSTA CO.—**Asta Construction Co.,** 33 N. Front St., Rio Vista—$10,821 for improvement of 4th St. between N and O Sts., and the improvement of State Hwy. between 10th and 18th Sts., and patching of bad spots on 10th St., Antioch —by City Council, Antioch. 9-13

CONTRA COSTA CO.—**Close Building Supply,** 721 C St., Hayward—$12,000 for a 23-lot subdivision, including concrete curbs and gutters and oil macadam streets at Pittsburg—by C. A. Hooper Co., Pittsburg. 9-19

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. 9-7

INYO CO.—**Vinnell Co.,** 1145 Westminster, Alhambra—$12,761 for highway improvements between Neatty Rd. and east boundary of Death Valley National Monument, about 0.8 mi. to be repaired with road mixed surfacing on imported borrow—by State Division of Highways, Sacramento. 10-1

LOS ANGELES CO.—**Case Construction Co.,** 1230 Wilmington-San Pedro Rd., San Pedro—$15,294 for a timber trestle, roadway, removal and redrive portion of steel sheet pile forebay of intake structure at Seal Beach—by Board of Commissioners, Water and Power Dept., Los Angeles. 9-7

LOS ANGELES CO. — **Hayden W. Church,** Box 392, Gardena — $18,937 for widening and resurfacing streets at San Pedro—by Los Angeles Harbor Commission, San Pedro Branch. 9-14

LOS ANGELES CO. — **J. E. Haddock, Ltd.,** 3538 E. Foothill Blvd., Pasadena—$30,600 for rock and oil paving for all streets and alleys in tracts 12459 and 13214, Los Angeles — by Avalon Housing Co., and Willowbrook Development Co., Los Angeles. 9-14

LOS ANGELES CO.—**D. R. Malcolm,** 14161 Oxnard Blvd., Van Nuys—$10,235 for the constr. of asphaltic concrete yard surfacing at the Reseda School, Reseda—by Los Angeles Board of Education, Los Angeles. 9-7

MARIN CO. — **Piombo Brothers & Co.,** 1571 Turk St., San Francisco—$37,591 for emergency drainage and restoration of shipping facilities in the county—by U. S. Engineer Office, San Francisco. 9-20

MENDOCINO CO. — **Guerin Brothers,** 208 S. Linden, South San Francisco—$182,963 for grading and surfacing with gravel

base and applying a seal coat to gravel base and constr. of a steel plate girder bridge, about 1.2 mi. in length, at Alder Creek — by State Division of Highways, Sacramento. 9-26

ORANGE & SAN DIEGO COS.—**N. M. Ball Sons,** Box 430, Berkeley—$637,799 for about 9.5 mi. of widening existing highway and paving with Portland cement and resurfacing with asphalt conc. portions of existing pavement between one mile north of Las Flores Creek and San Clemente—by State Division of Highways, Sacramento. 9-24

RIVERSIDE CO.—**Haddock Engineers, Ltd.,** 129 W. 2nd St., Los Angeles—$298-, 170 for grading and drainage for depot and service facilities, Chappo Flats, Camp Joseph H. Pendleton, Oceanside—by Bureau of Yards and Docks, Washington, D. C. 9-13

SACRAMENTO CO.—**J. R. Reeves,** Box 1072, Sacramento — $27,100 for improvement of Arden Way from Fairoaks Blvd. to Fulton Ave., Sacramento—by County Commissioners, Sacramento.

SAN DIEGO CO. — **V. R. Dennis Construction Co.,** Box F, Hillcrest Sta., San Diego—$46,390 for repairs to parade grounds and roads at the Marine Corps Base, San Diego — by Bureau of Yards and Docks, Washington, D. C. 9-21

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 Supervisors, San Mateo. 8-31

SANTA CLARA CO.—**Peninsula Pacific Construction Co.,** Spring and Chestnut Sts., Redwood City—$64,000 for grading, curbs, gutter, sewer pipe, sidewalks and paving at Crescent Park No. 4, Palo Alto—by W. A. Gould, San Carlos. 9-18

SHASTA CO.—**Harms Brothers,** Rte. 4, Box 2220, Sacramento—$46,622 for about 2.8 mi. resurfacing with crusher run base and applying seal coat between 1.6 mi. west of Round Mountain and 0.3 mi. west of Montgomery Creek—by State Division of Highways, Sacramento. 9-13

SISKIYOU CO.—**Clements & Co.,** Box 277, Hayward—$30,968 for about 1.9 mi. net length repairing with gravel base and crusher run base and applying seal coat thereto, between Gazelle and Klamath River—by State Division of Highways, Sacramento. 9-28

YUBA CO.—**Lester L. Rice,** P. O. Box 1151, Marysville—$12,175 for highway improvements in the county to consist of repairing with plant mixed surfacing material on highway between Wheatland and Morrison Crossing—by State Division of Highways, Sacramento. 9-7

Colorado

GRAND CO.—**Larson Construction Co.,** 3001 Welton St., Denver — $318,448 for construction of highway over Rabbit Ears Pass, about 11.2 mi. in length—by Public Roads Administration, Denver. 9-13

Idaho

BLAINE CO.—**Western Construction Co.,** Box 628, Pocatello—$12,922 for 24.7 mi. seal coat on U. S. Hwy. No. 93, between Timmerman Hill and Ketchum—by State Director of Highways, Boise. 9-6

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BOISE CO.—**Triangle Construction Co.,** Box 2617, Boise—$15,184 for 3.0 mi. road-mix bituminous material and sealcoating from Horseshoe Bend, north — by State Director of Highways, Boise. 9-6

Montana

YELLOWSTONE CO.—**Stanley H. Arkwright, Inc.,** 208 Securities Bldg., Billings —$396,582 for grading, surfacing, road mix oiling and the constr. of small drainage structures on the Billings-Pompey's Pilar Rd.—by State Highway Commission, Helena. 9-25

New Mexico

HARDING CO.—**M. M. Construction Co.,** Albuquerque — $12,594 for grading, construction of concrete curb and gutter, base course surfacing and blacktop surfacing with rock asphalt on State Hwy. Rte. No. 39, in the village of Mosquero—by State Highway Dept., Santa Fe. 9-20

LEA CO.—**Walter L. Denison,** 207 S. Hermosa Ave., Albuquerque—$36,907 for grading, minor drainage structures, base course surfacing and blacktop surfacing between Maljamar and the Maljamar Coop. Repressuring Agreement Plant — by State Highway Dept., Santa Fe. 9-20

QUAY CO. — **Floyd Haake,** 1201 Sierra Vista, Santa Fe—$11,475 for grading, minor drainage structures, construction of concrete curb and gutters, etc., on U. S. Hwy. Rte. No. 66, in the village of San Jon —by State Highway Dept., Santa Fe. 9-20

North Dakota

MORTON & STARK COS. — **Northern Improvement Co.,** Fargo — $505,214 for grading, stabilization base, bituminous surface and incidental constr. on U. S. Highway No. 10, from Glenn Ullin, west—by State Highway Department, Bismarck.

Oregon

LINN CO.—**D. F. McKenzie,** Sherwood—$17,037 for improving four streets at Albany. Three will be repaired with an oil mat and one with heavy asphalt paving — by City Council, Albany. 9-19

UNION CO.—**Newport, Kern & Kibbe,** 8607 Bradford St., Portland—$25,125 for approx. 10,900 cu. yd. crushed rock or crushed gravel in stockpiles on the La Grande Rock Production project, Old Oregon Trail, Wallowa Lake and Cove Highways — by State Highway Commission, Salem. 9-24

Texas

HIDALGO CO.—**Somers Paving & Roofing Co.,** La Feria—$32,322 for resurfacing all paved streets at McAllen—by City Council, McAllen. 9-14

Utah

SALT LAKE CO.—**Young & Smith,** 503 Beason Bldg., Salt Lake City—$29,842 for the construction of sidewalks in various parts of Salt Lake City—by Board of City Commissioners, Salt Lake City. 8-31

Washington

BENTON, WALLA WALLA & YAKIMA COS.—**Ensminger & Co.,** Box 1531, Yakima — $32,960 for manufacturing and stockpiling crushed stone surfacing mineral aggregates on highways throughout the counties and for resurfacing 9.8 mi. of secondary state hwys. with crushed stone surfacing, top course, from Prosser to Kiona — by State Director of Highways, Olympia. 9-26

OKANOGAN CO. — **Henry Hagman,** Cashmere—$66,094 for grading, draining, dismantling existing Wehmeyer river bridge span and erecting at new site with timber trestle approaches; construction of a timber sidewalk on Methow river bridge at Twisp and for two reinf. conc. bridges across overflow channels of Methow river near Twisp on 1.1 mi. of state secondary highway No. 16—by State Director of Highways, Olympia. 9-26

SNOHOMISH CO.—**Dawson Construction Co.,** Box 187, Bellingham—$77,395 for clearing and grubbing, grading, draining and surfacing with selected roadway borrow, and construction of 3 log bridges on 4.9 mi. of mine-to-market road, Williamson creek vicinity—by State Director of Highways, Olympia. 9-6

SPOKANE CO.—**Inland Asphalt Co.,** 10th & Havana Sts., Spokane—$12,727 to pave Indian Canyon Dr. from the S. P. & S. railway tunnel to Clarence St., Spokane—by City Council, Spokane. 9-7

STEVENS CO.—**D. A. Sullivan,** Parkwater — $23,141 for draining and surfacing with selected roadway borrow and crushed stone surfacing and stockpiling stone surfacing on 6.2 mi. of Secondary State Hwy. No. 6-A, Gun Club to Narcisse creek—by State Director of Highways, Olympia. 9-6

WHATCOM CO.—**R. L. Moss,** Zenith—$68,430 for grading, ballasting with selected roadway borrow, paving with Portland cement, conc. various bridge approaches and constructing 13 reinf. conc. bridges and culverts on State Highways Nos. 1 and 1-A, Blaine to Skagit County line—by State Director of Highways, Olympia. 9-26

FACTORY AND GENERAL OFFICES
LOS ANGELES, CALIF. BRANCHES:
SAN FRANCISCO HOUSTON PORTLAND

YAKIMA CO.—**J. W. Morrison & Co.,** Spokane—$21,100 for grading, ballasting and surfacing with selected roadway borrow and crushed stone surfacing, constructing two reinf. conc. slab bridges on 0.3 mi. of Secondary State Highway No. 3-B, White Swan to Toppenish creek—by State Director of Highways, Olympia. 9-26

Wyoming

ALBANY CO. — **Leach Brothers,** 332 Grand Ave., Billings, Mont.—$304,490 for grading, draining and misc. work on 8.6 mi. on the Laramie-Cheyenne Rd. — by State Highway Commission, Cheyenne. 9-26

CARBON CO.—**Etlin E. Peterson,** Casper—$104,163 for grading, draining, base course surfacing, oil treatment by the road mix method, stone chip seal coat, 2 reinf. conc. culverts, one I-beam span bridge, etc., on 1.0 mi. of the Saratoga Centennial Road — by State Highway Commission, Cheyenne. 9-26

FREMONT CO.—**Hopkins & MacPherson,** Laramie—$113,591 for grading, draining, base course surfacing and misc. work on the Riverton-Sand Draw oil field access road, Alkali Butte Coal Mine access road and Sand Draw Coal Mine access road—by State Highway Commission, Cheyenne. 9-20

Canada

BRITISH COLUMBIA — **General Construction Co., Ltd.,** Vancouver—$36,545 for the constr. of 1.5 mi. of the Dewdney trunk highway. This work involves the raising of the Pitt River road between the Commercial Hotel and the Pitt River Bridge—by Dept. of Highways, Ottawa. 9-25

Bridge . . .

California

MENDOCINO CO. — **John Berman & Son,** Eureka—$66,699 for constructing a bridge at Blue Slide Gulch, about 13.1 mi. north of Ft. Bragg, a concrete structure about 0.02 mi. to be graded and surfaced with imported borrow to which seal coat will be applied—by State Division of Highways, Sacramento. 9-7

ORANGE CO.—**William E. Thomas Construction Co.,** Box 1462, Sacramento—$16,757 for constructing two reinforced concrete box culverts about 2½ mi. southerly of Tustin—by State Division of Highways, Sacramento. 9-12

RIVERSIDE CO.—**Fred D. Kyle,** 714 W. Olympic Blvd., Los Angeles—$18,623 for the removal of the existing timber bridge and the constr. of a reinforced concrete slab bridge over Santa Gertrudes Creek on Main St., Temecula—by County Board of Supervisors, Riverside. 9-14

Texas

HIDALGO CO. — **Mitchell Darby Construction Co.,** Pharr—$46,539 for 5 bridges across the U. S. Government floodway, south of the towns of Alamo, San Juan, Pharr and McAllen—by U. S. Engineer Office, San Antonio. 9-13

Washington

LEWIS CO.—**Rumsey and Co.,** 3810 Airport Way, Seattle—$27,340 for a 157-ft. reinforced concrete continuous slab bridge on concrete piling near Elbe, over the overflow channel of the Nisqually river on Pri-

mary State Hwy. No. 5—by State Director of Highways, Olympia. 9-6

PEND OREILLE CO.—**Henry Hegman,** Cashmere—$99,853 for reinforced concrete culverts at McCloud, Kent and Sweet creeks and reinforced conc. bridges over Tacoma and Cedar creeks and grading and surfacing approaches thereto, on Primary State Hwy. No. 6—by State Director of Highways, Olympia. 9-6

WHATCOM CO.—**Cascade Construction Co.,** Box 4056, Seattle—$21,330 for reconstructing approaches and redecking steel span on south fork of Nooksack river bridge near Acme on secondary state highway No. 1-A—by State Director of Highways, Olympia. 9-26

Airport . . .

California

SANTA BARBARA CO.—**Clyde Wood, Inc.,** 816 W. 5th St., Los Angeles—$11,634 for seal coat treatment and marking of runways and taxiways at Santa Maria Army Airfield, Santa Maria—by U. S. Engineer Office, Los Angeles. 9-24

Water Supply . . .

California

SAN FRANCISCO CO. — **Pacific Pipe Line Co.,** 2128 San Pablo Ave., El Cerrito —$134,453 for laying 24-in. steel and 12-in. cast iron mains in Pacific, Jackson and Franklin Sts., San Francisco—by Public Utilities Commission, San Francisco. 9-12

SAN MATEO CO.—**Harry Lee,** 216 California Dr., Burlingame—$20,578 for the installation of 8-in. water main from Citrus Ave. pumping plant to residence No. 1, Daly City—by City County, Daly City. 9-7

Nevada

CLARK CO.—**McNeil Construction Co.,** 5860 Avalon Blvd., Los Angeles—$150,000 to construct a 1,500,000-gal. reinforced concrete reservoir on W. Charleston Blvd., Las Vegas—by Las Vegas Land & Water Co., Los Angeles, Calif.

Utah

WEBER CO.—**Young & Smith Construction Co.,** 503 Beason Bldg., Salt Lake City —$60,785 for the installation of water lines to the Utah Army Service Forces Depot, Ogden—by City Council, Ogden. 9-18

Washington

ADAMS CO.—**E. O. Johnson,** Spokane—$10,848 for a reinforced reservoir with appurtenances at Lind—by City Council, Lind. 9-22

GRANT CO.—**McAtee & Heathe Co.,** E. 3527 Trent, Spokane—$68,550 for a 1,000,000-gal. conc. tank reservoir and other water system improvements at Ephrata—by Town of Ephrata. 8-31

KING CO.—**Argentieri & Colarossi,** 1819 Weller, Seattle—$11,853 for the installation of water mains in Hillcrest Ave., Seattle—by Board of Public Works, Seattle. 9-21

KING CO.—**Pittsburgh-Des Moines Steel Co.,** 558 1st St., Seattle—$110,300 for a 1,000,000-gal. capacity elevated steel tank and tower at Seattle—by Board of Public Works, Seattle. 9-25

Sewerage . . .

California

LOS ANGELES CO.—**Green-Mears Construction Co.,** 3412 Ben Lomond Pl., Los Angeles—$17,700 for approx. 4600 lin. ft. of 10-in. cast iron pressure sewer in Braddock Dr. to connect present pump house located on Braddock Dr., near Huntley Ave. with the Los Angeles interceptor sewer on Overland Ave., Culver City—by City Council, Culver City. 8-31

LOS ANGELES CO.—**Long Beach Sewer Co.,** 2737 Magnolia Ave., Long Beach—$2,475 to construct a sanitary sewer in Harding St., between Cherry Ave. and Terminal St., Long Beach—by City Council, Long Beach. 9-7

LOS ANGELES CO.—**Oberg & Cook,** 2106 W. 93rd St., Los Angeles—$29,221 for a storm drain and appurtenances in Anaheim St., in right of way south of Anaheim St., and in Gaffey St., Los Angeles. Work will include grading, culverts, open concrete channels, open earth channels and appurtenances—by Board of Public Works, Los Angeles. 9-11

LOS ANGELES CO.—**V. C. K. Construction Co.,** 629 S. Atlantic Blvd., Los Angeles—$30,405 for 1.3 mi. of sanitary sewers in Cecilia St. and other streets in the county—by County Board of Supervisors, Los Angeles. 9-17

LOS ANGELES CO.—**V. C. K. Construction Co.,** 629 S. Atlantic Blvd., Los Angeles—$39,210 for 2.3 mi. of sanitary sewer in Quill Dr. and other streets in the county—by County Board of Supervisors, Los Angeles. 8-31

ORANGE CO.—**Underground Engineering Co.,** 124 W. 4th St., Los Angeles—$31,548 for an extension to the present sewer sys. in Elm St. and adjacent streets, Brea—by City Council, Brea. 8-31

SAN DIEGO CO.—**J. S. Barrett,** 1300 Coast Highway, Newport Beach—$65,878 for an extension to the sanitary sewer system and change over to interceptor sewer at the Naval Repair Base, San Diego—by Bureau of Yards and Docks, Washington, D. C. 9-13

SAN DIEGO CO.—**B. G. Carroll,** 2260 Main St., San Diego—$47,234 for installation of a sewer system in portions of 61st St., Fergus St., 62nd St., Stork St., 64th St., Akins Ave., Otay St., 63rd St., 65th St., Brooklyn Ave., Wunderlin Ave., Broadway and public rights of way at San Diego—by City Council, San Diego. 9-21

SAN FRANCISCO CO.—**R. Flatland,** 1000 Portola Dr., San Francisco—$17,105 for a drainage system in and adjacent to Shaughnessy Blvd., near Arroyo St., San Francisco—by Dept. of Public Works, San Francisco. 9-17

SAN FRANCISCO CO.—**Healy-Tibbitts Construction Co.,** 1100 Evans Ave., San Francisco—$128,676 for construction of Napoleon St. sewer westerly from Selby St. in Napoleon St. and Jerrold Ave., San Francisco—by Dept. of Public Works, San Francisco. 9-13

SAN MATEO CO.—**W. J. Tobin,** 5708 Glenbrook Dr., Oakland—$51,923 for installation of sewers in westerly portion of Menlo Park—by Menlo Park Sanitary District, Menlo Park. 9-6

SANTA CLARA CO.—**P. & S. Construction Co.,** 410 N. Tenth St., San Jose—$98,564 for a new sewer line to serve the in-

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POWER SHOVEL COMPANY

BENTON HARBOR, MICHIGAN

dustrial area immediately south of the San Jose limits—by County Board of Supervisors, San Jose. 9-14

Nevada

WASHOE CO.—**John B. Powers,** Box 1487, Reno—$45,156 for the construction of the East St. storm drain at Reno—by City Council, Reno. 9-6

Oregon

LANE CO.—**Oregon Installation Co.,** Rte. 4, Eugene—$79,826 for the installation of a 32-block long main trunk storm sewer, together with about 12 laterals off the main trunk, at Springfield—by City Council, Springfield. 9-11

Texas

DALLAS CO.—**E. L. White & Co.,** Dallas—$95,553 for improvements to the water system and extensive sewer developments at Oak Cliff and Dallas—by City Councils, Oak Cliff and Dallas. 9-24

Washington

KING CO.—**Walter McCray,** 2648 40th, W., Seattle—$14,382 for constructing a sewer outfall at W. Barton St., Seattle—by Board of Public Works, Seattle. 9-21

Waterway . . .

California

COLUSA CO.—**Morrison-Knudsen Co., Inc.,** Box 450, Boise, Idaho—$198,451 for levee enlargement, west levee, Sacramento River, Colusa to Packers—by U. S. Engineer Office, Sacramento. 9-7

HUMBOLDT CO.—**Mercer-Fraser Co.,** 2nd and Commercial Sts., Eureka—$40,751 for construction of four permeable pile jetties within a distance of about 0.2 mi. at Shivley Bluffs, about 9 mi. south of Scotia—by State Director of Public Works, Sacramento. 9-20

LOS ANGELES CO.—**C. R. Butterfield Co.,** 1401 N. Gaffey St., San Pedro—$75,830 for the extension of the river diversion dike at Pier A East, Long Beach Harbor—by Harbor Commission, City of Long Beach. 9-26

LOS ANGELES CO.—**Guy F. Atkinson Co.,** Russ Bldg., San Francisco—$26,750 for the construction of net ramps at the naval ammunition net depot, Seal Beach—by Bureau of Yards and Docks, Washington, D. C. 9-14

MARIN CO.—**R. G. Clifford,** Box 168, San Francisco—$46,900 for the construction of a new launchway and alterations to boathouse at the Point Reyes Lighthouse—by U. S. Coast Guard, San Francisco. 9-14

SACRAMENTO CO.—**Morrison-Knudsen Co., Inc.,** Box 450, Boise, Idaho—$84,250 for retard construction and enlargement of U. S. Dike on Yuba River from Rubke Bend 3.5 mi. southwest to Daguerre Point Dam, north of Sacramento—by U. S. Engineer Office, Sacramento. 9-7

SAN DIEGO CO.—**M. H. Golden Construction Co.,** 3485 Noell, San Diego—$75,603 for installing dolphins on the north side of the existing piers, 1 to 5 inc., and the north side of mole at the Naval Repair Base, San Diego—by Bureau of Yards and Docks, Washington, D. C. 9-20

SAN FRANCISCO CO.—**Duncanson-Harrelson Co.,** 960 Market St., San Francisco—$39,750 for the construction of

wharf No. 58, in Channel St. between 4th and 5th Sts., San Francisco—by Board of State Harbor Commissioners, San Francisco. 9-14

SAN FRANCISCO CO.—**M. B. McGowan, Inc.,** 625 Market St., San Francisco—$61,678 for constr. of the outer wharf of fleet landing at the Ferry Bldg., San Francisco—by State Harbor Commissioners, San Francisco. 8-31

SOLANO CO.—**American Dredging Co.,** 1419 Broadway, Oakland—$121,158 for dredging channel to old arsenal wharf at Benicia Arsenal—by U. S. Engineer Office, San Francisco. 9-14

SOLANO CO.—**J. D. Proctor, Inc.,** P. O. Box 247, Point Richmond Sta., Richmond—$39,440 for removing sunken obstruction for reserve fleet berthing at the Navy Yard, Mare Island—by Bureau of Yards and Docks, Washington, D. C. 9-18

SOLANO CO.—**San Francisco Bridge Co.,** 503 Market St., San Francisco—$251,600 for dredging for reserve fleet berthing facilities at the Navy Yard, Mare Island—by Bureau of Yards and Docks, Washington, D. C. 9-18

Oregon

MARION CO.—**J. N. and M. J. Conley,** 4332 NE. Royal Court, Portland—$31,116 for levees and revetments at Stayton—by U. S. Engineer Office, Portland. 9-7

Washington

PACIFIC CO. — **Strong & Macdonald, Inc.,** 4045 Ruston Way, Tacoma—$294,000 for repair of a jetty at the mouth of the Columbia River. The jetty will be reconstructed with 70,000 tons of rock and located on the Fort Casey Reservation—by U. S. Engineer Office, Portland, Ore. 9-26

Territories

HAWAII—**Hawaiian Dredging Co.,** Honolulu—$77,000 for dredging barge slip at Waipio Point—by Bureau of Yards and Docks, Washington, D. C. 9-24

Dam . . .

Montana

YELLOWSTONE CO.—**Walter Mackin,** Billings—$22,200 for the construction of a spillway to divert water from Big Ditch into Canyon Creek, about 11 mi. west of Billings—by Big Ditch Co., Billings. 9-7

Texas

GRAYSON CO.—**James & Phelps,** Oklahoma City—for extension of riprap on dam, Denison Dam and reservoir, Red River—by U. S. Engineer Office, Tulsa, Okla. 9-6

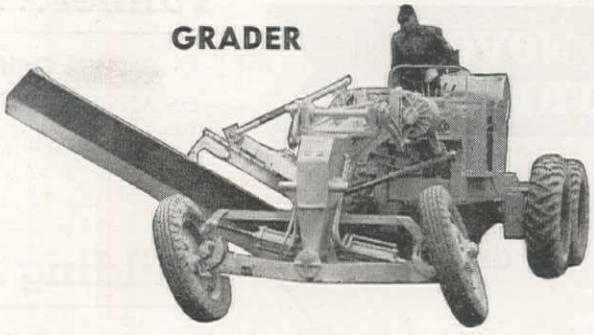
TAYLOR CO.—**O. J. Broughton,** 3548 Rosedale St., Dallas—$24,815 for spillway improvements at Fort Phantom Hill reservoir, Abilene—by City Council, Abilene. 9-13

Irrigation . . .

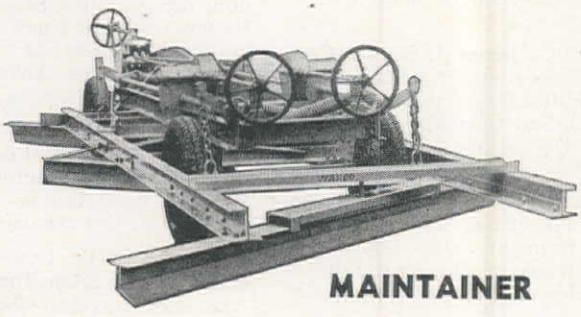
Oregon

DESCHUTES CO.—**W. C. Thompson,** 2801 3rd, San Francisco—$245,290 for further construction on the irrigation system on the Deschutes project, near Bend, to include earthwork and structures for laterals and sublaterals on the north unit of the project—by Bureau of Reclamation, Washington, D. C. 9-11

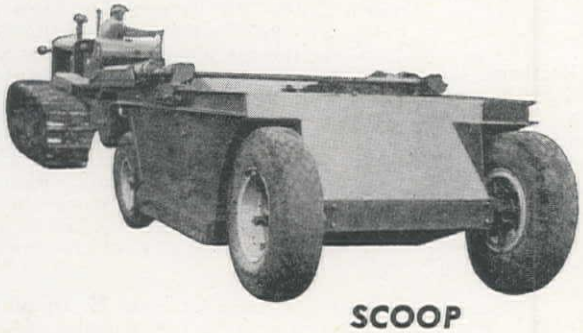
GRADER



WATCH THE SCOREBOARD



MAINTAINER



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Contractors Equipment & Supply Co.
Albuquerque, N. M.

Smoot Machinery & Supply Co.
Salt Lake City 5, Utah

Tunnel . . .

California

LOS ANGELES CO.—**Lindgren & Swinerton,** 605 W. Olympic Blvd., Los Angeles—for a tunnel and ramp at the Santa Anita Park race track, Arcadia—by Los Angeles Turf Club. 9-7

Building . . .

California

ALAMEDA CO.—**The Austin Co.,** 1001 Ray Bldg., Oakland—$50,000 for alterations to an industrial bldg. at 810 Carlton St., Berkeley—by Colgate-Palm Olive-Peet Co., Berkeley. 9-26

ALAMEDA CO.—**The Austin Co.,** 1001 Ray Bldg., Oakland—$150,000 for a factory bldg., installation of equipment, etc., at the corner of Sherwin and Horton Sts., Emeryville—by Sherwin-Williams Co., El Cerrito. 9-26

ALAMEDA CO.—**James I. Barnes Construction Co.,** Russ Bldg., San Francisco—$113,660 for additional facilities at the U. S. Naval Hospital, San Leandro—by Bureau of Yards and Docks, Washington, D. C. 9-13

ALAMEDA CO.—**Dinwiddie Construction Co.,** 620 Market St., San Francisco—$750,000 for 3 frame and stucco dormitory units and a cafeteria at the University of Calif. at Berkeley—by University of California, Berkeley. 9-7

ALAMEDA CO.—**MacDonald & Kahn, Inc.,** 200 Financial Center Bldg., San Francisco—$287,550 for barracks, mess hall and housing at the Postal Concentration Center, Oakland Army Base, Oakland—by U. S. Engineer Office, San Francisco. 9-7

ALAMEDA CO.—**Monson Brothers,** 475 Sixth St., San Francisco—$77,141 for reconstruction of warehouse No. 5 at the Oakland Army Base, Oakland—by U. S. Engineer Office, San Francisco. 9-7

ALAMEDA CO.—**C. F. Parker,** 135 S. Park, San Francisco—$78,640 for tent housing area at the Oakland Army Base, Oakland—by U. S. Engineer Office, San Francisco. 9-14

ALAMEDA CO.—**C. F. Parker,** 135 S. Park, San Francisco—$54,451 for a service and recreation bldg. at the Postal Concentration Center, Oakland—by U. S. Engineer Office, San Francisco. 9-25

ALAMEDA CO.—**Salih Brothers,** 988 Market St., San Francisco—$70,000 for a theater bldg. to seat 700 people. Building will have concrete walls, wood interior, steel trusses, etc., to be constructed at San Lorenzo Village—by Greenwood Corp., San Mateo. 9-6

ALAMEDA CO.—**Swanstrom & Stahl,** 2034" Hoover Ave., Oakland—$50,000 for construction of a one-story brick and steel warehouse and factory addition at 888 92nd Ave., Oakland—by Druge Brothers, Oakland. 9-24

CONTRA COSTA CO.—**Parker, Steffens and Pearce,** 135 S. Park, San Francisco—for a 7-story process laboratory bldg., structural steel frame, transite exterior, at Richmond—by Standard Oil Co., San Francisco. 10-1

FRESNO CO.—**Collins Construction Co.,** Box 586, Fresno—$150,000 for a one-story, reinforced concrete bldg., including a machine shop, storage space, etc., on Church Ave., Fresno — by Fruehauf Trailer Co., Fresno. 9-19

FRESNO CO.—**J. T. Cowan,** 536 Brix Bldg., Fresno—$250,000 to enlarge a warehouse and storage facilities at North H St., Fresno—by J. B. Hill Grain & Feed Co., Fresno. 9-14

LOS ANGELES CO.—**Alco Construction Co.,** 5423 Flemish Village Lane, Los Angeles—$43,970 for additional facilities, including a reinforced concrete vault bldg. addition to the existing administration and shore patrol bldg., to be constructed at Roosevelt Base, Terminal Island—by Bureau of Yards and Docks, Washington, D. C. 9-12

LOS ANGELES CO.—**A. B. Barker,** 121 S. Euclid, Pasadena—$70,000 for a reinforced concrete and brick, auto agency bldg. at 54th St. and Crenshaw Blvd., Los Angeles—by Crenshaw Motors, Los Angeles. 9-14

LOS ANGELES CO.—**Baruch Corporation,** 625 S. Olive St., Los Angeles—$1,500,000 (est.) for a new service bldg. of reinforced concrete at Jefferson St. and Grand Ave., Los Angeles—by May Co., Los Angeles. 9-5

LOS ANGELES CO.—**Buttress & McClellan,** 1013 E. 8th St., Los Angeles—$45,000 for additions to a factory bldg. at 1731 S. Wall St., Los Angeles—by Seaboard Coil Spring Co., Los Angeles. 9-14

LOS ANGELES CO.—**California Refrigerator Repair Shop, Inc.,** 7025 S. Western Ave., Los Angeles—$42,000 to build a 2-story frame and stucco store and shop bldg. at 7003-05 S. Western Ave., Los Angeles—by Self. 8-31

LOS ANGELES CO.—**Contracting Engineers,** 2310½ W. Vernon Ave., Los Angeles—$100,000 for the superstructure of a 1200-seat theater bldg. at 8610 Sepulveda Blvd., Los Angeles—by Second Sepulveda Housing Corp., Los Angeles. 8-31

LOS ANGELES CO.—**L. E. Dixon Co.,** 609 S. Grand Ave., Los Angeles—$525,000 for a two-story and basement addition and extensive alterations to a store bldg. at Vermont and Slauson Aves., Los Angeles—by Sears-Roebuck & Co., Los Angeles. 9-28

LOS ANGELES CO.—**L. E. Dixon Co.,** 609 S. Grand Ave., Los Angeles—$1,500,000 for construction of a new store bldg. containing 180,000 sq. ft. of floor space on a site occupying the majority of the block bounded by Hillcrest Ave., Manchester Blvd., Dorothy Place and Spruce St. in Inglewood. The structure is to be of reinforced concrete, with brick and plaster exterior—by Sears-Roebuck & Co., Los Angeles. 9-28

LOS ANGELES CO.—**Dunlap, Brummett & Demblon, Ltd.,** 507 Mission St., South Pasadena—$55,500 for three 4-unit apartment bldgs., and a duplex dwelling at Long Beach—by Self. 9-7

LOS ANGELES CO.—**Ray Gerhart,** 334 S. Greenwood Ave., Pasadena—$93,000 for a one and part two-story garage bldg., of brick and reinforced concrete construction, to be located on E. Olympic Blvd., Los Angeles—by Diamond T Truck Co., Los Angeles. 9-7

LOS ANGELES CO.—**William O. Gray,** 10911 Atlantic, Lynwood—$142,570 for the constr. of a new industrial plant on Bandini Blvd. at Ayres Ave., Los Angeles

County Dist.—by Southland Paper Converting Co., Los Angeles. 9-14

LOS ANGELES CO.—**H. F. Hoffman,** 10364 Laurel Canyon Blvd., Pacoima—$65,000 to build 22 four-room frame and stucco dwellings at Van Nuys—by Self. 9-7

LOS ANGELES CO.—**J. & B. Construction Co.,** 5572 Valley Blvd., Los Angeles—$41,478 for moving existing classrooms from the abandoned site of the El Monte High School to the new location, constructing new conc. foundations and floor slabs, connecting and covered passageways, etc., at El Monte—by El Monte Union High School District, El Monte. 8-31

LOS ANGELES CO.—**Jamison Investment Co.,** 8435 Beverly Blvd., Los Angeles—$53,600 for a 12-family, 36-room, frame and stucco apartment bldg. on S. Fuller Ave., Los Angeles—by Fred Jamison, Los Angeles. 8-31

LOS ANGELES CO.—**Marvin & Stephens,** 2337 Nidvale Ave., West Los Angeles—$42,000 for three 4-family, 12-room, frame and stucco court bldgs. in West Los Angeles—by Charles H. Marvin, West Los Angeles. 8-31

LOS ANGELES & SAN BERNARDINO COS.—**Robert E. McKee,** 4700 San Fernando Rd. West, Los Angeles—for the reconstruction of railroad depots at stations between Los Angeles and San Bernardino. The project consists of demolition of the wood frame bldgs., constr. and modernization with the salvaged materials supplemented with certain new materials—by Atchison, Topeka & Santa Fe Railway, Los Angeles. 9-18

LOS ANGELES CO.—**E. S. McKittrick Co., Inc.,** 7839 Santa Fe Ave., Huntington Park—$52,000 for a factory bldg., to cover an area 140x157 ft.; reinforced brick and concrete, at Pasadena—by Holly Heating & Mfg. Co., South Pasadena. 9-14

LOS ANGELES CO.—**J. A. McNeil Co.,** 714 W. Olympic Blvd., Los Angeles—for a new structural steel and reinf. conc. church bldg. to seat 1000 persons and a frame and stucco rectory bldg. at Los Angeles—by Roman Catholic Archbishop, Los Angeles. 10-1

LOS ANGELES CO.—**Murphy Brothers,** Box 475, Wilmington—$48,600 for a 10-unit, 40-room, frame and stucco apartment court at West Los Angeles—by Elizabeth C. Murphy, West Los Angeles. 9-7

LOS ANGELES CO.—**Myers Brothers,** 3407 San Fernando Rd., Los Angeles—$80,000 for the constr. of a steel frame storage bldg. to cover an area 100x130 ft. and 50x120 L-shaped at Los Angeles—by California Cornice, Steel & Supply Co., Los Angeles. 9-7

LOS ANGELES CO.—**J. O. Oltmans & Son,** 810 E. 18th St., Los Angeles—$70,000 for alterations and additions to a factory at 5675 Anaheim-Telegraph Rd., Los Angeles. The construction will provide additional mill mixing facilities and an increase in the size of the Banbury mixer—by U. S. Rubber Co., Los Angeles. 9-14

LOS ANGELES CO.—**Pacific Construction Finance Co.,** 5143 Sunset Blvd., Los Angeles—$58,000 to build three 4-family 20-room, frame and stucco apartment bldgs., on S. Occidental Blvd., Los Angeles—by Dave Appel, Los Angeles. 8-31

LOS ANGELES CO.—**C. L. Peck,** 354 S. Spring St., Los Angeles—for a new factory bldg. of steel frame and corrugated iron

constr. at 2301 E. Vernon Ave., Vernon—by Byron Jackson Co., Los Angeles. 10-1

LOS ANGELES CO.—**C. L. Peck,** 354 S. Spring St., Los Angeles—$275,000 to construct a mausoleum of reinforced concrete, covering an area of 141x83 ft., at Glendale—by Forest Lawn Co., Glendale. 8-31

LOS ANGELES CO.—**C. L. Peck,** 354 S. Spring St., Los Angeles—$1,500,000 (est.) for a reinf. conc. department store bldg. at Los Angeles—by Broadway Department Store, Los Angeles. 10-1

LOS ANGELES CO.—**C. L. Peck,** 354 S. Spring St., Los Angeles—$500,000 for a 7-story side addition, and altering the face of the present bldg. at 9600 Wilshire Blvd., Beverly Hills. The addition will be reinforced concrete constr., steel sash, limestone and marble facing, etc. — by Saks Fifth Ave., Beverly Hills. 10-1

LOS ANGELES CO.—**B. D. Pennington Co.,** Bank of America Bldg., Anaheim—$40,000 for a warehouse bldg. at 2100 E. Pacific Coast Highway, Wilmington—by Texas Co., Los Angeles. 9-6

LOS ANGELES CO. — **Realty Building Service,** 4040 Wilshire Blvd., Los Angeles—$286,000 to construct an addition to New Chinatown at Los Angeles—by China Development Co., Los Angeles. 9-7

LOS ANGELES CO.—**John B. Schmolle,** 2217 Camden Ave., West Los Angeles—$98,000 for a reinforced concrete blueprint plant at 115-119 S. La Brea Ave., Los Angeles—by Economy Blue Print and Supply Co., Los Angeles. 9-18

LOS ANGELES CO. — **Stronach Construction Co.,** 115 N. Robertson Blvd., Los Angeles—$250,000 (est.) for a two-story wholesale mercantile bldg. at Broadway and Adams Blvd., Los Angeles—by New York Merchandise Co., Inc. 9-18

LOS ANGELES CO.—**P. J. Walker Co.,** 3900 Whiteside Ave., Los Angeles—for a new department store bldg. at Pasadena. Construction will be of steel frame or reinf. conc., stone and brick facing, etc. Construction will start Nov. 1—by Bullocks, Inc., Los Angeles. 10-1

LOS ANGELES CO.—**John R. Waters,** 6314½ San Vicente Blvd., Los Angeles—$54,000 for building three 3-family, 14-room frame and stucco apartment bldgs. at West Los Angeles—by Olenna Brandt, Los Angeles. 9-14

LOS ANGELES CO.—**Del E. Webb Construction Co.,** 1105-14 Continental Bldg., Los Angeles — $50,000 for a 1-story and part basement office bldg. of light steel construction with plaster exterior, at 333 S. Beaudry Ave., Los Angeles—A. C. Martin, Los Angeles. 9-27

LOS ANGELES CO.—**Weymouth Crowell Co.,** 2104 W. 15th St., Los Angeles—for a two-story and basement addition at the side and rear of an existing bldg. on La Brea Ave., Inglewood. Addition will be reinforced concrete and masonry construction — by Southern California Telephone Co., Los Angeles. 10-1

LOS ANGELES CO.—**Zoss Construction Co.,** 1037 N. Cole Ave., Los Angeles—$63,880 for a 10-unit classroom bldg. at the Oxnard Street School, North Hollywood—by Board of Education, Los Angeles. 9-27

MONTEREY CO.—**Vern R. Huck,** 3021 Rowena, Los Angeles—$50,000 for a wood frame and corrugated iron cannery bldg., and a small frame and stucco office bldg. at Salinas—by Tervern Products Co., Salinas. 9-17

RIVERSIDE CO.—**T. C. Prichard,** 3964 Orange St., Riverside—$75,000 for a new theater bldg. of reinforced concrete construction at Third Ave. and D St., Perris—by Tom Sharpe, Perris. 9-17

SACRAMENTO CO.—**The Austin Co.,** 1001 Ray Bldg., Oakland—$800,000 for the first unit of a can factory and warehouse bldg. on the east side of 7th St., Sacramento—by Continental Can Co., San Francisco. 9-5

SAN BERNARDINO CO.—**J. N. Robinson,** 511 Base Line, San Bernardino—$150,000 to construct a four-story and basement, steel frame, reinforced concrete bldg. to adjoin the rear of an existing store at San Bernardino—by Sears-Roebuck & Co., Los Angeles. 9-28

SAN DIEGO CO.—**Anderson & Johnson Co.,** 4745 Hawley Blvd., San Diego—$83,877 for additions to the Central Elementary School at 4063 Polk Ave., San Diego—by Board of Education, Unified School District, San Diego. 9-11

SAN DIEGO CO.—**Haddock Engineers, Ltd.,** 605 W. Olympic Blvd., Los Angeles—$46,700 for dismantling and moving of target range at Camp Elliott, Linda Vista, and reassembling same at Camp Pendleton, Oceanside—by Bureau of Yards and Docks, Washington, D. C. 9-14

SAN DIEGO CO.—**William P. Kessling,** 5711 La Jolla Blvd., La Jolla—$40,000 to build three 1-story store buildings, a drive-in restaurant and a quick service restaurant at various locations in La Jolla.

SAN DIEGO CO.—**Scherer & Prichard,** 3964 Orange St., Riverside—$85,465 for a 900-seat reinforced concrete theater bldg. on Main St. at El Cajon—by Gerald Gallagher, El Cajon. 9-20

SAN FRANCISCO CO.—**Barrett and Hilp,** 918 Harrison St., San Francisco—$490,630 for foundations and piling for shipfitters' and boilermakers' shop at Hunters Point, San Francisco—by Bureau of Yards and Docks, Washington, D. C. 8-31

SAN FRANCISCO CO.—**Swinerton & Walberg,** 225 Bush St., San Francisco—for a reinforced concrete and structural steel six-story and basement office bldg. addition on the site of the Breiling Bldg., San Francisco—by Matson Navigation Co., San Francisco. 9-12

SANTA BARBARA CO.—**Robert D. Paterson,** 1911 San Andreas St., Santa Barbara—$150,000 for a two-story, 34-unit motel at the northeast corner of Cabrello Blvd. and Chapala St., Santa Barbara—by George Gage, Santa Barbara. 9-27

SANTA CRUZ CO.—**T. H. Rosewell,** Rte. 1, Box 539, Watsonville—$400,000 for three modern lettuce packing sheds and an ice plant, including a processing shed, ice holding room, frozen storage and freezing unit at Pajaro, on the Watsonville-Castroville Highway near Watsonville—by J. G. Marinovich, Watsonville. 9-28

SISKIYOU CO.—**Fred Lekberg,** Klamath Falls, Ore.—$73,000 for an ultra-modern, fireproof, 2-story tile and concrete hotel on Main St., Tulelake—by Ray Moresco, James Horn, William Zeigler and John Melin, Tulelake. 9-7

STANISLAUS CO.—**S. C. Giles & Co.,** 319 Elks Bldg., Stockton—$61,000 to construct a commercial bldg. at Oakdale—by Chris Mangells, Oakdale. 9-20

STANISLAUS CO.—**McCoy & Butler,** 1128 F St., Marysville—$109,552 for construction of new reinforced concrete 15-classroom grammar school bldg. at Modesto—by City School Dist., Modesto. 9-5

STANISLAUS CO.—**Wieland Brothers,** 191½ Eye St., Modesto—$130,000 for general appliance store, remodeling the tire department, new mill and storage tanks for bulk handling of grain and installation of automatic unloading equipment, and an all-steel warehouse and machine shop at Modesto—by J. S. West & Co., Modesto. 9-28

SUTTER CO.—**H. H. Larsen Co.,** 64 So. Park, San Francisco—$300,000 for concrete dry kilns, large mess hall, bachelor quarters and cottages at the Acme Hop Ranch, Tudor—by Acme Brewing Co., Tudor. 9-13

TULARE CO.—**Thermal Insulation Co.,** 2351 Jerrold Ave., San Francisco—$80,000 for a pre-cooling and cold storage plant at Exeter—by Mayflower Fruit Association, Exeter. 9-18

Idaho

BANNOCK CO.—**Brennan & Cahoon Co.,** Box 288, Klamath Falls, Ore.—$50,000 to construct a new show room and warehouse on North Fourth, between Clark and Lander, Pocatello—by Intermountain Equipment Co., Boise. 9-6

Montana

LEWIS & CLARK CO.—**Al Johnson Construction Co.,** Foshay Tower, Minneapolis, Minn.—$480,000 for a 16-stall roundhouse and 135-ft. turntable at Helena—by Northern Pacific Railroad Co., St. Paul, Minn. 8-31

Nevada

CLARK CO.—**Walter A. Stinson,** c/o U. S. Lime Products Corp., Sloan—$85,000 for a reinforced concrete primary and secondary crushing plant and quarry at Apex—by U. S. Lime Products Corp., Sloan. 9-18

Oregon

JOSEPHINE CO.—**Sergeant & Cancilla,** 338 S.W. 9th, Portland—$52,756 to construct an 8-classroom frame school at Kerby—by County School Board, Grants Pass. 9-7

LANE CO.—**Eugene Engineering Co.,** Eugene—$60,103 to build a six-classroom tile grade school at Florence—by School Board, Florence. 9-18

MULTNOMAH CO.—**Burns & Co.,** Pittock Block, Portland—$100,000 for a one-story and basement combination masonry, structural steel and reinforced concrete addition to a bakery plant at Northeast 12th, at Flanders St., Portland—by U. S. Bakery, Portland. 8-31

MULTNOMAH CO.—**Ross B. Hammond Construction Co.,** 1241 Williams Avenue, Portland—$500,000 for a beverage plant at Portland. The bldg. will cover an area 80x460 ft. and the roof will provide space for an autogyro and helicopter landing field—by Columbia Distributing Co., Portland. 9-26

Texas

BEXAR CO.—**C. L. Browning, Jr.,** 812 Insurance Bldg., San Antonio—$244,559 for construction and conversion of the AAF convalescent and regional hospitals and redistribution station at the San Antonio Aviation Cadet Center—by U. S. Engineer Office, San Antonio. 9-17

BEXAR CO.—**Hill & Combs,** 321 Melrose Place, San Antonio—$85,900 for a 1-story concrete frame bldg., at San Antonio—by Nelson Tannery, Inc., San Antonio. 9-28

BEXAR CO.—**F. A. Nunnelly,** 118 Delaware St., San Antonio—$90,501 for miscellaneous bldgs. at Dodd Field, Fort Sam Houston—by U. S. Engineer Office, San Antonio. 9-13

DALLAS CO.—**Cowdin Brothers,** 411 S. Haskell, Dallas—$125,000 for constr. of a 1-story bldg., to include an auditorium, cafeteria and classrooms at Dallas—by Sacred Heart Parish Church, Dallas. 9-25

DALLAS CO.—**Cowdin Brothers,** 411 S. Haskell, Dallas—$50,000 for an addition to a business building at Dallas—by Adleta Show Case Co., Dallas. 9-21

DALLAS CO.—**Henger Construction Co.,** Dallas National Bank Bldg., Dallas—$250,000 for a 2-story and basement addition to a book store at Dallas—by Cokesbury Store, Dallas. 9-28

DALLAS CO.—**W. McGrady,** Waco—$49,500 for 18 buildings and a 2-story office bldg. to be known as Alamo Plaza Hotel Courts, at Dallas—by Charles Mooney, Waco. 9-10

DALLAS CO.—**Vivrett & Vivrett,** Southland Life Bldg., Dallas—$99,750 for constr. of a one-story food locker at Dallas—by Park Cities Frozen Locker Co., Dallas. 9-28

GAINES CO.—**M. B. F. P. Construction Co.,** Lubbock—$73,950 for a 1-story, brick, metal doors and windows, structural clay tile bldg., at Seminole—by Seminole Consolidated School District, Seminole. 9-11

HIDALGO CO.—**Schneider Construction Co.,** M. & M. Bldg., Houston—$100,000 for the construction of a packing plant at Weslaco. 9-4

NUECES CO.—**Jack Walsh,** 41 Country Club Place, Corpus Christi—$64,947 for a 1-story and mezzanine bank building at Corpus Christi—by First State Bank, Corpus Christi. 9-18

Utah

SALT LAKE CO.—**Paul Paulsen,** 55½ 1st St., Salt Lake City—$150,000 for a garage and office bldg., to be 1- and 2-story, brick and concrete construction, with a bus and truck yard, at 3rd S. and 4th W., Salt Lake City—by Denver & Rio Grande Western Railroad Co., Denver, Colo. 9-21

Washington

KING CO.—**Atherton Construction Co.,** Terminal Sales Bldg., Seattle—$130,000 for a dairy plant at Seattle—by Golden Rule Dairy Co., Seattle. 9-19

KING CO.—**Paul N. Carlson,** 1308 Madison St., Seattle—$325,000 for a nurses' home to be a 6-story and basement, reinforced concrete structure at Summit Ave. and Columbia St., Seattle—by Swedish Hospital Association, Seattle. 9-11

KING CO.—**Industrial Electronics Co.,** 1828 Yale Ave., Tacoma—$108,832 for construction of radio program system and ex-

tension and improvements to existing fire alarm system at the U. S. Naval Hospital, Seattle—by Bureau of Yards and Docks, Washington, B. C. 9-17

KING CO.—**George Schuehle,** 9302 S. 7th St., Seattle—$200,000 for the addition of a fourth floor and remodeling and refurnishing of entire bldg. at 5th and Pine Sts., Seattle—by Best's Apparel, Inc., Seattle. 9-20

PIERCE CO.—**MacDonald Building Co.,** 1517 S. Tacoma Way, Tacoma—$300,000 for additional construction to the War Department personnel center at Fort Lewis—by U. S. Engineer Office, Seattle. 9-28

SPOKANE CO.—**Hazen & Clark,** 1101 Howard S., Spokane—$126,352 for alterations to barracks at Fort Wright, Spokane—by U. S. Engineer Office, Seattle. 9-12

SPOKANE CO.—**Clyde M. Ludberg Co.,** Hutton Bldg., Spokane—$104,341 for remodeling and redecorating Sutton Hall at the Eastern Washington College of Education at Cheney—by Board of Directors, Eastern Washington College of Education, Cheney. 9-21

Canada

BRITISH COLUMBIA — **Bennett & White Construction Co., Ltd.,** 510 W. Hastings St., Vancouver—$360,000 for the new temporary bldg. to house the Department of Veterans' Affairs, at Hare and Bute Sts., Vancouver—by Veterans' Administration, Ottawa. 9-13

BRITISH COLUMBIA—**Commonwealth Construction Co., Ltd.,** Vancouver—$326,381 for construction of the new Royal Inland Hospital at Kamloops—by Dept. of Public Works, Ottawa. 9-13

BRITISH COLUMBIA—**Commonwealth Construction Co., Ltd.,** Vancouver—for a cement supply house of frame construction with corrugated asbestos exterior, at Vancouver—by Evans, Coleman & Evans, Ltd., Vancouver. 9-13

BRITISH COLUMBIA—**E. M. Craig Company,** 470 Granville St., Vancouver—$60,000 for the construction of an apartment block. The buildings will be two stories in height and of reinforced concrete, located on Cambie St., Vancouver—by A. L. Hook, Vancouver. 9-25

BRITISH COLUMBIA — **E. A. & G. Diffner,** 2594 Grant St., Vancouver—$50,000 for erection of a school at Deep Cove—by District of North Vancouver School Board, Vancouver. 9-25

BRITISH COLUMBIA—**Dominion Construction Co., Ltd.,** Vancouver—$100,000 for a new meat packing plant, of concrete and brick constr., to be located at the north end of Fraser Ave., Vancouver—by Fletcher's Limited, Vancouver. 9-13

Miscellaneous . . .

California

LOS ANGELES CO.—**C. W. Driver, Inc.,** 111 W. 7th St., Los Angeles—$81,068 for installation of an automatic sprinkler system at the Long Beach Naval Hospital, Long Beach—by Bureau of Yards and Docks, Washington, D. C. 9-14

LOS ANGELES CO.—**Stratton Construction Co.,** 3537 E. Colorado Blvd., Pasadena—$48,661 for added work at the Jet Propulsion Laboratory at the California Institute of Technology, Pasadena—by U. S. Engineer Office, Los Angeles. 9-14

Idaho

BONNER CO.—**James C. Roberts,** Spokane, Wash.—$40,832 for construction of 43 mi. of electric power line throughout the county — by Northern Idaho Rural Elect. Rehabilitation Assn., Inc., Sandpoint. 9-13

GOODING CO.—**Morrison-Knudsen Co.,** Box 450, Boise—$3,000,000 for constr. of a 16,500-kw. hydroelectric generating plant and the erection of 120 mi. of electrical transmission line from Hagerman Valley to Emmett and Boise, and rural electric transmission line extensions. Plant will be located in the Snake River Canyon south of Hagerman—by Idaho Power Co., Boise. 9-27

Montana

BEAVERHEAD CO.—**Charles Shannon,** 502 S. Washington St., Butte—$190,959 to construct an electric distribution project, 133.7 mi. in length in the county—by Vigilante Electric Cooperative, Inc., Dillon. 9-7

GALLATIN, PARK & SWEET GRASS COS.—**Bennit & Lewis,** Billings—$112,546 for 99.8 mi. of electric lines throughout the three counties—by Park Electric Cooperative, Inc., Livingston. 9-13

New Mexico

MORA CO. — **Bridgeman Construction Co.,** Albuquerque—$191,521 for constructing 185 mi. of electric line throughout the county—by Mora-San Miguel Electric Cooperative, Inc., Mora. 9-17

Oregon

DESCHUTES CO.—**Huenergard Electric Co.**, 7309 S.W. Benz Park Court, Portland —$64,508 for construction of 71.7 mi. of electric line—by Central Electric Cooperative, Inc., Redmond. 9-20

Texas

COLLINGSWORTH CO.—**Eugene Ashe Electric Co.**, Ft. Worth—$87,945 for construction of 105.9 mi. of electric line—by Greenbelt Electric Coop., Inc., Wellington. 9-17

Utah

IRON CO.—**Wasatch Electric Co.**, Salt Lake City—$80,000 for the construction of 55.8 mi. of transmission line in the county —by Escalante Valley Electrical Association, Inc. 9-20

Washington

COWLITZ CO.—**Henry George & Son**, Hutton Bldg., Spokane—$240,000 for additional grain storage bins at the port's grain elevator at Longview—by Board of Commissioners, Port of Longview. 9-12

COWLITZ CO.—**Hart Construction Co.**, 3536 E. 11th St., Tacoma—$45,622 for excavation and furnishing and driving piling for the foundation of additional grain storage bins at the port of Longview — by Board of Port Commissioners, Longview. 9-14

PEND OREILLE CO. — **Agutter Electric Co.**, Seattle—$86,312 for 88.5 mi. of electric line to be constructed throughout the county—by Pend Oreille Electric Co-op., Inc., Newport. 9-17

PROJECTS PROPOSED

Highway & Street...

California

SAN FRANCISCO CO.—Funds in the amount of $1,421,775 have been allocated to the city of San Francisco by the State Director of Public Works, for an extensive highway construction program on state highways within the city. 9-11

Washington

KING CO.—Street improvements for the city of Kirkland are being planned and will cost in the neighborhood of $547,000. 9-7

Bridge . . .

Washington

COWLITZ CO.—Plans have been proposed for a steel highway bridge across the Coweman River at Kelso. Construction of the bridge would consist of a fixed steel span with conc. piers and approaches approx. a quarter of a mile above the existing span. 10-1

Airport...

California

SAN DIEGO CO.—The San Diego City-County Aviation Advisory Committee, San Diego, are making plans for the improvement of 18 airports in the county. Estimated cost of the program is $1,376,000. 9-7

Water Supply . . .

California

SHASTA CO. — The Shasta Dam Area Utility District, Redding, is planning the construction of a water system estimated to cost about $665,000. 8-31

Idaho

BONNEVILLE CO.—The village of Ammon, recently approved the construction of a new $20,000 water works system. Work is to begin in the near future. 9-6

TWIN FALLS CO.—Plans and specifications are being prepared for increased facilities to supply the city of Twin Falls with 10,000 gallons of water daily. This will include new distribution plant and four filter beds. Bids are to be called at an early date. 9-6

Washington

KING CO.—Approval has been received and bids will soon be called for a $500,000 water system to be constructed at Bellevue. 9-24

Sewerage . . .

California

BUTTE CO.—The city of Gridley plans the construction of a new sewage disposal plant to cost approx. $85,000. 10-1

SANTA CLARA CO.—Plans are under way for a $1,400,000 storm drainage system in the central portion of the city of San Jose and $300,000 additions to the sanitary sewage collection system, also at San Jose. 10-1

Nevada

WASHOE CO.—Plans for the construction of sewage facilities at Sparks to cost $80,000 have been approved and final plans are to be started at once. 10-1

Texas

HIDALGO CO.—The city of Mission has received approval for the construction of a sanitary sewer system in that city to cost approx. $109,261. 9-13

Washington

FRANKLIN CO.—A new water filtration project for the city of Pasco, to cost about $250,000 is being planned for construction in the near future. It is to be a 6,000,000-gal. capacity plant. 9-26

PIERCE CO.—The city of Puyallup is laying the groundwork preparatory to drawing plans for the construction of a new sewer system and disposal plant to cost about $600,000. Work will be started as soon as equipment and materials are available. 10-1

Waterway . . .

California

SOLANO CO.—The Navy has approved $2,641,000 for construction at the Mare Island Navy Yard of berthing facilities for vessels of the reserve fleet. 9-6

TULARE CO. — Approximately $75,000 worth of improvements will be made on the St. John's River near Visalia. Work is anticipated to commence this fall. 9-19

Oregon

HOOD RIVER CO. — Plans are under way for a port development project estimated to cost $125,000 at Hood River. Developments would include constr. of a 3200-ft. air strip, reclaiming about 32 ac. of land from the slough, extension of the existing river mole, constr. of a yacht basin, etc. 9-19

Texas

GRIMES & MONTGOMERY COS.—A flood control system to cost approx. $1,000,000 is now being planned by the San Jacinto River Conservation and Reclamation District, San Jacinto. 9-10

NUECES CO.—Bids will soon be called for dredging intra-coastal waterways between Corpus Christi and Port Isabel. The project will cost approx. $1,600,000. 9-12

Building . . .

Arizona

PIMA CO.—A new theater bldg., with 800 to 1000-person seating capacity is being planned by Publix-Rickards-Nace, Inc., to be erected at Tucson. Plans provide for a parking lot adjacent to the theater bldg. The entire project is estimated to cost between $75,000 and $100,000. 9-7

California

ALAMEDA CO.—The Board of Education of the city of Berkeley has received authorization from WPB to proceed with the construction of the Berkeley High School auditorium bldg. at a cost of $1,000,000. 9-7

GLENN CO.—Funds have been allotted for two wings to the present school at Orland, to include a combination library and cafeteria, a kindergarten and two classrooms, at an est. cost of $58,600. 10-1

IMPERIAL CO.—Construction is scheduled to begin in October on a $3,000,000 sugar beet factory with a daily slicing capacity of 2400 tons, near Imperial, for the Holly-Sugar Corp. 9-26

LOS ANGELES CO.—The state is planning to construct a war bldg. for 92 persons at the Norwalk State Hospital, Norwalk, to cost approx. $119,000. 9-26

LOS ANGELES CO.—Preliminary plans have been approved for the construction of a bowling alley bldg. on South Brand Blvd., Glendale, for Ford Growell. The

structure will be of reinf. brick, to cost approx. $50,000. 10-1

LOS ANGELES CO.—Plans have been completed for construction of additions to the American Can Co. factory at Los Angeles. Additions include a 2-story structure, to contain manufacturing and cafeteria facilities; a 1-story manufacturing bldg. addition; and a 1-story warehouse. Construction will be of reinforced concrete and brick with steel roof girders. Project will cost approx. $1,000,000. 10-1

LOS ANGELES CO.—Etna Construction Co., Los Angeles is planning the construction of 20 seven-family, 32-room frame and stucco apartment bldgs. at Los Angeles. Estimated cost of the project is $315,000. 10-1

LOS ANGELES CO. — The United Air Lines is planning to build airport terminal facilities, including hangars, shops, offices, etc., at the Los Angeles Municipal Airport. 10-1

LOS ANGELES CO.—Plans are being prepared for the construction of 850 six-room dwellings on a 180-ac. tract of land extending from Western Ave. to Arlington Ave. and from 108 St. to Imperial Blvd., Los Angeles, for R. S. Diller, Los Angeles. Estimated cost of the project is $6,000,000. 9-7

LOS ANGELES CO. — E. N. Hurley, Chicago, Ill., chairman of the board of Electrical Household Utilities Corp., has announced immediate constr. on a site in the Los Angeles area of a plant to manufacture Thor washing machines, ironing machines and dishwashers. Est. cost is $250,000. 9-12

LOS ANGELES CO.—Plans have been disclosed for the construction of a new store building for I. Magnin & Co., to be located on the southwest corner of Wilshire Blvd. and Bedford Dr., Beverly Hills. Estimated cost of the project is $4,000,000 and work is scheduled to begin in the very near future. 9-7

NAPA CO.—Plans are being prepared for the construction of buildings for the State Veterans' Home at Yountville. Construction will include a hospital bldg. and convalescent barracks at an est. cost of $1,133,000. The structures will be of reinforced concrete. 9-7

SACRAMENTO CO. — Plans are being completed for the remodeling of the Physicians' Bldg., 80x100 ft., to provide 70,000 sq. ft. of floor space for the expansion of the Roos Brothers apparel store at Sacramento. Expansion will cost $1,000,000. 10-1

SAN BERNARDINO CO. — Plans are under way for the construction of 300-capacity dormitories at California Institution for Men, Chino. 9-26

SAN FRANCISCO CO.—Apparel City, Inc., San Francisco, is preparing plans to construct an apparel center, including one-four- and six-story bldgs. of reinforced concrete at San Francisco. The extensive building project is estimated to cost approx. $4,000,000. 9-20

SAN FRANCISCO CO.—Plans are being made for the expansion of the Hale Brothers department store at San Francisco. The anticipated project will involve approx. $3,500,000. 9-7

SAN FRANCISCO CO.—Expansion of market facilities is being planned for the Crystal Palace Market at San Francisco, to cost approx. $1,250,000. 9-7

SAN FRANCISCO CO.—The Western Crown Cork & Seal Corp., San Francisco, is making plans for expansion of its factory facilities at an estimated cost of $3,000,000. 9-7

SANTA CLARA CO.—Plans are being prepared for a reinf. conc. fruit and vegetable cannery on a 23-ac. site, to consist of a main manufacturing bldg., a boilerhouse, a finished stock warehouse and cold storage unit, to be located at San Jose. 10-1

SANTA CLARA CO.—Plans are being completed for the construction of a restaurant and cocktail lounge to consist of three dining rooms, large kitchen, bar, etc., of wood frame constr., at Palo Alto, to cost approx. $75,000. 9-19

TULARE CO.—An allotment of funds has been made for construction of classrooms, a cafeteria and shops at Tulare Union High School. Project will cost approx. $221,500. 10-1

VENTURA CO.—Funds have been allotted for the erection of a cafeteria at Haydock School; a cafeteria and assembly room at the Wilson School; and six classrooms and shop and homemaking rooms at the Ramona School. Construction at the Oxnard schools is est. to cost about $249,140. 10-1

Nevada

WASHOE CO.—Plans are under way for a new library building at Reno, for the county. The structure will be of reinforced

concrete, and will cost approx. $350,000. 10-1

WASHOE CO.—Plans for a $600,000 Riverside Hotel addition, at Reno, are being prepared. Work will include constr. of an 8-story, Class A, reinf. concrete and steel addition and tower to contain 80 units, new dining room, banquet room, outdoor dining section, etc. 9-26

New Mexico

LEA CO.—The El Paso Natural Gas Co., El Paso, Tex., is planning to construct a $4,000,000 dehydrating plant and a $5,500,000 gas purification plant at Jal. 9-20

SANTA FE CO.—Plans for a new State Capitol office bldg. and governor's mansion at Santa Fe have been approved by the FWA. The est. cost of the project is $1,500,000. 9-7

Oregon

MULTNOMAH CO.—A high school expansion program to cost approx. $250,000 is being planned for Beaverton, by the joint Washington - Multnomah Union High School District, as the first step in a program to cost an est. $500,000. 10-1

Texas

DALLAS CO. — Plans are complete for the erection of a four-story annex to the Southwestern Life Insurance Bldg., Main and Akard, Dallas. The addition will cost approx. $250,000. 9-14

EL PASO CO.—The Y. M. C. A., El Paso, is planning to construct a three-story building on N. Oregon St., El Paso, to cost in the neighborhood of $500,000. 9-14

Utah

SALT LAKE CO.—Plans are being prepared for the construction of a new $350,000 headquarters bldg. for the fire department at Salt Lake City. The structure will be two stories of brick construction. 9-6

UINTAH CO.—Plans are being prepared for the construction of a hotel at Vernal to cost approx. $150,000. 9-26

Washington

KITSAP CO.—Plans are being prepared for the construction of a reinforced conc. bank building to cost approx. $180,000, at Bremerton. 9-7

KING CO.—Sanipractic Hospitals, Inc., is making plans for the construction of a $1,500,000 reinforced concrete, seven-story and basement hospital bldg., at Seattle. Plans are expected to be complete in December. 9-20

SPOKANE CO.—The city of Spokane is making plans for a four-story addition to the county courthouse, which will adjoin the east end of present courthouse and extend east to Madison, at a cost of $250,000. The commissioners also approved an item of $75,000 for remodeling in the courthouse, and of $125,000 for an addition to the courthouse garage. Construction will begin in the new year. 9-14

Foreign

MEXICO—Industria Electrica de Mexico, S. A., plans to begin construction immediately on a $15,000,000 electrical products factory, for which a 175-ac. site has been purchased 20 mi. northwest of Mexico City. 9-18

Miscellaneous . . .

California

KERN CO.—Expansion at the Naval Ordnance Test Station, Inyokern, at a cost of $1,624,000, has been approved by the Bureau of Yards and Docks. Work will include a plane-handling tower and numerous other bldgs. and facilities. 9-7

ORANGE CO.—Funds have been allotted for additions and extensions to a water distribution system, together with appurtenances; a storm sewer system; extensions to a sanitary sewer sys., including a sewage flow recording station and all necessary appurtenances. Also a treatment plant, and elevated water storage tank, and park improvements, including playground, utility bldgs., etc., at Anaheim, to cost about $238,050. 10-1.

Oregon

MULTNOMAH CO.—The California Asphalt Corp., San Francisco, Calif., is planning the construction of a $1,000,000 asphalt refinery at Willbridge. 9-18

SHERMAN & WASCO COS. — The Wasco Electric Cooperative, Inc., The Dalles, has announced plans to construct approx. 573 mi. of electric distribution lines throughout the two counties. Contract is to be let in the very near future. 9-27

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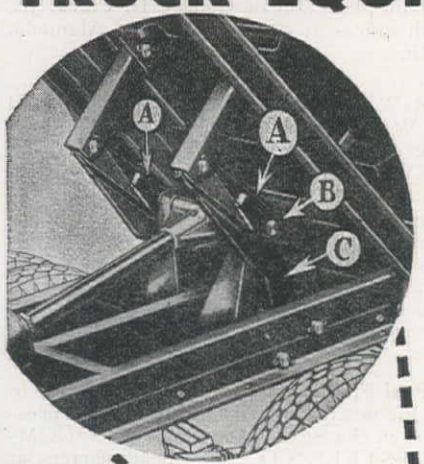
TRUCK EQUIPMENT



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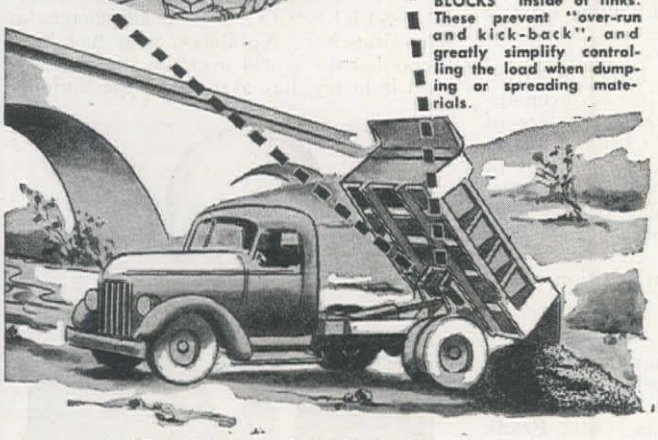

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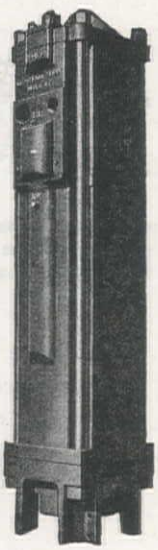

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TRADE WINDS

News of Men Who Sell to the Construction West

CALIFORNIA

West Coast offices of the RICHKRAFT CO. were opened September 15 in the Pacific Bldg., Oakland, Calif., under the management of **C. A. Cook.**

Cook joined the Sisalkraft Co. in 1933 and served as San Francisco salesman for this company from 1939 until 1943, during which time his experience covered every phase of merchandising sales and service of building papers. He brings to his new duties a broad knowledge of construction the country over, especially in California. Since 1943 he has been district engineer for the H. H. Robertson office in San Francisco.

The Richkraft Co. manufactures a complete line of building papers and, in addition, they sell Richkure compound for curing airport runways and Richkraft curing spray machines for handling it. They have developed a large business in striping airport runways, streets and roads with Prismo reflective paint, through the activities out of the general offices in Chicago and the Eastern office at Westport, Conn. It is planned to extend this same activity to the West Coast. A complete group of plain traffic paints is also a part of the Richkraft line.

Richkraft products in the Northern California territory will be distributed through PACIFIC COAST AGGREGATES, INC. Main offices of this firm are in San Francisco with branches at Oakland, Fresno, Stockton, Sacramento, Berkeley, Emeryville, San Jose and Daly City. NELSON EQUIPMENT CO. of Portland, Ore., with branches at Seattle, Spokane and Twin Falls, Ida., will service the Northwest territory. Further distribution is being arranged promptly.

☆ ☆ ☆

Hunter Nicholson has been appointed Los Angeles factory manager of KELITE PRODUCTS, INC.

In his association with Kelite, Nicholson is to concern himself largely with factory methods and controls, placing special emphasis on improved production techniques and even greater standardization of Kelite materials. He comes well qualified for this position, having had chemical production experience with such companies as American Potash and Chemical Co., Dicalite Co., A. R. Mass Chemical Co. and Firestone Tire and Rubber Co.

☆ ☆ ☆

SUPER CONCRETE EMULSIONS, LTD., of Los Angeles, Calif., has been appointed California sales representative of the SIKA CHEMICAL CORP., manufacturing affiliate in the United States of the internationally-known Swiss waterproofing concern, KASPER WINKLER AND CO. The new representative will also handle Plastiment, a concrete densifier and retarding agent, in addition to the waterproofing lines.

☆ ☆ ☆

Peer Nielsen has been named vice president and general superintendent in direct charge of operations at the KAISER STEEL PLANT, Fontana, Calif. **Frank Backman,** who served as general superintendent during the original construction of the plant, remains as general superintendent in charge of new construction. Nielsen was, until recently, general superintendent of the government-owned steel plant at Geneva, Utah, which has been under the management of a U. S. Steel Corp. subsidiary.

☆ ☆ ☆

J. H. Hope has been appointed industrial representative for the CAPITOL TRACTOR AND EQUIPMENT CO. of Sacramento, Calif. "Jimmy," as he is known to the contracting trade, has had considerable experience as an engineer and estimator. He was previously sales representative for Wooldridge Co. and R. G. LeTourneau. Three other appointments in the same company are **Lee Stinchfield** to the post of field service engineer, **W. J. "Bill" Smith** from agricultural sales manager to general sales manager, and **Gordon Harris** from sales promotion manager to director of sales.

☆ ☆ ☆

William Naumann has taken over as manager of the new production division of the manufacturing department at CATERPILLAR TRACTOR CO., San Leandro, Calif. Naumann, a graduate of the "Caterpillar" apprentice school in 1933, served as gear technician in the inspection dept. and as a superintendent in the machine shop, being advanced to assistant factory manager in 1942. Since the first of this year he has been factory manager. The new division into which Naumann steps was formed after more than a year's study of production control functions.

☆ ☆ ☆

PACIFIC CLAY PRODUCTS announces the acquisition of the operating properties of N. CLARK & SONS, Alameda, Calif., manufacturers of architectural terra cotta, ceramic veneer, quality tile, and kindred products. As a division of Pacific Clay Products, activities will continue under the direction of **George D. Clark, Jr.,** with offices at 401 Pacific Ave., Alameda, Calif.

☆ ☆ ☆

BURT W. DREYER COMPANY, and N. W. WOODALL, have been appointed direct Mill Representatives for RIGID-TEX CORPORATION, Buffalo, N. Y., manufacturers of rigidized metals. The Southern California District will be handled by the Dreyer Company, with headquarters at 714 W. Olympic Boulevard, Los Angeles, while N. W. Woodall, with offices at 7 Front St., San Francisco, Calif., will service the San Francisco District.

☆ ☆ ☆

Paul F. Kohlhaas has been appointed to fill the newly-created position of vice president in charge of engineering of COLUMBIA STEEL CO., with headquarters at San Francisco. Kohlhaas, who has been "schooled the world over" in the iron and steel industry, has assisted in the building

of plants in England, China, Japan, Manchuria, India and many parts of the European continent. Two of his most interesting missions were the building of the Japanese steel mills at Yawata, Japan, and Anshan, Manchuria. Kohlhaas has been chief engineer of Columbia Steel Co. since 1941.

☆ ☆ ☆

Charles A. Menefee, who has been with the INSLEY MANUFACTURING CORP., Indianapolis, Ind., for 18 years, has been appointed manager of the company's parts and field service department. In a reorganization program, the field serv-

ice and parts department was made a separate organization.

☆ ☆ ☆

Harold Q. Noack has been appointed Pacific Coast manager, responsible for directing the sales of copper wire, tubing, cable and other products for PHELPS DODGE COPPER PRODUCTS CORP. Noack's territory will include the eleven Western states and the Hawaiian Islands, with headquarters at the company's Los Angeles, Calif., plant. Noack, well known to the electrical industry on the Coast, held the position of Pacific Coast sales manager for Hubbard & Co. for more than 20 years.

☆ ☆ ☆

NORTHROP-GAINES, INC., a wholly owned subsidiary of NORTHROP AIRCRAFT, INC., has been announced as the new name of Socal Foundry, Los Angeles, Calif., coincidentally with its peacetime production plans. Lightweight airplane metals and advanced fabricating techniques will be used in the manufacture of streamlined materials-handling equipment and an improved line of transport toys.

☆ ☆ ☆

MACHINE TOOL DIVISION, CLAYTON MANUFACTURING CO., of Alhambra, Calif., has been purchased by GLOBE PRODUCTS MANUFACTURING CO., Los Angeles, Calif. The principal product affected is the Clayton Boring Bar Holder and accessories. This acquisition by Globe was effected to increase that company's line of machine tools essential to manufacturing plants of all sizes.

☆ ☆ ☆

PACIFIC NORTHWEST

O. A. Tucker, well-known West Coast shipbuilding executive, recently accepted the position of vice president and general manager of the EVERETT PACIFIC SHIPBUILDING AND DRY DOCK CO., at Everett, Wash. Tucker came to his new post from Pacific Iron and Steel Company, Tacoma, where he was president and general manager, directly prior to which he was general manager of Tacoma division, Seattle-Tacoma Shipbuilding Corp., a subsidiary of Todd Shipyards. At the same company, **James N. Cunningham** has been named works manager, having been advanced from the position of assistant works manager.

☆ ☆ ☆

Win Wilson, proponent of prefabrication who in 1939 developed the plywood structures system under which more than 5,000 prebuilt homes were erected in Southern California, is re-entering business at Tacoma, Wash. Wilson returns to civilian life after three years in the South Pacific as an Army Air Forces Lieutenant-Colonel. At present his office is at the plant of TACOMA LUMBER FABRICATING CO., where he is associated as consultant.

William (Bill) Schannep has been appointed district representative in the Pacific Northwest for PIONEER ENGINEERING WORKS of Minneapolis, Minn. His territory includes Washington, Oregon, Idaho, Western Montana, Alberta and British Columbia, with headquarters at Seattle, Wash. Before accepting the new post, Schannep was associated with the Feenaughty Machinery Co., working out of their main office at Portland, Ore.

☆ ☆ ☆

J. Stephen Thurlow has been appointed manager of the Seattle, Wash., branch of J. J. ROSS MILL FURNISHING COMPANY, a Portland, Ore., concern. Thurlow succeeds **John Schade,** who has retired, to the managership.

INTERMOUNTAIN

H. H. NIELSEN COMPANY, Salt Lake City, Utah, has been appointed sales and service representative for INSLEY MANUFACTURING CORPORATION of Indianapolis, Ind. The Nielsen Company will represent Insley in Utah, eastern Nevada and western Wyoming. THE BUD FISHER COMPANY, Albuquerque, New Mexico, is the new Insley dealer for that state. The new dealers will carry complete stocks of Insley parts and will maintain complete service facilities for Insley Excavators.

☆ ☆ ☆

C. P. Wells, formerly assistant manager of INTERNATIONAL HARVESTER COMPANY, Amarillo, Tex., has just been

appointed manager of the International motor truck branch at Denver, Colo. He succeeds **I. A. Leimbrook,** who has been promoted to general line sales manager of the Southern District. Wells started with the company as salesman at a branch formerly maintained at Parsons, Kan. In 1929 he became a wholesale representative at Parsons and in 1931 was transferred to Oklahoma City, where he remained in advanced capacities until his move to Amarillo in 1939.

☆ ☆ ☆

AMONG THE MANUFACTURERS

FRUEHAUF TRAILER COMPANY announces that branches of their company now have building projects completed or well under way in nine western cities, to effect greatly increased service facilities for the users of Truck-Trailers throughout the West. The expansion program embraces Seattle, Salt Lake City, Fresno, Phoenix, Spokane, San Diego, Portland, El Paso and Billings, Mont. Each modernized plant has a fully-equipped machine shop, modern steam-cleaning and spray-painting equipment, and extensive storage space for spare parts and accessories.

☆ ☆ ☆

Albert L. Bergstrom has been elected vice-president of all engineering for TIMKEN ROLLER BEARING CO., Canton, Ohio. He has been with the firm since 1929, occupying the position of Executive Engineer since 1938. **O. J. Horger,** formerly in charge of railway engineering and research for the firm, has been named chief engineer of the railway division and **C. L. Eastburg** has been appointed his assistant. **P. C. Paterson** will be service manager of the railway division.

☆ ☆ ☆

Hobart C. Ramsey, executive vice president of WORTHINGTON PUMP AND MACHINERY CORP., has, in addition, been named president of the RANSOME MACHINERY CO., subsidiary of Worthington in Dunellen, N. J., where concrete mixers and road pavers are made. **J. G. Ten Eyck,** who has just completed five years active service with the Navy and who was formerly president of the industrial engineering firm of Ten Eyck, Inc., has been named vice president and general manager of the Dunellen plant. **Kenneth W. Horsman,** formerly superintendent of welding and steel fabrication at the Worthington Harrison Works, has been transferred to Ransome as works manager. Newly-elected directors of the Ransome Co. are Ten Eyck and **Carl F. Oechsle.**

☆ ☆ ☆

C. W. Pendock, president of LE ROI COMPANY, well-known industrialist and construction equipment manufacturers of Milwaukee, Wis., recently announced the establishing of a foreign sales department. **William F. Huggins** has been appointed manager of the newly-formed department, according to announcement by **J. M. Dolan,** general sales manager. Huggins' offices will be located at the general and administrative headquarters of the company in Milwaukee.

☆ ☆ ☆

Don Poor has been appointed advertising manager of CECO STEEL PRODUCTS CORP., Omaha, Neb., and will headquarter in the offices of the firm's manufacturing division at Chicago. He has a long record of publicity and advertising

behind him. For five years prior to his new appointment, Poor was assistant advertising and sales promotion manager of LYON METAL PRODUCTS, INC., of Aurora and Chicago Heights, Ill.

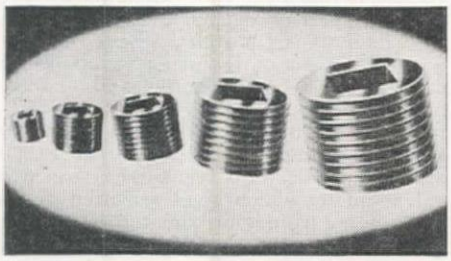
NEW EQUIPMENT

Plastic Pipe Seals

Manufacturer: American Molded Products Company, Chicago, Ill.

Equipment: Molded plastic pipe seals and thread protectors.

Features claimed: Light of weight, tough and durable, these plastic pipe seals have a square countersunk head which makes them handy to remove or tighten. Plastic takes accurate and durable threading, is non-corrosive, dielectric and most efficiently excludes moisture, oil, dirt, grit and corrosive fumes. The countersunk heads are of dimensions to fit commercial square bars of standard cold rolled steel. The pipe seals and thread protectors are available for the following sizes: ⅛, ¼, ⅜, ½, ¾, and 1 in.



Cable Cutter

Manufacturer: P. S. Pell & So., San Francisco, Calif.

Equipment: Hydrashear-Wire rope cutter.

Features claimed: A compact hydraulic shear capable of cutting up to 1 in. wire rope without adjustments. It can be carried to the rigging, is self contained, and only attention needed is occasional sharpening of the removable cutting blade.

The shear is 5 in. wide, 7 in. high, 13 in. long, weighs approximately 40 lbs.

Test Bridge For Resistors

Manufacturer: Associated Research, Inc., Chicago, Ill.

Equipment: Comparison "Wheatstone Bridge."

Features claimed: Model 81 Low Limits Bridge is one of a series of units for the rapid comparison of resistors having similar values. It is admirably adapted to volume testing of motor windings, transformer primaries or secondaries, rheostats, lamps, potentiometers, and any item that offers resistance to flow of current. The overall adjustable range is from ¼ ohm to 10,000 ohms. The indicator is a sensitive zero center galvanometer which gives sensitivity control ranging from approximately ¼ per cent to 10 per cent. The unit is self-contained, measuring 8 x 8 x 12 in., and weighs 18 lb., mounted in grey wrinkle finish metal cabinets.

Cable-operated Scraper

Manufacturer: LaPlant-Choate Manufacturing Co., Cedar Rapids, Iowa.

Equipment: New 8½ cu. yd. cable-operated scraper.

Features claimed: New model (C-108) offers a floating apron that adds considerably to the performance of the scraper. The apron opens 30 in. before the rear ejection gate moves, thus preventing any compaction of the load between gate and apron, and also permits adjustment of the apron to any position before loading. The open top bowl, free of overhead obstructions, permits loading by shovel, dragline, or elevating grader. The high lift cam action controlling the bowl enables it to discharge any type of material including rock and sticky gumbo. With this arrangement the clearance of the bowl is 14 in. and allows the even distribution of the load in layers of controlled thickness from 14 in. to ½ in. In digging and loading the rear wheels are inside the cut at all times, yet because of the scraper's low center of gravity, effective side slope work is possible.

Portable Nozzle Tester

Manufacturer: Buda Company, Harvey, Illinois.

Equipment: Diesel engine nozzle tester.

Features claimed: Handy portable oil hydraulic operated testing device which can be operated by any mechanic or diesel engine operator to check and set diesel nozzles. The new mechanism is simple as a hydraulic jack and weighs less than 20 lbs., including a steel carrying case. The

universal diesel nozzle tester can be used to accurately determine injector opening pressure, spray pattern for uniformity and to check other irregularities such as sticking needle valves, dribble and leakage around valve seats. Equipped with a standard hydraulic pressure gauge, 3⅛ in. dial, 3000 p.s.i. capacity and 100 lb. graduations. Auxiliary gauges of 5,000 and 7,500 capacity are also available. Illustrated literature will be mailed on request.

Industrial Can Opener

Manufacturer: Merrill Brothers, Maspeth, New York City, N. Y.

Equipment: Steel Drum Opening Tool.

Features claimed: A simple but powerful, fast-cutting tool, operating on somewhat the same basic principle as the familiar can opener, but naturally much more powerful and stronger. With it, the top of a steel drum or other metal container can be cut away with ease that saves valuable time and eliminates the damage and mis-

haps usually encountered in the opening and handling of medium weight and light drums. The tool is said to be highly endorsed by safety directors due to the even, smooth hole it cuts and the even manner in which the edges are folded back close to the barrel edge. The use of the opener also prevents the danger of the contents, such as corrosive chemicals, from splashing and getting on the hands of the operator. It is made of a steel drop forging, 23½ in. long, weighs 5½ lbs.

Salt Tablet Dispenser

Manufacturer: Mine Safety Appliance Company, Pittsburgh, Pa.

Equipment: Moulded Plastic Salt Tablet Dispenser.

Features claimed: A durable bakelite dispenser, easily operated with one hand, which is corrosion and moisture-proof. It is to be used wherever hot working conditions are present. It dispenses one tablet at a time, every time, with each fractional turn of the dispensing knob. Its 1,500-tablet capacity eliminates necessity for frequent refilling. Both sodium chloride or a combination 10-grain sodium chloride and dextrose tablets are available for use in the dispenser.

Water Injector

Manufacturer: DeLABco, San Francisco, Calif.

Equipment: Motor energizer-water vapor injector.

Features claimed: Designed to effect sizable economies in both operation and maintenance of trucks and passenger cars, this new Delabco motor energizer is built on proven scientific principles. This practical application of water vapor injection gives smooth over-all engine operation even with low-octane gasoline. Less choking and quicker starting minimizes crankcase dilution. Water vapor injection combined with

explosive gases softens and reduces carbon. Improved combustion means cleaner spark plugs and less sludge in the oil.

Construction is simple, and the only servicing required is the periodic addition of water to maintain the proper level of the chemical solution in the energizer. Two electrodes are immersed in the chemical solution and are so connected that the current flows through the energizer whenever the ignition switch is turned on to start the engine. An air valve with a tube extending to the lower ends of the electrodes allows a metered amount of air to enter and creates a turbulent action with formation of water vapor.

Electrolysis of the water starts as soon as the current is turned on. The resulting formation of hydrogen and oxygen gases, mixed with water vapor, enters the engine cylinder through the carburetor and absorbs some of the knock-producing heat. The lower temperature at the time of explosion largely eliminates the tendency of the fuel to knock or ping, and smooths out the entire operation of the engine.

Economy Range Finder

Manufacturer: White Motor Company, Cleveland, Ohio.

Equipment: A combined speedometer and a tachometer.

Features claimed: The Economy Range Finder is designed to assist the driver operate the truck more efficiently and economically. It is especially useful on mountainous grades where the ground speed of the truck is no indication of the motor speed. With this instrument the driver is assisted in shifting gears at the right time to save fuel, conserve the trucks and make schedules. Not only can they read the engine speed directly on the speedometer dial, but instructions are clear. A spiral white line for each transmission gear is offered

on the dial, and this is combined with a scale of r.p.m. printed on the speedometer pointer.

As the speedometer pointer moves around the dial, the edge of the pointer crosses the spiral white line for each gear, showing the r.p.m. A white area on the pointer indicates the ideal operating range from 1,700 to 2,400 r.p.m., and at either end is a red area which indicates when the engine is operating outside the proper range. By watching the pointer, the driver is told the proper point to shift gears.

Safety Emergency Alarm

Manufacturer: Brown Instrument Company, Philadelphia, Pa.

Equipment: An electronic air-operated emergency alarm.

Features claimed: Brown Electronik contact controller, provides a safety alarm operating automatically to provide on-off control for air actuated valves, solenoid valves, contactor panels, or signal lights. The mechanism operates through a set of contacts actuated by a cam which can be set manually to the safe temperature. The alarm is set off whenever the temperature pen reaches this previously determined setting and the remote control of valves or other gear is effected.

Concrete Mixer

Manufacturer: Kwik-Mix Company, Port Washington, Wis.

Equipment: Portable concrete mixer.

Features claimed: A new 1-bag concrete mixer, the Kwik-Mix 6-S Dandie went on the market June 1st. Soon to follow are two new models 16-S and 11-S. All models are welded construction throughout and utilize high strength steel extensively to provide durability with light weight.

The tilted flow-line discharge chute, an exclusive feature on the Dandie Mixers, is said to empty the drum faster because it reaches deeper into the drum.

The 6-S Dandie is well balanced on automotive type leaf springs and pneumatic tires, trails fast and handles easily.

The Kwik-Mix 6-S Dandie mixes 5 cu. ft. of concrete plus 10 per cent and complies with A.G.C. standards for this new size which replaces the 5-S and 7-S sizes.

Aluminum Door

Manufacturer: Berry Door Company, Birmingham, Mich.

Equipment: All-aluminum overhead retracting garage door.

Features claimed: Developed for post-war residential garage construction this light weight door can be installed by one man.

A new operating principle that does away with all cumbersome hardware in the interior of the garage makes low installation cost possible. The entire operating mechanism is compactly placed in an all metal box 6x6x24 in., weighing only 18 lbs., mounted in an upper corner of the door. This does away with all track, weights, and exposed springs that take up installation time and room inside the garage.

By following aircraft design principle to eliminate mass and weight, an all-aluminum door weighing less than 60 lbs. has been made possible. Rigid reinforcing provides a sturdy door that will not sag or buckle and will give a lifetime of trouble-free service plus ease of operation.

An opening 7 ft. high and 8 ft. wide, to the interior of the jam, is required for the installation of standard size door. Multiples of 8 ft. doors can be used without the necessity of installing breaker strips or posts to separate the doors. This is a desirable design feature allowing more freedom of movement in multiple car garages.

The door is to be marketed through nationwide building outlets and at a price that will offer the builder a good profit and still bring the door within the reach of modest home owners. Data sheets covering design, construction and installation are available.

Hoisting Clamp

Manufacturer: Merrill Brothers, 46-18 Arnold Ave., Maspeth, New York.

Equipment: Volz flat surface lifting clamp.

Features claimed: A clamp that will pick up and securely hold flat sheet metal or grip the edge of barrels or any other thing which can be inserted into the jaws of the clamp. The clamp combines two clamping principles, one a pressure grip, the other a wedge grip which prevents the load from slipping from the jaw once it is engaged. It releases instantly and automatically

when the load or weight is relieved from the grip of the jaws. A cantilever arm actuates one jaw and all working parts are enclosed in a strong drop-forged casing, eliminating all danger of bent parts by exposure to rough treatment. Clamps are supplied in four sizes, ½, 1, 3, and 6-ton capacities. They will take from 0 to 2-in. thickness material.

Safety Groove Stair Tread

Manufacturer: Wooster Products, Inc., Wooster, Ohio.

Equipment: All Steel Safe Grooved Tread and Stair Step.

Features claimed: The Wooster safety tread may be either bolted or welded to steel stringers, and is furnished with open risers or enclosed steel risers. This type of construction has the advantage of the safety tread being integral with the steel step.

It is suitable for use on fire escape stairways, in power plants, industrial buildings, warehouses, and subways. The safety tread affords a firm, secure foothold. This is primarily due to the grooves, plus the fact that the tread surface is comprised of non-slip, abrasive grip filler. The safety grooves are interlaced with slots which permits ready drainage, thus keeping the tread free of clogged materials, and making them practically self-cleaning.

Corrosion Resistant Paint

Manufacturer: American Pipe & Construction Co., Los Angeles, Calif.

Equipment: Anti-fouling and corrosion protective paint for boat hulls.

Features claimed: The new product, Amercoat No. 23, was tested by the Case-American Construction Company by applying it to a section of the hull of their "San Diego" dredge. The hull was sandblasted down to bright metal and one prime coat brushed on, two spray coats of Body Coat, and three Seal coats were applied to a section 850 sq. ft. in area in June 1941. At the same time the remainder of the dredge hull was coated with two applications of red lead, a coat of standard anti-corrosive and a coat of standard anti-fouling paint. On dry docking the dredge in July, 1945, after over four years of service, and after removing the mussels, barnacles and grass from the surface of the hull, the Amercoat coating on the sides and bottom was found to be tough, durable and intact. There was no rust beneath the coating. This condition was general over the entire 850 sq. ft. except for small abraded areas, and even here the corrosion had not cut back underneath the coating.

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.

Air Reduction Sales Co., New York, N.Y. —"Oxygen—Indispensable Servant of Industry," is a new 24-page, two-color booklet dealing with the production and use of oxygen in industry. Illustrations and explanations tell how higher purity of oxygen is obtained and describe the different types of containers available according to the individual user's needs. Technical aid services are offered and a list of manuals on specific phases of oxygen and their industrial applications is given.

R. G. LeTourneau, Inc., Peoria, Ill.—A profusely illustrated book just off the press offers latest information on earth-moving and lifting equipment. The catalog describes in detail the entire LeTourneau equipment line, giving full-page showroom type photos as well as on-the-job action pictures. Operational features are fully described and specifications given, and improvements over older models are listed. LeTourneau distributor shop and service facilities are also enumerated.

J. H. Williams & Co., Buffalo, N. Y.—Recently issued Bulletin No. 4 lists seven of the benefits of the Saxe Welded Erection System. It also contains many letters from users testifying to the merits of the system.

Kwik-Mix Co., Port Washington, Wisconsin—A 12-page catalog illustrates every important construction feature of the new Kwik-Mix 16-S Dandie, one of the first of the new 3-bag size concrete mixers. Detailed explanations and illustrations of the tilted flow-line discharge chute and skip shaker are shown.

David White Co., Milwaukee, Wisconsin —An explanatory bulletin on the new coated lens for surveying instruments is now available. Diagrams and a light transmission table showing higher percentage of light transmitted by coated surfaces are offered to support claims of superiority of coated lens instruments.

Armco Drainage & Metal Products, Inc., Middletown, Ohio—A new 60-page catalog entitled "Armco Products for Engineering Construction," designed in a new and convenient way lists some 21 drainage and related products for use in airports, building construction, flood control, power and irrigation, highways, streets and railways, sewage treatment and water supply, industrial, mines and other types of construction. Each product is described in a special bulletin, lising its uses and features, who uses it, and gives a reference to more detailed literature.

The Farval Corporation, Cleveland, Ohio —Advantages of the centralized lubricating system when installing machine equipment for postwar operations are pointed out in an illustrated 4-page folder. "When You Reconvert" is a compact summary of how the Farval system operates, with statements of specific results attained through its use. As an example, the folder points out that one oiler per shift formerly was required to lubricate a large machine; installation of the Farval system not only

released the three for other work, but reduced the consumption of oil from 6 gal. to 1 pint per day. Bearing replacements for two 30-ton cranes which formerly amounted to $800 in 6 months were eliminated. Production from one large press was increased 12 per cent by elimination of a shut-down every four hours to lubricate by hand, and maintenance cost was reduced 75 per cent through elimination of bearing repairs.

Ideal Commutator Dresser Co., Sycamore, Ill. — "Modern Motor-generator Maintenance and Repair Equipment" is the name of a recently published, well illustrated, 36-page booklet. Within its covers are a page of hints on commutator care, two pages on commutator troubles and their remedies. Whole chapters are devoted to various commutator and ring maintenance equipment, coil winding equipment, portable industrial blowers, electric soldering tools, soldering and miscellaneous tools, wire strippers. A complete index appears in the front of the book.

Victor Equipment Co., San Francisco, Calif.—A new publication (Form 52) devoted entirely to Victor hand and machine cutting torches and tips. The book contains 34 pages, well illustrated in color. Cutting torches and tips for every useful fuel gas and every type of cutting operation are discussed in this and other publications furnished by the company.

Iowa Manufacturing Co., Cedar Rapids, Ia.—The company recently published a 23-page book, "Cedarapids . . . Men and Machines in War and Peace," which traces the history of the company and its equipment since W. Guy Frazee designed the first Cedarapids Crushing Plant and Howard Hall and Charles Norberg together founded the company, through the war and into the postwar period. The book is profusely illustrated with action pictures of the equipment, as well as company personnel.

General Excavator Co., Marion, Ohio—Recently released by the company is a uniquely arranged Specifications Bulletin Folder on the Type 10 Model 105, a combination crane, shovel, dragline, pneumatic-tired machine. Included in the 2-color folder describing this "Machine of Tomorrow" is a series of detailed descriptions covering power flow, construction and operation. A fast-moving photographic technique—large pictures with brief factual text—portrays graphically the Type 10's features and advantages.

Chicago Bridge and Iron Co., Chicago, Ill.—Publication is announced of a new 9-page leaflet, "The Hortonspheroid," which describes the reduction of evaporation losses from volatile liquids by storage under pressure in Hortonspheroids. The reduction of filling, boiling and breathing losses is discussed with a description of the fillings included with Hortonspheroids. Gauging methods, tank strappings and water calibration are described.

American Institute of Steel Construction, Inc., New York, N. Y.—A beautifully illustrated booklet demonstrating the versatility of the structural steel fabricating industry depicts imposing peacetime structures, munitions factories, and various war craft, all of which were made possible by steel. The photographs are especially noteworthy.

The Elwell-Parker Electric Co., Cleveland, Ohio — "Industrial Logistics," a twelve-page, illustrated booklet, outlines simple and effective methods for handling materials and manufactured products economically and safely, and explains how a

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.

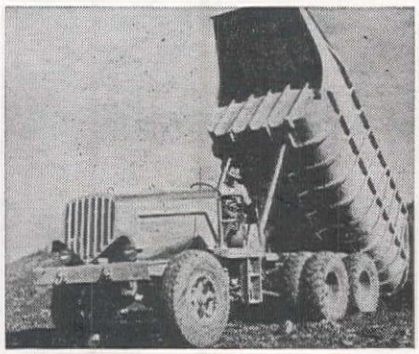
CONVEYORS

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.

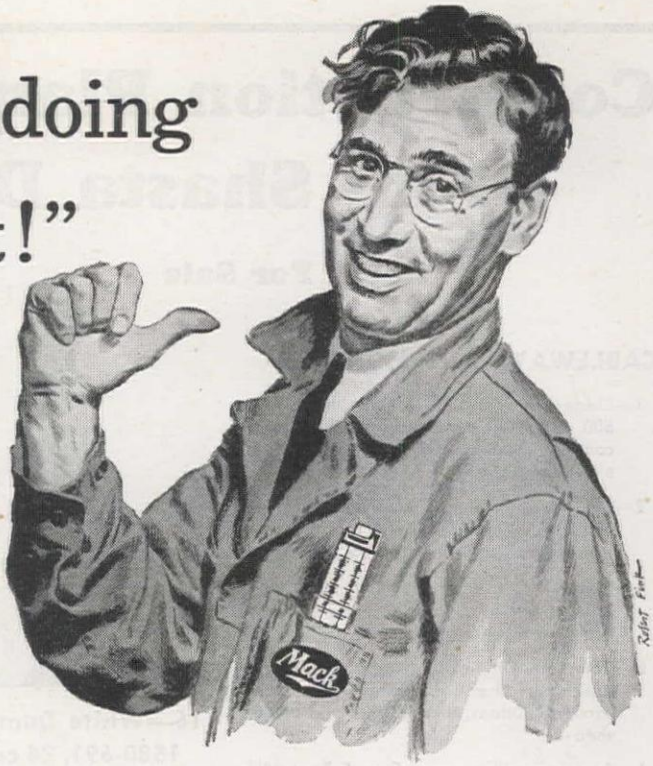
ALL ITEMS SUBJECT TO PRIOR SALE

PACIFIC CONSTRUCTORS, INC.

GENERAL CONTRACTORS — BOX 898, REDDING, CALIFORNIA **Phone 512 REDDING**

"Me...an Engineer...doing this and liking it!"

"Ever hear of a design engineer *repairing* the trucks he designs? It happens regularly at Mack—and we wouldn't have it otherwise! Believe me, mister, every time a Mack engineer gets his hands dirty, he's saving your money and your mechanic's time. It's like this . . ."



1. When a designer gets away from his drawing board and under the hood, he really begins to appreciate the maintenance man's angle. He sees mighty quickly . . .

2 . . . why a truck should be designed so that a repair man can reach the parts he wants without spending half a day just getting to them . . .

3 . . . and he begins to sense that groping for a part under the hood or chassis is a lot different from pointing to it on a blueprint. Well, sir, after a couple of lessons like that . . .

4 . . . you've got a mighty practical design engineer! We Mack engineers have been through the mill. That's why we're so conscious of the importance of *accessibility* as a maintenance factor.

5. Mack design makes your mechanic's job easier—saves his time and your money—shortens layoffs for repairs. Just one more reason why Mack Trucks *cost less in the end.* Look around—look ahead—buy Mack!

Mack

TRUCKS

FOR EVERY PURPOSE

ONE TON TO FORTY-FIVE TONS

Performance Counts

★ BUY THAT VICTORY BOND TODAY ★

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

planned system of materials transportation reduces costs in procurement, production and distribution of goods. The booklet points out the increased cost of articles due to handling operations.

Bonney Forge & Tool Works, Allentown, Pa.—A colorful new catalog illustrating the drop forged WeldOlet fittings has been completed for distribution to the trade. A complete line of branch outlet fittings is available including welded, threaded, and socket outlets in their various angles and applications. Drop forged offset or hillside flanges for tanks, barrel flanges, and heavy boiler fittings are all illustrated in a variety of shapes and sizes. All fittings of the WeldOlet line conform to the A. S. T. M. specifications for both material requirements and size.

La Bour Company, Inc., Elkhart, Ind.—Presented in a booklet a radically new approach to a very old pumping problem. The improved model G self-priming vertical type pump is equipped with a self-sealing hydrobalance unit. It has but one running part, the impeller, with its integral hydraulic seal. The drive shaft enters the pump from the suction side, and the seal is thus required to work only against atmospheric pressure, with a maximum pressure differential of 14.7 lb. per sq. in.

Littleford Bros., Inc., Cincinnati, Ohio—"Here's the Story in a Nut Shell," an attractive leaflet telling the outstanding features to be found in Spray Master Pressure Distributors in connection with the construction of highways. This leaflet is profusely illustrated with photographs as well as sketches, showing action pictures of the Spray Master at work building and maintaining roadways. Special features of the various models of Distributors are clearly illustrated and explained.

Diesel Engine Manufacturers Assn., Chicago, Ill.—An interesting new 12-page booklet, introducing the economy of Diesel engines for producing the power in municipally-owned power plants. This booklet is the first of a series to be issued under the general title, "Diesel Facts." A special section of the booklet treats of the procedure to be followed by a city that wants to have its own power plant. Another section outlines the widespread use of Diesel engines in the generating projects of the Rural Electrification Administration.

OPPORTUNITY SECTION

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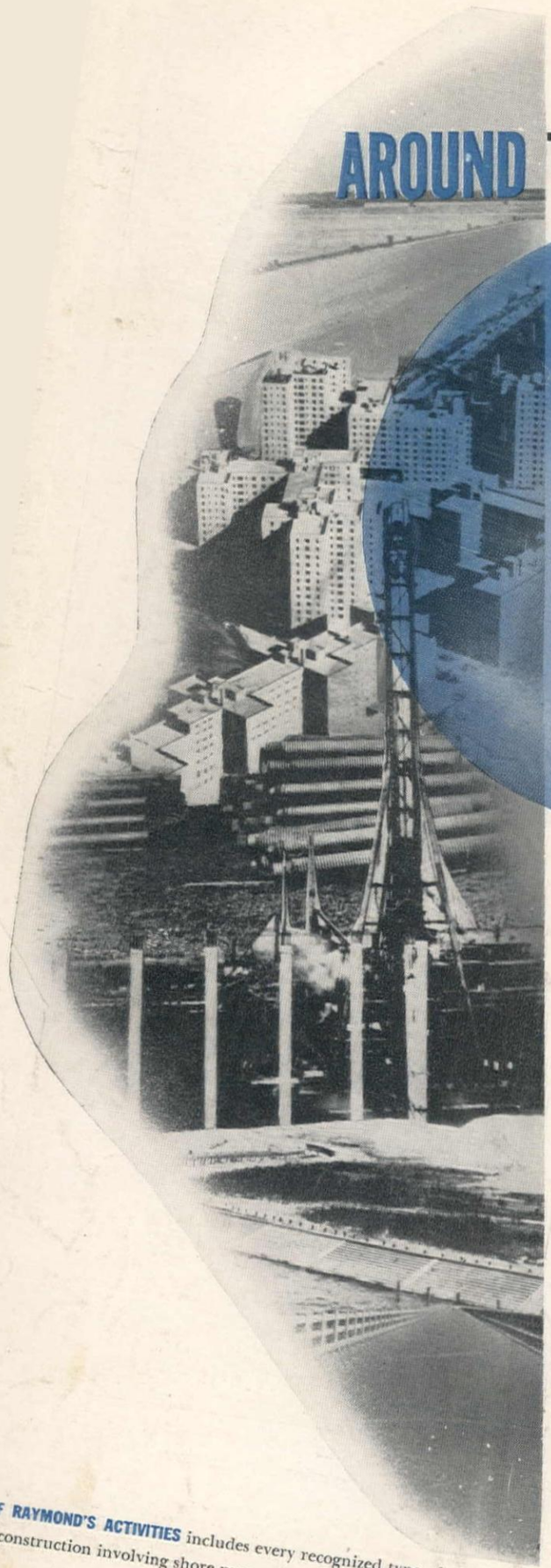

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