WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

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NOVEMBER • 1944

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$3.00 PER YEAR

IN THIS ISSUE

NAVY BLIMPS at rest in 1,000 x 300-ft. hangar at Moffett Field, California, illuminated with mercury vapor lamps.

DITCH DIGGING

2½ feet per min.

ON EVERY fighting front, U. S. Engineers use this versatile Barber-Greene Ditcher to speed the digging of drainage ditches, sanitary and water lines, foundations, etc. Under average conditions, the Ditcher attains a digging speed of 2½ feet per minute—a stiff pace that can be maintained only with the help of *effective* lubrication.

On every construction job, equipment maintains the pace easier when effectively lubricated. And to more and more contractors today, *effective* lubrication means —Texaco.

Texaco Marfak, for example, used in your tractors, shovels, bulldozers, trucks, etc., provides ideal film lubrication inside a bearing, yet maintains its original consistency at the outer edges . . . sealing itself in, sealing out sand, dirt, water. Its tough adhesive film cushions bearings against road shocks. Makes parts last longer.

For wheel bearings, use *Texaco Marfak Heavy Duty*. It stays in the bearings—off the brakes. Seasonal repacking is no longer required.

Texaco lubricants have proved so effective in service that they are definitely preferred in many fields, a few of which are listed at the right.

Texaco Lubrication Engineering Service is available to you through more than 2300 Texaco distributing points in the 48 States. The Texas Company, 135 East 42nd Street, New York 17, N. Y.

THEY PREFER TEXACO

★ More revenue airline miles in the U. S. are flown with Texaco than with any other brand.

★ More buses, more bus lines and more bus-miles are lubricated with Texaco than with any other brand.

★ More stationary Diesel horsepower in the U. S. is lubricated with Texaco than with any other brand.

★ More Diesel horsepower on streamlined trains in the U. S. is lubricated with Texaco than with all other brands combined.

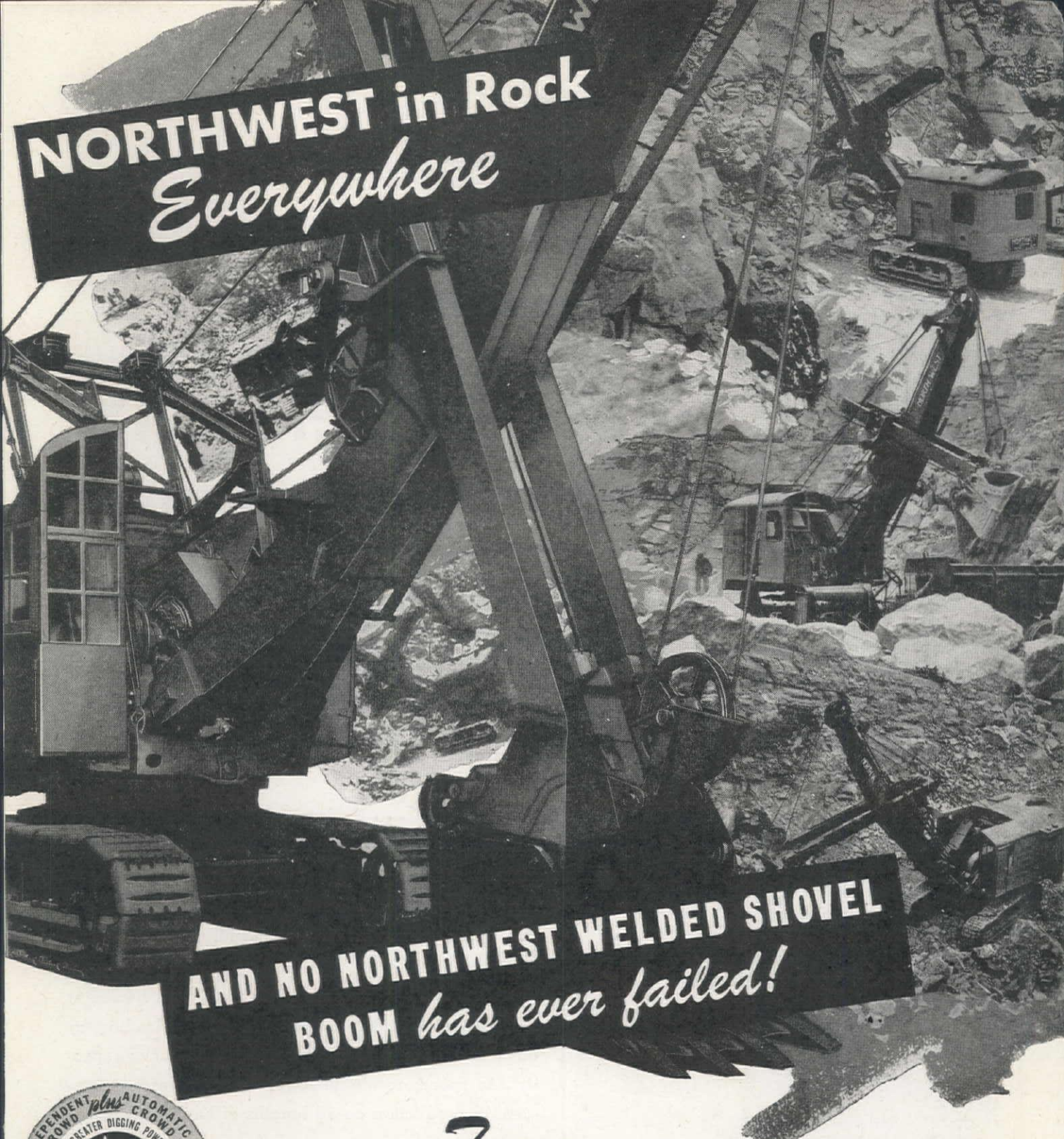
★ More locomotives and railroad cars in the U. S. are lubricated with Texaco than with any other brand.

TEXACO

REG. T. M.

TEXACO MARFAK

TUNE IN THE TEXACO STAR THEATRE EVERY SUNDAY NIGHT—CBS ★ HELP WIN THE WAR BY RETURNING EMPTY DRUMS PROMPTLY



INDEPENDENT CROWD plus AUTOMATIC CROWD
FOR GREATER DIGGING POWER
The DUAL CROWD

THAT'S something else for you to think about in your post war planning! Better built—cheaper to operate—a Real Rock Shovel and if you have a Real Rock Shovel you'll have high output in any kind of digging.

NORTHWEST ENGINEERING COMPANY
1736 Steger Bldg. • 28 E. Jackson Blvd., Chicago 4, Illinois

Northwest Sales Agents:

ARNOLD MACHY CO., INC.,
149 W. 2nd South St.,
Salt Lake City, Utah

BALZER MACHY. CO.
2136 S.E. Eighth Ave.,
Portland, Oregon

Branch Offices:

255 Tenth St.,
San Francisco, Calif.

1234 Sixth Ave., South
Seattle, Wash.

3707 Santa Fe Avenue
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NORTHWEST

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

"Made to Order" for MORE PAY DIRT PER DAY

HERE ARE THREE REASONS WHY EUCLIDS CUT HAULING COSTS

DEPENDABILITY . . . Both Rear-Dump and Bottom-Dump EUCLIDS are built from the bottom up for heavy duty off-the-highway service. Continuous performance records on hundreds of the toughest mining and construction jobs are evidence of superior design, rugged construction and painstaking production.

VERSATILITY . . . Haul earth, rock, coal and ore with ample power for steep grades and difficult hauls . . . fast, easy loading with efficient loading equipment — shovels, draglines, elevating graders or transfer bins . . . quick, clean dumping on the fill or into hoppers.

EFFICIENCY . . . Pay loads of 15 to 30 tons hauled at top speeds of 21.8 to 34 m.p.h. . . . fast loading by efficient digging equipment, coupled with Euclid capacity and speed, results in lower cost per yard and increased production on all lengths of haul.

Compare Rear-Dump and Bottom-Dump EUCLID performance with other combinations or types of hauling equipment and you will know why leading contractors and industrials use efficient digging and loading tools and Euclid hauling equipment to keep costs down on both long and short hauls. Your Euclid distributor will be glad to supply helpful facts and figures for your hauling requirements.

The EUCLID ROAD MACHINERY Co. · · · Cleveland 17, Ohio

THE EUCLID ROAD MACHINERY CO.

3710 SAN PABLO AVENUE — PIEDMONT 8046 — EMERYVILLE, CALIFORNIA

CONTRACTORS' EQUIPMENT & SUPPLY CO., Albuquerque; INTERMOUNTAIN EQUIPMENT COMPANY, Boise; HALL-PERRY MACHINERY COMPANY, Butte; F. W. McCOY COMPANY, Denver; COLUMBIA EQUIPMENT COMPANY, Portland; A. H. COX & CO., Seattle; LANG COMPANY, Salt Lake City.

WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

Covering the Western Half of the National Construction Field

Contents for November, 1944

J. M. SERVER, JR.
Editor

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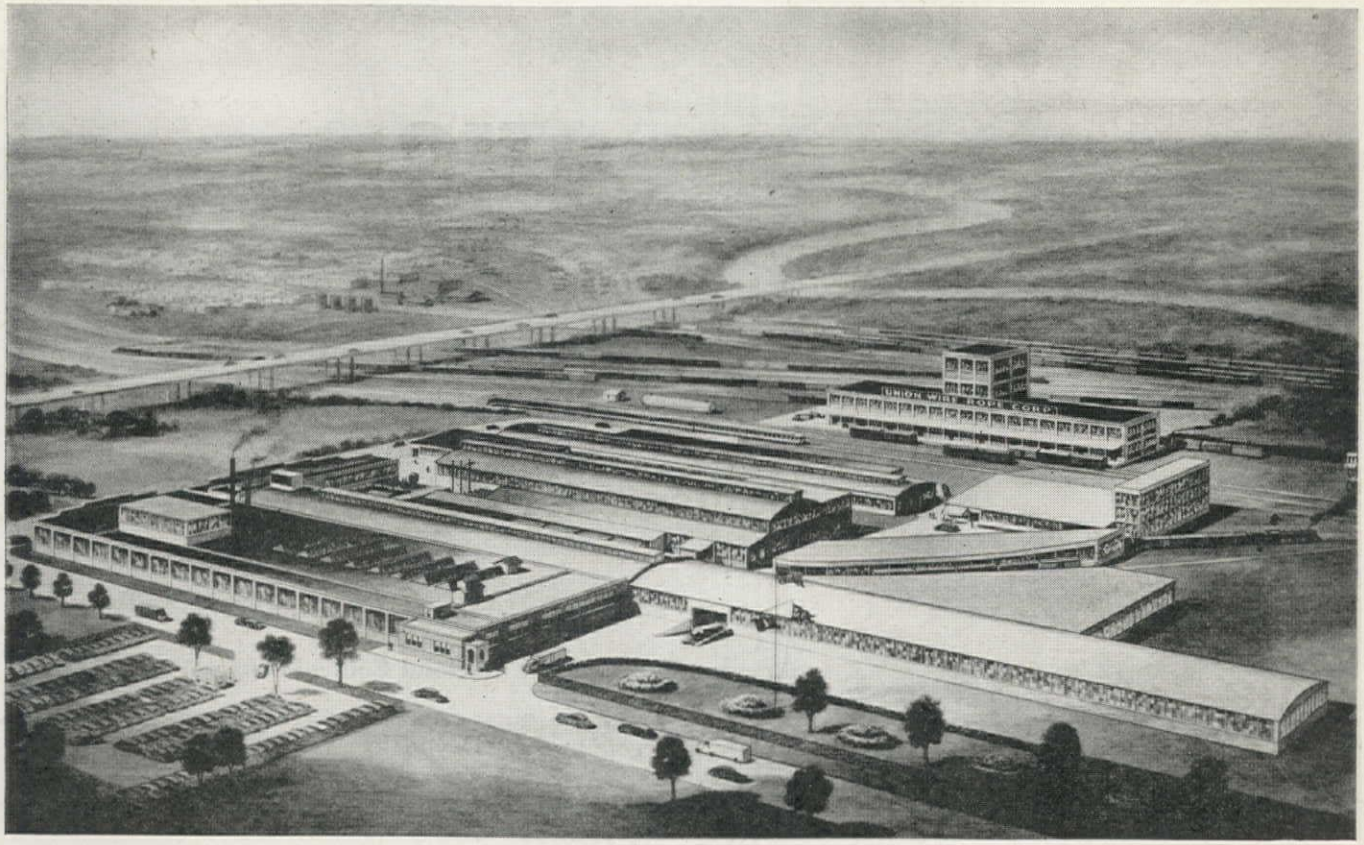


One of the Most Modern Plants in the World Producing Wire Rope for All Types of Industries

The uses of wire rope are many and varied. There must be different kinds and sizes, and so designed as to properly perform different functions on many kinds of machines and under many different operating conditions.

Obviously, wire rope making is a job for specialists. In the great factory of Union Wire Rope Corporation it is in the hands of specialists—from the determination of the correct steel formula for each type of wire rope to meet every field condition. These specialists devote their whole time, creative ability and skill to the one job of making wire rope. At this job they do not propose to be surpassed.

UNION WIRE ROPE CORPORATION

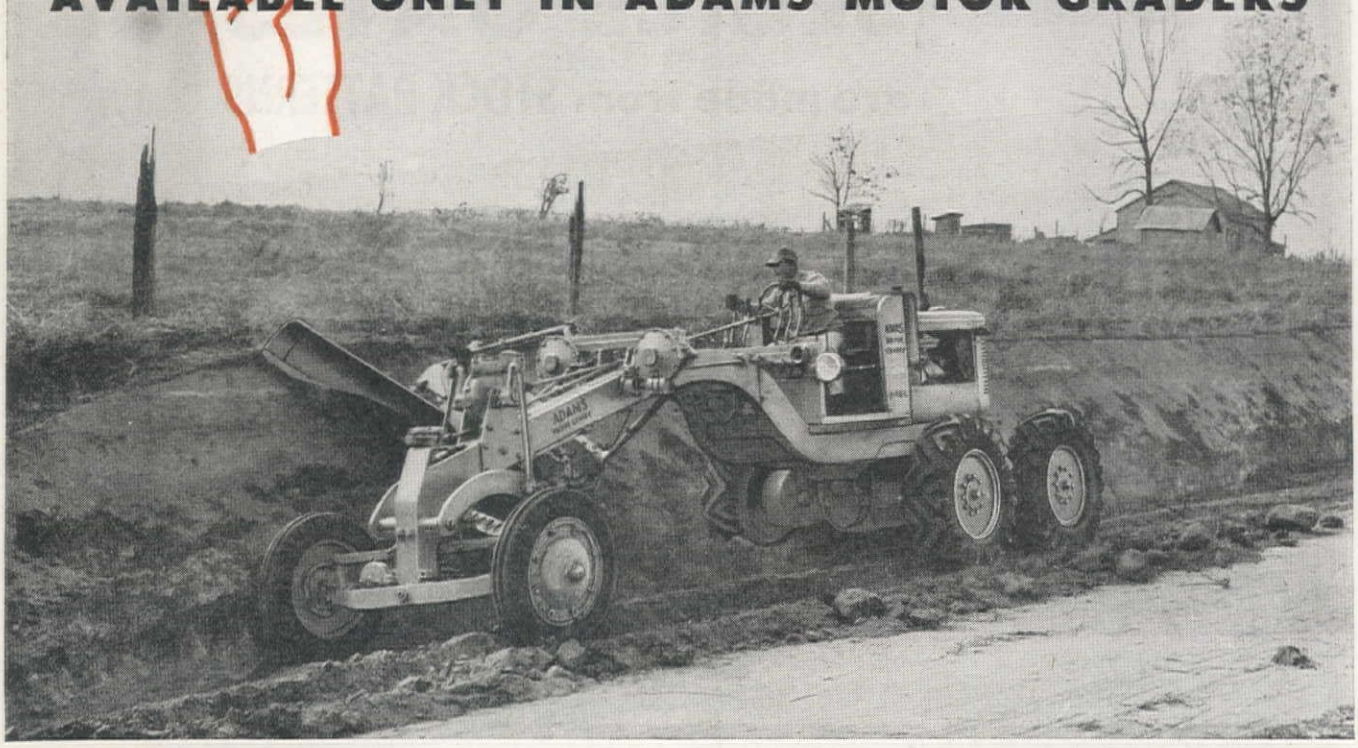
2146 Manchester Ave., Kansas City 3, Missouri, U. S. A.

union Wire Rope

1-T

3 FEATURES

AVAILABLE ONLY IN ADAMS MOTOR GRADERS



PROBABLY no one motor grader on the market has an important operating feature which cannot be found in some other motor grader but that doesn't mean that all motor graders are alike or of equal value. Only in Adams do you get the combination of the three operating advantages described below which are preferred by most experienced operators:

❶ 8 Forward Speeds . . . High Transport Speed

Wide working range permits operator to select exact speed to make each cut at fastest practicable rate. Result—more work done per day . . . Transport speeds run as high as 21 mph.

❷ Accurate, Dependable, Mechanical Controls

Not only operate easily and quickly but, because they always operate at uniform speed, provide more accurate adjustments than do hydraulic controls. Two adjustments can be made at same time without affecting speed of either.

❸ Push-Button Starting From Operator's Cab

Electrically-equipped Adams machines are started as easily as your automobile in any kind of weather. Saves time and tempers on cold mornings.

In addition to these features, you get Strength and Durability . . . Well-Balanced Weight Distribution . . . Adequate Power and Traction . . . Adaptability to a Wide Range of Jobs . . . Economical Operation and "near-by" Adams Service wherever you go . . . See your local Adams dealer now about your post war requirements.

J. D. ADAMS COMPANY • INDIANAPOLIS, IND.

At war's end we'll need many new roads and many jobs for returning service men. Plan post war projects now and meet both needs.

Let These Distributors Service Your Equipment

ALASKA—Glenn Carrington & Co., Fairbanks
ARIZONA—O. S. Stapley Company, Phoenix
CALIFORNIA—J. D. Adams Co., San Francisco, Los Angeles
Sutton Tractor & Equip. Co., Sacramento
J. G. Bastain, Redding
COLORADO—McKelvy Machinery Co., Denver
IDAHO—Intermountain Equipment Co., Boise, Pocatello
MONTANA—Industrial Equipment Company, Billings
NEVADA—Allied Equipment, Inc., Reno
NEW MEXICO—Hardin & Coggins, Albuquerque
OREGON—Howard-Cooper Corp., Portland, Eugene
UTAH—The Lang Company, Salt Lake City
WASHINGTON—Howard-Cooper Corp.,
Seattle, Spokane, Walla Walla
WYOMING—Industrial Equip. Co., Billings, Mont.
The Lang Company, Salt Lake City, Utah

ADAMS ☆ ROAD-BUILDING AND EARTH-MOVING EQUIPMENT ☆

TO MOVE MORE YARDAGE CHEAPER ON TOMORROW'S LONGER HAULS

REPLACE OBSOLETE, ONE-PURPOSE RIGS *with* TOURNAPULLS

You'll Require Less Equipment Investment . . . Can Handle Longer Jobs or More of Them with the Fewer Rigs . . . Try It.

Postwar construction plans for rebuilding, relocating and widening highways; for lengthening airports; and for reclamation projects definitely show the trend is to longer-haul earthmoving. To profitably handle these longer-haul jobs of tomorrow, you'll need equipment that can move big yardages fast. Tournapulls are the answer.

With Tournapulls you use the same cable-controlled, positive-ejection type Carryall Scraper that has proved so successful with tractors in the past, but you use it faster. You get the same one-man loading, hauling and spreading efficiency, plus off-road truck hauling speeds. You eliminate expensive one-purpose loading tools and cut out costly, idle waiting time in the borrow pit. Result: You move bigger yardages faster on all hauls from 300′ to 3 miles . . . same time cut equipment investment almost in half.

Rubber-Tired Power Benefits

Tournapull design concentrates weight and power on two big rubber-tired drive wheels to give you greater traction and maximum flotation and quick turning. These big drive tires (21 x 24) will take heavy loads over ground where normal-tired equipment bogs down. What's more your big tires have practically no wearing parts . . . also cushion equipment against shock and reduce operator fatigue.

Big tires enable Tournapulls to go practically anywhere you can go with tracks, but good haul roads like this enable you to move 10 to 20% more yardage hourly with same hauling equipment. Tournapull shown is working on Alaskan Highway.

See Your LeTourneau Dealer

Why use one-purpose loading and hauling rigs or slow-moving crawler equipment, when you can move more yardage, more profitably with Tournapulls. See your LeTourneau distributor . . . he can help you get Tournapulls NOW for essential jobs.

Tournapulls spread their loads evenly and accurately while moving. Big tires aid compaction, enable you to travel over concrete runways. This Tournapull is fine grading between forms at Muroc Airfield in California.

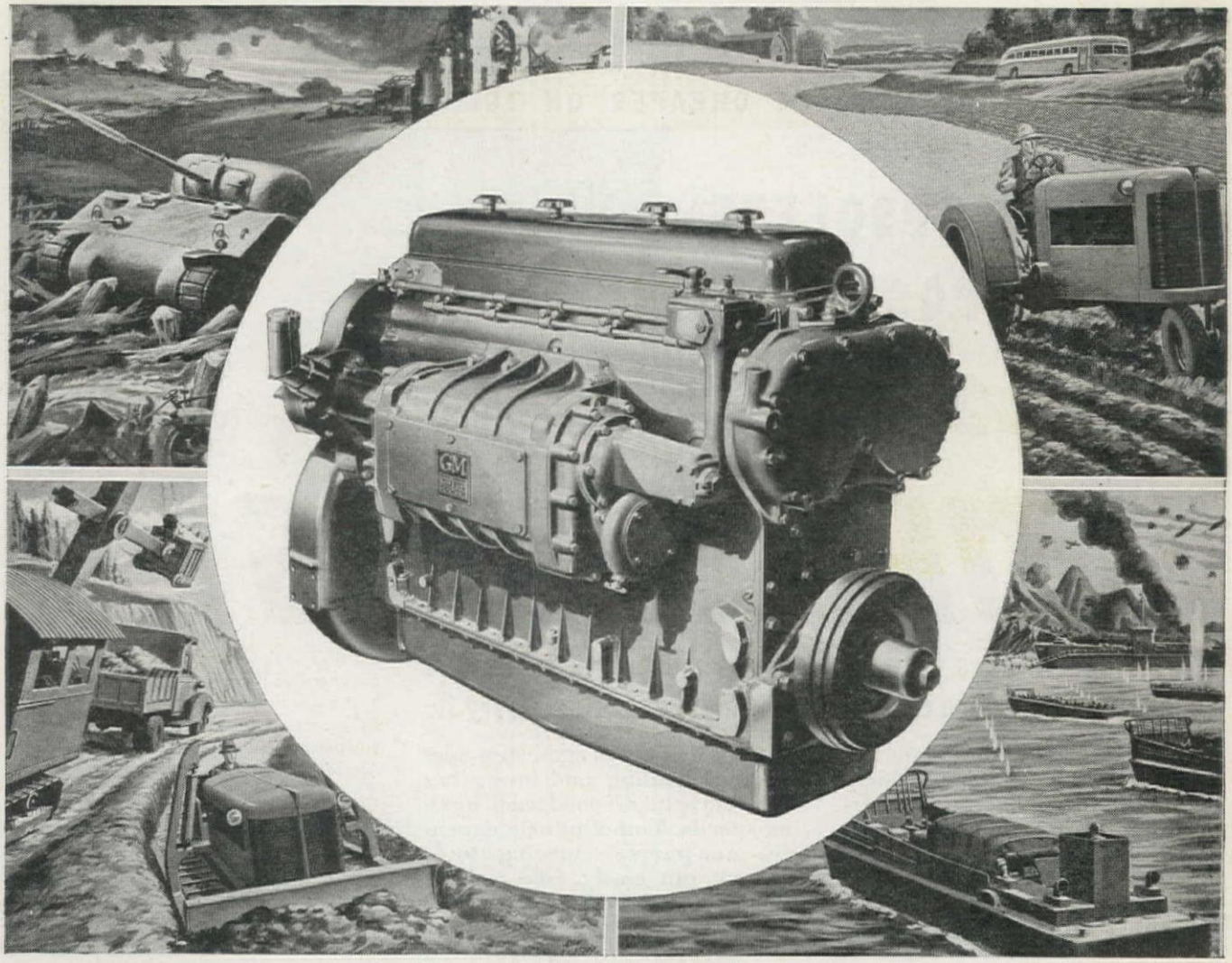
LETOURNEAU
PEORIA, ILLINOIS • STOCKTON, CALIFORNIA

2300 Now in Use by Alert Earthmovers

TOURNAPULLS

RUBBER-TIRED POWER FOR FASTER EARTHMOVING

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.



GM DIESELS SERVE WHEREVER AMERICA NEEDS POWER

America's fighting Engineers and Seabees really work miracles. Sand dunes are leveled. Jungles are cleared. Landing strips appear overnight. Staggering loads are moved over land and sea.

Helping them work these miracles are General Motors Diesel engines.

Because these engines are rugged and dependable, they get the toughest kinds of jobs to do.

Because they take so little fuel, they save precious transport space.

Because they have been designed for simplest maintenance, they stay on the job and keep on the go.

War is a tough proving ground for engines. It shows their mettle, reveals their stamina. As they perform their wartime tasks, these GM Diesels are proving the service they will continue to render in the many civilian needs for dependable, economical power after the war.

The Army-Navy "E" for efficiency in war production flies proudly over the GM Diesel plant in Detroit.

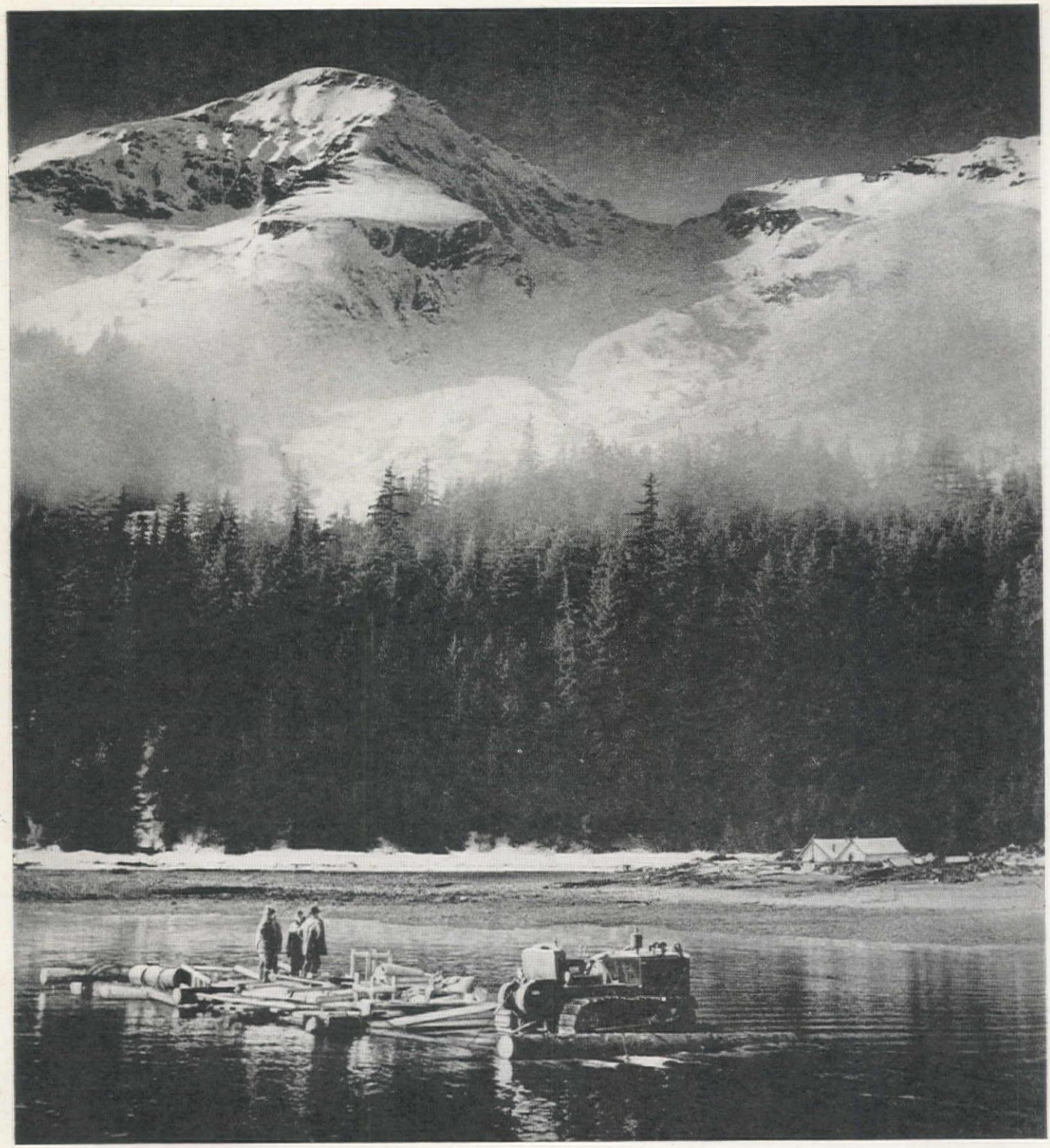
KEEP AMERICA STRONG
BUY WAR BONDS

GM
GENERAL MOTORS
DIESEL POWER

ENGINES . . 15 to 250 H. P. . . **DETROIT DIESEL ENGINE DIVISION,** Detroit 23, Mich.

ENGINES . . 150 to 2000 H. P. . . CLEVELAND DIESEL ENGINE DIVISION, Cleveland 11, Ohio

LOCOMOTIVES . . . . . ELECTRO-MOTIVE DIVISION, La Grange, Ill.



CONSTRUCTION of the Canol pipe line and refinery project in Northern Canada and Alaska required breaking trail through primeval wilderness, often at sub-zero temperatures, to establish communication and transportation facilities incidental to construction.

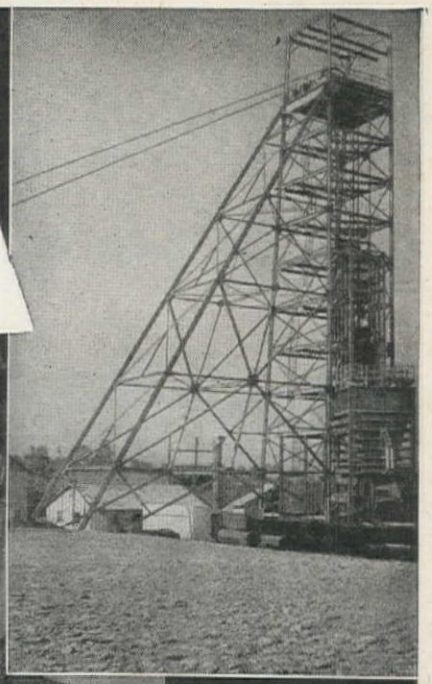
W. A. BECHTEL CO.

Constructors

SAN FRANCISCO

Project illustrated: A joint venture,
BECHTEL-PRICE-CALLAHAN

Solving Problems on the Delaware Aqueduct



Headframe — Delaware Aqueduct job

Lidgerwood hoist employed in construction of Delaware Aqueduct

BUILDING the longest tunnel of all time posed some tough problems for engineers. On the 85 mile route of the aqueduct, running 300 to 2,000 feet below the surface from the west slope of the Catskills to New York City, fault zones and areas of porous rock were encountered — mud was forced into the tunnel in 1,000 yard lots, under water pressure up to 290 lbs. per square inch. Liberal grouting was called for; in some cases, extensive bulkheads as well. And, of course, all the materials to meet these problems had to be passed through shafts.

It is a compliment to the engineers, and a tribute to the reliability of the hoisting equipment, that these situations were overcome *without* delaying the scheduled progress of the aqueduct. On several of the contracts, Lidgerwood hoists were used to operate the shafts — Lidgerwood-modified or overhauled equipment was used on various other portions of the project. As engineers and contractors have come to expect, the Lidgerwood hoists performed their vital function day-in and day-out, without causing expensive tie-ups.

Lidgerwood hoists have a 70-year record of dependable, efficient operation in mine, quarry and construction service. Built to *fit the job,* there's a Lidgerwood steam, electric, gasoline or Diesel hoist to meet every construction requirement.

LIDGERWOOD
ESTABLISHED 1873
Manufacturing Company
MAIN OFFICE AND WORKS • ELIZABETH 8, NEW JERSEY

Steep Rock's 120,000,000,000-Gallon Hose

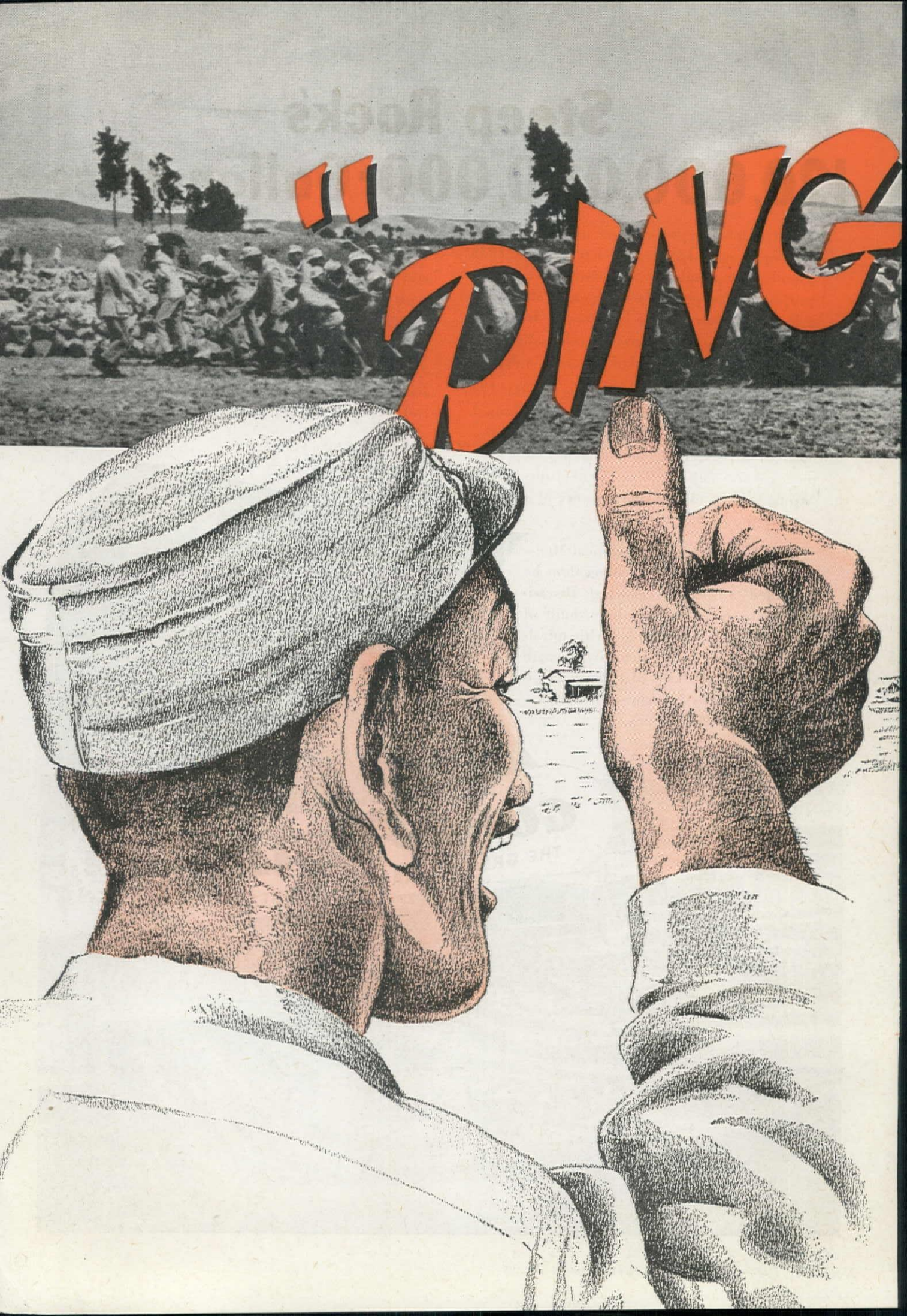
PICTURED below you see some of the huge floating pump barges and discharge lines used in draining the fabulous Steep Rock Lake mining project. As you probably know, some 120 *billion* gallons of water had to be pumped from this wilderness lake to give access to the millions of tons of rich iron ore buried beneath its depths.

This called for fourteen huge pumps mounted on floating barges, each discharging to shore through giant pipe lines, in which a flexibility of 15 degrees is essential – a requirement that necessitates rubber hose connections strong enough to hold the pressure of a steadily increasing head of water.

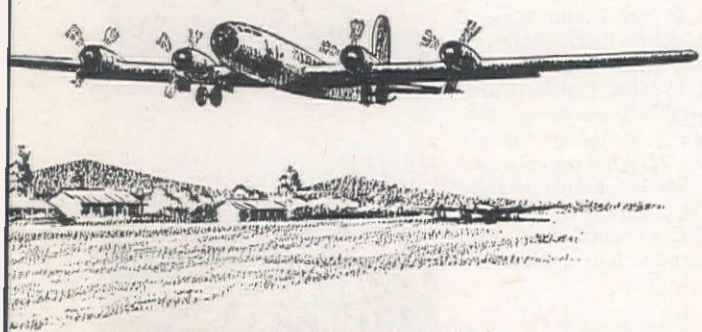
The G.T.M.—Goodyear Technical Man—was consulted. For these connections he specified a specially-designed Diversi-pipe type of heavy-duty hose, built of synthetic rubber reinforced with spirals of heavy round steel wire to give strength with flexibility. Each of these joints is 11½ feet long by 24 inches in diameter and weighs 1,900 pounds.

Today Steep Rock Lake has been practically emptied by this huge Goodyear-jointed line. This mine is already in production – a tremendous exploit to which Goodyear's skill and experience in fabricating synthetic rubber contributed an important share. For expert advice on any rubber problem, it will pay you to consult the G.T.M. Just call your nearest Goodyear Industrial Rubber Products Distributor.

BUY WAR BONDS—BUY FOR KEEPS


"PING

("EVERYTHING'S OKAY")



SHOUTS of "Ding hao!" from grinning Chinese workers greeted B-29 fliers when they returned to China's air bases from their first bombing of the Nips' homeland. "Everything's okay!"... now that Allied bombs repay a long-standing debt. Forgotten are the toil, sweat and blood put into the superfortress fields.

But history will not forget. Recorded for all time is the seemingly impossible feat a half-million Chinese workers accomplished with bare hands and makeshift tools. Longer and more level than any previously constructed forward combat fields are China's vast system of B-29 strips —"so long that a man at one end of the strip can scarcely distinguish a man at the other."

If only tractors with rollers, bulldozers and scrapers . . . motor graders and other modern construction tools could have been available!

A main part of the supplies of all Armed Forces, construction machines are being used IN FORCE, in every theater of war, where it is at all possible to ship, fly or truck them. Ingenuity and mass manpower is the only answer to their lack. Fortunately, China had both. We join in paying tribute to a brave nation. To their "Ding hao!" we say "MORE POWER"... on land as well as in the air . . . and it will come soon!

ALLIS-CHALMERS

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

Bethlehem Steel

for

POST-WAR HIGHWAYS

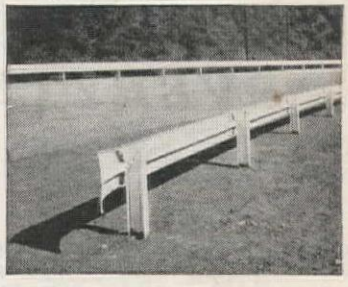
It's going to be a huge post-war job, building the new highways needed by a growing America, carrying out hundreds of construction projects that had to lie fallow during the wartime years.

When the job begins, Bethlehem's complete line of highway products will again be at the service of road builders. Bethlehem road steels, backed by years of experience, have proved themselves—they're engineered all along the line for sturdy performance.

Plan to handle your post-war highway contracts by specifying this reliable source of supply for *all* road-steel products. Contractors can save time, bookkeeping and letter-writing by placing one order for all their needs for a given highway job with a conveniently-located Bethlehem warehouse. For full information about Bethlehem Road Steel Service, get in touch with the nearest district office, or write direct to Bethlehem Steel Company, Bethlehem, Pa.

REINFORCING STEEL

Bethlehem *Reinforcing Bars,* plain and deformed, are made of new billet steel in standard sizes and grades, and can be bent to shape and cut to size in most Bethlehem warehouses. *Bar Mats,* made of deformed bars clipped together, are easy and convenient to install, and lie flat. *Welded Wire Fabric* is fabricated from tough, cold-drawn wire to meet all standard highway specifications.



HIGHWAY GUARD

Bethlehem's beam-type guard rail, called tne *Safety-Beam,* is made in standard 12 ft., 6 in. lengths, or if preferred, can be supplied in lengths up to 50 ft. *Cable Guard Rail* is durable three-strand steel cable, with a double-galvanized coating. *Highway-Guard Bracket,* made of high-tensile spring steel, is attached with one bolt to steel or wood posts, and supports three or four cables.

STEEL POSTS

Bethlehem *Steel Highway Guard Posts* are readily driven and have superior resistance to impact and side thrust. Bethlehem also makes posts for right-of-way fence, as well as the fence itself.

STEEL PILING

Bethlehem *Steel Sheet Piling* for temporary or permanent retaining structures. *Steel H-Bearing Piles* for bridges, over- and under-pass, and other load-bearing structures.

BETHLEHEM STEEL

OTHER BETHLEHEM PRODUCTS FOR HIGHWAYS

ROAD JOINTS — DOWELS — DOWEL BAR SUPPORTS
ROAD STRIP — WIRE ROPE AND STRAND — BAR TIES
GUARD RAILS — ANCHOR RODS — RIGHT-OF-WAY FENCE AND POSTS
PIPE — HOLLOW DRILL STEEL — DIGGING BARS
STRUCTURAL STEEL — STEEL CRIBBING MOLD BOARDS
REINFORCING FOR CONCRETE — BRIDGE FLOOR REINFORCING
CORRUGATED SHEETS — CONCRETE SLAB SPACERS
TURNBUCKLES — TIE RODS, SPIKES, BOLTS AND NUTS
TIMBER BRIDGE HARDWARE

EQUIP YOUR PRESENT TRACTORS WITH USEFUL ATHEY MobiLoaders!

You Can Increase Your Tractor's Range of Uses . . . Give It Extra Work To Do

WHY NOT step up the usefulness of your present "Caterpillar" Diesel Tractor by equipping it with an Athey MobiLoader?

One or more of your present machines possibly has just completed a construction job—operating a bulldozer, or pulling a wagon or scraper and now stands idle. Is there some maintenance work, rebuilding or improving it could be doing?

You can keep your machines busy with the fast-working, cost-cutting Athey MobiLoader—the machine that has countless uses.

Athey MobiLoaders are backed by 4 years of performance in the field. They've piled up records of big production on loading operations of all kinds.

They're loading stock piled gravel, stone, rock, coal, ore, earth, snow and other materials quickly and economically. They're working in gravel pits—on coal stripping operations—in ore mines—loading many materials in less time, at less cost.

Bucket capacities for the Model W4-1 MobiLoader range from 3/4 to 1 1/8 cubic yards; Model 8 MobiLoader has bucket sizes from 2 3/4 to 4 1/2 cu. yds., depending upon the type of material.

Used by the Armed Forces on battle fronts in every theatre of war, they're sold and serviced by the world-wide "Caterpillar" dealer organization which has no equal.

MOBILOADERS

ARE AVAILABLE FOR

"CATERPILLAR"

D4 & D8

TRACTORS

★

SEE YOUR DEALER

You get big-capacity, high-speed loading with the proved overhead Athey MobiLoader, plus ample crowding action for digging

Ask your ATHEY-"Caterpillar" Dealer, or write direct to Athey Truss Wheel Co., 5631 W. 65th St., Chicago 38, Illinois, for further information.

ATHEY

FAST, DEPENDABLE LOADING EQUIPMENT


Important..
ANNOUNCEMENT
205
HERE IT IS!
ORDERS ACCEPTED NOW FOR POST-WAR DELIVERY . . .
SEE THE KOEHRING DISTRIBUTOR FOR COMPLETE INFORMATION
KOEHRING COMPANY • MILWAUKEE 10, WISCONSIN

You can't take one away from the other—the Steel, the Rope, the Men who make it, engineer it, and apply it to the drums and sheaves. They add up to rope service ● **ROEBLING** *"Blue Center"* **STEEL WIRE ROPE**

WHAT CAN YOU EXPECT from Roebling? Rope that has known capacity to deliver service. Engineering, in our plant and at your job, to put the rope to work right. Maintenance practices that protect its long life. » » Your postwar profits and postwar jobs will depend in part on operating rope-rigged equipment at lowest cost. You can leave that part to Roebling.

JOHN A. ROEBLING'S SONS COMPANY OF CALIFORNIA

San Francisco • Los Angeles • Seattle • Portland

ROEBLING

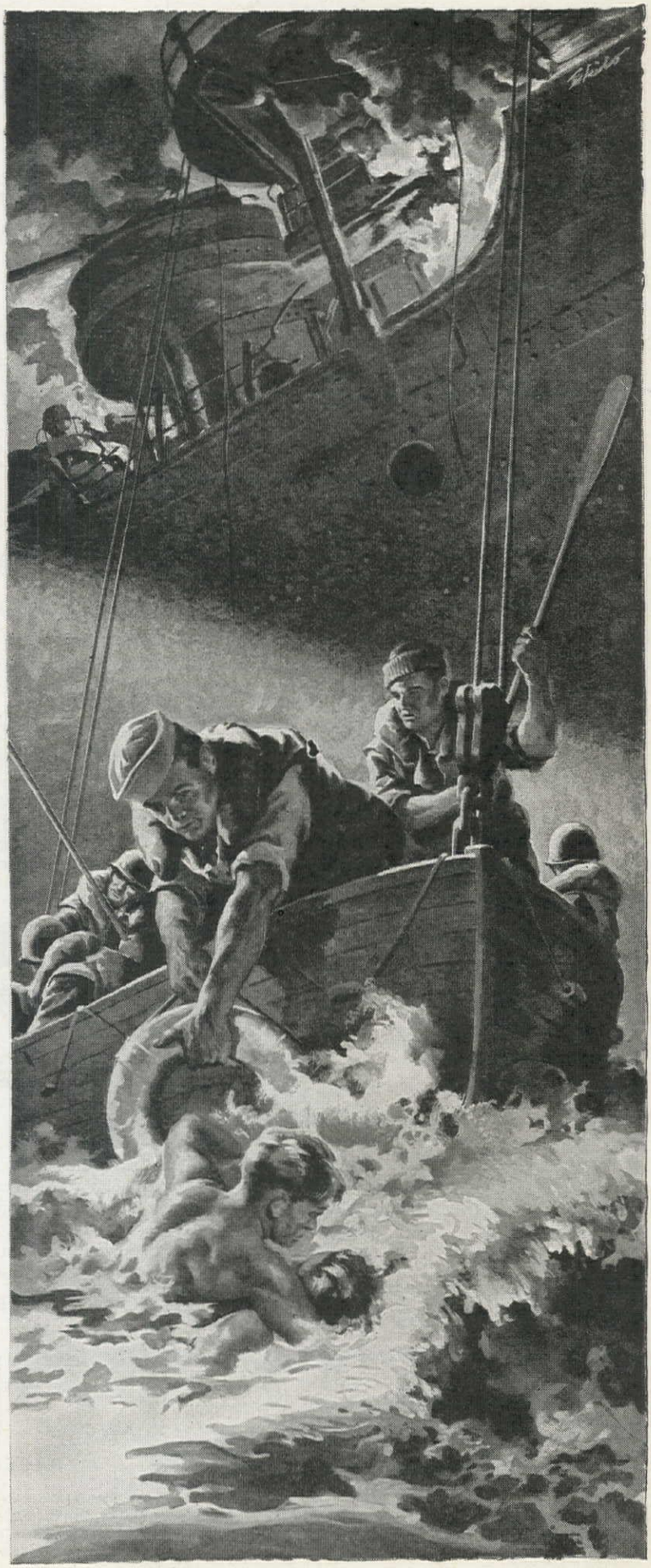
PACEMAKER IN WIRE PRODUCTS

WIRE ROPE AND STRAND • FITTINGS • AERIAL WIRE ROPE SYSTEMS • COLD ROLLED STRIP • HIGH AND LOW CARBON ACID AND BASIC OPEN HEARTH STEELS • ROUND AND SHAPED WIRE • ELECTRICAL WIRES AND CABLES • WIRE CLOTH AND NETTING AIRCORD, SWAGED TERMINALS AND ASSEMBLIES • SUSPENSION BRIDGES AND CABLES.

BACK OF EVERY ATTACK...

Preformed wire rope

SPEEDS VITAL OPERATIONS



It's hell on high water. Enemy dive bombers drop deadly loads. A direct hit! Exploding shells rip the ship wide open. It trembles and shudders.

General alarm sounds. Then the command, *"Abandon ship!"* All hands race for the lifeboats – their only means of escape from the flaming, sinking wreckage.

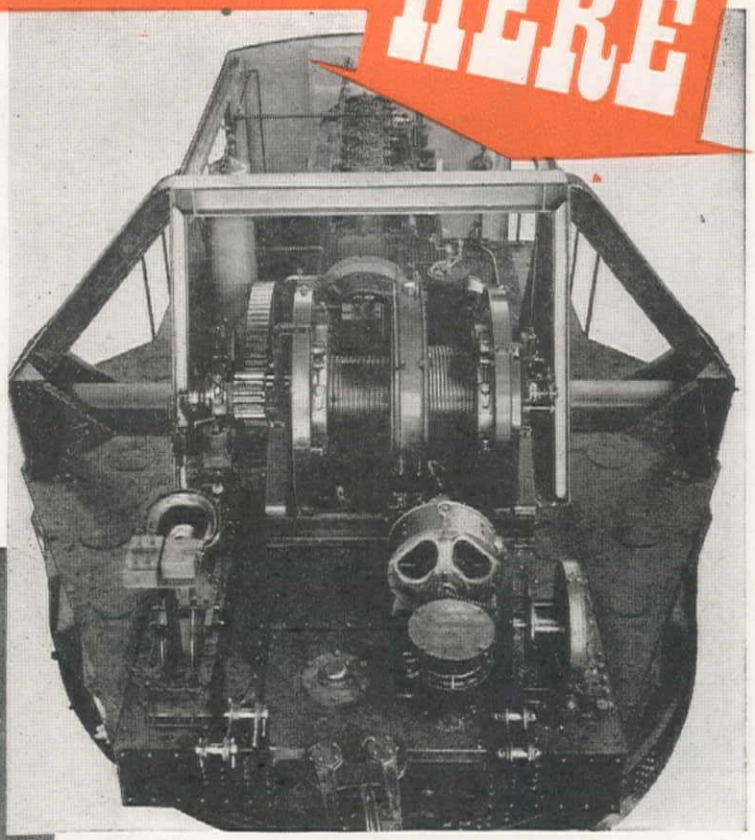
Men huddled in these boats are lowered to safety by Preformed wire rope. It handles easily and smoothly. No delay from tangled, twisted rope when delay would cost lives.

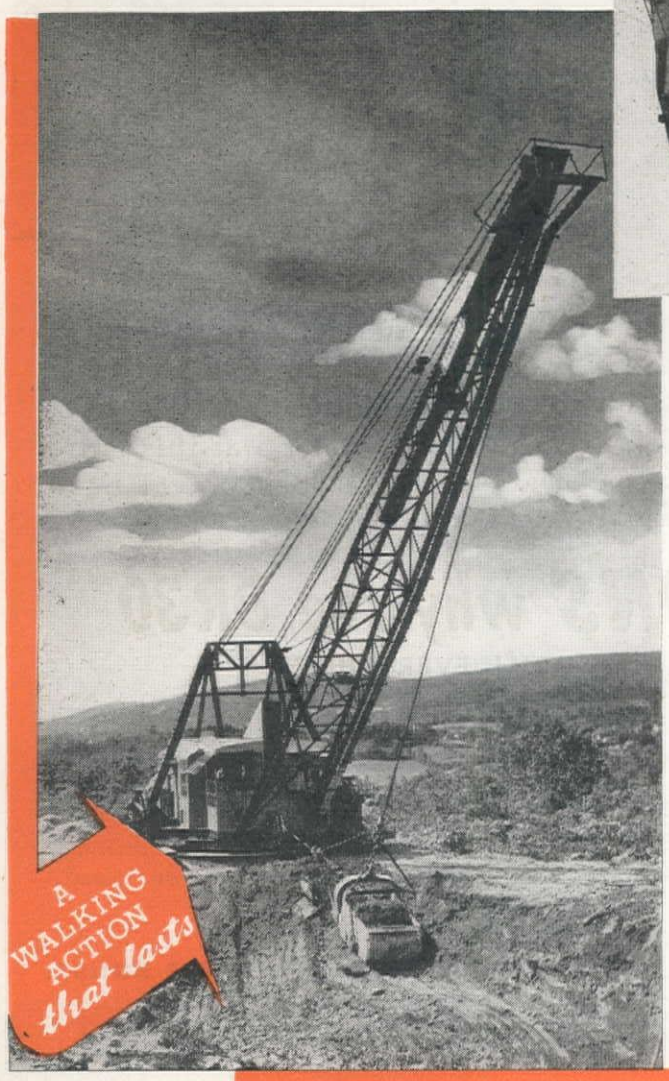
That's why for lifeboats it's Preformed. At sea, on land, in the skies, it's the tough wire rope for the tough war jobs.

ASK YOUR OWN WIRE ROPE MANUFACTURER OR SUPPLIER FOR PREFORMED WIRE ROPE

SIMPLICITY HERE

MEANS EXTRA YARDAGE EVERY SHIFT





Bucyrus-Monighan Walking Draglines have a simplicity of design that means real efficiency in all kinds of dragline work. Notice in the picture above how the machinery is located well back, to provide good rope leads and maximum counterweight effect. Notice the lack of complicated gadgets, gears or shafts. Bucyrus-Monighan simplicity means smooth performance and minimum maintenance, both in digging and in walking. Bucyrus-Monighans have proved their ability in all kinds of digging. They have the combination of speed and dependability to give the all-out performance we need for victory. They are manufactured with booms to 250 feet, buckets to 20 cubic yards.

G43-C

BUCYRUS MONIGHAN

SOLD BY

BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE, WISCONSIN

9 DR 30's on this JOB!

Pneumatic tires can be had if specified by purchaser in his application for priority to Construction Machinery Branch of War Production Board.

• Plenty of rock here! So husky, maneuverable Cleveland DR 30 Wagon Drills were used to good advantage at this large, west coast naval base.

Here are 7 REASONS why the DR30

IS THE MOST POPULAR WAGON DRILL EVER BUILT:

1. They drill at *any* angle and in *any* direction, flat holes from 4" to 8' aboveground, also straight up or down.
2. Feed capacity is over 8 feet, and the Cleveland DR 30 handles depths to over 25 feet.
3. The recoil device holds machine to its work, and increases the drilling speed from 10 to 25%.
4. Forward leg point holds the drill and steel in line whether operating in down, flat or angle holes.
5. Centralizer keeps steel from "walking" when starting hole, prevents breakage of bit points.
6. The twin jack-screw mechanism permits easy moving of U-bar, and also shortens set-up time.
7. The main wheels swivel 90° for line drilling, and 180° in order to obtain narrower tread.

Ask for Bulletin 132

BACK THE ATTACK—BUY MORE WAR BONDS

LEADERS IN DRILLING EQUIPMENT

THE CLEVELAND ROCK DRILL CO.

DIVISION OF THE CLEVELAND PNEUMATIC TOOL COMPANY

CABLE ADDRESS: "ROCKDRILL" • CLEVELAND 5, OHIO

WESTERN BRANCHES: SAN FRANCISCO, CALIFORNIA, 582 Sixth St.; SALT LAKE CITY, UTAH, 65 West Fourth South St.; WALLACE, IDAHO, 515 Bank St.; EL PASO, TEXAS, 1225 Texas St.; BUTTE, MONTANA, 41 East Broadway.

CALIFORNIA DISTRIBUTORS: LE ROI-RIX MACHINERY COMPANY, 3817 Santa Fe Ave., Los Angeles; THE RIX COMPANY, INC., 582 Sixth St., San Francisco.

The "Facts of Life" for wire rope users . . .

EVEN when you start with a good wire rope—such as American TIGER BRAND—treat it right if you want it to give all the life that is built into it.

In this handy 48-page booklet are the things every wire rope user should know about proper rope handling and care.

The easy-to-follow instructions and the practical suggestions it offers are based on the experience of thousands of rope users. They will help you avoid the common errors that shorten rope life and reduce operating efficiency.

Subjects covered include — correct handling of ropes, how and when to lubricate, attaching of clips and sockets, splicing, care of sheaves and drums, minimum safety factors and many other helpful hints that will show you how to keep your wire rope operating at maximum efficiency and for the longest possible time.

Right now, with seasoned operators few and far between, this handy guide to better rope performance is doubly valuable. This booklet is free. Send for as many copies as you need and get them into the hands of the right men.

Send for FREE WALL CHART, too

The ten vital rules of wire rope care and handling are graphically illustrated and briefly described in this attractive wall chart. Printed in colors, on a 15" x 21" heavy cardboard mount, it can be placed for ready reference wherever wire rope is being used. Acts as a constant reminder of good wire rope operating use and practice.

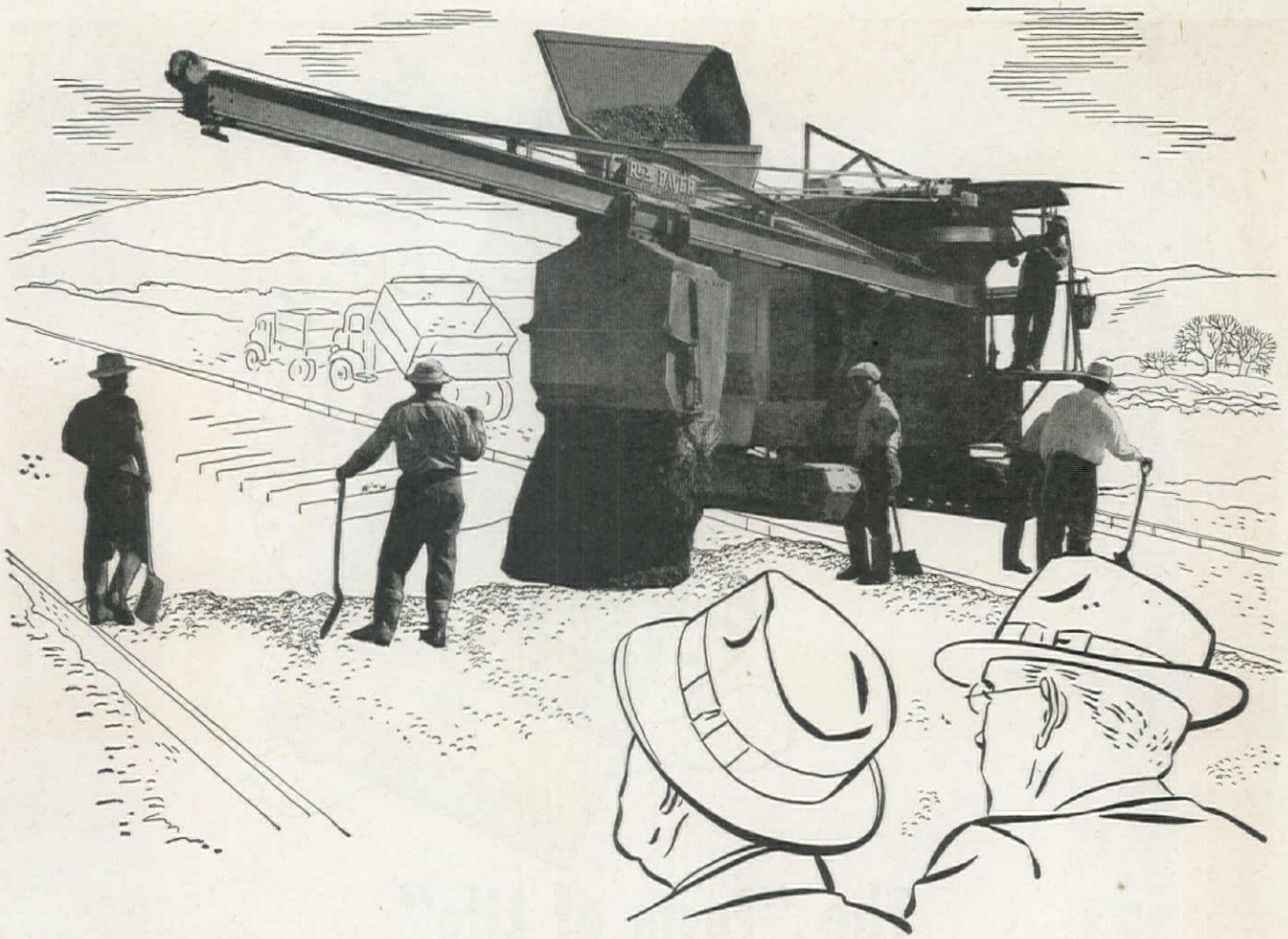
COLUMBIA STEEL COMPANY
San Francisco, Los Angeles, Portland and Seattle

AMERICAN STEEL & WIRE COMPANY
Cleveland, Chicago and New York

United States Steel Export Company, New York

USS

UNITED STATES STEEL



2,000,000 square yards *is a lot of concrete!*

. . . Enough to build a 20-foot highway from Chicago to Milwaukee and back again. That's what my Rex Paver placed. And that's not all. In addition to placing that concrete, my Rex 34E Double Drum Paver helped me keep up to schedule—and in many cases beat it! And it's still going strong. I'm sure glad I bought it.

There's another thing, too. I thought you were kidding about that Rex Mechanical Man you said every Rex Paver had. Well I'm convinced he's in that paver now. We get batch after batch with never a lost motion.

The entire batch cycle of 7 different operations is mechanically controlled. That means every batch goes through with clocklike regularity—saving seconds every batch. And those *saved* seconds mean extra batches every day. It's by far the fastest performer I've ever owned.

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, Mixers, Pavers, Moto-Mixers and Pumpcretes. 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.*

Arnold Machinery Co., Salt Lake City, Utah; Brown-Bevis Equipment Co., Los Angeles, California; Brown-Bevis Equipment Co., Phoenix, Arizona; Construction Equipment Co., Spokane, Washington; Contractors Equipment and Supply Co., Albuquerque, New Mexico; Corson Machinery Co., Ray—Denver, Colorado; Hall-Perry Machinery Co., Butte, Montana; Intermountain Equipment Co., Boise, Idaho; Loggers & Contractors Machinery Co., Portland, Oregon; Star Machinery Co., Seattle, Washington; Industrial Equipment Company, Emeryville, California.

REX

CONSTRUCTION MACHINERY

BAKERS ON *THE BIGGEST CONSTRUCTION JOB IN HISTORY* —WORLD WAR II

Top: Baker building road in New Caledonia.
Center: Making fuel "dumps"; Fiji Islands.
Bottom: Dozing trees for air base; Australia.
Bakers are on every front.

So you think Boulder Dam and the Panama Canal were big jobs? They were pikers compared to the construction job of them all—World War II. More earth is being moved, more trees dozed, more roads, bridges and buildings built and more buildings razed than on any other job at any time.

It's taking an endless amount of construction equipment of all kinds, including Baker Bulldozers and Gradebuilders by the hundreds.

This *Biggest Construction Job* calls for speed—that's where Bakers come in. Powerful hydraulic down-pressure on the blade bites deep into Italian lava, Algerian sand or South Pacific coral —gets full loads faster. Too, Bakers are as simple as they look—fewer parts—easier to maintain. No wonder the boys in the Seabees and the U. S. Engineers swear *by* them—not *at* them.

After monthly war quotas have been met, a few units are left for high priority requirements. If yours is a war job, you may be eligible. See your Baker, Allis-Chalmers dealer.

THE BAKER MFG. CO.

506 Stanford Avenue **Springfield, Illinois**

BULLDOZERS SNOW PLOWS **BAKER** CONSTRUCTION EQUIPMENT

TECO TIMBER CONSTRUCTION FOR POSTWAR PROJECTS

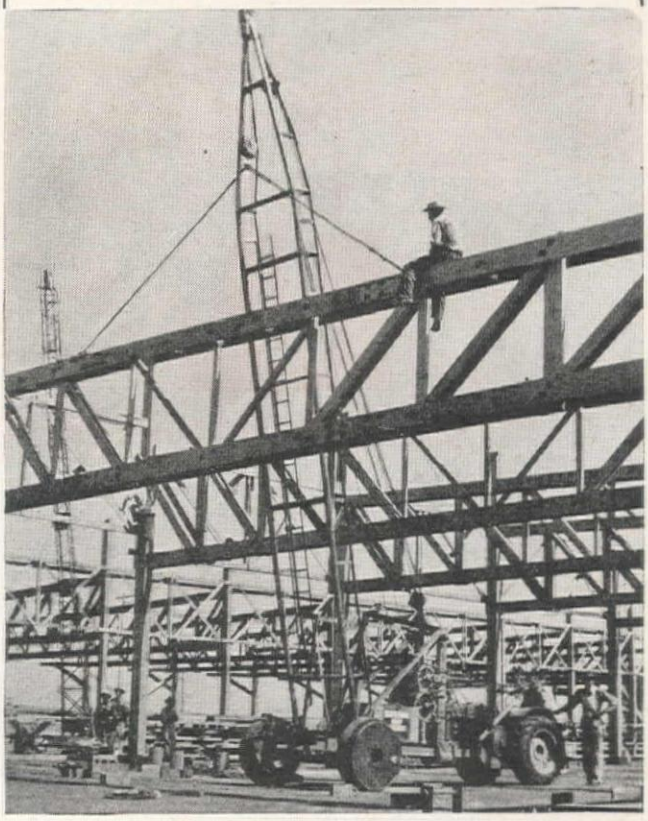
Modern timber engineering has been greatly simplified by the TECO Connector system of construction.

Wartime structures by the thousands point the way to the peacetime application of TECO Connectors in the planning of light and heavy timber structures.

Experienced timber fabricators throughout the country are ready to quote you.

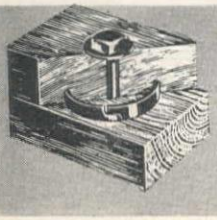
Our Western Service and Sales Offices can give you prompt service on TECO Connectors and grooving tools. Write for helpful booklets.

Erecting Teco timber trusses for Spiegl Dehydration Plant at Salinas, California. Designed and erected by Summerbell Roof Structures of Northern California, Oakland, California.



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

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



SPECIFY TECO CONNECTORS
SPLIT RINGS • SHEAR PLATES
GROOVING TOOLS

KEEP ME POSTED

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Put my name on your mailing list.

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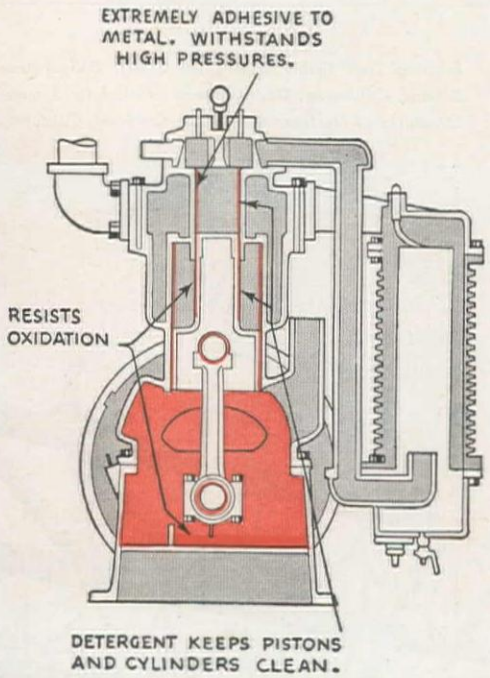
STANDARD ENGINEERS NOTEBOOK

VOL. 1-W NO. 9

Inhibited oils for air compressor lubrication

Manufactured from selected base stock oils and special inhibitors, Calol Multi-Service Oils have increased the efficiency of air compressors for many operators.



The inhibitors in Calol Multi-Service Oils prevent the formation of excessive gum and sludge caused by contact with air, pressure and contaminants. They also possess detergent qualities which keep cylinders, pistons and other moving parts clean.

There is a wide range of viscosity grades in Calol Multi-Service Oils so selection of exactly the proper weight for each compressor can be made, thus providing an oil that will keep the oil feed down to the correct rate. The grades are: 55X - (SAE 20); 65X - (SAE 30); 75X - (SAE 40); 85X - (SAE 50).

Lubricants recommended for good pump lubrication

The correct and most efficient lubricant for each part in every type of pump may be found among Standard's numerous Calol products. Those generally used are listed in the chart below.

PUMPS — Reciprocating Steam Driven

PARTS TO BE LUBRICATED	LUBRICANT
Steam Cylinders and Valves Pressures above 150 lbs.	Calol Cylinder Oil-155PX or 190PX
Pressures below 150 lbs.	Calol Cylinder Oil-130X or Calol Valve Oil-130X
External Bearings and Eccentrics, Oil	Calol Red Engine Oil-15
Grease	Calol Grease-3

Triplex, Geared Pumps

Exposed Gears	Calol 304 Gear Grease or Calol Pinion Grease-2
Bearings, Oil	Calol Red Engine Oil-15
Grease	Calol Grease-2 or -3
Eccentrics	Calol Grease-2 or -3
Guides	Calol Grease-2 or -3

Rotary; Centrifugal and Screw Type Pumps

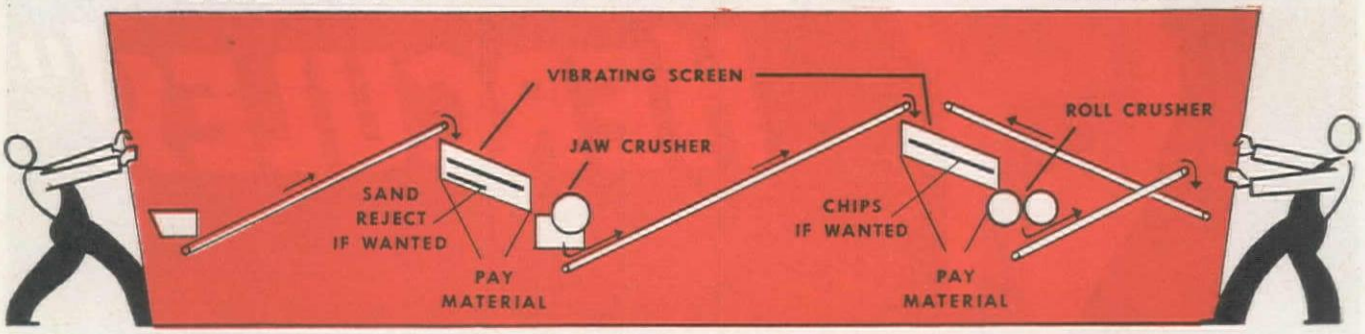
Bearings, Oil	Calol Turbine Oil -15
Pin Cups, Grease	Calol Grease-1
Compression Cups	Calol Grease-2 or -3
Ball or Roller Bearings Tight Housing, Oil	Calol Turbine Oil -15
Grease	Calol Grease-2 or Calol H.M.P. Grease-1

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

STANDARD OF CALIFORNIA

BOTTOM DECK FEED *Produces more!*

THE PIONEER DUPLEX GRAVEL PLANT

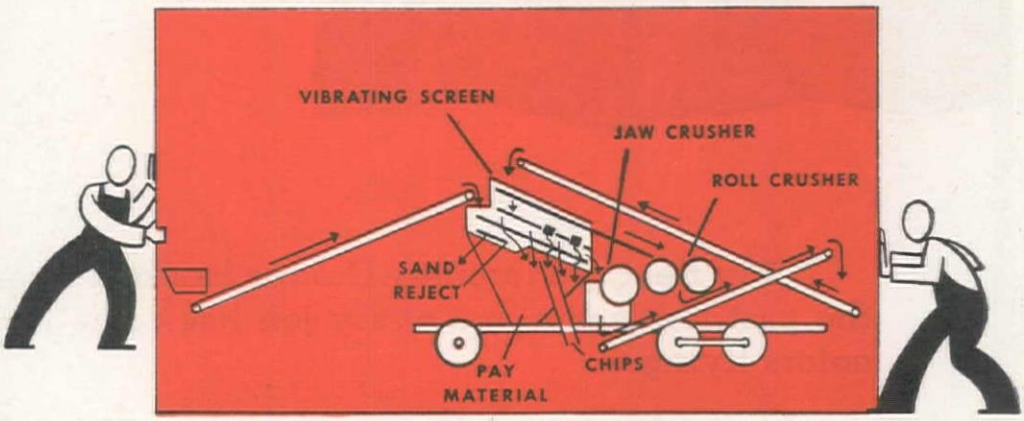


SPREAD IT OUT

Here is how the equipment in a Pioneer Duplex Crushing and Screening Plant would look if it were spread out in separate units.

PUT IT TOGETHER

In the Pioneer Duplex Plant all this equipment comes in one compact package, on one set of pneumatic tired trucks, due to the ingenious, exclusive Pioneer "Bottom Deck Feed." Here is how it is arranged. The pit material is fed onto the bottom deck—throughs go to the pay material hopper—material retained goes to jaw crusher. Crushed rock is fed to top deck—throughs are carried on blank middle deck and by-passed around bottom deck directly into pay material hopper, material retained on top deck goes to roll crusher and then back to screen.



Here are the advantages of the Bottom Deck Feed:

1 Doubles the screen area producing pay material. Both top and bottom decks produce pay material.

2 Increases crusher output. The work of both crushers is balanced by opening or closing jaw crusher, thus keeping both crushers working to maximum efficiency and capacity.

3 Crushed material is not mixed with pit run material on screen.

4 "Stone Chips" can be produced without additional equipment.

Pioneer "Bottom Deck Feed" Gravel Plants are built in five sizes for every gravel requirement. There is one size that will answer your problem. Let us show you the advantages on your specifications.

PLAN WITH

Pioneer
ENGINEERING WORKS
ENGINEERS and MANUFACTURERS of QUARRY-GRAVEL AND MINING MACHINERY
Crushers • Screens • Conveyors • Feeders and Portable Plants
MINNEAPOLIS 13, MINNESOTA

FOR PROFITABLE PRODUCTION

"I'M SURE GLAD I PICKED HERCULES!"

"My fleet of Hercules Dumps has had a real workout the past few years, but every job has come through with colors flying.

It's really surprising how seldom Hercules bodies need service or repairs, and when they do, my Hercules distributor is right on the job.

My drivers like Hercules Hydraulic Hoists because of their ample reserve power, their dependability, and their "button-ease" dash controls, with no levers in the cab.

That Hercules slogan, "Men like to say they use them", certainly applies to me!"

Write us, or see the nearest Hercules Distributor regarding the Dump Bodies or Hoists you need now.

HERCULES STEEL PRODUCTS CO.

GALION, OHIO

ALLIED TRAILER & EQUIP. CO., Seattle, Wash.; NEWELL TRUCK EQUIPMENT CO., Portland, Ore.; A. PASTERIS CO., Oakland, Calif.; STANDARD CARRIAGE WKS., INC., Los Angeles, Calif.; STANDARD IRON WORKS, San Diego, Calif.; SAWTOOTH CO., Boise, Idaho; WESTERN CONSTRUCTION CO., Billings, Mont.; WYOMING AUTOMOTIVE SUPPLY CO., Casper, Cheyenne, Rock Springs, Sheridan, Wyoming; McKELVY MACHINERY CO., Denver, Colo.; MORROW & CO., Albuquerque, New Mexico.

THESE SLINGS PASS WARTIME INSPECTION

FOR SAFETY...SPEED...ECONOMY OF MANPOWER AND MATERIALS

When virtually every load is tagged for war production, efficient handling becomes an obligation—one you'll discharge on all counts with Yellow Strand Braided Wire Rope Slings.* *Safety?* The strength of this patented sling lies in tough Yellow Strand Wire Rope, so braided that it gains marked flexibility . . . conforms readily to any product . . . grips it gently but securely. *Speed?* Light weight and high kink-resistance make the sling easy to carry, attach and remove. *Economy?* A compact braided sling conserves manpower and materials, compared with bulky types. Even when lifting heavy locomotives, turbines, pressure towers or weapons, a Yellow Strand Braided Sling will require fewer men —and less steel. And for such lighter lifts as jigs, tools, drums or crates, a Yellow Strand Sling offers relief from the fiber shortage. Fitting material-handling equipment to your specific job is the function of Broderick & Bascom's specialized Sling Engineers. Investigate today!

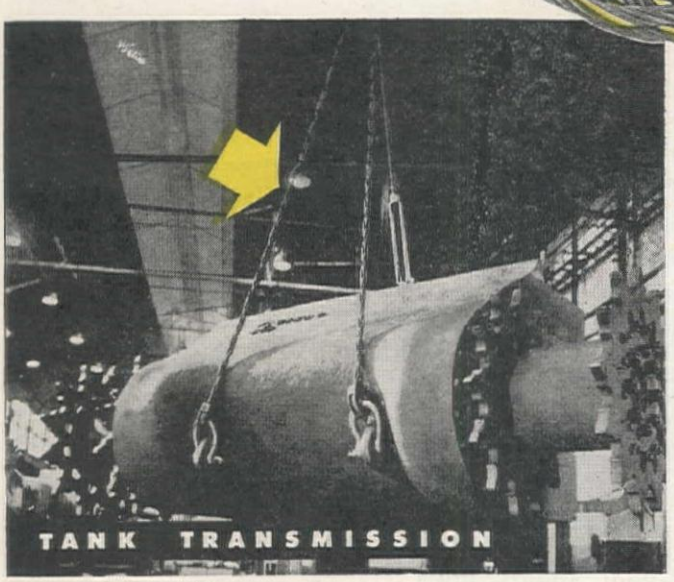
Broderick & Bascom Rope Co., St. Louis

Branches: SEATTLE, New York, Chicago, Houston, Portland
Factories: SEATTLE, St. Louis, Peoria

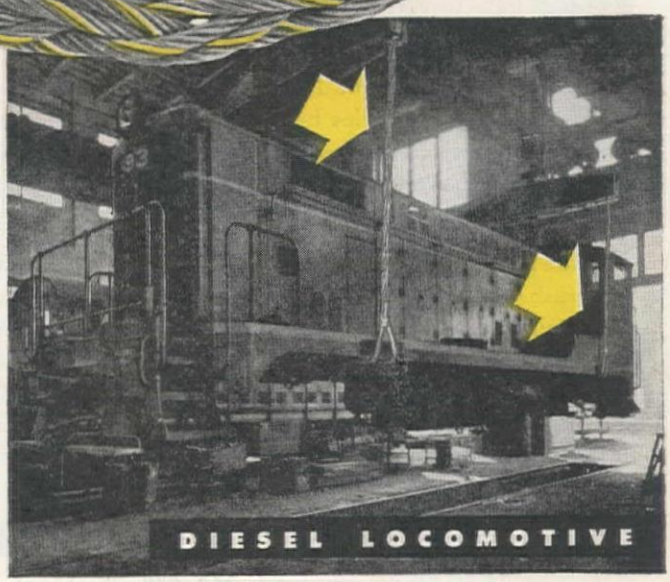
FREE

Riggers' Hand Book

96-pages of practical wire rope sling information. Send for free copy.



TANK TRANSMISSION



DIESEL LOCOMOTIVE

*Patents: U. S., 1475859, 1524671, 2142641, 2142642, 2299568 • Canadian, 252874, 258068

BRODERICK & BASCOM

YELLOW STRAND

Braided Wire Rope SAFETY SLINGS

J. A. Gallagher, Madison, Wisc., contractor uses a Universal 546-P primary unit with 20" x 36" jaw crusher in Viroqua, Wisc. quarry. Plant is electric-powered.

Below: Beu & Sons use a 546-P primary unit with 20" x 36" crusher for primary reduction of limestone at Ackley, Iowa. Secondary plant has No. 4 Universal Pulverizer.

The 30" x 42" Welded Steel Plate Roller Bearing Crusher on this 546-P Primary Unit increases output for Art Overgaard's No. 1 plant at Cashton, Wisc. This is the third 546-P unit purchased by this operator.

Quarries step-up output with this UNIVERSAL Primary Unit!

These Universal Portable Primary Crushing Units greatly increase output for quarries because larger chunks of shot rock need not be rejected or sledged. In addition, they increase the output of secondary crushers by delivering material of a more uniform size to them.

Made in four sizes: 16" x 24", 20" x 36", 24" x 36" or 30" x 42" jaw crushers. Apron feeder empties onto bar grizzly with bypass chute for material suitable for secondary unit. Apron feeder can be readily detached and slid off onto a truck to facilitate hauling. Ideal for use with Universal 822-Q, 410-Q, 880 and other plants as well as *other makes* of quarry plants that need to be geared to tomorrow's requirements. Send for details.

UNIVERSAL ENGINEERING CORPORATION
323 8th St. West, Cedar Rapids, Iowa

ARMY NAVY

UNIVERSAL

CRUSHERS, PULVERIZERS, COMPLETE PLANTS, SPREADEROLLERS, PORTABLE ASPHALT PLANTS

Start Post-War Planning Now!

LE ROI

Portable Air Compressors Combine Speed with Economy

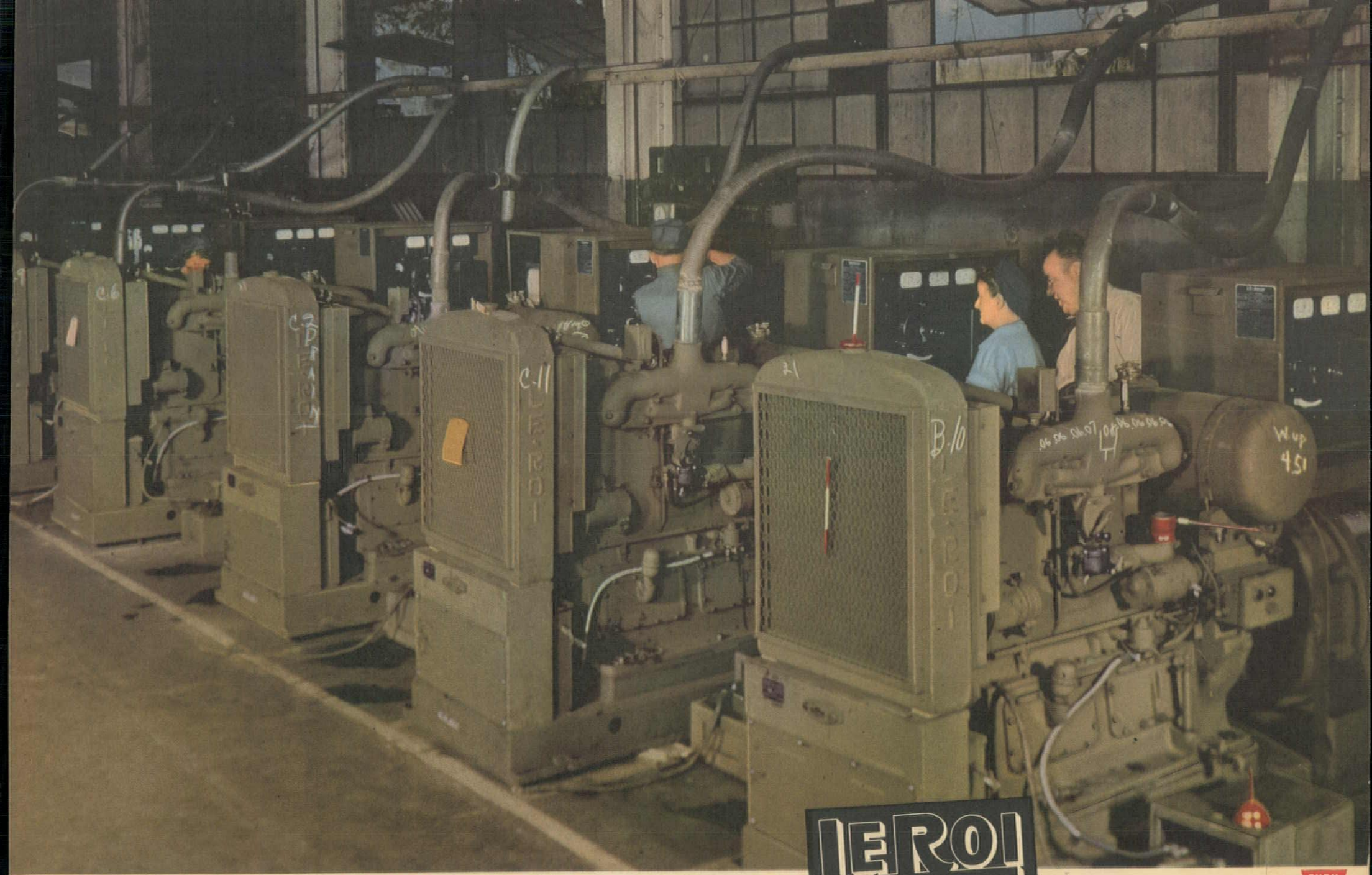
Owners of Le Roi Compressors are congratulating themselves because of two factors: (1) they have the advantage of extra mobility on the road between jobs (Le Roi Compressors can be towed at average traffic speeds) and in moving about on the job site, (2) Le Roi Compressors usually avoid complicated overhauls through quick-maintenance aids such as removable wet sleeve cylinders, hardened valve-seat inserts, valve-in-head construction, and many others.

You save time and money on fast-moving schedules, when Le Roi Compressors are on the job. Remember, this is the only compressor in which the same manufacturer builds both valve-in-head engine and compressor — a perfect team, designed and built to work together. All standard sizes are available for approved projects. Write for bulletins.

ON THE REVERSE SIDE — A battery of Le Roi Engines are given exhaustive performance tests before being sent to the U. S. Signal Corps for use on some of their equipment.

LE ROI COMPANY
1726 S. 68th St., Milwaukee 14, Wis.

LE ROI



Dependable power in the making . . . test line of **LEROI** engine-generator sets

TURN THE PAGE

CLETRAC *Tru-Traction** is a dividend payer

ON any job of scraping, bulldozing, hauling, logging, where going is tough and competition is keen, you'll find Cletrac Tru-Traction power a dividend payer.

With Cletrac the pull of one track is balanced against the pull of the other. The work demanded of each track is divided. When turning a Cletrac, the speed and pull of one track is equalized and coordinated so that both tracks always pull—one traveling faster than the other. The action and speed of each track is under positive mechanical control of the operator at all times.

Unless you understand thoroughly the Cletrac Tru-Traction principle—Controlled Differential Steering—patented and used exclusively for years by Cletrac, you cannot wisely judge the value of any tractor. An easily understood book—Cletrac Controlled Differential Steering—explains Cletrac Tru-Traction in detail. Send for a copy and study it thoroughly before you purchase your next tractor.

With Tru-Traction CLETRACS:

Move smoothly around curves.
Consume less power in turning.
Steer the same downhill as on the level.
Turn shorter with full loads.
Stop and hold larger loads on hills.
Handle off-center loads with least trouble.
Have less loading strain on side frames when turning.
Power is never disconnected.

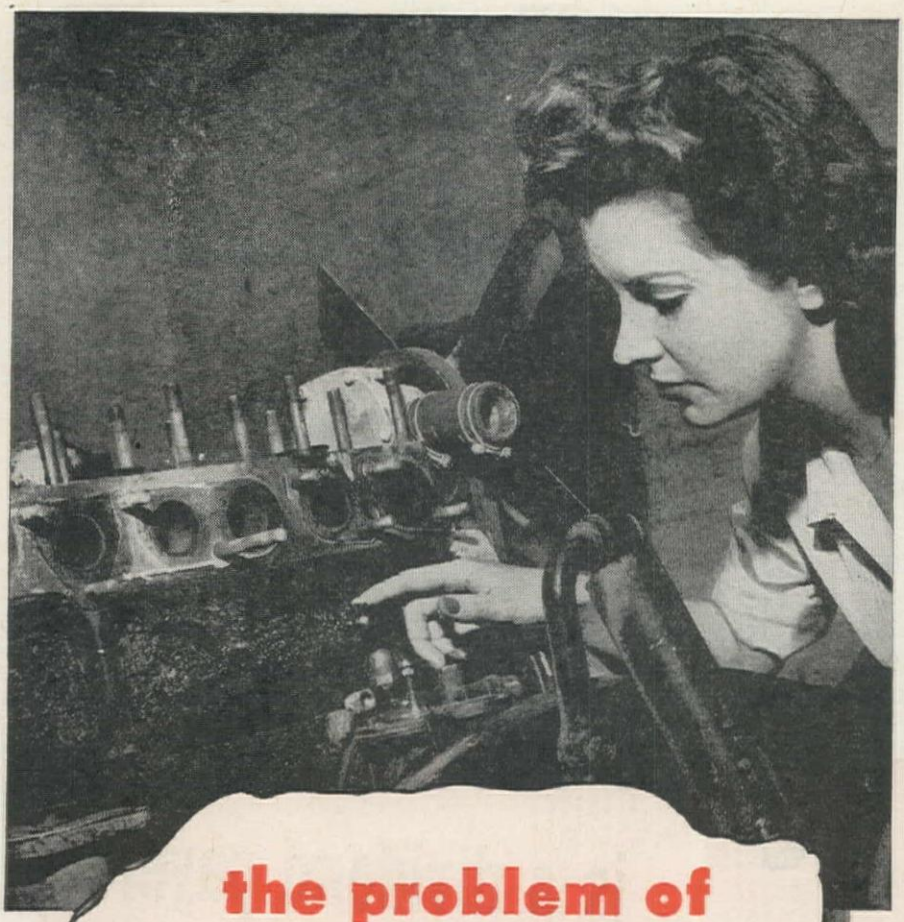
*Tru-Traction is power on both tracks at all times

THE CLEVELAND TRACTOR COMPANY · CLEVELAND 17, OHIO

CLETRAC *Tru-Traction* TRACTORS

GASOLINE OR DIESEL

STATE OF CALIFORNIA—Gustafson Tractor Co., Eureka; Mechanical Farm Equipment Dist., Inc., San Jose; Raymond L. Comber, Modesto; Nelson Equipment Co., Los Angeles; Tractor & Equipment Co., San Leandro. STATE OF WASHINGTON—Burrows Motor Company, Yakima; A. C. Haag & Co., Spokane; Pacific Hoist & Derrick Co., Seattle. STATE OF OREGON—A. C. Haag & Co., Portland; Loggers & Contractors Machinery Co., Portland. STATE OF IDAHO—Idaho Cletrac Sales Co., Lewiston; The Sawtooth Company, Boise. STATE OF MONTANA—Western Construction Equipment Co., Billings, Montana. VANCOUVER, B. C.—A. R. Williams Machinery Co., Vancouver.



the problem of SLUDGE

IT IS well known among automotive engineers that engine deposits (sludge) cause stoppage of oil circulation, sticky rings, oil pump trouble and other serious damage resulting in overhaul time and expense.

Sludge either stays in suspension in the oil and causes the lubricant to become black, or it sticks to the motor parts and does its dirty work of destruction.

LOW AND HIGH TEMPERATURE SLUDGE

There are two general types of sludge – that caused by low temperature operations and that by high.

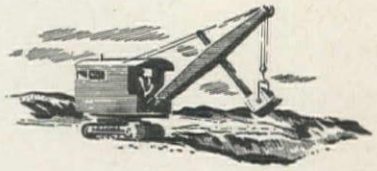
Low temperature sludge is usually a semi-solid material with the consistency of soft mud. It is composed of oil mixed with water and fine particles of carbon, metal, dirt, dust or fuel gums.

"Stop and Go" operation with prolonged idling of the motor is a common cause of low temperature sludge. A leak in the water system surrounding the cylinders may also be responsible. Low temperature sludge clogs the oil lines and screens, resulting in burned out bearings and scuffed cylinder walls.

The principal difference between high temperature sludge and low is that the former contains large amounts of resins resulting from the oxidation of the oil in the crankcase. This type of sludge is comparatively free from water and soot.

High temperature sludge produces two different kinds of deposits in the engine. The granular or "coffee ground" sludge in the crankcase or oil pan and on the surface of the pump screen is well-known to mechanics. Varnish, gummy or lacquer-like deposits that form on piston and ring faces and cylinder walls, because of high temperature oxidation of thin oil films, is another kind.

High temperature sludge is caused from prolonged high speed and engine operation, overloading the engine, clogged radiator or cooling system.



HOW TO REMEDY SLUDGE SITUATION

Low temperature sludge can be easily recognized by simply heating some of the deposit on a piece of metal over a flame. If the material foams or sputters and crackles, then water is present. To remedy this, check for internal water leaks and raise the temperature of the cooling water to 160° to 180° and keep it there by means of radiator shutters or thermostats.

To remedy high temperature sludge, inspect radiators and water jackets and see that they are clean and free of mud and scale. Drain and flush crankcase frequently, especially in heavy duty service. Oxidation of the crankcase oil can be minimized by the use of oil coolers in heavy duty truck service. Keep the crankcase oil temperature below 200° F.

To prevent either type of sludge, keep the lubricating oil clean. Filtering is not enough. Frequent draining and flushing of the crankcase is essential. Drain oil while hot. Base drain periods on a type-of-use basis, rather than time or mileage interval. Keep both air and oil filters free from dust and other foreign matter.

MACMILLAN RING-FREE OIL HELPS REDUCE SLUDGE – *One of your most effective sludge remedies is a good lubricating oil. Macmillan Ring-Free Motor Oil (for either Diesel or gasoline fuels) is so refined that it removes the carbon and sludge from the working parts of the engine. It cleanses as it lubricates. The deposits are kept in the oil in suspension and are drained off when you change oil. That's why Ring-Free is black when it's drained.*

You'll be surer of fewer motor troubles with Ring-Free Oil.

Free Folder on Sludge – Its Causes and Cures

Write today for your copy • Address: Macmillan Petroleum Corp., 530 W. Sixth Street, Los Angeles 14, Calif.

MACMILLAN RING-FREE MOTOR OIL

MACMILLAN PETROLEUM CORPORATION – 50 WEST 50TH STREET, NEW YORK 20 • 624 SOUTH MICHIGAN AVENUE, CHICAGO 5 • 530 WEST SIXTH STREET, LOS ANGELES 14 • COPYRIGHT 1944, MACMILLAN PETROLEUM CORPORATION

...when contractors and users of heavy construction equipment *will* be able to obtain delivery of new equipment.

When that day comes, Byers will be ready to offer their many customers and prospective customers a variety of newly engineered, tested and perfected postwar shovels and cranes, draglines and trench hoes that are powerful, fast and modern. They are now being used on war work, by war contractors and by the armed forces.

Never before have Byers new models had so extensive, thorough and prolonged a test period before being offered for general sale. Some have been operated for three years under wartime conditions by their present owners. Some have worked two and three shifts daily, providing our engineers with data that results in improved products you will be eager to own and use.

Government wartime restrictions have given us the time and opportunity to achieve these results. With complete confidence Byers is now planning for converting to quantity production on these new postwar models as soon as physically possible. When the day comes to announce them, you will realize that this advanced engineering could only have been the result of a long and carefully planned program . . . a program to provide you with better values in shovels and cranes.

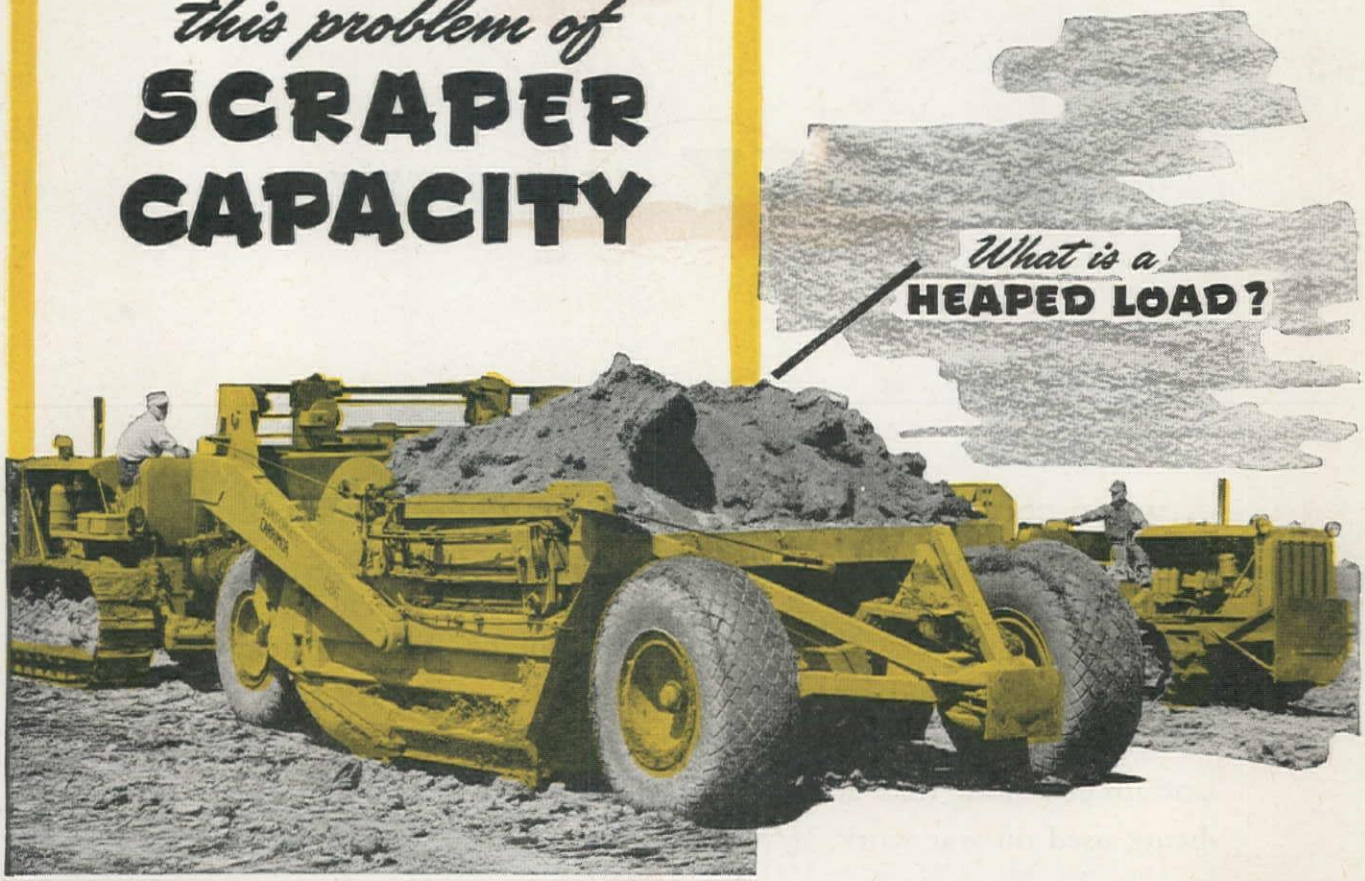
We then ask you to consult your nearest Byers dependable distributor who will be fully equipped to explain and demonstrate to you the many advantages of new Byers shovels and cranes.

THE BYERS MACHINE CO.

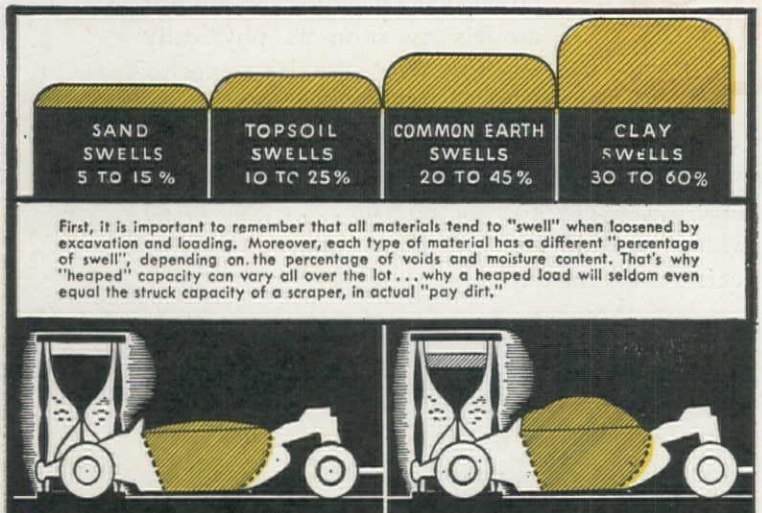
★ Ravenna, Ohio ★

Distributors throughout the World

LET'S ANALYZE *this problem of* SCRAPER CAPACITY



TWO REASONS WHY "HEAPED" CAPACITY IS MISLEADING



First, it is important to remember that all materials tend to "swell" when loosened by excavation and loading. Moreover, each type of material has a different "percentage of swell", depending on the percentage of voids and moisture content. That's why "heaped" capacity can vary all over the lot . . . why a heaped load will seldom even equal the struck capacity of a scraper, in actual "pay dirt."

On short hauls and poor loading material, it usually doesn't pay to waste time getting a full "heaped" load because it may take you practically as long to load the last quarter as it did the first three-quarters—regardless of whose scraper you use. In other words, on short haul jobs, you'll be time and money ahead if you can avoid spending too much of your total time cycle in loading.

LaPLANT-CHOATE

Earthmoving and Land Clearing Equipment

For years, it has been common practice among various scraper manufacturers to talk about "pay dirt" in the same breath with "*heaped*" capacity. Yet as every experienced dirt mover knows, figures on "heaped" capacity can be very misleading because *all classes of material tend to heap differently when loaded into a scraper.* Moreover, on many jobs, it doesn't pay to load "the last yard" because too much of the total time cycle may be consumed in loading—even with the help of a pusher.

Struck Capacity Safer!

For these reasons, LaPlant-Choate engineers have consistently maintained that the only logical way to estimate scraper yardage is on the basis of *struck* capacity—using the exact volume of the scraper bowl. Even then, the wise dirt mover usually deducts a certain percentage for "swell". However, by using *struck* capacity, you at least have a safer, more accurate figure to start with because "heaped" capacity is always an "unknown quantity." That's why it always pays to find out *which figure* a manufacturer is using, before accepting any claims regarding "yardage moved." For further information, see your LaPlant-Choate "Caterpillar" distributor, or write, LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa.

YOURS

FOR TOMORROW'S HEAVY-DUTY, HIGH-SPEED HAULING

• THE "CATERPILLAR" DIESEL DW-10 TRACTOR

ON GIANT construction jobs from coast to coast, hundreds of "Caterpillar" Diesel DW-10 Tractors have long been proving their advantages for high-speed, heavy-duty hauling. These versatile, powerful prime movers have fitted so many tasks so well that the demand has always exceeded the supply.

There are sound reasons for this outstanding record, some of which are outlined below at right. Other advantages are to be found in the design of the machine itself and the organization that builds and services it.

From bumper to final drive, it is a "Caterpillar" machine—built and backed by one manufacturer. The DW-10 is designed solely as a high-speed, heavy-duty hauling unit that will deliver maximum yardage on a long haul with real profit to the owner and complete safety for the operator. Available for it are matched scrapers and wagons that take full advantage of its power and speed. Its "Caterpillar" Diesel engine, like its five-speed transmission, high-traction final drive and sturdy box section frame, are all specially designed and built for this one machine. Add to this its scientific weight distribution, maximum loading pressure, short turning and low center of gravity and you have a real picture of its speed and safety.

Like all "Caterpillar" products, DW-10 Tractors have been available only for war-essential work. When the factory is permitted to resume production for unrestricted uses, these machines will be ready to solve high-speed hauling problems everywhere. Your "Caterpillar" dealer has full information on these modern hard-working earthmovers. He'll be glad to share it with you.

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

"Caterpillar" Diesel DW-10 Tractor with 8.5-yard scraper being pushdozer loaded with "Caterpillar" D8 Tractor on a muddy Army airport in California.

"Caterpillar" Diesel DW-10 Tractor and 8.3-yard W-10 Wagon hauling from shovel on a railroad job in Maryland.

- Five forward speeds —2.4 to 18.1 m.p.h.
- Six-cylinder "Caterpillar" Diesel engine
- "Finger-tip" power steering
- "High-traction" differential
- Power brakes
- Short turning
- Full-floating, upholstered seat
- High clearance
- Constant mesh transmission
- Matched equipment
- 8.5-yard scraper*
- 8.3-yard wagon*

*Struck measure

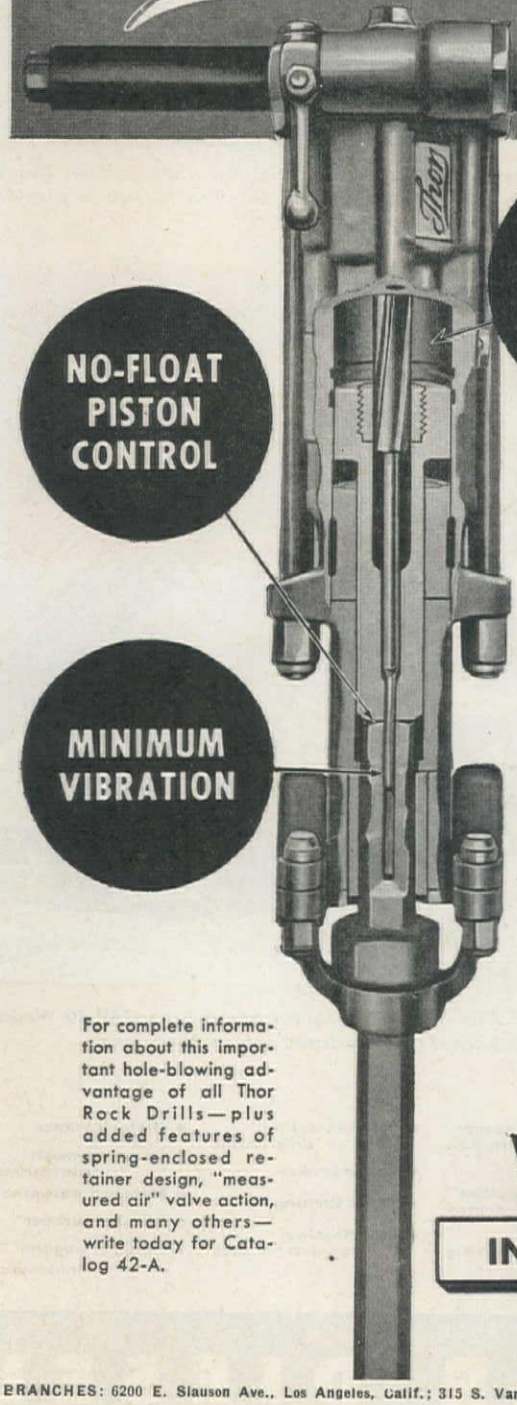
CATERPILLAR DIESEL

REG. U.S. PAT. OFF.

TRACTORS · ENGINES AND ELECTRIC SETS · EARTHMOVING MACHINERY

They BLOW all cuttings free for FASTER, SURER DRILLING!

Thor ROCK DRILLS



FULL-LINE PRESSURE

NO-FLOAT PISTON CONTROL

MINIMUM VIBRATION

Full-Pressure Air Blast Straight Through the Tool Assures Positive Hole-Cleaning

There's no accumulation of cuttings at the drilling point to cut down speed or stall the drill by jamming the steel when Thor Rock Drills let go with their *full-line* blast of air to keep the hole clean . . . to keep the drilling rate fast and steady!

Powerful hole-blowing is an important advantage of all Thor Rock Drills which not only steps up drilling speed for more footage per shift, but also slashes maintenance costs by extending the life of both the tools and the drill steels through minimum vibration.

HERE'S WHY CUTTINGS WILL NOT STALL THOR ROCK DRILLS!

Full-Line Pressure—Exclusive Thor design places exhaust ports to remove all air from *below* the piston when the operator blows the hole. Full-line air pressure is concentrated behind the piston to force it down tight against the steel—directing full air power straight through the machine and into the hole.

No-Float Piston Control—Forcing the piston tight against the steel prevents floating and fluttering inside the cylinder during the blowing operation. No air is wasted. Hole-blowing is extra-efficient and powerful.

Minimum Vibration—The air tube inside the piston and hammer is *held rigid* by tight joining of the piston and steel to assure longer service life by reduction of vibration.

For complete information about this important hole-blowing advantage of all Thor Rock Drills—plus added features of spring-enclosed retainer design, "measured air" valve action, and many others—write today for Catalog 42-A.

Thor *Portable Pneumatic and Electric Tools*

INDEPENDENT PNEUMATIC TOOL COMPANY

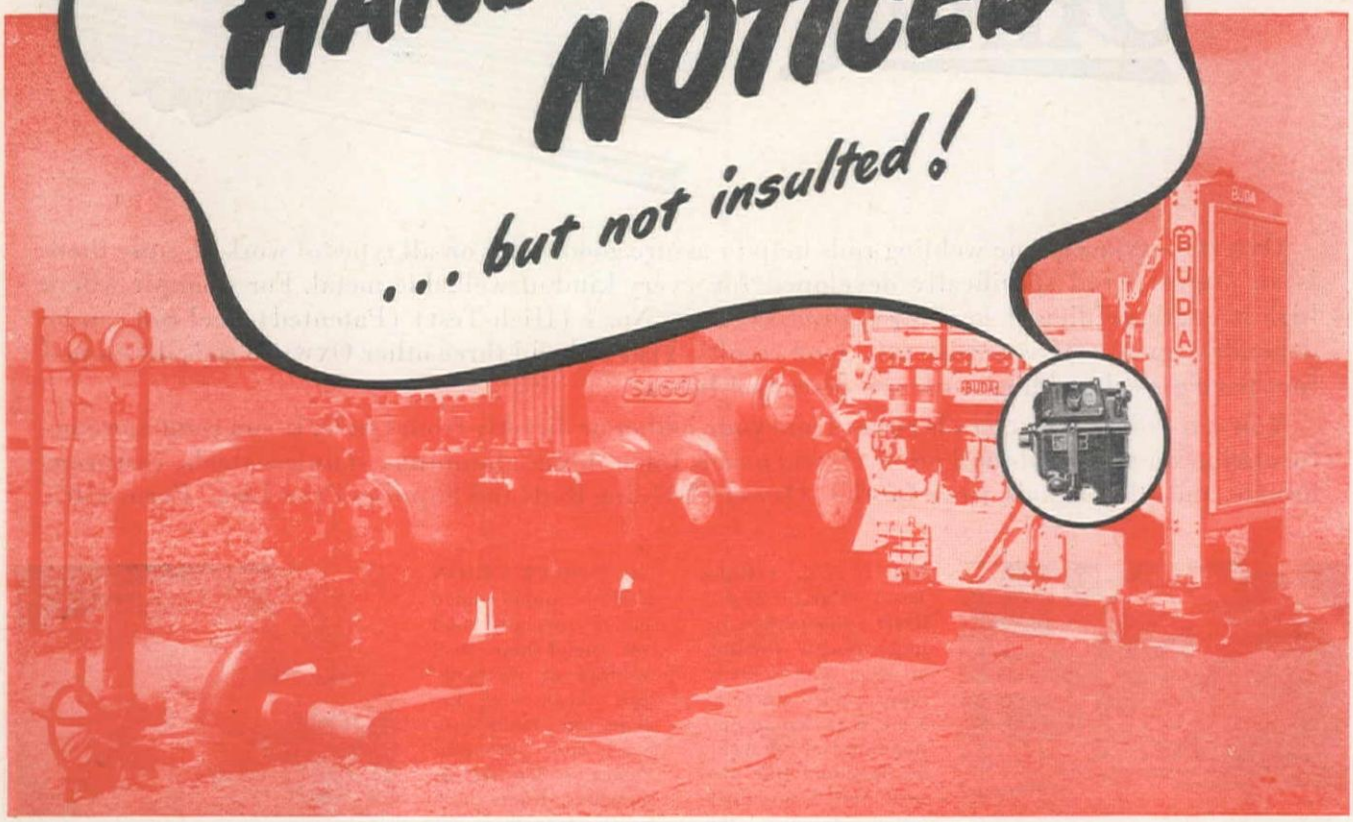
600 W. JACKSON BOULEVARD, CHICAGO 6, ILL.

Branches in Principal Cities

BRANCHES: 6200 E. Slauson Ave., Los Angeles, Calif.; 315 S. Van Ness Ave., San Francisco, Calif.; 1741 First Ave., S., Seattle, Wash.; 54 E. Fourth, S., Salt Lake City, Utah.

HARDLY NOTICED

... but not insulted!

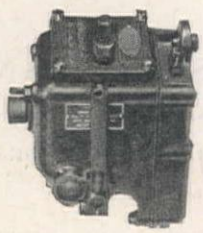


● It's no insult to a Pierce Flyball Governor when it is hardly noticed in its regulation and protection of a Diesel engine that powers equipment used in pipeline pumping, or any one of hundreds of industrial applications in which good governing is required—or desirable.

With only regular lubrication and cleaning, Pierce Governors give dependable engine regulation and maximum protection—without calling attention to themselves for ragged performance, frequent adjustment or need of some "tinkering."

The famous flyball principle means positive compensation for change in load on jobs where constant speed is required. It means *mechanical* dependability for unfailing protection against destructive overspeed and abuse. And rugged design plus durable construction makes Pierce Governors give satisfactory performance often beyond the service life of the engine itself.

Pierce Governors for Diesel engines are available in two types—either driving independently of the fuel pump, or directly from the fuel pump shaft. If your present Diesel engines are not Pierce-equipped, write for full information.



THE PIERCE GOVERNOR COMPANY, INC., 1645 OHIO AVENUE, ANDERSON, INDIANA

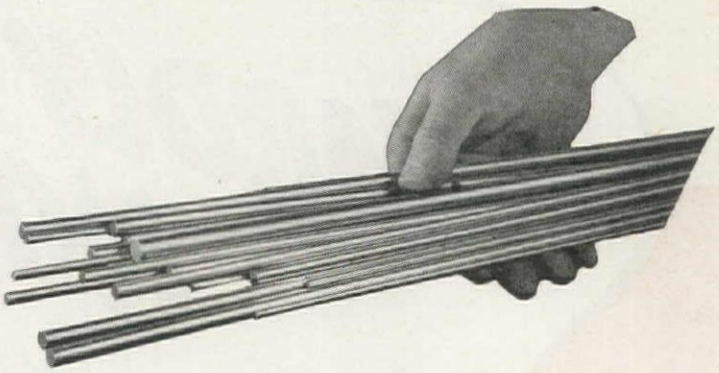
Manufacturers of Pierce Precision Governors and Sisson Automatic Chokes

Canadian Manufacturer and Distributors: BURLEC LIMITED, Toronto 13, Canada

PIERCE GOVERNORS

When Ordering Steel Welding Rods

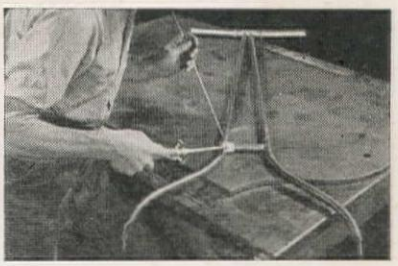
SPECIFY Oxweld



OXWELD oxy-acetylene welding rods help to assure good welds on all types of work because there is an OXWELD rod specifically developed for every kind of weldable metal. For example where high strength welding of steel is required, OXWELD No. 1 (High-Test) (Patented) steel rod can be depended upon to give consistently good results. This rod and three other OXWELD rods developed for specific steel welding work are described below.

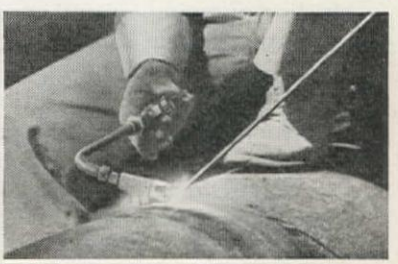
You can order OXWELD rods either from your jobber or directly from Linde. If you want more information on these rods and other OXWELD rods for welding aluminum, stainless steels, cast iron, bronze, and other metals, write for the "Oxweld Welding Rods and Supplies Price List," Form 4507.

No. 1 H.T. (High-Test) (Pat.) STEEL ROD is unequalled for high-strength welding of steel plate, sheet, pipe, and structural steel. It is also an outstanding rod for welding castings like the steel crane frame illustrated, because the weld metal is susceptible to the same heat-treatment as the casting. OXWELD No. 1 H.T. can be used with greater economy for equal strength than cheaper rods since the amount of weld metal can be reduced, saving welding rod, gases, and labor as well.



NO. 7 DRAWN IRON ROD is copper-coated and is especially good for run-of-shop steel welding of relatively thin sheet, and for plate, pipe, tanks, castings, and structural shapes ¼ in. or less in thickness, where high tensile strength is not a factor. Here, for example, it is used to repair a tubular metal handle. This rod has free-running properties and produces welds that are easily machinable and extremely ductile. Elongation is over 50 per cent, measured by the free-bend test.

NO. 34 MILD STEEL ROD is copper-coated rod for welding steel plate, sheet, structural shapes, castings, and vessels that are not subjected to excessive strain. It is intended for use where low price, rather than high tensile strength and ductility, is a primary consideration. Welds made with No. 34 rod are slightly higher in tensile strength and lower in ductility than those made with No. 7 rod.



NO. 32 CMS (Pat.) STEEL ROD is especially developed for high-strength (75,000 to 90,000 lb. per sq. in.), high-speed welding of pressure vessels and pipe. Because of its properties, this rod can be used in the larger sizes with larger flames. Shown here No. 32 CMS rod is being used with Linde's multiflame steel welding method, which results in greater welding speeds and economy of materials.

MARITIME "M" AWARD FOR OUTSTANDING PRODUCTION ACHIEVEMENT

THE LINDE AIR PRODUCTS COMPANY

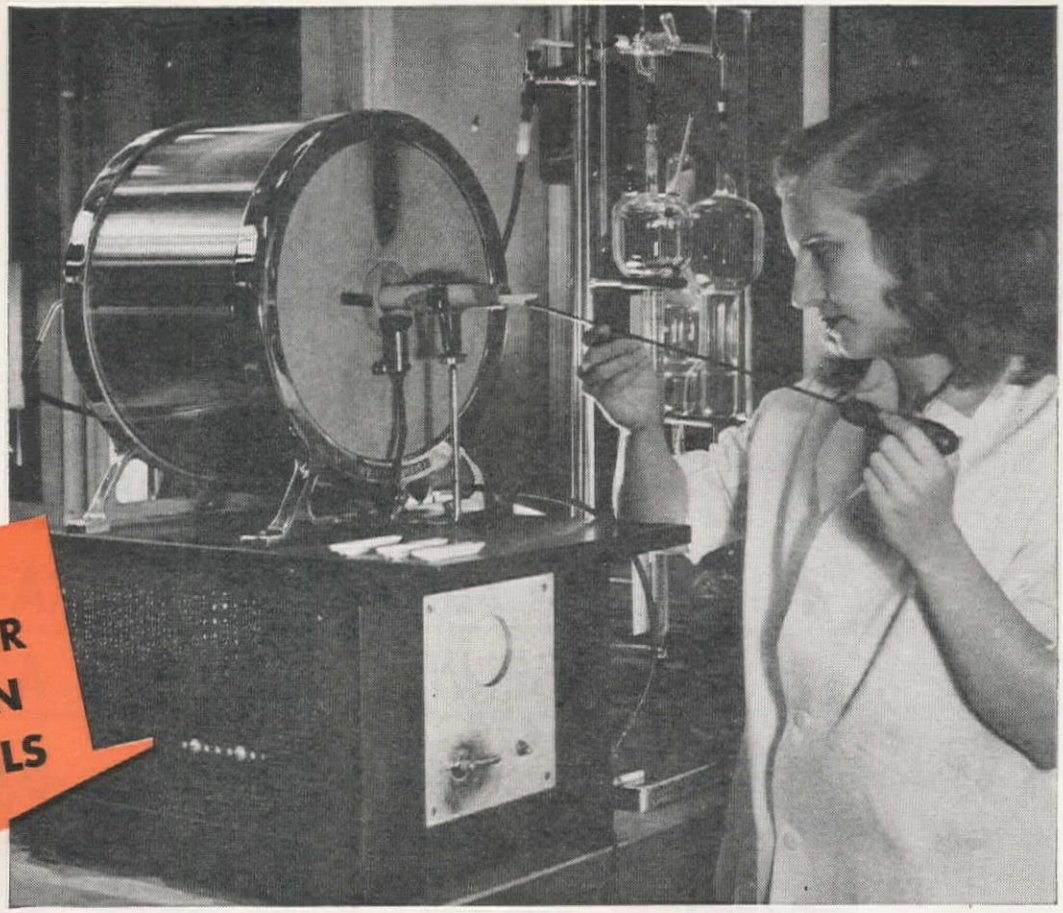
Unit of Union Carbide and Carbon Corporation

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

In Canada: Dominion Oxygen Company, Limited, Toronto

The word "Oxweld" is a registered trade-mark of Union Carbide and Carbon Corporation.

BUY UNITED STATES WAR BONDS AND STAMPS



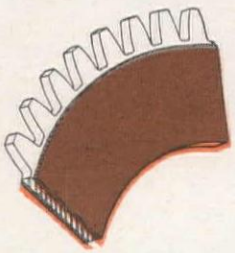
YOUR POST-WAR FRICTION MATERIALS

...are being perfected NOW!

MEASURING the exact amount of carbon in each Velvetouch formula, as shown in the photograph above, is only one of many controls by which we assure uniformity of quality. Our laboratories are engaged in never-ending research to improve still further the friction qualities of Velvetouch *all-metal* clutch facings and brake linings . . . so that your earth-moving equipment will start and stop more smoothly, more dependably.

THE S. K. WELLMAN COMPANY

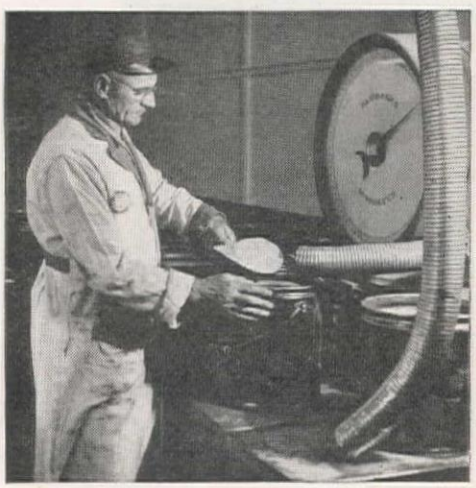
1374 EAST 51st STREET • • CLEVELAND 3, OHIO



Velvetouch is *all metal*—a combination of powdered metals, compressed, sintered and welded to a solid steel backing.

For Brake and Clutch . . . Use Velvetouch

The "INSIDE STORY" of POWDER METALLURGY



CHAPTER 1. Powdered metals—iron, lead, tin, etc.—first are carefully blended in the right proportions for each type of brake and clutch. After thorough mixing, they are ready for the molding and sintering operations.

MARION DISTRIBUTORS

Brown-Bevis Equipment Co., 4900 Santa Fe Ave., Los Angeles 11, Calif.; 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 Ave., South, Seattle 4, Wash.

California's First Big Furnace – Specifications called for building a blast furnace among the orange groves and vineyards of Southern California. It involved a quick schedule of steel fabrication, transportation and erection. It was assigned to Consolidated Steel Corporation.

Today, the big furnace of Fontana, casting its tons of yellow pig, is a symbolic nucleus of the new industrial West. A big job, a unique job, quickly and well done, it bears testimony to the ability of the Consolidated Steel organization.

If steelwork is part of your postwar thinking, Consolidated is prepared now to help you plan. For information, address the president.

KEEP BUYING
WAR BONDS

Consolidated Steel

FABRICATORS • ENGINEERS • CRAFTSMEN

CONSOLIDATED STEEL CORPORATION, LTD., LOS ANGELES, LONG BEACH, WILMINGTON, CALIFORNIA; ORANGE, TEXAS

LARGEST INDEPENDENT IN THE WEST

PRODUCTS FOR

MOTOR TRUCK *NEWS FLASH!*

FWD TRUCKS AVAILABLE FOR CIVILIAN PURCHASE ON AND AFTER JANUARY 1, 1945

GOOD NEWS — FWD four-wheel-drive trucks, pre-eminent in war services, with production previously restricted almost exclusively for the military, are soon to be available for motor transport, highway, utility, oil fields, and other essential civilian services.

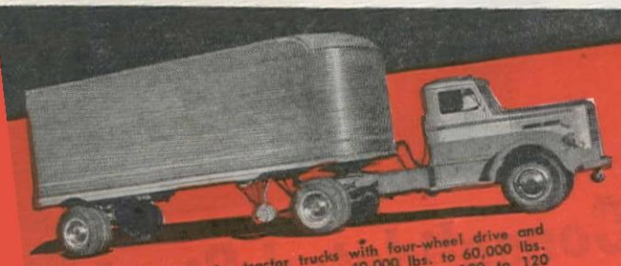
Recent directive from the WPB provides for production of substantial number of FWD trucks in a wide variety of models and types, 2½ to 15 tons capacity; such trucks to be built only for essential civilian uses. FWD trucks built under this release will be available for purchase on and after January 1, 1945. Deliveries will be made in keeping with priority of orders as received; immediate action and prompt placing of orders is urgent to assure delivery before limit of production is reached.

Write—wire—or phone us directly, or the nearest authorized FWD dealer for full information and your eligibility to purchase under these new rationing regulations.

THE FOUR WHEEL DRIVE AUTO CO.
CLINTONVILLE, WISCONSIN
CANADIAN FACTORY: KITCHENER, ONTARIO

FWD TRUCKS

These and other FWD Trucks, 2½ to 15 tons capacity, available to qualified purchasers.



FWD's "H" series tractor trucks with four-wheel drive and gross vehicle weight ratings from 40,000 lbs. to 60,000 lbs. Powered with gasoline engines ranging from 100 to 120 horsepower on wheelbases from 120" to 144" in conventional or cab-over-engine types.

"U" series FWD's with gross vehicle weight capacities of 22,000 to 28,000 lbs. Powered with 125 h.p. gasoline engines, 5 speed transmission, 11:00x20 tires, wheelbase 150". Four wheel drive.

Six-wheel drive FWD trucks with gross vehicle weight capacities of 55,000 lbs. Powered with either gasoline or diesel engines of 150 and 200 horsepower. Wheelbase from 214½" to 276".

Straight trucks in FWD's "H" series range 17,000 to 20,000 lbs. gross vehicle weight capacity with wheelbases from 144" to 154". gasoline engine powered with power plants from 100 to 120 horsepower and with four-wheel drive.

Utility Line Construction and Maintenance trucks by FWD with 5 and 7 man cabs, special power-take-offs and line bodies. Powered with 115 h.p. engine on 144" wheelbase with four-wheel drive, 5 speed transmission, 144" wheelbase and 9:00x20 tires.

FWD's four-wheel drive Road Maintainer — built for underbody scraper use with extra heavy frame and other features that make it the ideal unit for street and road maintenance. Engine 115 h.p. — 5 speed transmission — 8:25x20 dual tires.

"M" series FWD's powered with either gasoline or diesel engines ranging from 150 to 200 h.p. and with capacities ranging from 30,000 to 42,000 lbs. gross vehicle weight. Four wheel drive.

TRAXCAVATE

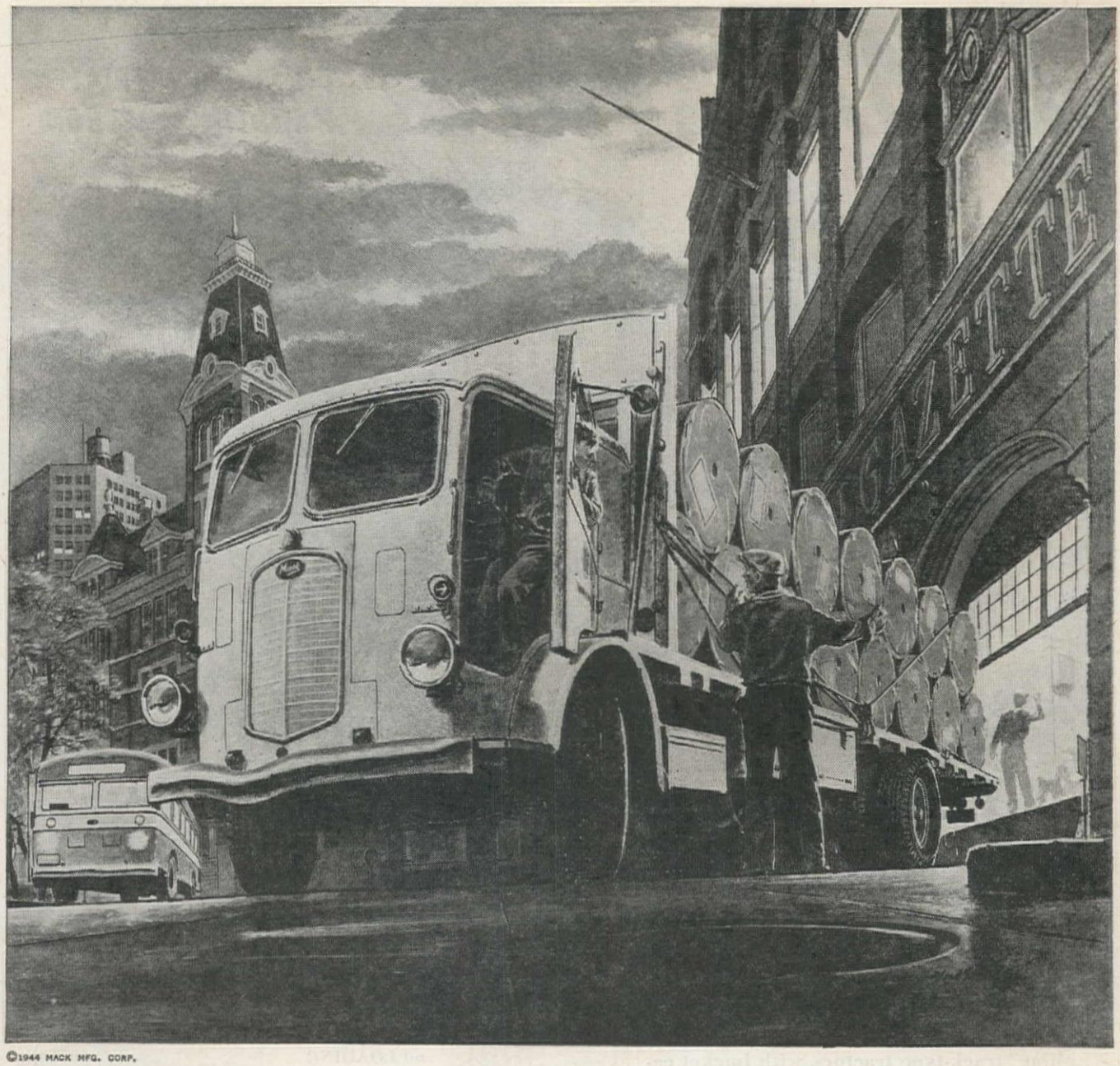
THE MODERN DIRT and MATERIAL HANDLING METHOD

Two of the fleet of TRAXCAVATORS owned by a prominent Chicago excavating contractor.

That's the way to get digging, loading, grading, and carrying jobs done quickly, at lowest cost! TRAXCAVATORS are modern tractor excavators that combine in one machine the usefulness of a shovel, loader, scraper, bulldozer, etc. They move around jobs easily under their own power; can readily be transported on streets and highways. Powered by "Caterpillar" track-type tractors, with bucket capacities from ½ to 2½ cubic yards. Bulldozer blade quickly interchangeable with the bucket; other attachments also available. Your Trackson-"Caterpillar" dealer will be glad to show you, in interesting facts and figures, why TRAXCAVATOR users say, "Traxcavate!" Or, write for literature to TRACKSON COMPANY, Milwaukee 1, Wisconsin

TRAXCAVATOR

The Original Tractor Excavator



THE SCOOP THAT HAS LASTED 44 YEARS!...

The first Mack, built in 1900, started something *more* than just a successful American business. That first Mack wasn't built to match another truck —but to be the *best* truck in the world, bar none. Every Mack since has been built with the same aim. The result is a *working* reputation known around the world. The phrase "Built like a Mack truck" wasn't put into the language by us. It *grew* there out of what Macks *do* on the job. Yes, 44 years of front-running performance back your judgment when you pick a Mack!

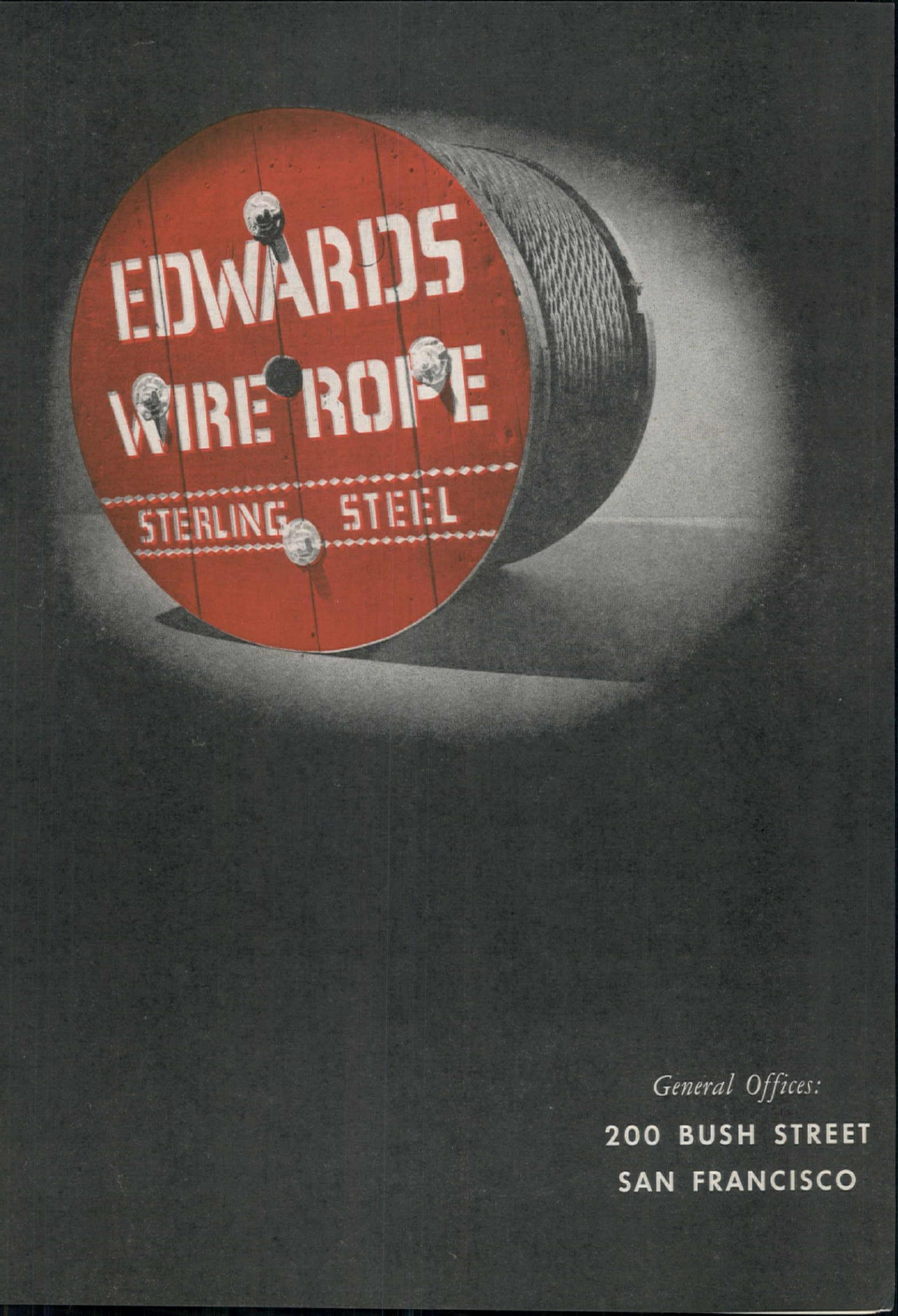
Mack International Motor Truck Corporation
Los Angeles, Sacramento, San Francisco, Seattle, Portland
Factory branches and dealers in all principal cities for service and parts.

Mack

TRUCKS
FOR EVERY PURPOSE
ONE TON TO FORTY-FIVE TONS

BUY U. S. WAR BONDS

IF YOU'VE GOT A MACK, YOU'RE LUCKY...IF YOU PLAN TO GET ONE, YOU'RE WISE!



General Offices:

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SAN FRANCISCO

Unique COLBY *Installation!*

COLBY dual-platform elevators are designed and built in any desired capacity for loading material and supplies to decks of ships. Both the inner and the loading platforms travel a vertical distance of 60 feet. The inner platform travel is entirely independent of the loading platform which can be set to connect with a ship at any level. The loading platform is equipped with a telescopic apron and folds back against the main structure when berthing ships or not in use. This particular installation, shown loading an aircraft carrier, is fixed at one point although other Colbys of this design are movable . . . traveling along the face of the dock as may be required.

Pre-war installations, embodying this same principle, have been in operation for years on the Atlantic Seaboard — in the Mississippi Valley and on the Pacific Coast.

Designers and Manufacturers *of* **CRANES AND MARINE ELEVATORS** *and Material Handling Equipment*

COLBY STEEL AND ENGINEERING COMPANY

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417 Market St., SAN FRANCISCO 5
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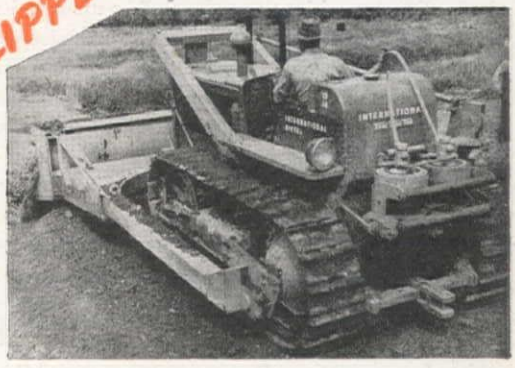
LET YOUR EARTH MOVING OPERATIONS REVOLVE AROUND WOOLDRIDGE TERRA CLIPPER SCRAPERS



To keep worlds of earth constantly on-the-move, around the clock, month after month, requires earthmoving equipment that's engineered and ruggedly built for heavy duty year 'round performance. By consistently moving larger heaping yardage loads, trip after trip—shift after shift, with less time out for repair Wooldridge Terra-Clipper Scrapers not only keep jobs on schedule but keep costs and upkeep down. In these times especially, when maintenance is such a problem you can count on Wooldridge dependability. Always specify and rely on Wooldridge Scrapers. Make them the hub of all your earthmoving operations.

WOOLDRIDGE heavy duty Earthmoving Scrapers are built in sizes ranging from 4 to 30 cu. yard capacities. When you buy scrapers, power units, bulldozers, rippers or trailbuilders specify and rely on WOOLDRIDGE Equipment.

WOOLDRIDGE

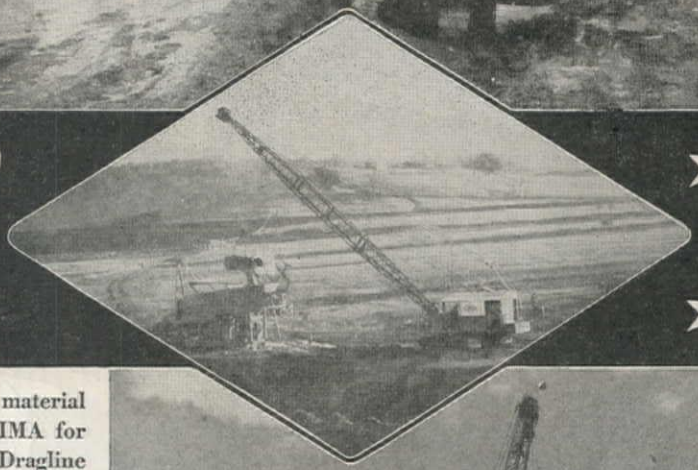
MANUFACTURING COMPANY • SUNNYVALE, CALIFORNIA

SCRAPERS • POWER UNITS • BULLDOZERS • RIPPERS • TRAIL BUILDERS

BOILING BOWL TERRA CLIPPER PRINCIPLE

SCRAPERS

DESIGNED TO DO A BETTER JOB FASTER

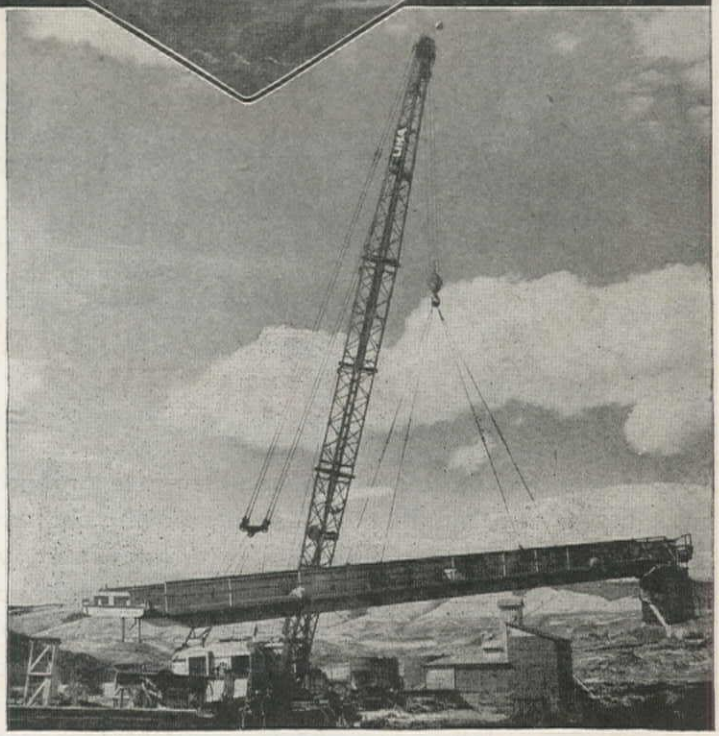


Whatever may be your earth moving or material handling problem, you can depend on LIMA for the right size and type of Shovel, Crane or Dragline to do the job quickly and efficiently. LIMA excavators are manufactured in eight different sizes ranging from ¾ cubic yard to 5 cubic yards. Crane capacities range from 13 tons to 100 tons. Dragline capacities vary, depending upon the nature of the work. Each unit, regardless of size, is ruggedly constructed for hard continuous usage. Every part is designed and built especially for the work the part is to perform. LIMA Shovels, Cranes and Draglines will give you a new conception of power, speed and efficiency on any earth moving or material handling job. Right now, practically our entire output is going to the Armed Forces. After victory your excavator needs will have our closest attention.

LIMA LOCOMOTIVE WORKS, INCORPORATED

Shovel and Crane Division - - LIMA, OHIO

See Distributors Below



LIMA SHOVELS CRANES DRAGLINES

SHOVELS, ¾ YD. TO 5 YD. CRANES, 13 TONS TO 100 TONS
DRAGLINES, VARIABLE

Seattle office, 1932 First Avenue South; General Machinery Company, E. 3500 Block, Riverside; Feenaughty Machinery Company, 112 S.E. Belmont St., Portland, Oregon and 600 Front St., Boise, Idaho; Garfield and Company, 1232 Hearst Bldg., San Francisco, Calif.; Smith Booth Usher Company, P. O. Box 3578 Terminal Annex, Los Angeles, Calif.; F. W. McCoy Co., 956 Cherokee St., Denver, Colorado; Smith Booth Usher Co., 1756 Grand Avenue, Phoenix, Arizona; Steffeck Equipment Co., Main & Cutter Streets, Helena, Montana; Willard Equipment Company, 860 Beach Avenue, Vancouver, B. C., Canada; Western Machinery Company, P. O. Box 2196 (748 W. 8th St.), Salt Lake City, Utah; Contractors' Equipment and Supply Company, Springer Bldg., P. O. Box 456, Albuquerque, N. M.; Contractors' Equipment and Supply Company, 810 North Stanton St., El Paso, Texas.

One of these Answers May Help You Lower Your Maintenance Costs!

Q **Is there a way to add "M. P. T."* to machines?**

A There sure is. It's an Alemite Portable Service Station. Here's a typical performance: Time was being lost on 5 machines through slow lubricating methods. With the Alemite Portable Service Station, power lubrication was brought "on the job." Lubricating time was cut 50%—gaining 100 minutes "M. P. T." per day. The savings in time, maintenance and machines paid for the new method in a short time. Are you interested in adding "M. P. T." to your machines?

**More Productive Time*

Get Set for Winter With "On the Job" Power Lubrication With An Alemite Portable Service Station

This complete power lubrication department on wheels carries lubricants to machines on the job. Developed by Alemite, the unit includes high-and-low pressure Alemite Barrel Pumps, Alemite Motor Oil Dispenser, hose reels and gas engine air compressor.

It's the sure way to fight ruinous winter friction and costly shut-downs and it is proving itself on thousands of construction jobs. Write for catalog. Alemite, 1819 Diversey Parkway, Chicago 14, Illinois, or Belleville, Ontario.

Q **Can track roller bearing wear be reduced in winter?**

A Of course! One contractor was having an epidemic of track roller bearing failures. He decided to use "on the job" power lubrication. Track roller and other bearing expense dropped 25%. Shut-down time was saved and put back into production. Consumption of lubricants dropped almost 20%! Say! have you checked up on your lubrication methods lately?

Q **Will your greases and oils "take it" this winter?**

A It all depends on whether they're Alemite's. You see, Alemite builds extra-wide operating range into all of its greases and oils. The result is amazing toughness and free-running qualities that fight friction in the coldest weather! Alemite "Sub-Zero" lubricant, for instance, is designed for heavy-duty cold weather work—*actually protects bearings down* to 40° below! Does that kind of performance sound good to you?

WANTED

Tough Job by Man with "MML" Degree!

This man, an Alemite Lubrication Specialist, is a "Master of Modern Lubrication." His technical training, skill and experience equip him to come on your job and consult with you about applying the most modern lubricating methods. He has added more productive time to machines, saved lubricants and man power. He has installed safer, surer, more accurate lubricating methods.

He's ready to go to work for you now, backed by the world's most experienced organization in the handling and application of lubricants. Call him. Or, if you prefer, write Alemite for the address of the nearest Alemite Lubrication Specialist.

Another Product of STEWART WARNER

ALEMITE REG. U.S. PAT. OFF *First in Modern Lubrication*

CONSULTATION • ENGINEERING • EQUIPMENT • LUBRICANTS • MAINTENANCE

Unacal Truck-Bus Oil

Of necessity, many products have suffered in quality because of the war. Others which have managed to maintain prewar standards are so scarce as to be almost nonexistent.

But your problem is simplified when it comes to the purchase of lubricating oil for your equipment. For Unacal Truck-Bus Oil –Union Oil Company's 100% pure paraffin-base lubricant–is still the same top quality, *balanced* motor oil that you bought before the war.

Unacal Truck-Bus Oil has been blended to afford sufficient body for adequate lubrication at high temperatures, yet it is fluid enough

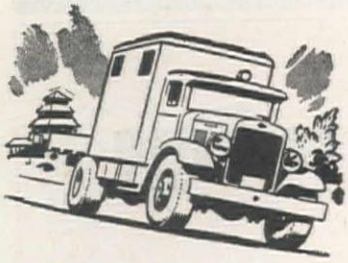
to protect engines during early morning starting or during cold weather driving.

UNACAL
TRUCK-BUS OIL

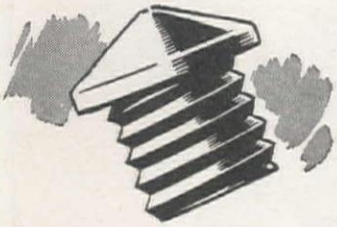
Unacal Truck-Bus Oil can be used successfully in every type of gasoline engine. Solvent refining gives it a high oxidation stability which makes it possible for engines using it to run longer between overhauls. Since it is a wholly distilled oil, carbon and sludge formations are reduced to a minimum.

Remember–when it comes to motor oil, you need accept no substitutes. You can still obtain Unacal Truck-Bus Oil from your local Union Oil representative. Call him for a supply today.

Another
UNION OIL
Success-Tested Product



Typical of the exhaustive field tests which marked the development of the modern, high speed Cummins Diesel, was the gruelling 14-day grind which came to an end on Christmas Day, 1932, at the Indianapolis Speedway. Here, under AAA supervision, a Cummins-powered Indiana truck set a non-stop distance record for trucks: 14,600 miles (5,840 laps of the 2½-mile oval!).



The injector cup wiper is an inconspicuous part of the Cummins Diesel, but its development made a conspicuous contribution to the Cummins Diesel's efficient and economical performance. This patented cup wiper, perfected only after countless modifications in piston design, eliminates carbon on the injector cup, creates additional turbulency, assures more complete combustion.

Metallurgy plays an important role in the Cummins Diesel trend to ever lighter, stronger construction. Example: 5,000 samples were analyzed in selecting the cast iron for the block—a foundry was rebuilt and its methods completely revised—but the increase in tensile strength from 20,000 to 50,000 pounds per square inch more than justified the cost.

CUMMINS DEPENDABLE DIESELS

Automotive Models: Designed for all types of heavy-duty trucks in either highway or off-the-highway service.

★ ★ ★

Industrial Models: Portable and stationary engines, power units, and generating sets for service in any industry requiring heavy-duty power.

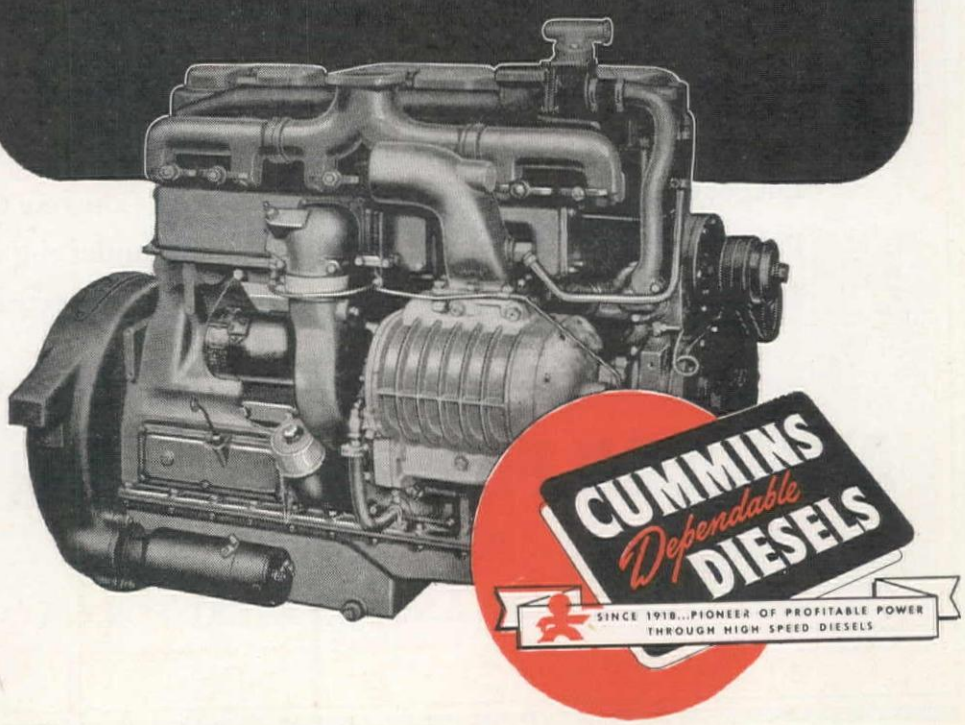
★ ★ ★

Marine Models: Propulsion engines and marine type generating sets designed for all types of fishing boats, work boats, and pleasure craft.

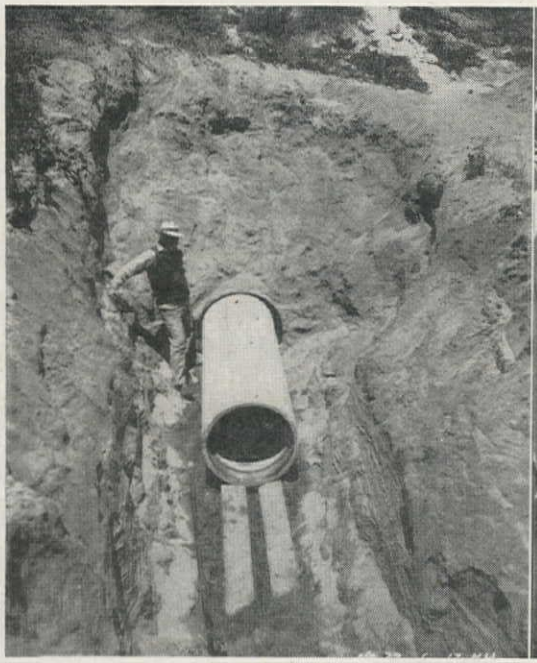
Spade Work

The diesel's higher thermal efficiency was proved many years ago . . . but it took the builders of Cummins Diesels to prove that diesel engine weights and dimensions could be brought within practicable limits. They proved it in 1932 with the original high speed diesel . . . proved it after 14 years of intensive "spade work" in the refinement of lubrication, cooling, metallurgy and many other aspects of design and construction . . . proved it by putting diesels in equipment and on jobs where diesels had never worked before. Today, you will find diesels in virtually every automotive, industrial, and marine service that requires heavy-duty power . . . and if you look closely enough, you'll find a very large proportion of those diesels are Cummins Dependable Diesels.

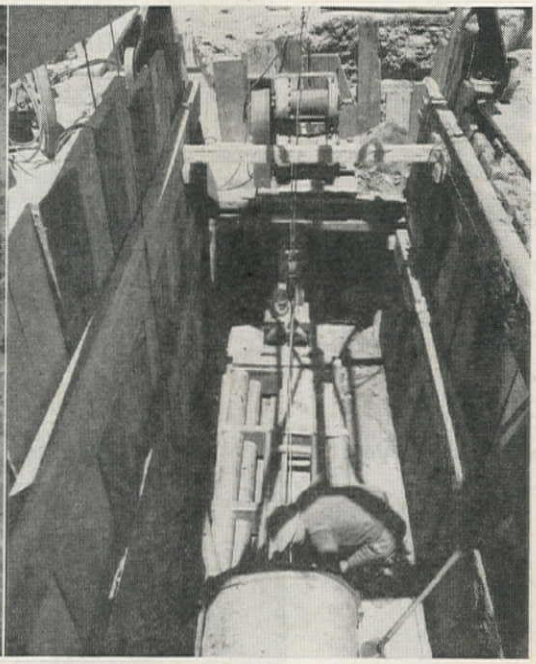
CUMMINS ENGINE COMPANY, INC., Columbus, Ind.



Lock Joint Concrete Cylinder Pipe for Main Water Supply Lines



Inserting the 24" Concrete Cylinder Pipe Through Casing



Jacking 36" Welded Steel Pipe Casing Under State Highway

The above views were taken during installation of 24" concrete cylinder pipe in Dyke Pipe Line, a Federal Works Agency Project for the City of San Diego, California (7400 feet of 24" Lock Joint Concrete Cylinder Pipe, 200 pounds operating pressure). Pipe line crossed under the state highway and also under the Santa Fe Railway. Total length of jacked casing was 370 feet.

PIPE MANUFACTURED AND INSTALLED BY

AMERICAN PIPE AND CONSTRUCTION CO.

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OAKLAND SAN DIEGO

JACKBITS Lower Drilling Costs

1. The wide range of Jackbit designs and sizes permits the use of small starters and minimum gauge changes. This greatly increases drilling speed. On one large tunnel job, when Jackbits were put to work, the drilling time dropped from 16.4 to 13.5 minutes per foot of heading advanced.

2. Jackbits result in the use of sharp bits a greater percentage of time. Rock drill upkeep costs are thereby reduced.

3. Air consumption per foot of hole drilled is less.

4. The cost of drill steel transportation is practically eliminated.

5. Jackbits reduce the amount of drill steel purchased annually.

6. Reconditioning is easy and costs are low.

The *Jackbit Line* is complete. You can resharpen your Jackbits on an I-R Grinder or Hotmill. You can heat-treat them in I-R Furnaces. You can forge Jackrod threads and shanks in I-R Sharpeners. You can easily and quickly convert your engine lathes for the complete Jackrod threading operation with the new Box Tool and adjustable Die Head.

The experiences of contractors, mining men and quarry operators the world over show that the savings gained from the use of Jackbits range from 10 to 40%.

Ingersoll-Rand

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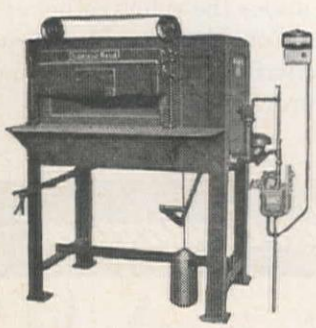
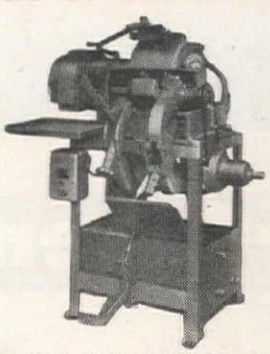
JACKBITS ARE BACKED BY A COMPLETE LINE OF RECONDITIONING EQUIPMENT



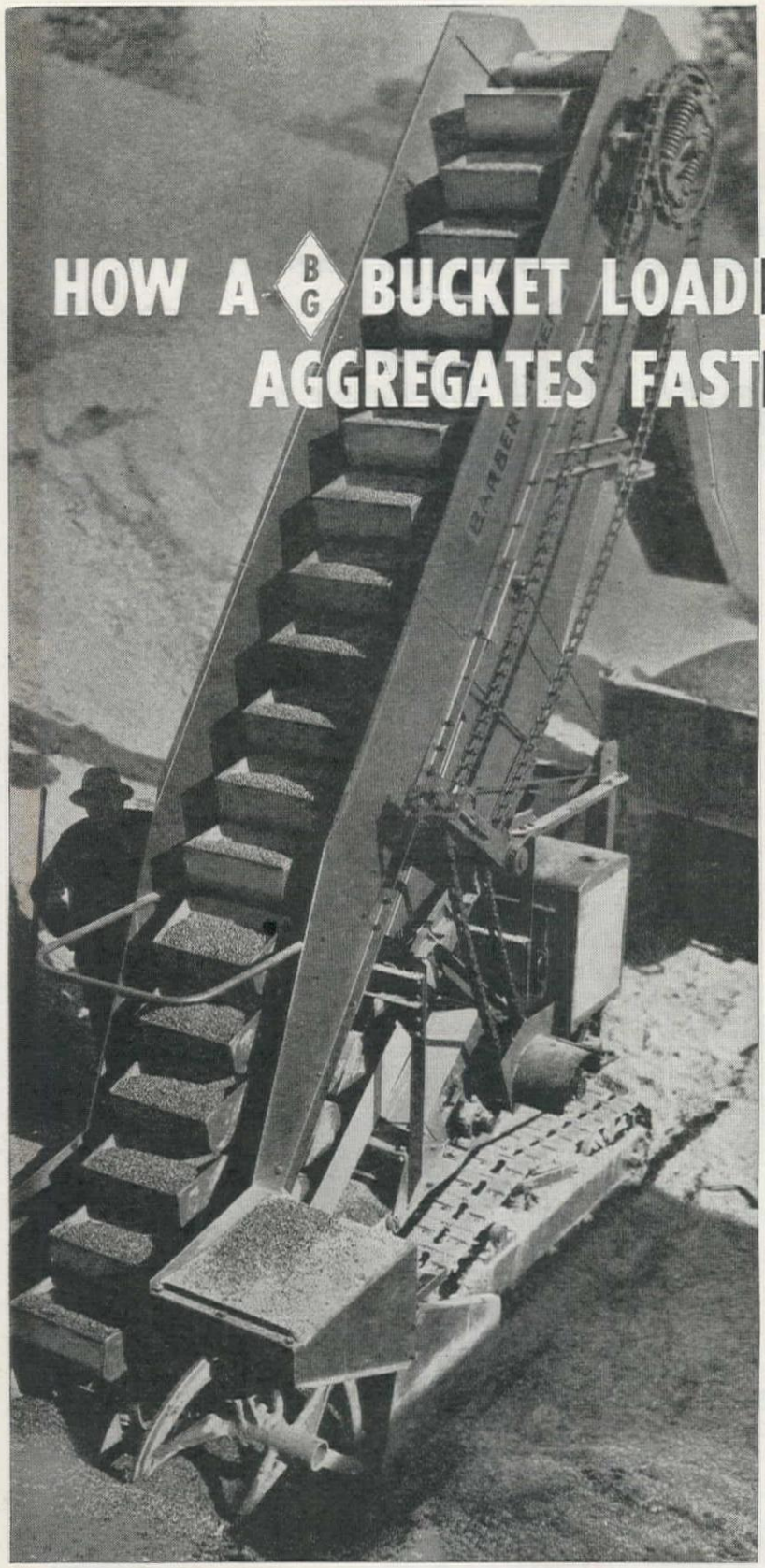
The JF Jack Furnace is a rapid-heating oil furnace designed for servicing Jackbits.

Four sizes of drill steel sharpeners permit the right selection for any job of shanking or threading, etc.



The J3 Jackbit grinder will regrind 35 hardened or 50 annealed bits per hour.

The JMA Jackmill is a high-production hotmill that handles 200 or more Jackbits per hour.



HOW A B G BUCKET LOADER HELPS HANDLE AGGREGATES FASTER AND CHEAPER

THIS versatile Barber-Greene Bucket Loader is a valuable job-coordinating unit in pit and quarry.

You can save money by processing aggregate at a uniform rate, even during "off" seasons, and storing it in stockpiles.

A Barber-Greene will reload it into trucks, whenever needed, at exceptionally low cost. In fact, many operators have found that the saving in truck time alone justifies its purchase.

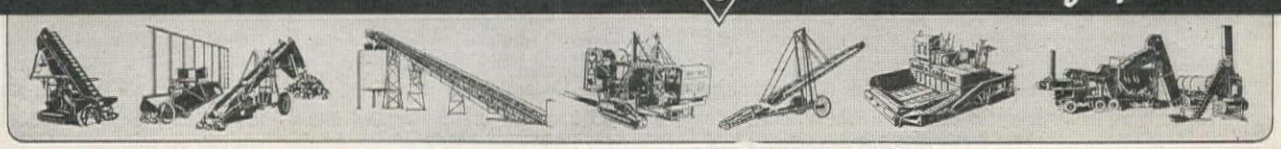
Continuous handling by the B-G Loader is extremely advantageous in feeding material to processing equipment — screens, crushers, belt conveyors.

The B-G Bucket Loader also can be used for stripping, light excavating, screening, and many other cost-saving applications.

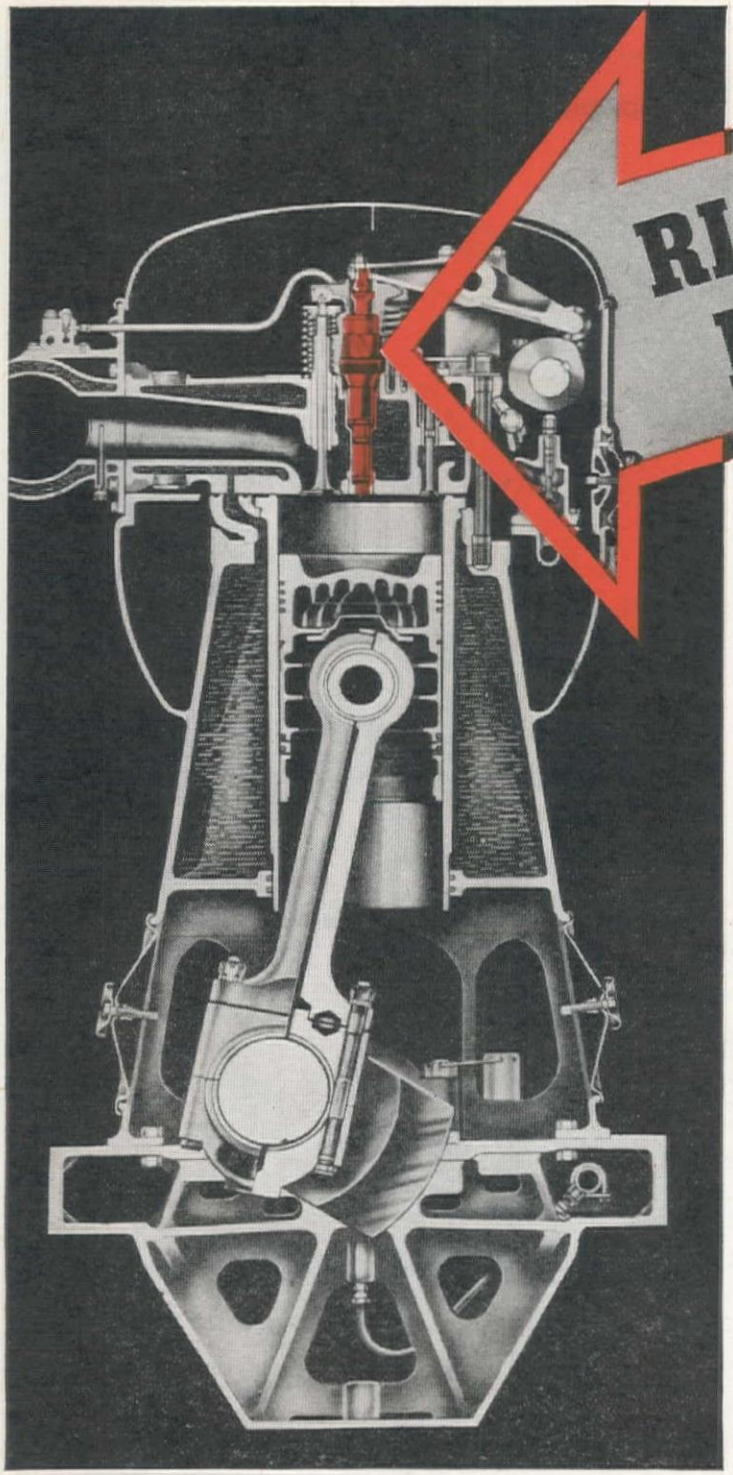
Full crawler mounting, tank type chassis, automatic overload release, synchronized spiral feeding, floating boom, centralized control, and 12 crowding speeds are but a few of the advanced mechanical features that give the B-G Loader long life and fine performance under the rigors of heavy, steady work. Consult your B-G representative or write the Barber-Greene Company, Aurora, Illinois.

44-28

Barber-Greene B G *Constant Flow Equipment*



Brown-Bevis Equip. Co., Los Angeles, Phoenix; Columbia Equip. Co., Portland, Spokane, Seattle, Boise; Contractors Equip. & Supply Co., Albuquerque; Jennison Machinery Co., San Francisco; Lund Machinery Co., Salt Lake City; Western Construction Equip. Co., Billings; Ray Corson Machinery Co., Denver.



RIGHT WHERE IT BELONGS!

The unit-type fuel injector in Hendy Diesel Engines is right in the head...*logically* placed for satisfactory service under all load conditions, with *uniform* high-pressure fuel charge to *each* cylinder. This injection system provides individual fuel pumps for each cylinder...does away with long, high-pressure fuel lines... simplifies service because the entire unit can be easily removed for cleaning.

In addition to the unit-type fuel injector you'll find other important features too, such as...overhead camshaft, direct actuated dual intake and exhaust valves, and hydraulic tappets. All these features, *combined for the first time in a single engine,* reduce the number of wear points, simplify service and contribute directly to the lower maintenance costs a successful Diesel operator must have.

In marine service—or for stationary duty—Hendy Diesels can serve you well. They combine two great qualities...all the ruggedness for rough seas; all the good features for low-cost operation.

Hendy Diesels for marine or industrial service... 6 or 8 cylinders, 350 to 675 hp... are also available with Hendy generators as complete electric generating plants.

Hendy is currently supplying 250 kw Diesel generating sets for a large number of AVI cargo ships.

Write today for complete data—ask for the New Hendy Series 50 Diesel Engine Catalog.

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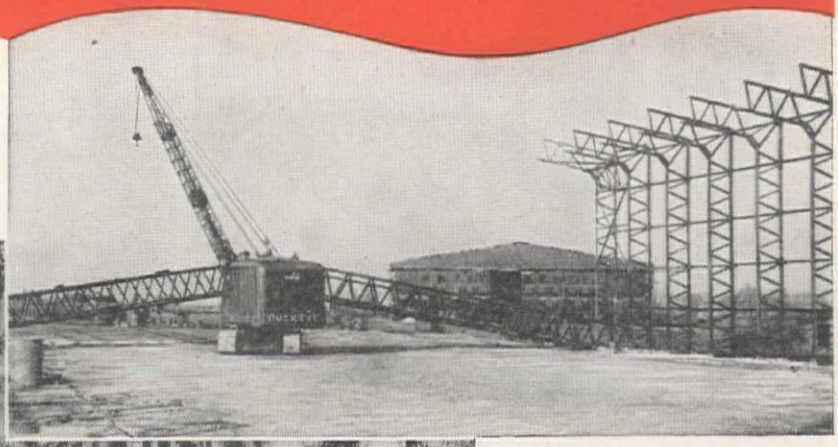
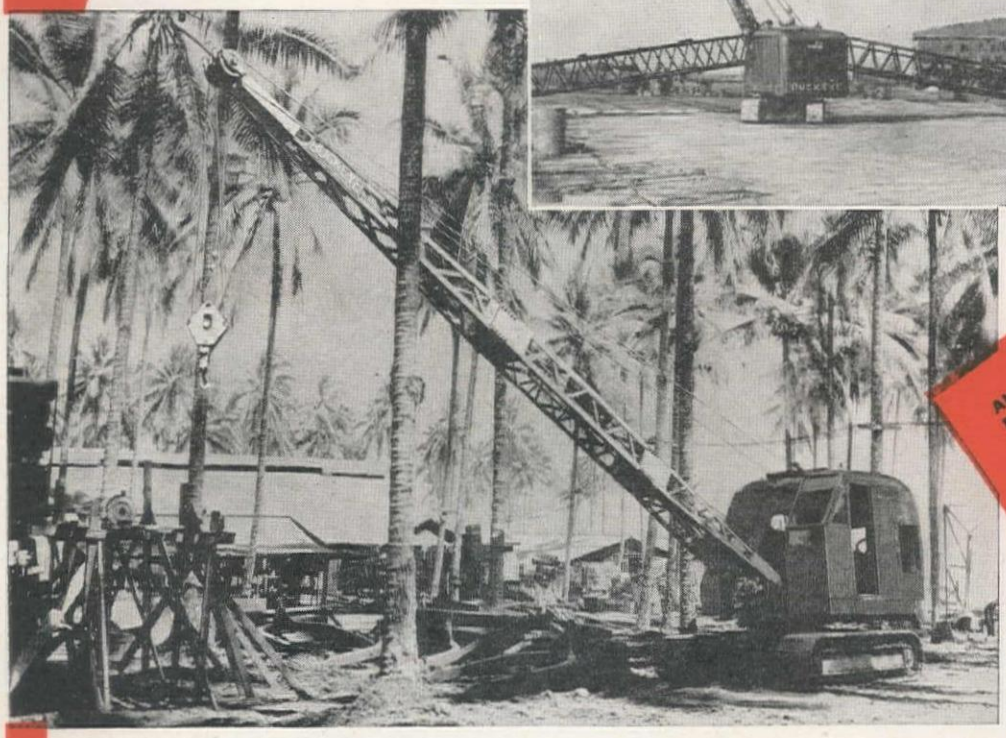
The Buckeye Clipper's *smooth speed* amazed our Allies!





Above: Buckeye Clipper Crane erecting steel framework for hangar somewhere in England. British Combine photo.

Left: Clipper Crane at Milne Bay, New Guinea. U. S. Army Signal Corps Photo.

American-made power shovels and cranes have been shipped to all parts of the world. Prior to the war, Buckeye was so busy supplying domestic users that few Clippers were shipped abroad. Since the war, however, practically our entire output has gone to battle-fronts around the world. For the first time, many Australians, Russians, Free French, British and others of our Allies have seen how Mevac Vacuum Power Control simplifies power shovel and crane operation.

Reports indicate that they are amazed at the way Buckeye Clippers handle — fast, smooth, positive action that minimizes wear and tear, reducing the need for maintenance. Six small handles operate the vacuum cylinders which control all operations.

Clippers have all of the features of sound engineering design that you expect to find in a modern shovel *plus* exclusive Mevac Vacuum Power Control. They have an enviable war record. A Clipper on your peacetime jobs will insure maximum profits; minimize maintenance costs. Send for a copy of "The Age of Clippers."

BUCKEYE TRACTION DITCHER CO.

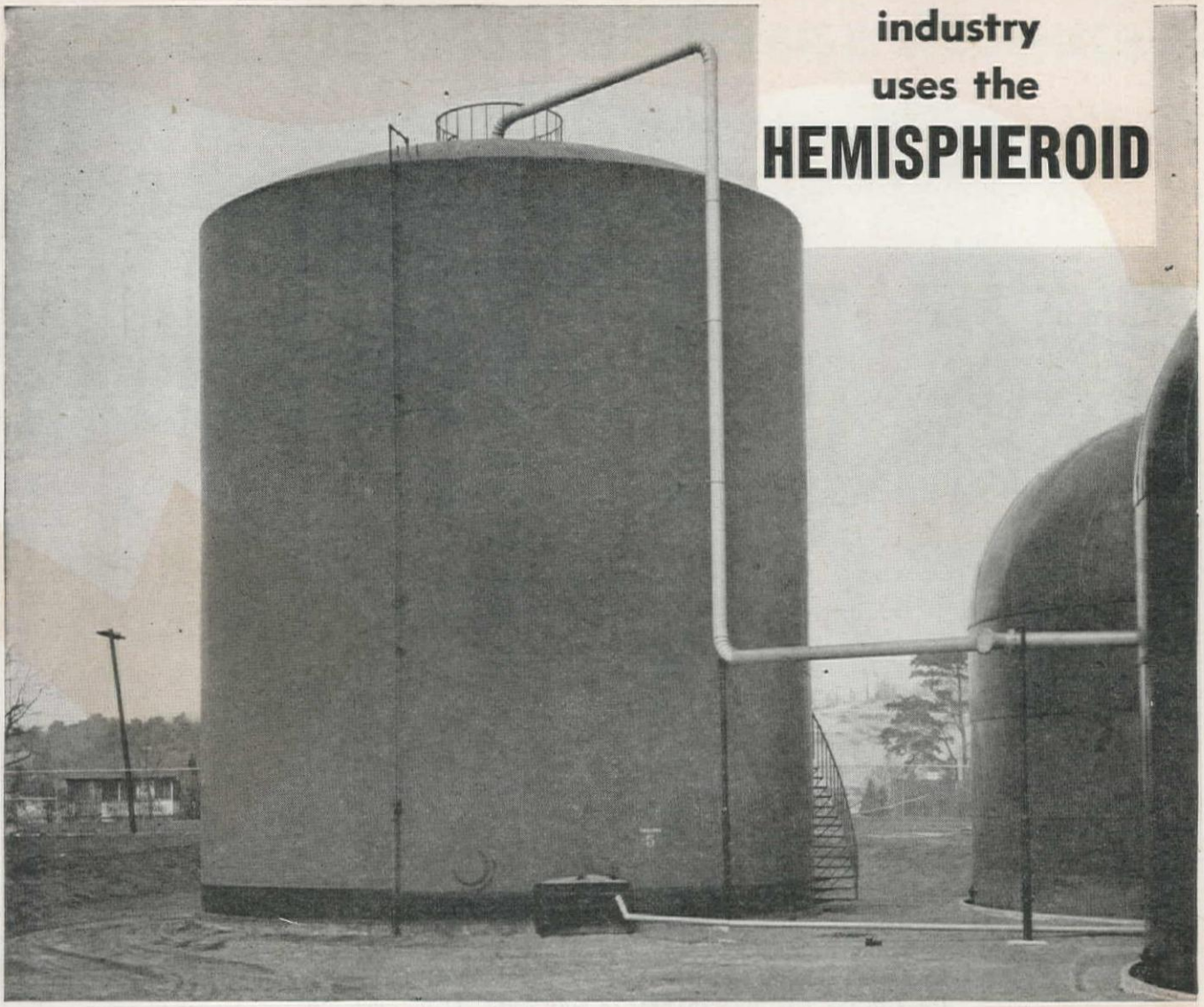
Findlay, Ohio

Built by **Buckeye**

Convertible Shovels Road Wideners Trenchers
Spreaders R-B Power Finegraders Tractor Equipment

. . . for storing products of low volatility

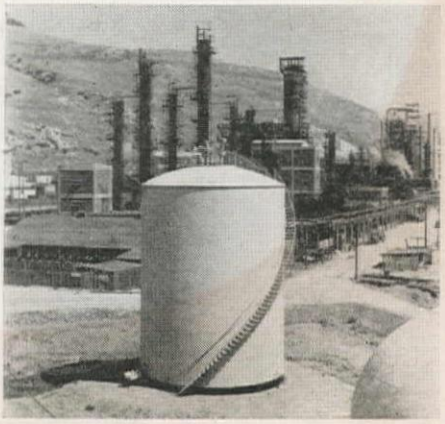
industry uses the HEMISPHEROID



LIQUIDS with volatile components should be handled and stored under pressure to prevent excessive loss by evaporation as well as product deterioration. For the storage of liquids that are only *slightly volatile*, industry has learned that it's hard to beat a Hemispheroid. Here's how these pressure vessels operate: Protection is accomplished by making use of the simple fact that no loss will occur as long as vapor does not escape from the tank. The tanks are built to withstand the maximum vapor pressure of the product being stored and are equipped with relief vents set to open above this pressure. Instead of allowing the air-vapor mixture to escape when the temperature rises, pressure is built up inside the tank.

The efficiency and simplicity of Hemispheroids make them ideal for industries requiring storage facilities for many diversified products. Write our nearest office for information or quotations on installations to meet your needs. There is no obligation on your part.

The 12,500-bbl. Hemispheroid shown above is used to store aqua ammonia. Below: 5,000-bbl. Hemispheroid at an aviation gasoline plant storing isomate at 5 lbs. per sq. in. pressure.



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Plants at BIRMINGHAM, CHICAGO, and GREENVILLE, PENNSYLVANIA

WESTERN CONSTRUCTION NEWS
WITH WHICH IS CONSOLIDATED WESTERN HIGHWAYS BUILDER
November, 1944 Vol. 19, No. 11

Government and Employment

AS THE WAR draws to an end it is being said with increasing frequency that if business can't provide jobs in the postwar period, the government must. Sometimes it goes—if business won't do it, government will.

These are generalities. It is necessary to look more closely at some of the details of how government would do what business is unable or unwilling to do.

The performance of the services which are generally accepted as public responsibilities involves a certain volume of employment opportunity. Government needs engineers, lawyers, policemen, firemen, teachers, janitors, clerks, truck drivers, and many other kinds of labor services, but there is a limit to the number of persons who can be advantageously employed in the discharge of the established public functions.

In two directions greater leeway is possible. One is by the simple expedient of padding the payrolls so that there will be an unnecessary number of clerks, typists, firemen, teachers or what not. This is the easiest and most direct way of wasting the taxpayers' money.

A second direction in which government can create more jobs is the invention of new public services and activities. This process has been going on for a long time. It has not been inspired primarily by a sense of obligation to deal with unemployment. Rather, it has been a product of the whole trend of economic and social change.

This kind of provision of employment by government is part of the familiar scene. Even so, and despite the atrocious padding of payrolls that has at times occurred, it serves only as the introduction to the original declaration that if business can't or won't provide jobs for all, the government will.

Two practical questions emerge. The first is: "How will these jobs be provided?" The second is: "How will government get the money?"

As to the first question, there are three possibilities. First, there can be a further and still more luxuriant growth of the bureaucratic system. Second, government can organize and manage publicly-owned industrial undertakings. A third way is by engaging in various improvement projects usually lumped together under the rubric "public works." These improvements include principally roads and buildings, but the term covers every variety of construction project.

What may be said of these steps that are available to government to provide jobs when private business can't—or won't—do it? The superficial result is that employment is created and wages are paid. Equally superficial analysis deduces that the purchasing power of those wages will set in motion all the forces and factors of production and thus induce private industry to enlarge its employment beyond the scope existing prior to the government spending.

It did not happen so during the 1930's, and the red-faced spenders were obliged to carpenter out an entirely new doctrine to explain the failure of pump-priming and to justify the continuance of deficit financing.

If it were true that the prime essential of prosperity were the maintenance of consumer purchasing power, regardless of the equivalent given in some productive activity or function for that income, then this condition could be established and maintained quite as effectively by simply printing and passing out greenbacks as by any legerdemain of public industry or public works. True, the delivery of greenbacks to the deserving unemployed would be very like a dole, a payment for doing nothing. If the workers, as consumers, are given purchasing power in the form of wages which may have been paid for creating no values whatever in useful goods or services, the resulting competition of consumers for the available goods leads to inflation.

So much for how the government will provide jobs when private business does not. The second aspect of the problem relates to the manner in which government is to get the means of payment on the scale required to remove large numbers of persons from the unemployment rolls.

Again there are three major possibilities. The first is by taxation. A second source of government funds is borrowing from individuals, from banks or from both classes of investors in some combination. This system does not immediately affect the government credit, since the taxing power can be used to support it. But the taxes will fall on the active business firms and the employed workers, who will in time be adversely affected by exactions imposed for such purposes.

A third source of government funds is the issue of paper money. This is a kind of forced loan, in a transaction in which the persons who are provided with jobs by government are the initial public creditors.

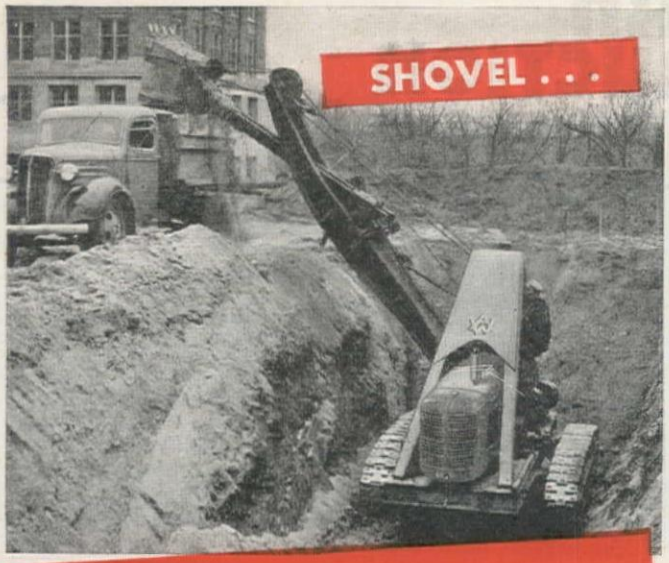
This is the technique of inflation. There is no easy road back from the first state of inflation, and in due course there would be the same symptom of a relative lack of purchasing power at the new level. Temporary relief could again be obtained by injecting another, and larger, dose of purchasing power, and so on until the collapse of the monetary unit forced, in one swoop, the liquidation and readjustment which the inflationary process had to that point been successful in delaying.

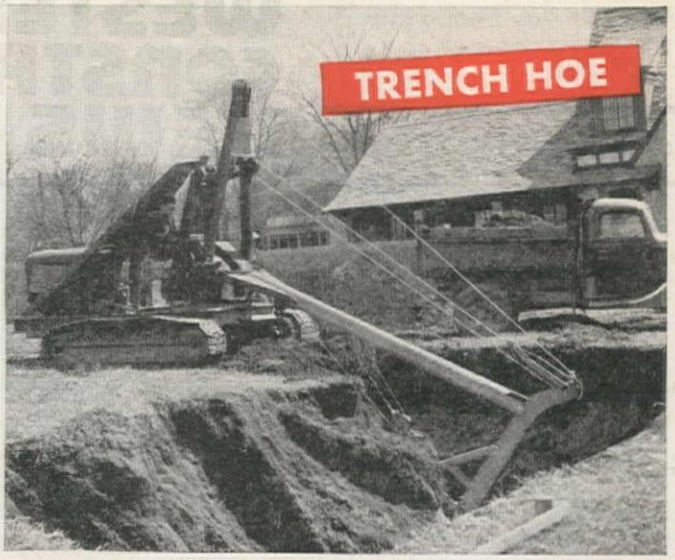
Such is the logical outcome of any attempt by government to step in and give employment on a large scale under circumstances where private employers are not doing it.

It appears that government can and should develop its policy along another line. To begin with, when private business cannot or will not provide employment, there is usually a reason. If the cause or causes are removed, the jobs will begin to reappear. Instead of making a promise about what government will do to give jobs, a far more sensible policy would be to say that when private business cannot or will not provide jobs, every facility of government will be utilized to find out why this condition exists and to aid in effecting such changes as will eliminate it as quickly as possible. Such a policy would rest on the sound and defensible foundation that private employment is the natural and wholesome way for people to earn a living. Given an efficient and intelligent public administration, the discovery and correction of the blocks and jams in the economic machinery should not involve too great delay, particularly if the governmental attitude were that of prompt action, honest diagnosis and wholehearted cooperation with private enterprise in accomplishing the result.

Such a policy is offered as a substitute for compensatory spending and other inflationary tricks. It would leave the main responsibility for providing jobs where it belongs, namely on private business, and it would assign to government the kind of participation in the prevention of unemployment which government can reasonably be expected to undertake. The drawbacks of this proposal are, first, that it lacks the demagogic appeal of extravagant promises to take care of everybody, and second, that it involves serious, thoughtful self-examination by all parties—in business, labor and agriculture as well as in the government—if honest diagnosis and sound remedy were to be laid out.

—Condensed from *The Tax Review*, Oct., 1944.





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WESTERN STATES WELDING & PRESS COMPANY, 1304 North Fourth Street, Albuquerque, New Mexico

WESTERN CONSTRUCTION NEWS
NOVEMBER • 1944

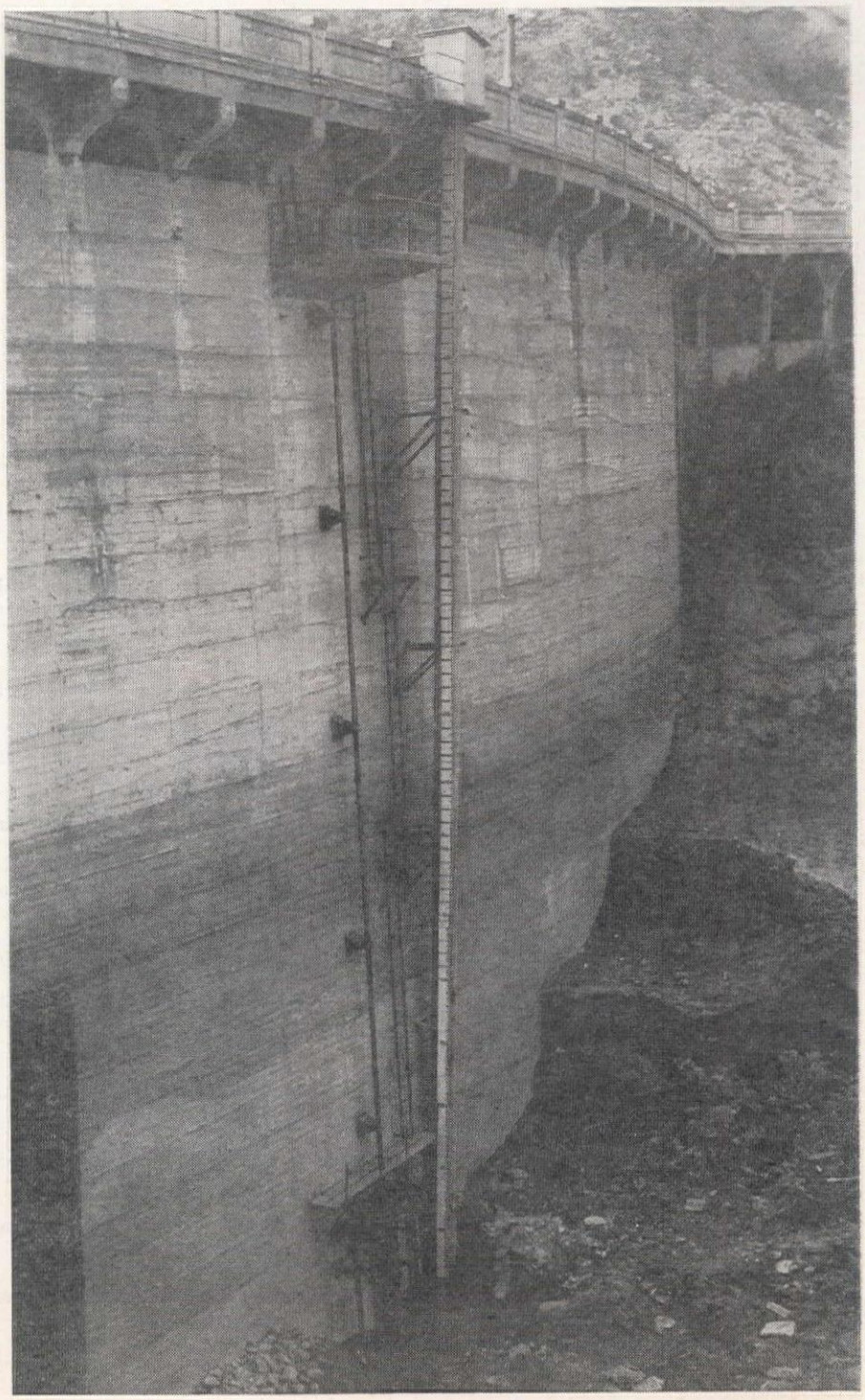
Devil's Gate Dam—
Sluiceway Driven Through Structure

Silt deposition in Los Angeles County flood control dam, with consequent interruption of percolation and loss of water storage space, necessitates construction of new 60-in. sluiceway — All steel parts secured from other installations

By PAUL BAUMANN
Assistant Chief Engineer
Los Angeles County Flood Control District
Los Angeles, Calif.

DEVIL'S GATE DAM, a curved gravity structure, 115 ft. high and 300 ft. long, was completed in June, 1920. It was the first major dam built by the Los Angeles County Flood Control District as a part of its first line of defense in the form of flood regulating dams located at or near the mouth of the principal canyons on the south slope of the San Gabriel mountains. It is a concrete structure and is believed, to the best of our knowledge, to be the first concrete dam, at least on the west coast, which was built by means of movable panels. It was built by contract with Bent Brothers, engineering contractors. The dam is located on the Arroyo Seco. It forms a barrier across a gorge known as Devil's Gate, approximately a mile below the mouth of the Arroyo Seco Canyon, and controls a watershed which comprises 30.62 sq. mi.

The reservoir site being roughly 215 acres in surface area, relatively flat and wide, had served as a percolating ground for water discharging from the canyon for many years prior to the construction of the dam and had thereby been an important link in the water supply system for the city of Pasadena. Water galleries had been constructed underneath the floor of the gravel deposits and shallow wells had been located along the east bank of the stream. A sub stream bed barrier had been constructed immediately upstream from the dam site to control the under flood. The water percolating through the gravels of the old stream bed and the



UPSTREAM FACE of Devil's Gate Dam, with the completed sluiceway, protected by an iron rod trash rack. The slide gate, valve stem, and operating platform were part of the job. The depth of siltation is evident from the accumulation in the background.

east bank aids significantly in the replenishments of the Monkhill ground water basin.

Percolation disturbed

After the construction of the dam, siltation of the reservoir took place at a relatively slow rate until a forest fire in the fall of 1933, which denuded a part of the Arroyo Seco watershed. It was followed by a major flood known as the New Year's flood of 1934. Silt eroded, particularly from the burned area of the watershed during this flood, settling in the lower part of the reservoir in large quantities. It was of such fineness and depth that the percolation into the gravels commenced to be adversely affected.

The flood of March 2, 1938, produced a large amount of debris from this watershed, the bulk of which was carried down into the reservoir. While the coarse material was deposited immediately below the mouth of the canyon, the finer material was carried on down and allowed to settle out in the downstream portion of the reservoir, except for such particles as were kept in suspension in the course of discharge over the spillway, and the debris discharged through the outlet tunnel in the course of the flood regulation.

Sluicing operations through the outlet tunnel were carried on in 1940, 1941 and 1943. Streamflow ranging from 50 to 200 cu. ft. per sec. was utilized to generate the waterpower to move debris. The reservoir had first been drained. This is a prerequisite to all sluicing operations. The larger flows mentioned were utilized in the spring of 1941 when streamflow was generally abundant in the San Gabriel mountains as a result of the large rainfall which had fallen, well distributed, during the preceding winter months. The success of these operations, however, was limited because of the relatively high elevation of the outlet tunnel (1,007 ft., U. S. G. S.), which is 37 ft. above the original stream bed at the dam.

The following tabulation will aid in realizing the significance of siltation and consequently of sluicing in the reservoir.

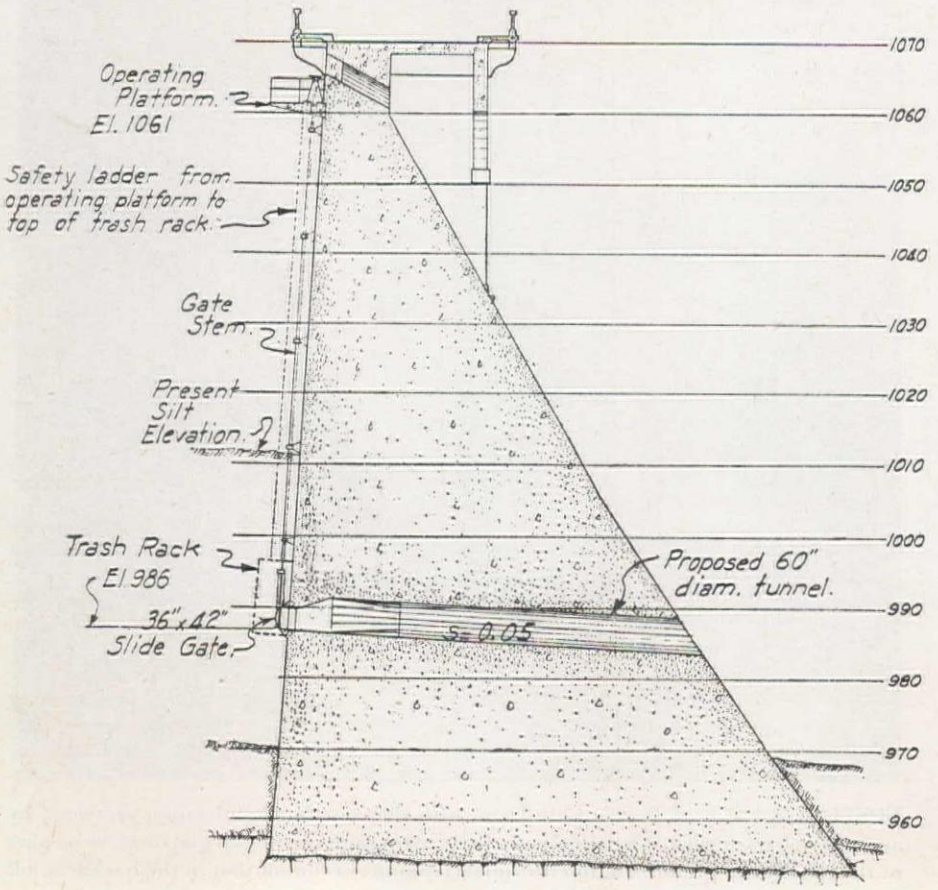
Date	Elev. Bottom at Dam U. S. G. S.	Storage At Spillway in Ac. Ft.	Net Loss in Ac. Ft.
April, 1929	970	4,601	.....
January, 1935	1,001	4,014	587
June, 1938	1,010	2,967	1,047
January, 1942	1,005	2,728	239
June, 1943	1,012	2,504	224
Total Loss			2,097

Design of sluiceway

In view of the significance of flood regulating storage as well as the percolation of water through the gravels for the replenishment of the ground water supply for the City of Pasadena and other communities, it was considered essential to provide a sluiceway through the dam located at such an elevation as to create a gradient of sufficient slope to move debris of the order of 6 in. in diameter and to make it possible to free the reservoir bottom from its silt cover. With this in view the sluiceway discussed here was designed. It consists of a tunnel 5 ft. in the clear through the dam on a slope of 5 per cent; a 36 x 42-in. sliding gate operated from a platform 9 ft. below the crest of the dam; a trash rack in front of the gate and a ladder way, housed in by safety netting for access to the trash rack during sluicing operations.

The entrance portal of the new sluicing is located at elev. 986, 16 ft. above original streambed. The opening is 3 ft. wide and 3 ft. 6 in. high; at 8 in. inside the face of the dam, this rectangular opening is increased in cross section to 36 x 60 in., by means of a transition section 4 ft. long; this larger section immediately opens into a second transition which changes the shape to circular, with a diameter of 60 in., continuing at this dimension to the downstream portal.

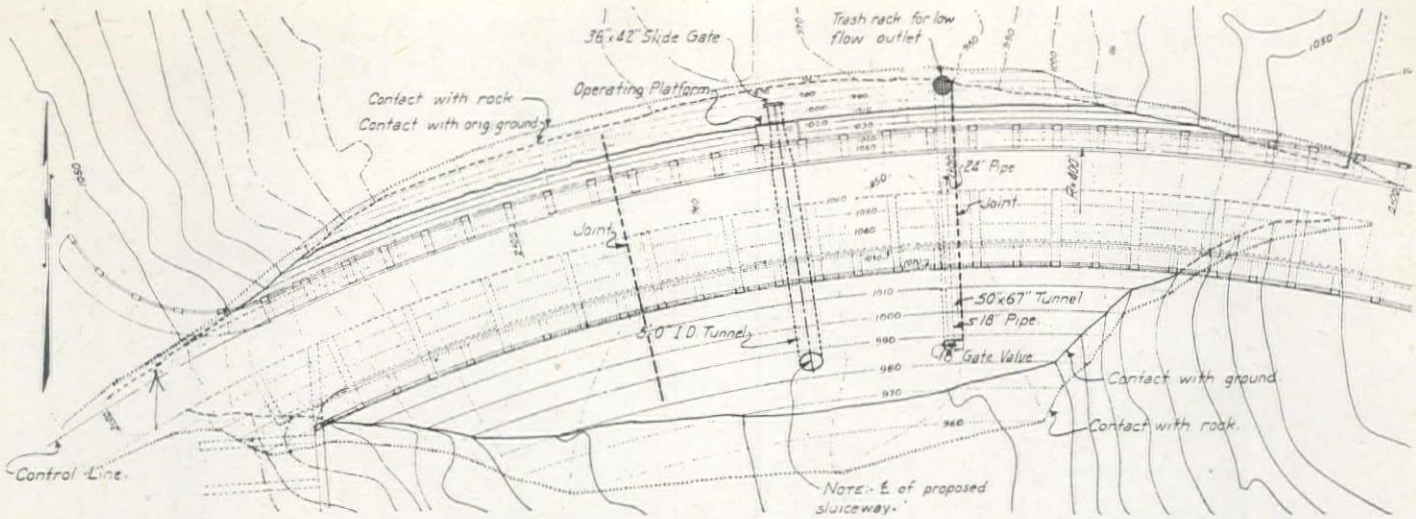
CROSS-SECTION of Devil's Gate Dam, 120-ft. flood control dam on the Arroyo Seco in Pasadena, Calif., showing the newly-installed sluiceway (shown here as "proposed") designed to reduce silt filling which was seriously reducing storage space and interfering with percolation of water, reaching to within 60 ft. of the crest of the dam.



Source of materials

Because of war restrictions, it was necessary to make use of gates and control works at hand. The gate had previously been installed at San Gabriel Dam No. 1 and had served to control the diversion from the outlet tunnel to the so-called Azusa Conduit. The gate stem had previously been installed at Big Dalton Dam in connection with a sluice gate there. The control mechanism for the latter sluice gate was moved from the top of the dam to a platform which was constructed close to the bottom of the reservoir. Approximately 100 ft. of gate stem and supports were thereby freed for use at Devil's Gate. Handwheel and screw stem had been a part of the original gate installation at No. 1, while the wheel stand was made up from new plate steel. It is intended to replace this 36 x 42-in. gate by a larger 60 x 60-in. gate when the present restrictions have been relaxed. This will require the breaking out of the top portion of the transition between the face of the dam and the circular tunnel section, and the modification of the transition to meet the larger gate. The present sluiceway is designed for a discharge of approximately 290 cu. ft. per sec. The ultimate capacity will be 500 cu. ft. per sec.

The trash rack was made up from old rail on hand by the District's shop. It consists of 60-lb. relay with flange turned upstream and the head downstream. In this manner the control or "bottleneck" is coincident with the out-



DEVIL'S GATE DAM in plan, showing location of the new 60-in. sluiceway, gate, and operating platform. The dam was originally built in 1920, gravity arch in design.

side of the rack. Hence, any piece of debris passing through the control section will pass through the rack unobstructed. Larger pieces have to be removed. The clear spacing between the flanges is 12⅝ in. and the trash rack is 10 ft. in height.

The tunnel was driven from the downstream side by means of Leiner drill and gads with the aid of light shooting. The total length of the tunnel is 58 ft. It was broken out in the rough to an average diameter of 6 ft. and it was holed through from the upstream end in 55 days from the start of the work. Tunnel lining was placed in shotcrete, average 6 in. thick. There is no reinforcing steel in the lining.

The completed installation cost was $8,863.74.

The design of the sluiceway was prepared under the supervision of W. B. Ream. R. D. Reeve, in charge of Operation and Maintenance Division, supervised the construction.

M. E. Salsbury is Acting Chief Engineer of the District.

Tacoma Power Plant Petition Denied by Federal Commission

THE FEDERAL POWER Commission has issued an order denying the petition of the city of Tacoma, Washington, for exclusion of the original La Grande Plant from the proposed license for two hydro-electric developments located on the Nisqually River in the Snoqualmi National Forest. The order also extends the time for acceptance of the license which will become effective Jan. 1, 1944.

The FPC order denying the petition states: "Under the plan of construction approved by the Commission the entire La Grande development, with the old and new units, is an integral part of the enlarged, comprehensive development of this section of the Nisqually River, and the old units are an essential part of the project. Operation of the project without the old generating units would not make the fullest possible use of the water resources available, and would not be desirable."

In its petition the city claims that the old 32,000 h.p. units in the original La Grande Plant should be excluded from the license because this plant has been operated since 1912 without any Federal license and should not be brought under license at this time. It also states that no change in the construction and operation of the units will be made except to supply the units from the new project tunnel, instead of the old tunnel and forebay. The old generating units will be connected to the new tunnel, and in time the present gravity tunnel, forebay and penstocks will be abandoned as inadequate and incapable of being utilized in the new system.

The upstream development of the proposed project consists of a concrete arch dam (Alder Dam) about 300 ft. high, storage reservoir with about 147,000 ac. ft. usable capacity and a powerhouse at the foot of the dam with installed capacity of 69,000 h.p.

The downstream development consists principally of a concrete gravity diversion dam about 200 ft. high, a regulating reservoir of about 10,000 ac. ft. capacity, a concrete-lined tunnel 14½ ft. in diameter and about 65,000 ft. long, and a powerhouse. The existing 32,000-h.p. generators, plus new generators having 55,000 h.p. capacity make a total capacity of 87,000 h.p.

WPB Approves $1,000,000 Sulphuric Acid Plant

CONSTRUCTION OF a $1,000,000 new sulphuric acid plant is under way at the Garfield smelter of the American Smelting and Refining Co. to more than double the smelter's production of sulphuric acid for western industries.

The plant, which will turn out 150 tons of acid a day in addition to the 100 tons already being made at an older plant nearby, will take about 10 months to finish. The construction has been approved by the War Production Board.

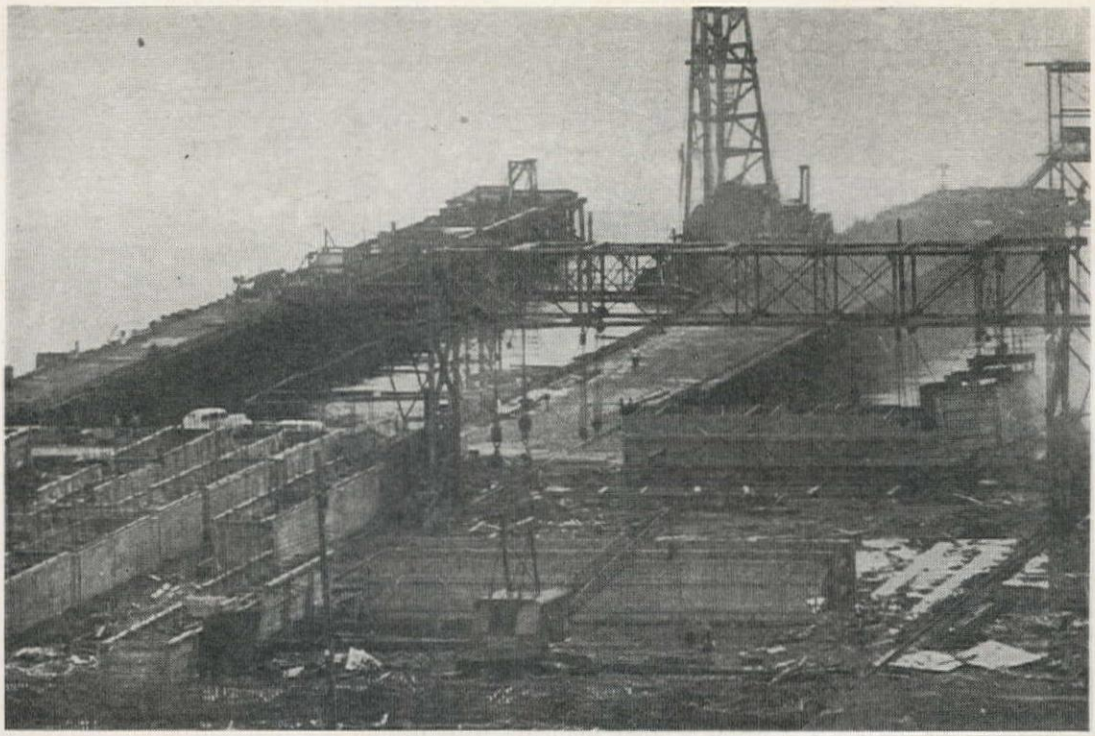
The plant is being built by the Garfield Chemical and Manufacturing Corp., a subsidiary of the Utah Copper Co., and the American Smelting and Refining Co.

Acid from the plant will be used at the new high octane gasoline plants in Utah and in California, at the Geneva Steel Mill, at the new Simplot Corp. phosphate rock processing works at Pocatello, Ida., and in other western industries.

The acid will come from sulphur dioxide gas derived from the Herreshoff roasting of copper-bearing iron pyrites. The gas, after metal-bearing dust is removed by electrostatic precipitators, is cooled in a tower to an average of 325 deg. Cent. by means of water. The cooled gases then go through other 22,000-volt electrostatic precipitation units to remove more metallic fumes and acid mist, and are then cleared in a coke filter, dried in a tower, and finally converted into acid.

Housing Forbidden in Oregon Flats Without Sewer Hook-up

NO MORE HOMES will be approved for building in the flatlands near Eugene and Springfield, Ore., until the applicant can show a direct connection to an operating sewer system, according to Kenneth R. Spies, Oregon State Sanitary Engineer. The rule will apply to all low lying areas along the Willamette river where the soil is heavy and the water table is high. Underground water has been found badly polluted in this area and seasonal rises in the water table flood private disposal facilities.



DOCK SITE showing work during forming operations. Left, foundation piles being driven and cut, floor forms cast on bank. Right, most of slab forms placed on dock bottom, pouring gantry in background, placing gantry in foreground.

Tremie Concrete—
Forms Precast for Naval Drydocks

Precast concrete forms for massive drydock floor slabs saved 1500 tons of structural steel required for conventional forms and eliminated underwater stripping. Saw, attached to gantry, cut piling under water. Specially designed tremie spouts suspended from gantry bridge expedited concrete pour

WITH A BID OF $3,684,000, approximately a million dollars under any other submitted, Ben C. Gerwick, Inc., San Francisco, Calif., was awarded the contract for construction of three drydocks for small naval vessels at the U. S. Naval Drydocks, Hunters Point, Calif., in June, 1943. Main items in the contract included hydraulic dredging for approach channels and removal of unstable bay mud from the underwater foundation area, placing a sand backfill under water, driving foundation piles for drydocks and piers, and construction of the reinforced concrete drydocks and related structures. Subsequent change orders adding construction and installation of various items of operating equipment brought the total contract amount to approximately $5,500,000. Electrical and mechanical work handled by Cory & Joslin, principal subcontractor, represented slightly over $1,000,000.

Work started June 8, 1943, under the direction of Captain G. F. Nicholson, Resident Officer in Charge of Construction, and Lt. Comdr. W. L. Dickey, project manager for the Navy Department; John C. Lewis, job superintendent for Gerwick; and Sol Felig, electrical superintendent, and Dave Joslin, mechanical superintendent, for Cory & Joslin.

Site preparation

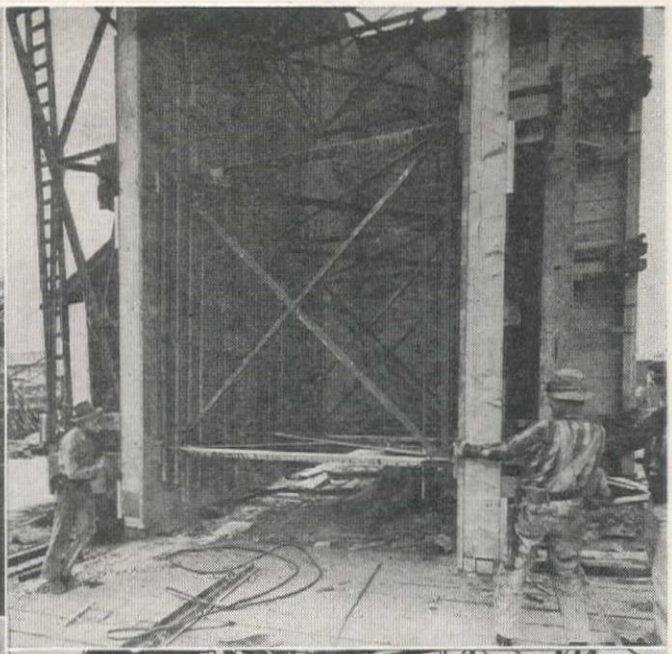
A total of 500,000 cu. yd. of material was removed from the approach channels and the foundation site, principally by hydraulic dredge. After unstable material had been removed, an underwater "backfill" requiring 140,000 cu. yd. of hydraulically-placed sand was made to provide a sand blanket approximately 10 feet thick throughout the drydock foundation area. Inasmuch as the sand blanket supported the forms for the drydock floor sections and provided the surface on which the tremie concrete was placed, it was necessary to bring the fill to grade with unusual accuracy.

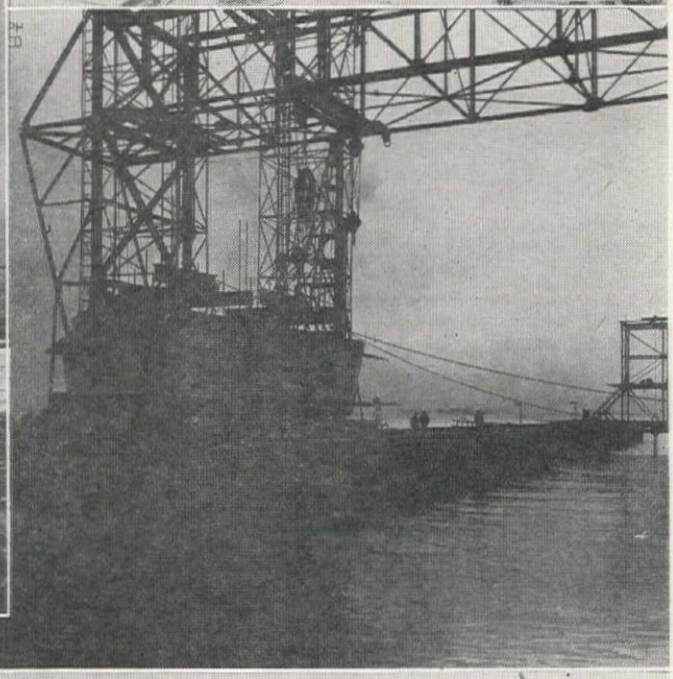
This was accomplished by operating a dredge moving slowly over the area. The depth of cut was adjusted to compensate for the changing tides. This method was accurate to about 0.1 ft.

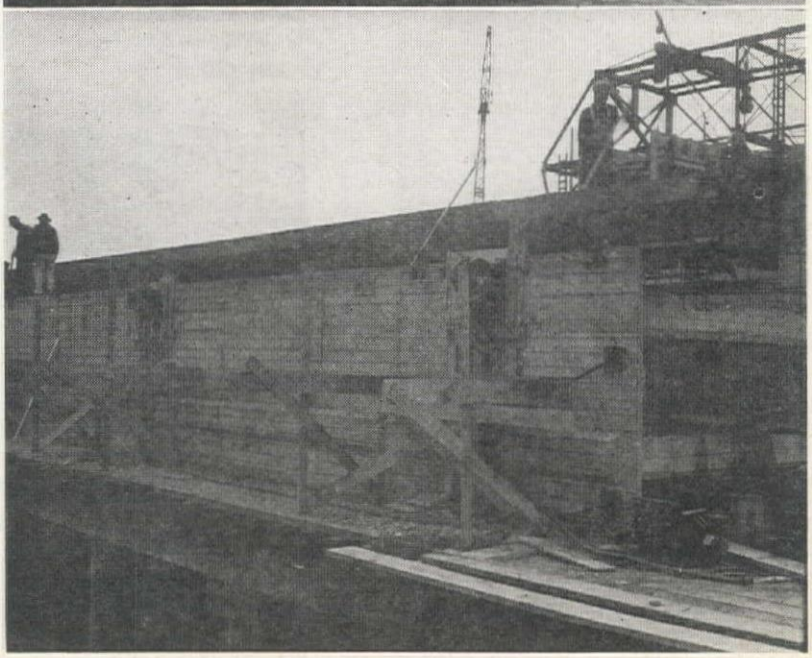
Low bearing values throughout the site required the driving of approximately 6,000 piles, varying in length from 35 to 140 feet. Five thousand of these piles were driven for drydock foundations, and 1,000 for the piers alongside each of the three drydocks. Driving of the pier piling was completed first, and the structures decked over, as the piers were used extensively in the subsequent construction of the drydocks. The piles beneath the docks were driven from a floating rig with an under-water pile driver hammer. During driving, sufficient air pressure was established in the hammer casing to keep the water out as the hammer followed the top of the pile below water. A saw operated under water, attached to the gantry by a frame, was used to move over the area and cut off the piles to an accurate elevation about 1.0 ft. above the sand floor.

Drydock construction

Conditions at the site required that the concrete drydock structures be poured







CONSTRUCTION SCENES at Hunters Point Navy Yard, San Francisco, Calif., during building of three drydocks for small naval vessels. Upper left, pile driver rig used for underwater driving of piles toppled against pouring gantry during storm that delayed early operations. Upper right, corner wall form for inboard end of drydock. Wall reinforcing to lap steel from bottom portion shown tacked to form bracing. Strut-tie shown grouted full with undercut block at end for watertight plug to be dry tamped. Middle left, precast concrete form for tremie concrete slab of dock. Reinforcing support shown at the top strut-tie. Forms were about 14-ft. wide and spaced 14-ft. apart on the drydock sand floor. Middle right, precast floor form for base of dock side wall being placed by gantry after checking site by divers. Lower right, precast floor slab form at the outboard end of dock showing hinge and gate seat in place, prior to lowering. Novel type "flap gate," hinged at bottom and swinging downward to open, designed for structures to replace usual floating caisson plug-type gate. This buoyancy operated flap gate is estimated to save from 30 to 60 min. in opening and closing time. In open position the gate is entirely submerged and lies on the channel bottom. Although not shown in these photographs, the side wall forms are also precast. They are assembled on their sides and erected for placing with the placing gantry.

LIFTING LOOP on precast forms for tremie concrete slab showing strut-tie connected to side wall of form.

largely under water. Specifications called for tremie concrete with design values of bond, shear and compression stresses comparable to concrete placed in the dry. A novel method of utilizing precast concrete forms was devised for the massive floor slab, which not only saved approximately 1,500 ton of structural steel required for conventional forms, but also eliminated all under-water form stripping.

A complete casting yard was set up at the on-shore end of each drydock site, so arranged that the rail gantries serving the drydock structure could be used to pick up the forms at the casting yard and place them in the drydock area as required. Forms for the floor slab sections were cast first. The final off-shore form for each of the three drydocks carried the hinge sections upon which the flap type drydock gates operated. A total of 2,000 cu. yd. of concrete was used in the precast forms. These forms were approximately 10 x 14 x 60 ft. and were made with the same concrete mix that was to be used in the tremie pour. The forms were bottomless and were placed 14 ft. apart on the drydock floor. Longitudinal keys were built on the outside walls of the forms. An under-water test tremie pour was found to have excellent bond with a precast form.

Before the floor slab forms were placed, it was necessary to "finegrade" the sand blanket which had been disturbed by pile driving operations. This was accomplished by means of a small drag operated from the traveling gantries.

Tremie concrete

When all foundation preparations had been completed, the form was picked up by the gantry, carried over the drydock site and lowered into position with careful alignment determined by pre-established reference points. A diver was sent down to check proper alignment of the form and proper seal of the form against the sand blanket. As soon as the floor slab forms and necessary reinforcing were in place, the placing of the tremie concrete was undertaken.

This was accomplished by means of a series of tremie spouts suspended from an adjusted cantilever frame mounted on the gantry bridge. The ends of the spouts were sealed, the spout lowered to the floor of the form and the dry spout filled with concrete from ready-mix trucks at the pier. The seal plug was then released and the spout raised sufficiently to start the pour of concrete. Correct hydrostatic balance to maintain a flow of concrete upward from the bottom of the spout was achieved by raising the spout slowly as the pour progressed. Divers made periodic inspections to see that no leaks developed in the forms, and made a final inspection upon completion of the pour to see that all reinforcing was adequately covered and forms were properly filled.

Side wall forms were placed as rapidly as possible and were poured with an especially designed tremie spout having a series of hopper openings at various elevations. As the spout was raised to compensate for the increasing height of the placed concrete, hoppers were attached to successively lower openings so that all pouring could be done from a stationary platform. A total of 73,000 cu. yd. of concrete was placed in the drydock structures, of which 61,000 cu. yd. were placed under water. Reinforcing steel required in the structures amounted to 5,500,000 lb.

Gate installations

A novel type of "flap gate," hinged at the bottom and swinging downward to open was designed for the structures to replace the usual floating caisson plug-type gate.

It was estimated that the buoyancy-operated flap gate would save from 30 to 60 min. in opening and closing time. In open position the flap-type gate is completely submerged and lays on the channel bottom slightly below the elevation of the drydock. Closing is accomplished by injecting compressed air, displacing the water in the gate chambers and causing the gate to rise upward into its closed position. To open the gate, air pressure is released and the buoyancy chambers are allowed to flood, causing the gate to swing out and submerge. Operating trials indicated that opening or closing operations could be completed in approximately 15 min.

The gate structures, weighing approximately 130 T. each, were fabricated by Judson Pacific Steel Co., Oakland, Calif., on a sub-contract. The same firm also furnished the gantry bridges used during the course of construction.

Service facilities

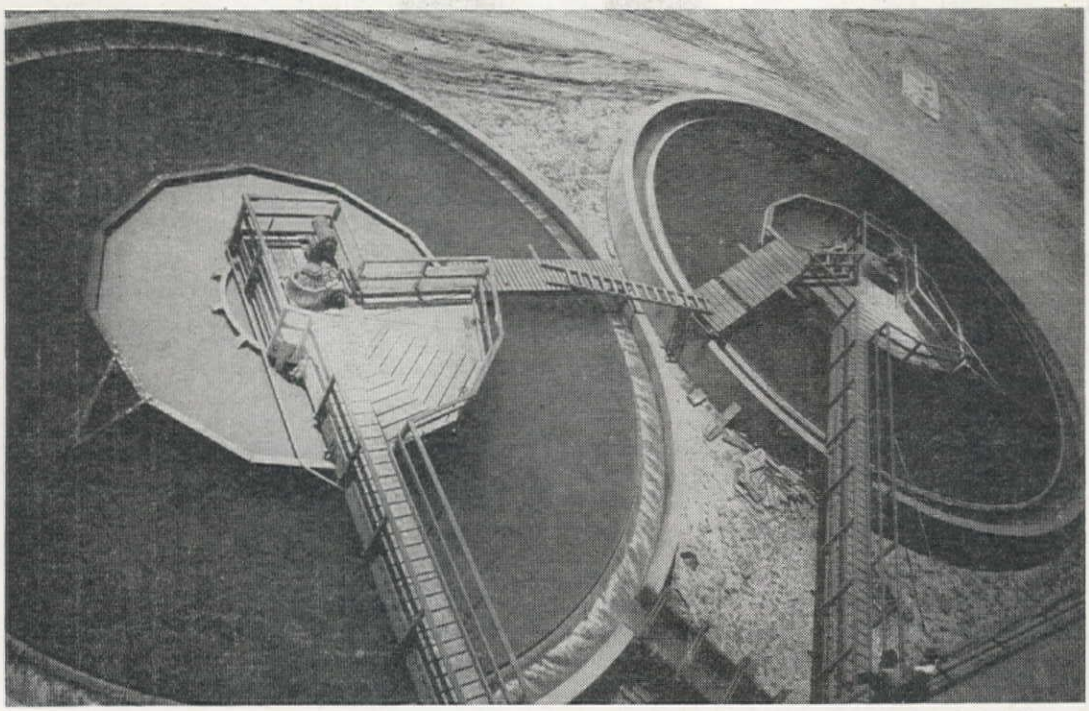
In addition to the drydock and pier construction, the contractor was required to backfill and pave a considerable area adjoining the drydock site after installing the many services required for operation of the drydock. Approximately 140,000 cu. yd. of Class 1 fill was required and 360,000 sq. ft. of paving; 6,600 track ft. of railroad track was laid in the contiguous area. As of July 15, 1944, the project was 99 and 9/10 per cent complete.

On July 21, Ben C. Gerwick, Inc. and associated contractors were awarded the Army-Navy "E" for high achievement in connection with the project. This was the second "E" award for construction work won by the Gerwick organization; their first award was made in recognition of the firm's work on the Oakland Army Base project.

The Hunters Point award was made at a special ceremony conducted in the presence of most of the crew employed on the project. Ben C. Gerwick accepted the award personally for his firm. It was presented by Rear Admiral Henry F. Bruns, Superintendent Civil Engineer for the project, and Col. K. M. Moore, Pacific Division Engineer of the Army Corps of Engineers.

BEN C. GERWICK (center) being congratulated by Rear Admiral Henry F. Bruns (left) at conclusion of ceremonies marking the presentation of the Army-Navy "E" award to the Gerwick organization and its associated subcontractors for high achievement in the construction of three drydocks at the U. S. Naval Drydocks, Hunters Point, Calif. Colonel K. M. Moore (right) presented token "E" pins at the ceremony.

Water for Utah Steel Plant



Accelerator Basins of the treated water system at Geneva Works steel mill, built by Columbia Steel Co. for Defense Plant Corporation. Lime, alum and soda ash are added to the water here, and sludge (8 per cent solids) is removed.

Supply of adequate quantity of cooling and other water for operation of a giant steel mill in the desert taxed the ingenuity of hydraulic engineers and resulted in construction of four separate systems—Very little wasted through evaporation or discharge, but practically all re-circulated

WHEN BRIGHAM YOUNG led his band of hardy pioneers into the barren valley of the Great Salt Lake nearly 100 years ago, the Mormons promptly built a dam and dug a ditch to form the first irrigation system in Anglo-Saxon history.

Recently placed in operation in the same area in Utah is another unique water supply system, though considerably more exacting and imposing in design and construction. This is the system supplying the numerous water needs of the new, quarter-billion dollar Geneva steel plant — a system that, through intricate recirculation, makes one gallon of precious water do the work of fourteen.

The huge Geneva works has been constructed on former pasture land 35 mi. south of Salt Lake City. The plant recently went into full production at its established rate of more than 1,000,000 tons of steel a year. Right now, its sole duty is to turn out plates and shapes for the West Coast shipyards. Whether it will operate after the war is a question that is being asked all over the west—but no answer has yet been indicated.

The government made its decision to build the plant at Geneva three years ago, choosing the site in central Utah because of the accessibility of coking coal, iron ore and limestone and because the mills would be equidistant by rail from the major western shipyards in southern California, San Francisco Bay and around Portland.

Although coal, ore and flux were nearby, the water supply problem was a very serious one, because the water needs of the extensive plant are measured by the millions of gallons, and the available supply at Geneva was definitely limited.

The plant site is on the shores of Utah lake, a fresh-water body draining into famed Great Salt Lake through the winding, sluggish River Jordan. However, the waters of the lake are so filled with silt at times that it was not economically feasible to consider its use as a water supply. The location was selected because the plant area is bounded by two trunk railroads, and because water that could be used was within piping range in the Wasatch mountains, five miles to the east.

Four different systems

There are actually four separate water systems at Geneva, each carrying out a separate and highly essential function in the exacting process of making steel.

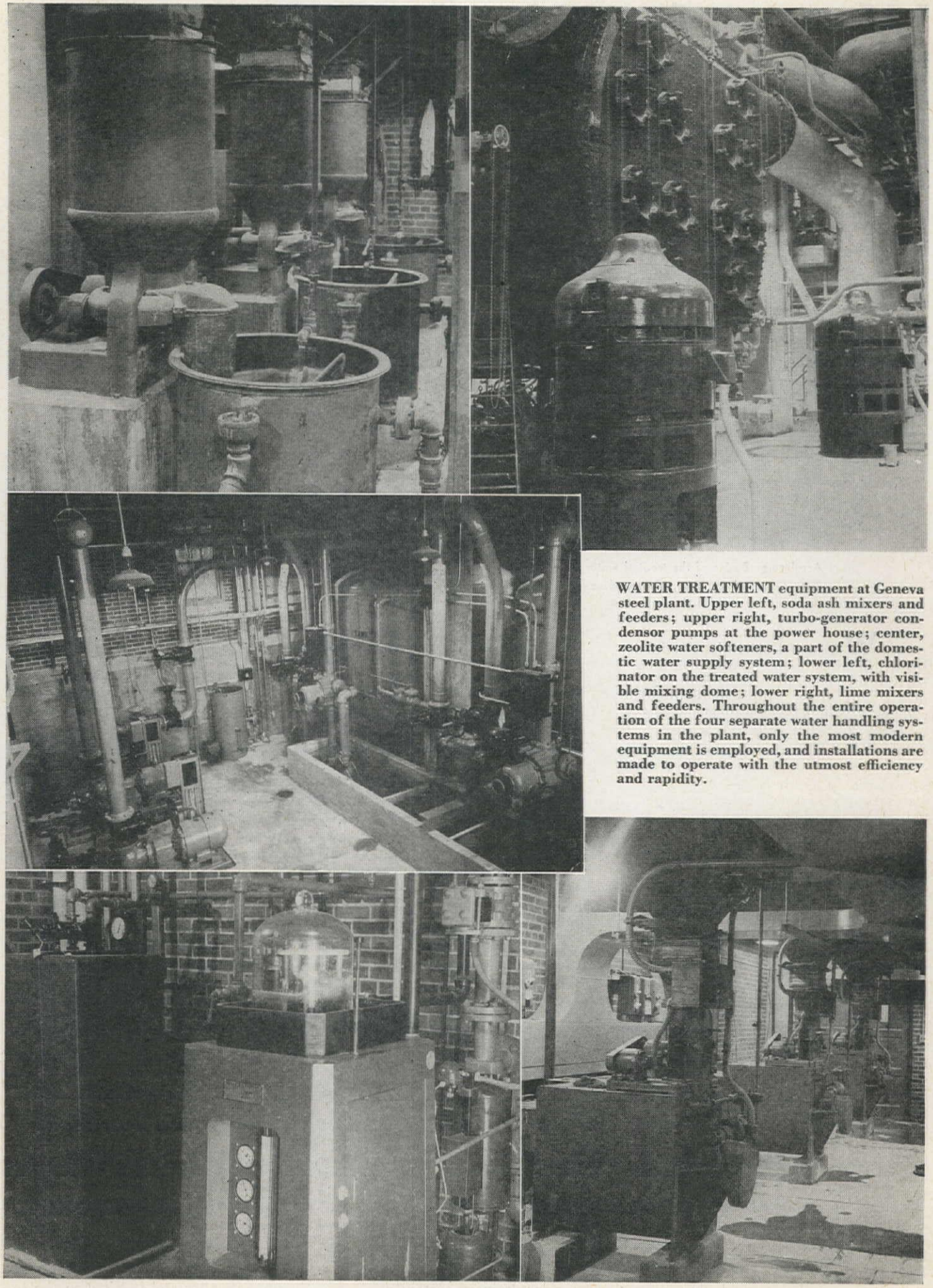
System No. 1 is the outdoor treated water system. No. 2 is the untreated water supply. No. 3 furnishes domestic water. And No. 4 is a ground water and surface drainage system.

Altogether, these systems handle an average load of more than 195,000 gal. per min. But of this total, only 13,600 gal. per min. represents new water. The rest is recirculated water, carried through the system of pipes and pumps that make water conservation at the huge mill an outstanding feature of its construction.

The primary water source for Geneva is the Deer Creek reservoir of the Provo River reclamation project — a reservoir completed only a few years ago in the Provo River canyon 14 mi. east of Provo. The Deer Creek water is purchased by the plant and piped to the millsite, to be augmented by water from plant area wells and from older irrigation ditches in which water rights were acquired along with land for the plant.

Treated water system

The Deer Creek supply comes directly from the tailrace of the Olmstead hydro-electric plant of the Utah Power and Light Co., at the mouth of the canyon. It goes through screens into a pump chamber and is lifted to the top



WATER TREATMENT equipment at Geneva steel plant. Upper left, soda ash mixers and feeders; upper right, turbo-generator condensor pumps at the power house; center, zeolite water softeners, a part of the domestic water supply system; lower left, chlorinator on the treated water system, with visible mixing dome; lower right, lime mixers and feeders. Throughout the entire operation of the four separate water handling systems in the plant, only the most modern equipment is employed, and installations are made to operate with the utmost efficiency and rapidity.

of a hill 500 ft. away by two vertical, mixed flow pumps, each with a capacity of 5,000 gal. per min. at 63-ft. head.

From the hilltop reservoir, the water flows by gravity to the water treating plant in the center of the Geneva works buildings, five miles distant, to become the "makeup" water to replace that lost, primarily through evaporation in a big cooling reservoir, from the treated water system.

The treating plant, with a capacity of 8,300 gpm, softens the makeup water to reduce its calcium hardness and takes out a large part of the magnesium.

The raw water comes into the treating unit through two Venturi tubes with gate valve controls on the discharge end to equalize the flow. Flow controllers actuate the system that determines the amount of lime, alum and soda ash to be fed to the external accelerator basins.

The chemicals dissolve in these basins and the effluent overflows to recarbonization chambers inside the treatment plant, where the pH value is controlled through use of sulphuric acid or carbon dioxide gas.

About 5,100 gpm are diverted from the treatment plant to pass through sand filters and a clear well basin to be used as evaporator feed for the adjacent power station and to feed the waste heat boilers of the open hearth furnaces.

The sludge from the accelerator basin is withdrawn into a pit in the basement by use of sludge pumps that handle the muck—averaging about 8 per cent solids—with ease. The sludge from the pit goes to a Dorr thickener, then to a centrifuge plant which reduces the water content to 40 per cent by weight before the remaining material is dumped into waiting railroad cars.

Cooling system

From the treatment plant the water flows, again by gravity, through a tunnel to the big cooling basin, the heart of the recirculation system.

When the engineering firm of Sergant and Lundy of Chicago was designing the water system, it was determined that a conventional cooling system to handle the water used at Geneva would require 48 induced draft cooling tower fans in double batteries on a 45 by 330-ft. plan. Some 1,500 hp. of motors would have been required to power the fans. This was not feasible economically for the Geneva operation, so the engineers specified the big cooling basin that is located immediately northwest of the main plant buildings.

The basin is constructed on the shore of Utah lake, protected from the muddy water of the lake by an earth dike. It has a surface area of 312 ac. The bottom of the basin is at 4,520 ft. elevation, the surface being 8 ft. higher. The operating level may safely run as low as 4,522.

The water from the treatment plant flows into the cooling basin at the north end. Before it goes out through the intake at the south end it must travel nearly two miles. During this journey the water cools down to an average temperature of 60 to 65 deg., a process involving a heat loss through evaporation of 18,000,000 BTU per min.

The cribhouse intake, at an elevation of 4,508, 12-ft. below the bottom of the basin, supplies another gravity feed conduit to the plant powerhouse and circulation system. The power for circulating the fluid in the treated water system is furnished by three Ingersoll-Rand centrifugal pumps, each with a rated capacity of 23,000 gpm with 180-ft. head. Each is powered by a 1,250 hp. motor.

On its way into the plant the treated water is kept under constant laboratory control and further conditioned in a chlorination plant. Pipes in the intake tunnel feed the chlorine solution into the incoming water. Some chlorination is also done on a spot basis from the cribhouse occasionally when the intake tunnel is being cleaned.

Heaviest consumers of the outdoor treated water system are the coke oven plant, which requires 12,610 gpm; open hearth plant, 15,625 gpm; blast furnaces, 9,380 gpm; plate mill, 5,690 gpm; and structural mill, 2,400 gpm. Practically all of this water returns to the cooling basin for another cycle through the plant because the system has a leakage loss — not counting evaporation from the reservoir—of only 450 gpm.

Untreated water

The outdoor untreated water system gets its supply from springs near the property, contributing 1125 gpm; deep artesian wells, 4,000 gpm; shallow flow wells, 4,400 gpm, and various irrigation canals, 5,850 gpm. Two more 23,000 gpm, 1,250 hp. pumps, do the circulating work for this water.

Primary demand on the untreated system is for water to cool the rolls of the blooming, plate and structural mills and to cleanse the blast furnace gas.

This water cannot be re-used economically for plant purposes. So it is purified to conform with state health standards and discharged into Utah lake, where it becomes available for Utah valley irrigation. The discharge, incidentally, as well as all incoming water, is carefully measured through weirs to determine payment or credit for water used or made available for irrigation, as the case may be.

Domestic water

The domestic water supply comes, at 300 to 2,400 gpm, from a number of artesian wells on the property that flow into a special collection basin.

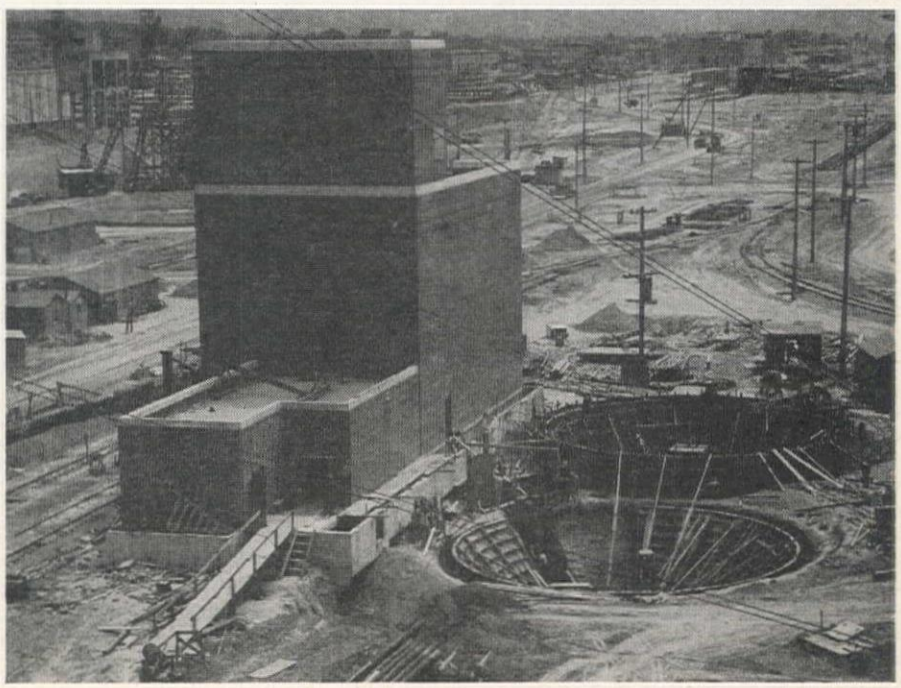
An automatic zeolite system and separate reservoir and pumping equipment handle the domestic water load which normally averages about 900 gpm. Two 750 gpm, 92-ft. head pumps draw the water from the basin and start it through the purification channels.

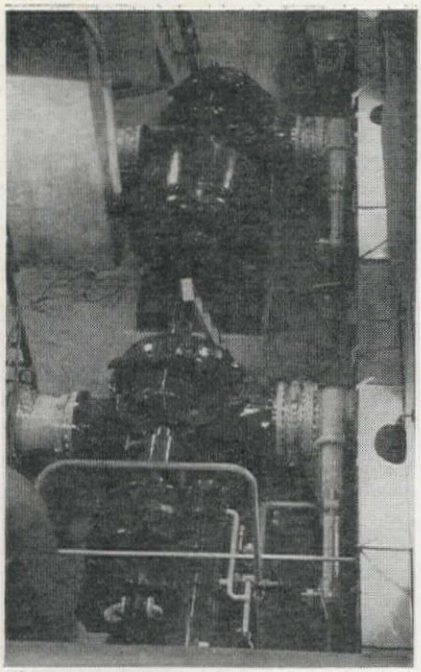
The softeners, reducing the hardness at a rate of 415 gpm, are of the pressure, downflow type containing zeolite, supported by layers of graded gravel, to remove the calcium and magnesium. The softeners are taken out of service to be regenerated three times daily. Otherwise, the cycle of softening, backwashing, brine injection and rinsing are performed automatically.

The iron content is kept at a minimum and the corrosive action reduced through a Calgon feeding system in which alkali is dissolved and introduced into the softened domestic water.

All domestic water is chlorinated by a Wallace and Tiernan water-operated hypochlorinator. The system's reservoir has a storage capacity of 45,000 gal., providing a reserve that would last at least 50 min. at maximum consumption if the entire supply failed. Three 750

ACCELERATOR BASINS of the outdoor treated water system at Geneva Works, during construction. Capacity of the treating plant, adjacent to the basins, is 8,300 gpm.





PUMPING PLANT on the treated water system at the Geneva plant. All equipment is electrically operated. Water source is the Deer Creek reclamation project.

gpm, 230-ft. head centrifugal pumps, motor driven, draw the water from the reservoir and pump it through pipes to the various domestic outlets throughout the plant.

Additional facilities

The ground water system lowers the elevation of the water table and at the same time provides additional untreated water. The sub-surface output flows through drain pipes and open ditches into collection basins and then into the pickup sump for the untreated water system. A coordinated surface water system, designed to handle runoff from rain storms of one-half inch per hour with a runoff factor of 90 per cent, uses open ditches wherever possible. Some of the runoff goes into the service water system, the rest into Utah lake.

In addition there are miles of steam pipe and an intricate sanitary sewage system designed to treat the domestic waste water from an average working force of 6,000 persons, averaging 80 gal. of water used each. The sewage is treated through a chlorine control apparatus, the effluent going into a 30-min. retention chamber, then into waste ditches or the untreated water system.

Colorado Collects $5,000,000 For Postwar State Buildings

UNDER COLORADO'S Ten-Year-Plan for providing postwar construction at state institutions, it will have accumulated approximately $4,697,000 toward new buildings by 1947, according to Dr. El Roy Nelson, director of the Colorado Planning Commission. The fund stood on Sept. 30, 1944, at $2,506,066.

Institutions are allowed to expend 1½ per cent for making postwar plans ahead of time, and under this provision the 10-year chart is being readjusted somewhat. Educational institutions in particular are making ready for a rush of returning service men more interested in technical education than ever before. Actual building plans are being prepared, so that work can start the instant materials are available after the war.

Among the larger allocations, as the plans now stand:

University of Colorado at Boulder, new physics and chemistry building, $400,000; new School of Business, $175,000; at Denver, Colorado General Hospital, $127,400; at Fort Collins, Colorado State College, auditorium and classrooms, $270,000; at Greely, State College of Education, remodelling and modernizing Cranford Hall, one of the older campus buildings, $200,000; new auditorium and music building, $265,000; at Golden, Colorado School of Mines, new chemistry and petroleum engineering building, $428,000; at Gunnison, Western State College, physical education building, $125,000; at Canon City, state penitentiary, $347,200; at Pueblo, State Hospital for the Insane, $580,700, increased patient facilities; state capitol, Denver, remodelling the utility, plumbing and heating systems, and reroofing the capitol, $491,000.

The funds for the program are set aside out of a tax levy originated in 1937, and are therefore definitely available.

Utah Power Firm Seeks To Purchase Affiliate

THE FEDERAL POWER Commission has announced receipt of an application filed under Section 203 of the Federal Power Act by the Utah Power & Light Company, a corporation organized under the laws of Maine and having principal offices in Salt Lake City, Utah, for an order authorizing it to acquire all the properties and assets of Utah Light & Traction Co., also of Salt Lake City. The Utah Light & Traction Co. is a subsidiary of Utah Power & Light Co. and both are controlled by the Electric Power & Light Corp., a sub-holding company in the Electric Bond & Share system.

According to the application, the Traction company owned, prior to July 12, 1944, transportation facilities which it sold to the Salt Lake City Lines, a non-affiliated company. The facilities to be acquired by Utah Power & Light include electric generating plants, transmission and distribution lines and systems and other electric properties in the State of Utah, which have been operated under lease by Utah Power & Light as a part of its interconnected electric power system since 1915.

The application states that the Utah Power & Light Co. proposes to acquire all the remaining properties and assets of the Traction company in consideration for the assumption of all the liabilities of Utah Light & Traction Co., the forgiveness of all indebtedness due to the former from the latter, and the cancellation of all of the capital stock of Utah Light & Traction Co., now owned by Utah Power & Light Co.

The Utah Power & Light Co. maintains and operates an interconnected electric power system located in the states of Utah, Idaho and Wyoming. The Utah Light & Traction Co.'s facilities are all located in Utah.

It is believed that the affiliation would result in more efficient operation of all properties and increased war power potential.

WPB Forms New Control Board for Construction

J. A. KRUG, chairman of the War Production Board, has announced that, in order to provide a centralized point of control over all matters pertaining to construction within WPB, a Construction Bureau is being established, responsible to Hiland G. Batcheller, operations vice chairman. The bureau will be headed by Arthur J. McComb of Montclair, N. J.

The Construction Bureau will include the existing Building Materials Division, the Construction Machinery Division, the Plumbing and Heating Division and the bulk of the Facilities Bureau, which is being abolished.

A Bureau Requirements Committee is being established to pass on all construction requirements and construction programs and all major construction projects. Appeals from its determinations will be taken only to the central Requirements Committee of WPB.

Krug pointed out that establishment of this bureau not only provides a centralized point of control for the handling by WPB's operating divisions of all problems in the construction field, but also furnishes a mechanism through which construction work can be actively promoted whenever diminishing war requirements make that possible.

Under the new set-up, a manufacturer or a contractor who seeks approval for a building project will go to the WPB operating division that has jurisdiction over his field, just as he would have done in the past. The Construction Bureau will not eliminate the responsibility of these divisions and their respective requirements committees for sponsorship of such projects, but it will provide a means through which the prospective builder can have all of his problems handled in one place, so that it will not be necessary for him to deal with a number of separate WPB divisions.

Ground Water Determinations

Technicians of U. S. Soil Conservation Service develop new techniques of using piezometers for observation of underground water flow characteristics—The instruments have been extensively used in Imperial Valley in permeability, drainage, pump drawdown and waterlogging studies

By W. W. DONNAN
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DURING THE PAST three years, the writers have developed and used in connection with drainage investigation, a very simple and satisfactory small-diameter ground water observation well, technically termed a piezometer. They believe it may have many applications outside the particular fields in which they are working and it is known to have been adopted by several other agencies interested in ground water problems. The purpose of this paper is to present a description of the equipment and techniques, with a brief discussion of their application.

Applications to ground water problems

One of the simple applications of the piezometers is to determine ground water table fluctuations. In this case they are installed in single units in a grid over the area to be observed. For a 160-ac. field a 300-ft. spacing might be used. For a less intensive study over several square miles, perhaps a spacing of one-quarter to one-half of a mile would be sufficient. The depth of this type of installation would be governed by the expected depth of water table at low ebb of the yearly cycle and by the existence of any unusual stratification as indicated by suitable borings. Practically all studies of drainage problems necessitate a determination of the water table levels and fluctuations. The simplicity, ease of installation, and accuracy of piezometers makes them very inviting devices to employ. Piezometers might also be used to determine the effect of over-irrigation on the water table in connection with water use or water application efficiency studies.

For securing ground-water flow patterns where the efficiencies of various types of drainage devices are to be determined, or for studies of seepage from canals, or source and direction of extraneous ground-water flow, groups of two or more piezometers at each location are employed.

The termination points of the piezometers in any one group will vary with subsoil stratification and with the depth of the flow pattern desired. Such installations often indicate the existence of upward flow from permeable aquifers underlying a stratum of low permeability. Effective drainage in such instances can best be achieved by tapping these aquifers and reducing the hydrostatic pressure by pumping or other practical means. From the data obtained with piezometers, ground water flow patterns can be prepared.

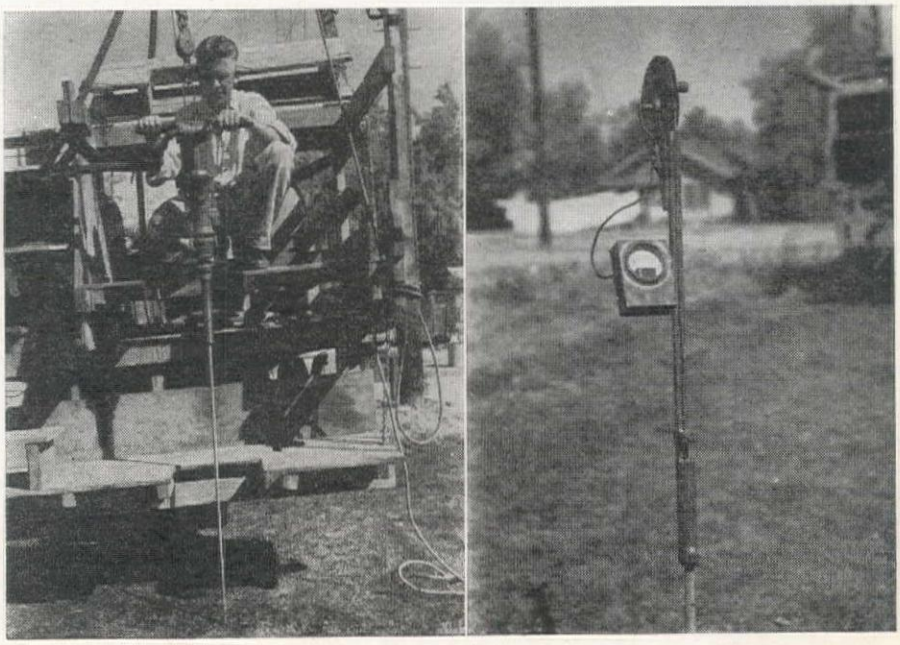
The locations of the lower ends of the piezometers are plotted on a vertical section. The elevations of the water levels in the piezometers are then penciled in at these points and contour lines of equal hydrostatic head (equipotential lines) are drawn. The actual flow lines are normal to these equipotential lines. These flow patterns are very helpful, and often provide a basis for the design of improvement works.

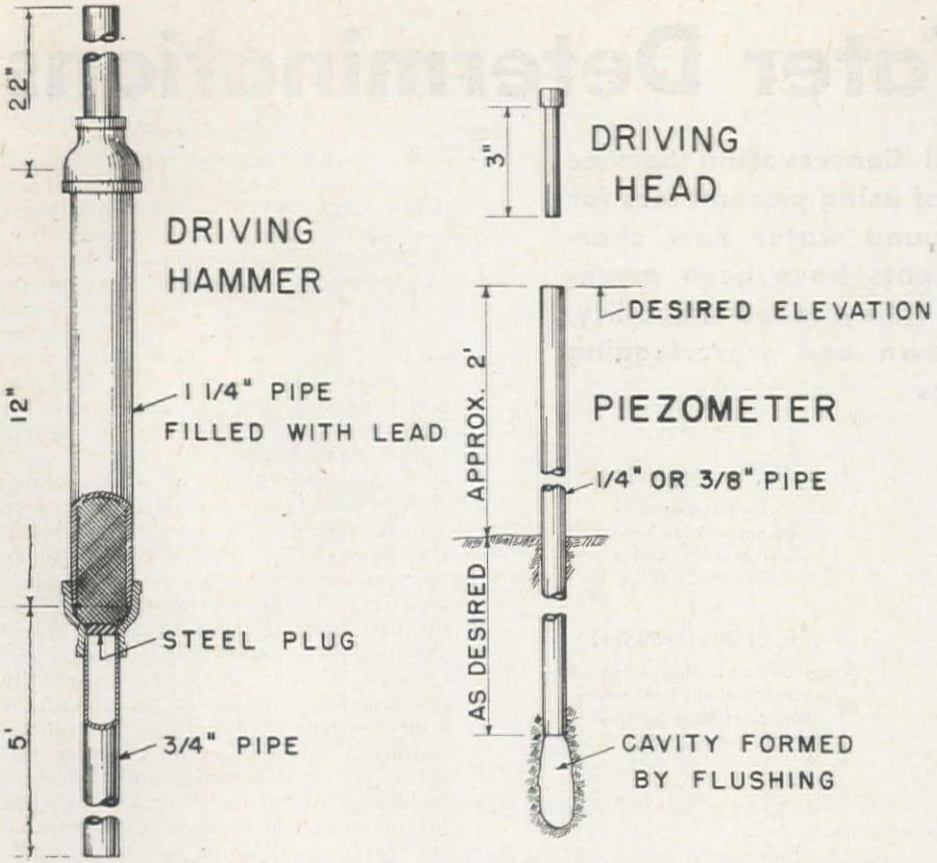
Although the writers have not used piezometers for this purpose, it is believed that they are well adapted for determining hydrostatic pressures in connection with the construction of earth embankments (highway fills, levees, dams, etc.). When such embankments are placed upon saturated foundation material of fairly low permeability part of the load is transferred temporarily to the water within the soil pores, and this pore water pressure increases as the fill rises. Settlement takes place gradually as the water escapes from the material. In some cases sand drains are installed to permit more rapid drainage. Observations of the hydrostatic pressures involved are important. For materials of very low permeability, increased sensitivity can be obtained by equipping the piezometers with simple mercury manometers, instead of using open piezometers and the electric water level indicator described later herein. When this is done, equilibrium is quickly obtained with very little water actually moving in or out of the piezometer. A bourdon gauge (pressure or vacuum as required) can also be used as the indicator. Where dewatering operations are to be carried out for construction work piezometers can be used to determine the extent and scope of the ground-water problem. Sewers, foundations, and all types of subaqueous work require accurate information on the ground-water before an estimate of cost of construction can be made. Piezometers can be used economically in making surveys of this type. When the actual dewatering with well points or other means is in progress the piezometers would be useful to indicate the degree of success of the operations.

Use in Imperial Valley

In connection with drainage studies

PNEUMATIC DRIVER employed by Soil Conservation Service for inserting piezometers used in studies in the Imperial Valley of California (left). Electrical water level indicator mounted on piezometer. Operated by penlight batteries, wire on reel.





DETAIL DRAWINGS of pneumatic driving hammer and the piezometer itself. Piezometers have been driven as far as 30 ft. into the ground using this hammer, which operates by fitting the ¾-in. pipe over the driving head of the instrument. All tops are set level.

conducted by the writers, piezometers have been used and have proved satisfactory for field permeability studies, using a modification of the Thiem method as described by Wenzel in U. S. G. S. Water Supply Paper 887. Briefly the method consists of putting down a shallow well penetrating the material for which the permeability is desired. In Imperial Valley, the subsoil material consists generally of alternating strata of clay and fine sand. Suitable borings are made to determine the stratification and a small gravel envelope well is put down to a depth of 12 to 20 ft., ending in a stratum of clay. Piezometers are installed along lines radiating in four directions from the central well, being spaced in geometric progression from it. Spacing of 2.5, 5, 10, 20, 40, and 80 ft. from the well have been found satisfactory. The number of piezometers at each location is dependent upon the stratification encountered. If the clay layer in which the well is terminated is not too thick, a set of piezometers penetrating the underlying sand provides an indication of the extent to which this material contributes to the flow. Piezometer readings are obtained before pumping, and at intervals during a period of continuous pumping. The extent of the drawdown gradually increases, and comes into equilibrium with the radial flow toward the well. From the data obtained, the effective permeability of the subsoil material can be calculated. Such data are essential to a rational design of drainage systems.

Piezometers might find widespread application in the solution of many problems not mentioned here. Suffice it to say that their principal advantage over other devices used for determining ground-water levels lies in their simplicity, ease of installation, accuracy and low cost.

Ground-water piezometers

The term "piezometer" is not new, having been used by McLaughlin and Israelsen for a similar device in 1932 and discussed by them in Bul. 242 of the Utah Agricultural Experiment Station. The present instrument was devised by the U. S. Regional Salinity Laboratory and first used in the Imperial Valley of California in 1942. It involves simplifications in technique of installing and operating which has increased its usefulness. Since that time piezometers have found application in the solution of many ground water and drainage problems in the Imperial Valley and elsewhere. They were briefly described by Christiansen in *Agricultural Engineering*, Vol. 24, pp. 339-342, October, 1943, and have been mentioned by Israelsen and Reeve in Bul. 313 of the Utah Agricultural Experiment Station.

The ground-water piezometer consists of a standard ¼- or ⅜-in. galvanized iron pipe, driven vertically into the ground to a definite level. Before driving the piezometer a loose rivet is placed in the lower end to keep the soil from entering. When the desired depth is reached a jointed rod is inserted and the rivet is punched out of the bottom, leaving an open pipe or well. In some soils the protecting rivet is not needed.

A driving head is placed on the upper end of the pipe to protect it from damage while being driven. The driving is done with a special hammer fashioned like a steel fence post driver. It consists of two pieces of ¾-in. pipe, 22 in. and 5 ft. long, respectively, joined together by a 1-ft. section of 1¼-in. pipe filled with lead. This leaded section is fitted with a steel plug at each end to receive the blow. The piezometers are started into the ground with the soft, pipe end of the hammer over the driving head. When the top of the piezometer is driven to within 5 ft. of the ground surface the hammer is inverted and the driving continued until the top of the piezometer is at the desired elevation, about 2 ft. above the ground. Piezometers have been driven with a pneumatic jack hammer by using a driving cap over the top into which the jack hammer pilot will seat. This method of driving has made it possible to install piezometers to 30-ft. depths in very heavy soils.

Care is taken to start the piezometers as nearly plumb as possible, using a carpenter's spirit level. They may be installed in single lengths up to 14 ft. by working from a step ladder. When greater depths are required the pipes are joined with standard pipe couplings. The maximum depth to which they can be installed is limited only by the difficulty in driving and in removing the rivets.

After the piezometers are driven to the approximate grade an engineer's level is used to set the tops to an exact elevation, which facilitates computations. An easy method of setting all the piezometers at the same level is to mark the driving hammer with a strip of adhesive tape. The driver can then tap them into position at the direction of the level man without having to remove the hammer and set the rod. Since readings are made to the nearest hundredth of a foot the tops should be set within that limit of accuracy.

FLUSHING the piezometer with flexible tubing is the last step in preparing it for use in recording ground water levels.

Flushing piezometers

An essential feature which in a large measure determines the success of the piezometers is the flushing operation, which leaves a small cavity at the lower end of the piezometer. After it has been driven to grade and the rivet punched from the lower end, the pipe is cleaned out by pumping water into it through a flexible tube. The water escapes by flowing upward through the annular space between the tubing and the wall of the pipe.

The equipment needed for this flushing procedure includes a 5-gal. water container and a stirrup pump with a length of plastic tubing (Saran-¼-in. O. D.) adequate to reach the bottom of the deepest piezometer. The tubing is marked with colored lacquer at 1-ft. intervals, or to correspond to the lengths of the piezometers used.

The plastic tubing is pushed down inside the pipe until it nears the bottom, while pumping; then is gradually lowered until the end is about even with or just slightly below the end of the piezometer. Flushing is accelerated by working the tubing up and down, with care being used not to lower it past the desired depth. The first water to overflow the pipe is usually very silty, but as pumping continues it clears. The tubing is then withdrawn while pumping continues, and the piezometer is tested for sensitivity by filling and observing the rate at which the water drops. Experience will soon indicate the approximate rate to be expected. If it appears too slow the flushing is repeated, the tubing being lowered slightly below its previous level to enlarge the cavity. In some permeable sands, piezometers have taken the water so rapidly that no overflow occurred, whereas, for some soils of low permeability, the rate of subsidence of the water in the piezometer is hardly perceptible. In some instances an equilibrium level is obtained in a few minutes, while in extreme cases 24 hours or more may be required.

The rate at which the water level subsides is a rough but useful indication of the soil permeability. A piece of glass tubing of the same outside diameter as the pipe may be installed on top of the piezometer with a short rubber tube connection. This permits the rate of water level drop to be determined.

When the piezometers are driven without rivets, plugs of soil 6 to 8 in. in length will pack in the lower end. In some soils these plugs can be flushed out in less time than would be required to punch out the rivets.

Sometimes piezometers will seal up after being in use for several months. Where several are used in the same vicinity, erratic readings of one or more indicate sealing, which can be readily overcome by reflushing. A loose rivet set in the top of the piezometer will prevent insects from entering.

Water level indicator

The use of small diameter pipe necessitates a different type of sounding device than is commonly used for larger observation wells. A satisfactory electric water level indicator has been developed for this purpose. The essential parts of the device are a flexible rubber covered wire marked with 1-ft. graduations, small penlight batteries as a source of current, and a milliammeter or voltmeter to indicate the closed circuit.

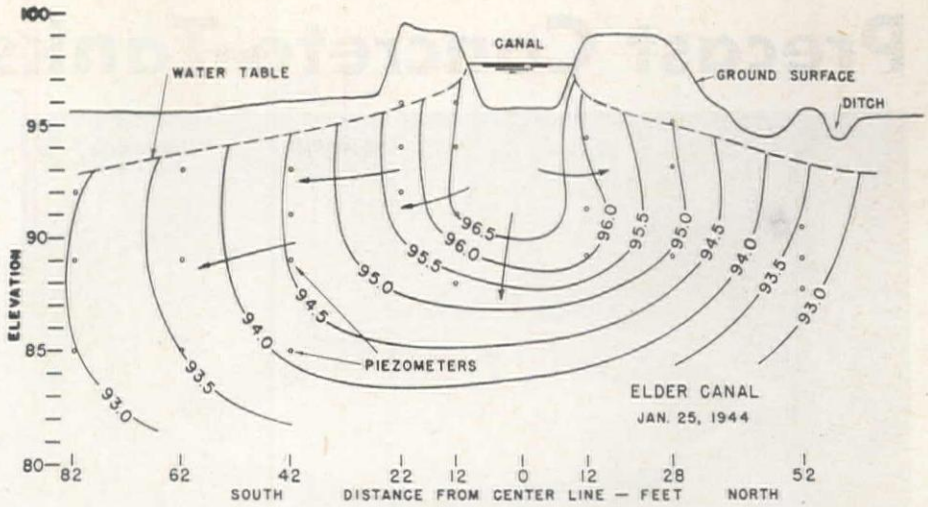
The wire should be very flexible and well insulated and should not kink easily. It is held on a reel, and the end is equipped with a weighted tip. It is marked at 1-ft. intervals with colored lacquer bands, using a color code to indicate the foot reading. The wire passes in front of a fixed scale 1 ft. long graduated in tenths and hundredths of a foot. This scale reads from the top down so that the reading is obtained directly to 0.01 ft.

The sounder tip is made from a piece of ¼-in. brass tubing about 1 ft. long (⅛-in. tubing can be used for ⅜-in. piezometers). The insulated contact wire passes through this tubing and is soldered to a metal tip which is insulated from the brass tubing with a piece of lucite machined to fit into the end of the tubing. A reel that will accommodate just one width of the wire has been found most satisfactory.

A milliammeter of 0-25 ma. range is well adapted as an indicator or a high-resistance volt-meter is satisfactory. When ground waters contain a relatively large amount of dissolved salts, a single cell will give a satisfactory reading, otherwise two cells may be required. The instrument is arranged so that when it is seated over the top of the piezometer pipe, the readings give the distance from the top of the piezometer to the water surface. The weighted wire is unreeled into the piezometer until the tip end contacts the water surface, completing the electric circuit. The piezometer itself acts as a part of the circuit, one terminal of the dry cell being grounded to the instrument, which makes contact with the piezometer. With care, readings are accurate within 0.01 ft.

Removal of piezometers

The piezometer pipes may be used many times over if care is taken in removing them from the ground. Lengths up to 8 ft. usually can be pulled by hand after loosening by turning with a pipe wrench. For deeper installations several adaptations of an ordinary soil tube jack have been used. One consists of a set of small grippers that fit around the piezometer and are raised by the jack. A better method involves the use of an A-frame or tripod of 2 x 4-in. material from which is suspended a ratchet hoist. A wooden chuck clamp is fastened to the piezometer and attached to the hoist pull chain. When the pipe is removed it should be cleaned of soil and corrosive scale and straightened. Some pipe has been used as many as six times.



FLOW PATTERN of ground water seepage from a typical irrigation canal, showing piezometer locations. These investigations have been carried out in Imperial Valley.

Fresh Water Canal Trap Proposed at Salt Lake

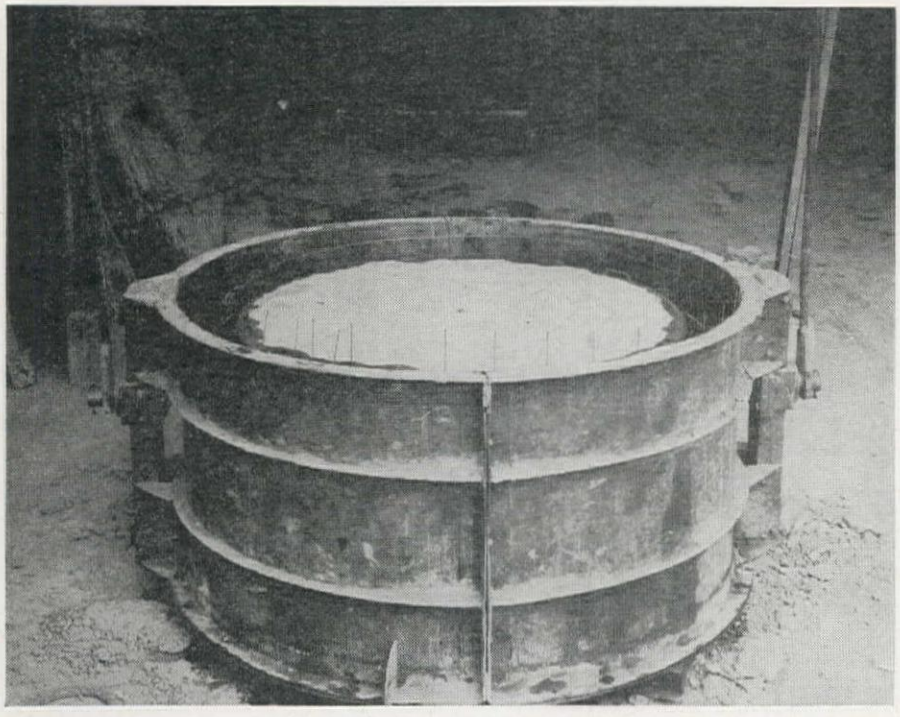
REGIONAL DIRECTOR E. O. Larsen of the Bureau of Reclamation reports that the Bureau is considering the possibility of constructing a 200-ft. wide canal along the east shore of Great Salt Lake as a means of increasing the fresh water supply of the industrial section of Utah.

The proposed canal would trap fresh drainage water and carry it to points between the Willard reservoir and the smelters and copper refineries at Magna for use as needed. The canal is being considered in place of a previously suggested dike across Antelope Bay of Great Salt Lake, after studies found that construction of the dike would be extremely difficult.

At the same time, Utah State Engineer Ed H. Watson disclosed that current heavy industrial water demands have not seriously lowered Utah's underground water supplies. He attributed the favorable situation to the state's strict water conservation laws.

However, Watson suggested that it would be advantageous after the war to build a hydro-electric power plant on the Colorado river in eastern Utah to furnish new electrical power for industry and possibly to pump Colorado river water over the Wasatch mountains into the Salt Lake basin for agricultural, industrial and domestic uses.

Precast Concrete Tanks for Fuel Oil



STEEL PLATE MOLD for 500-gal. tank with welded steel mesh reinforcement in place in preparation for pouring. Tank is poured bottom side up and immediately turned over (note trunnions) on clamped pallet to permit concrete to settle toward floor.

Use of precast concrete for fuel oil tanks necessitated by steel plate restrictions—Various sizes manufactured by adding 15-in. rings to height of basic 500-gal. steel-plate mold for each additional 250 gals.—Tank made impervious to petroleum products by lining inside surface with synthetic thermoplastic

By FRANK M. BROOKS
General Manager
Art Concrete Works
Pasadena, Calif.

THE BOMB EXPLOSIONS at Pearl Harbor, which diverted the national productive capacity from peace to war, were felt in every nook and corner of our industrial structure.

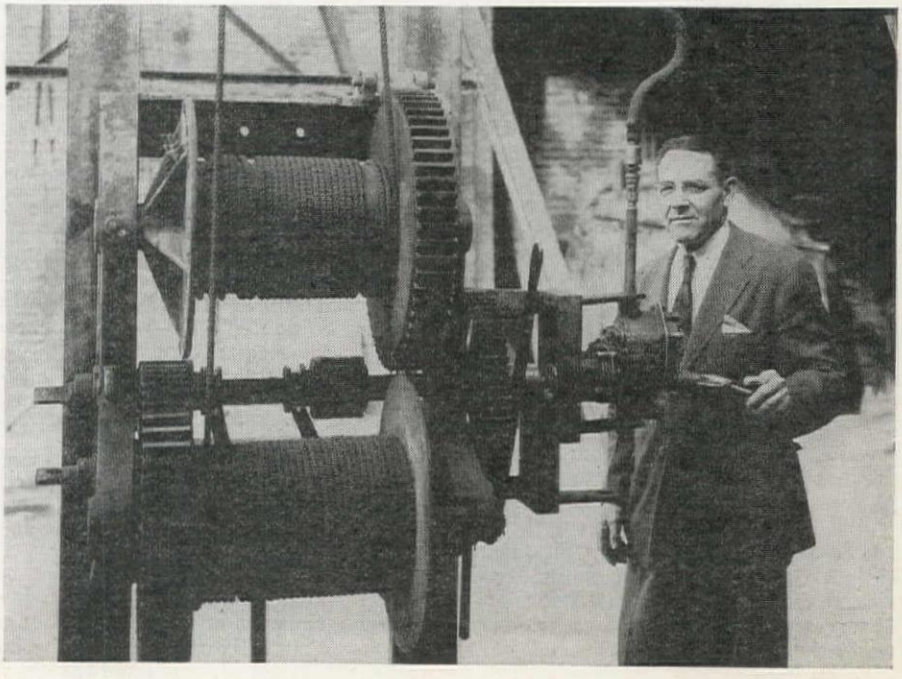
Illustrative of this fact is the experience of the Art Concrete Works of Pasadena, California. This firm has devoted its efforts during most of its 33 years to supplying the requirements of public utilities for precast concrete meter boxes, valve boxes and junction boxes used in the underground distribution of water, gas, electricity and telephone. Until early 1942 the largest unit manufactured weighed less than 200 lbs. During the past two years this plant has produced, regularly, units which weigh 12,000 lbs. each.

The War Production Board limitations on the use of strategic materials, of which the most important was steel plate, applied not only to their use by fabricators, but equally to their use in the huge construction programs of the Army Engineer Corps, the Navy Bureau of Yards & Docks, the Maritime Commission and War Housing Administration. The West Coast portion of these programs, designed to house great concentrations of military and civilian personnel, lay in a region where the conservation of natural gas for industrial use was imperative, and almost without exception plans called for the use of fuel oil for space heating, hot water and cooking purposes.

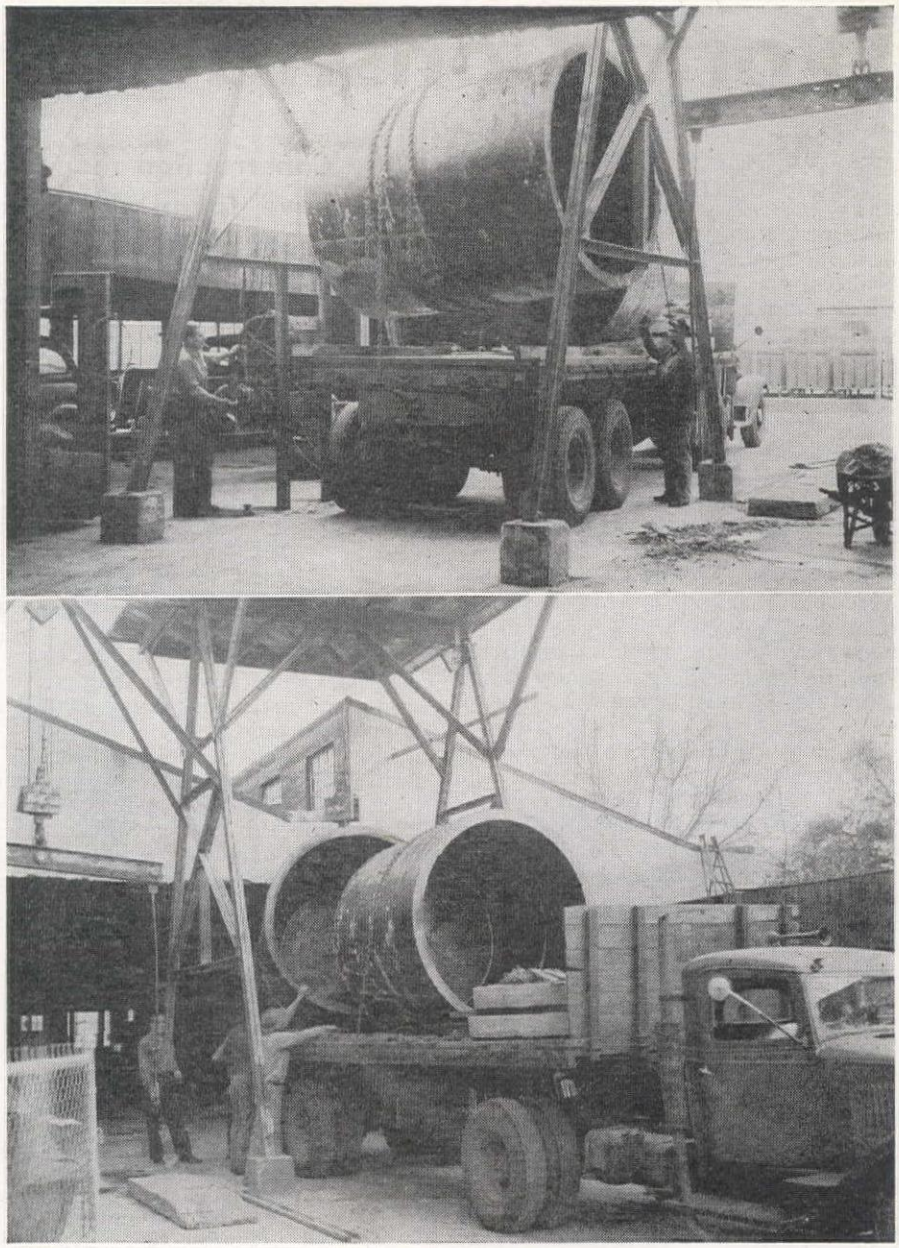
When it became evident that steel tanks for the storage of this fuel oil would not be obtainable, the Los Angeles office of the Army Engineers suggested that this firm explore the possibilities of precast concrete tanks for fuel oil. These tanks would be required in capacities ranging from 500 gal. to 1,500 gal. and in large numbers. Reinforcement was to be held to a minimum to conserve steel. A tentative design was submitted and was approved with minor changes. An initial order was placed for 43 tanks of the 500-gal. size for one Army airfield, and designs for the necessary molds and handling equipment were rushed to completion. The first tank was made on June 20, 1942, and since that date some 1,500 tanks have been made and shipped to construction projects in Southern California, Arizona and Nevada.

Tank specifications

The tanks are all cylindrical, 6 ft. 9 in. outside diameter, with the top inside diameter of all sizes above 500 gal. being 6 ft. 1 in., and having parallel 4-in. walls to within 3 ft. of the bottom, which is the 500-gal. level. At this point the inside diameter is reduced to 6 ft. and tapers inward to 5 ft. 7 in. at the bottom. The floors of all the tanks are 4 in. thick. The overall heights vary from 3 ft. 4 in. for the 500-gal. tank to 8 ft. 4 in.



HAROLD P. MANLEY, engineer of the Art Concrete Works, demonstrating the 2½ h.p. air drill he adapted to drive hoist consisting of wire rope blocks and double drum "crab" hoist.



STEEL GANTRY, 22 ft. high, provides two hoisting locations side by side. Completed tanks are loaded by one hoist without interrupting production work under the other (lower left).

for the 1,500-gal. size. The weights of the tanks without covers vary from 6,800 to 12,000 lbs.

The cover is a circular flat slab 7 ft. 6 in. outside diameter and 4 in. thick, with a skirt 4 in. wide which extends downward outside the top edge of the tank for a distance of 2 in. It weighs approximately 2,000 lbs. and is provided with a 22-in. inside diameter central manhole which is covered in turn with a 30-in. outside diameter manhole cover 2½ in. thick. This manhole cover is keyed in place with a circular tongue and groove joint. The joint between the top edge of the tank and the large cover, as well as the joint between the large cover and the manhole cover, is sealed with a heavy mastic compound at the time of installation in the field. The same cover is used on tanks of all capacities.

All tanks are provided with the necessary openings for filling, discharging, venting and sounding. These take the form of threaded pipe couplings cast into the sidewall and cover, each coupling being anchored into the concrete by means of short lugs welded to its outside surface.

The concrete is specified to have a 28-day compressive strength of 500 lbs. p.s.i. with a ¾-in. maximum aggregate. During the early days of the project when every day gained in delivery was so vital, the use of high-early-strength cement enabled the specified strength to be obtained in 7 days. All tanks are water cured by sprinkling.

The method of reinforcing is the same for all sizes. A cage of 6 x 6-in. 10-10 welded steel mesh is located centrally in the sidewall and bottom of the tank. In the 1,000 and 1,500-gal. sizes an additional ring of ⅜-in. deformed bar with a welded joint is placed near the top edge. The covers are reinforced with the same size mesh plus two ⅜-in. welded rings, one near the outside edge and one around the manhole.

The treatment of the inside and outside surfaces of the tanks varies with the specifications. When installation is to be in the ground a waterproofing treatment consisting of one coat of asphaltic primer and two coats of hot mopped asphaltic enamel is applied to the outside. For above ground installation this treatment is omitted. The inside surfaces are lined with a synthetic thermoplastic, applied in solution in five coats, one of primer, two of enamel, and two of sealer. This material is completely impervious to all petroleum products, including 100-octane gasoline.

Manufacturing methods

In designing the manufacturing and handling methods it was decided at the outset that:

(1) Molds should be fabricated of steel plates adequately reinforced with angles and channels, to provide satisfactory service over an extended period and should permit the manufacture of the various sizes by adding to the height of the basic 500-gal. mold in increments of 15 in. for each additional 250 gal.

(2) Placement of the concrete should be by means of internal vibration to secure maximum density and minimum surface defects.

(3) The filled mold, after being poured bottom up, should be immediately turned right side up on a clamped pallet so that the inevitable settlement of the concrete in the side walls would be toward, rather than away from the floor of the tank, thus avoiding the possibility of a settlement crack between the two. Trunnions were provided on the outer mold for the turning operation.

The covers are poured flat on the shop floor in a mold consisting of a circular shell in two halves and the required cores to form the outside rim and the manhole.

The cover mold and the 500-gal. tank mold are filled by direct discharge from mixer trucks. The taller tank molds are filled by shoveling from an intermediate platform onto which the mixer truck discharges.

The internal vibrator is of standard design, having a 2-in. diameter head. The rotating element is direct driven at 9,000 r.p.m. by flexible shaft from an electric motor and has a low amplitude of vibration.

The handling equipment consists of a permanent steel gantry 22 ft. high which provides two hoisting locations side by side. This permits loading out of completed tanks by one hoist without interrupting production, being carried out simultaneously under the other hoist.

Impossibility of quick delivery of electric hoists necessitated the improvisation of other equipment. Wire rope blocks and a double drum "crab" hoist were used and a Chicago Pneumatic rotary air drill of 2½ h.p. was adapted to drive the hoist. Later, the same combination on a smaller scale was used to equip a portable gantry on casters, which is used in moving the covers and in handling the molds during their assembly.

World Construction Company

Construction men from all parts of the country have found that their skills, built up through years of work on difficult projects, have a definite and very important part in winning the war—Intelligence, brawn, training, combine to win battle of advance Navy invasion base construction

By SEABEE R. P. DAY
In the South Pacific

WHEN THE COMMANDER got out of his station wagon and walked across the review field at Camp Bradford one October day in 1942, a thousand men snapped to attention. They were Seabees, one of the earlier battalions. Already construction battalion strength was piling up so fast that clothing had not been completely issued to these men.

The music hushed. They stood a little awkwardly, self-conscious in blue denim. Many had come from places relatively high in the construction world. Their destiny was now in their commander's hands. He would lead them, and they would follow as faithfully as they opened their ranks for his inspection. For they were hardrock stiffs from the most rugged school on earth, all new to the Navy way of life. Looking down the lines, the commander saw plenty of hair as gray as his own beneath the rows of white hats.

He paused in front of a barrel-chested, Wallace Beery-type of character who looked as if he had roughnecked oil wells all the way from Tulsa to Kettleman Hills, and recently. He slouched easily at attention, his shoes barely polished, his white hat cocked far back on a red head that was getting bald about ten years ago. His attitude said, "I'm bored with this. When do we go to work?"

The commander said sternly, "Sailor, your hat's on crooked."

"God dammit, so's yours—sir," drawled the burly one, without batting an eyelash. He put exactly the right inflection on the "sir."

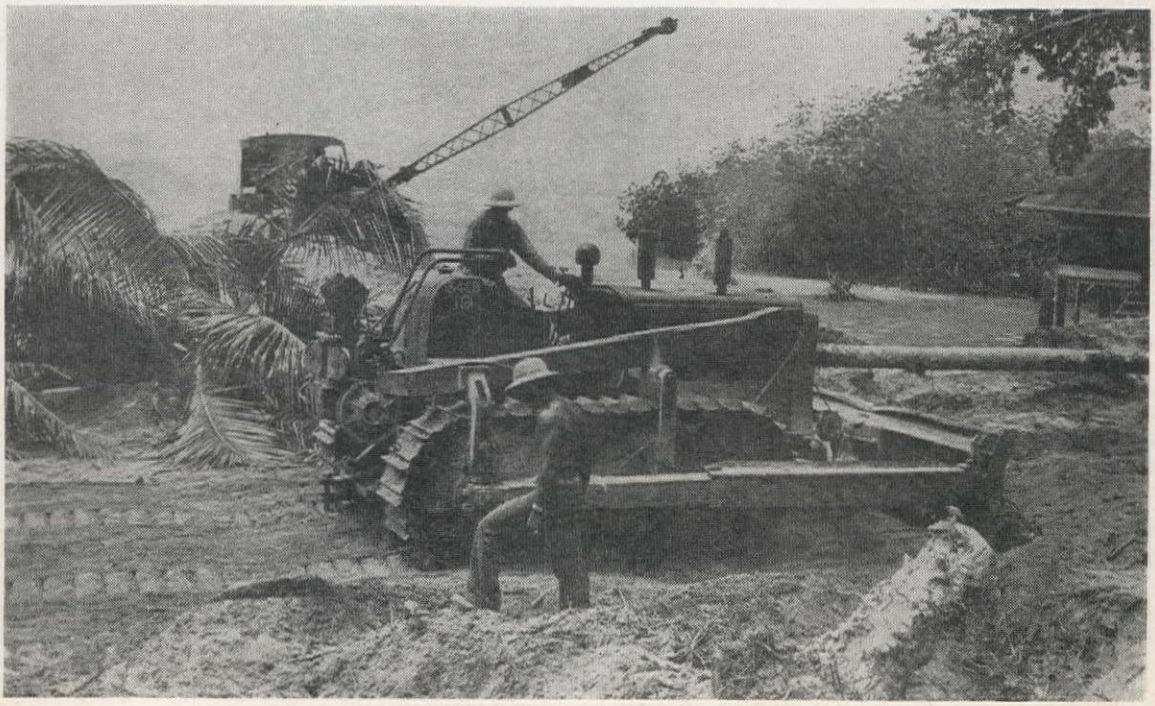
A tough bunch

That is the Seabee spirit, not exactly insubordinate but long enough on guts to make anybody in the questionable stage, regardless of his rank, feel decidedly uncomfortable. These men enlisted because the construction work they did in civilian life appealed to them. The man who tries to make them over into a spit and polish Navy man is not popular—definitely.

More facts have been used loosely in writing about this branch of the service than any other good subject in years. The public thinks the Seabees are a robust race of rowdy Americans who suddenly, under the stress of war, got to be supermen. Stories—how they substituted Coca-Cola bottles for insulators and installed an oil drum on the front end of a bulldozer to replace the bullet damaged cooling system — come trickling in from war correspondents. They are not out-of-the-way accomplishments.

What the Seabees are doing now is exactly what they did in civil life. If they are supermen it did not take a war and a Navy to make them so. The ranks of the Associated General Contractors of America are filled with the same caliber of men; indeed, Seabee ranks are filled as well with former AGC members. While you couldn't crowd a single Seabee out of the Navy while the war lasts, there are mighty few who, when V-day comes, will not move heaven and raise hell to rejoin some civilian contractor's force within 24 hours of the time the big show is over. They are as proud of the Boulder Dams and Pennsylvania Turnpikes they built in other days as they are of their accomplishments in the seven seas.

Seabees operate on headwork more than tradition and precedent and because of this they show up colorfully. There has never yet been a Seabee organization that has failed. Led by Civil Engineer Corps officers who were commissioned mostly from engineering schools, these units have made airfield construction history. Less publicized, but just as important, are such activities as ship repair, the operation of drydocks, roadbuilding, maintenance and operation of power plants, refrigeration, plumbing shops and even passenger elevators. When the Bureau of Yards and Docks



SEABEES COMMENCE construction of wharf facilities immediately after Japanese have been thrown back from the beach of a captured island in the south Pacific ocean.

purchased some of the largest hydraulic dredges in the world, it had in the Seabee ranks men who not only were hydraulic dredgemen, but some of whom had spent several years on the very rigs the Navy purchased from civilian dredging contractors.

Seabees are not surprised that they have done well. Most of them will admit that they have not done enough. Whenever a Seabee clipping is sent out to some battalion, it invariably lands up on the bulletin board, to be read with quiet smiles and remarks like, "Hell, we haven't done a thing, yet."

Praise from British

This is no inference that the stories as written are false, far from it. When the commanding officer of a British warship reports a unit of Seabees to be "on the ball" more than any outfit he has ever transported, including British and Australian personnel, it is high praise.

It happened largely on account of the cooks of Seabee Maintenance Unit 574, who lent a hand in the British galleys. Their cooking was so good that Capt. A. Ian Robertson, RNR, wrote in his commendation, "My own ship's company has been complaining that the standard of cooking has fallen off ever since the Seabees disembarked."

The admiral's opinion

Many times recently Seabee surveyors and engineers have worked in front of the Marines' front lines; building bridges, blazing trails or doing other necessary work. They have toiled under fire. According to Admiral Ernest J. King, in a report to the Secretary of the Navy, the Seabees have lent a strong hand to the operations now under way in the Pacific theater.

"In the Pacific, where distances are great and the expedious construction of bases is frequently of vital importance, construction accomplished by the Seabees has been of invaluable assistance," the admiral said.

"Furthermore, Seabees have participated in practically every amphibious operation undertaken thus far, landing with the first waves of assault troops to bring equipment ashore and set up temporary bases of operation. Other specialized services include the handling of ponton gear, the repair of motor vehicles, loading and unloading of cargo vessels and in fact every kind of construction job that has to be done."

Tokyo knows about the Seabees, too. A recent broadcast complained that they weren't fighting fair. "Their work of transforming captured atolls to airfields in a matter of days is nothing but a vulgar display of material," according to Radio Tokyo.

The first Seabee regiment of 3,300 men was formed on Dec. 28, 1941, just 21 days after Pearl Harbor. Today a peak strength of approximately 250,000 men has been reached, more than half of them overseas. In addition to the regular battalions, the war demonstrated the need for special units. Specialist detachments were formed. Stevedore units load and unload ship cargo. Maintenance units operate bases built and vacated by the regular battalions, who then move on to new fronts. They were all trained at Camps Allen, Bradford and Peary in Virginia; Endicott in Rhode Island; Lee-Stephenson in Maine; Parks in California; and at three advance base depots in Gulfport, Miss.; Hueneme, Calif.; and Davisville, R. I.

A 50-TON MINE HOIST rigged up by Seabees at the top of a 750-ft. inclined railway used for supply of equipment, materials, and supplies to an Alaskan coast defense project. Seabees practice jobs they knew in civilian life, at same time ready to fight.

Seabees boast of two things. In their branch of the service, more than any other, a man is more likely to do a job similar to that he did in civil life. Also, he is more likely to get a furlough in the states after being overseas a year or so than any other branch of the service except the Army Air Corps.

Advantages for Seabees

There are a few other advantages, too. Seabee beer gardens, movies and ships' stores are as good as the best on any base. Master Gunnery Sergeant Lou Diamond of the Marine Corps would bellow like a bull if you told him he would have made a wonderful Seabee. Lou was always doing something to help his men who "wasn't getting their beer like they should." That is the picture of a Seabee. He works harder, plays harder and gripes louder than anyone in the service.

A battalion is guided by its officers, and nearly all the actual construction work is left up to the men. They use their own methods to get results with a minimum of delay. Compared to the other branches, Seabee officers are not too numerous. Most of their time is taken up in the administration of battalion affairs, keeping personnel records, operating a bureau of supplies and accounts, and planning ahead from one month to the next what construction is to be done. The officers have their job and the men have theirs.

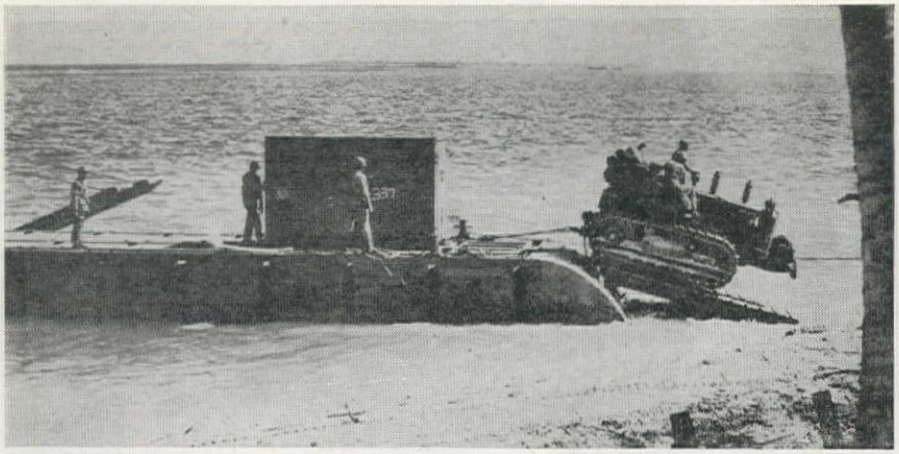
On a typical base job the battalion is likely to be split up into a number of subdivisions. Some will operate a motor pool and garage, where vehicles are repaired and serviced. There may be a laundry, refrigeration facilities, a plumbing shop, powerhouse, carpenter shop and a host of other miscellaneous operations. In case these things have to be built, new construction takes precedence over any other activity. Always there will be a heavy equipment shop, because the Seabee bulldozer is about as well known as the Seabees themselves.

The Seabee chief petty officer is to that branch of the service what the master sergeant is to the Army. He runs it. He is the man who is respected as much as he is hated, and vice versa. He is the one who speaks his piece whenever and to whomever he pleases. He is the man to whom a departmental officer goes to get results. Methods are usually up to the chief, who is always liable to removal if he is not familiar enough with his job.

The reason the Seabees have made airfield history is because of this effective relationship between officers and men. As any contractor knows, it is as important to use good equipment efficiently as it is to purchase it in the first place. Airfield construction involves the use of power shovels, trucks, carryall scrapers, tractors and rollers. Because American forces have that kind of machinery available they have built airstrips through rough terrain. The Japanese, depending mostly on hand labor, are limited to easy sites, cocoanut groves, plains and flat lands.

Head work

Because the overall plan is carefully conceived and understood by all Seabees, stories of rapid completion of projects, improvising and substitution become routine. The Seabee who in-



HEAVY EQUIPMENT being hauled from a ponton causeway by a Seabee-operated tractor at a wharfless South Sea island. These ponton causeways, or floating wharfs, were developed by the Seabees, and have been found useful in both the European and Asiatic war areas.

stalled an empty oil drum on the front end of his machine as a substitute for the radiator the Japs shot away was using his head. But so were the men who planned for him to get the tractor in the first place.

The man who equipped those same tractors with preformed wire rope before they left the states, for instance, did immeasurable good. Preformed is an improved cable product which has demonstrated on many a recent contractor's job that it will add about 30 per cent more hours of wearing life than is ordinarily possible with the older type of cable. The Navy does not indorse any product, but three officers and six heavy equipment chiefs who were asked for their personal opinions about preformed rope in doing the research for this piece all agreed that many an hour which ordinarily might have been spent in changing worn cables was saved for effective work by this selection of wire rope.

So many of the things the Seabees do remain unsung because they have so little story value. Many a working hour has been added to the performance of a carryall scraper because some obscure chief or ensign had the foresight to provide regular lubrication, no matter where the machines were working. By being careful with fuel handling and storing, many a diesel engine never stalled. That there is no story value or romance connected with alemite service and routine centrifuging of diesel fuel does not lessen their value as important facts in the story of Seabee performance.

When the final story is told and the secret of Seabee performance is revealed, it will be these general plans which weigh heavily. If the Seabee legend is "just a vulgar display of material" as Tokyo says, then it must be that some one in the Seabee organization made an especially accurate list of what was needed.

There is one phase of Seabee performance which has never fully come to light because it is so illegitimate. If all the facts were known about the amount of red tape that has been cut between Seabees, marines, army engineers, air forces and even the submarine service, there would be a waiting line in front of every brig, guardhouse and federal jail on the face of the earth.

Let us say the army air base needs some grading on taxiways. They have no bulldozers. The Seabees, who are close by, have the bulldozers but for the moment they are out of enamel in their paint shop. Enamel is a commodity carried in generous quantities by the air corps. Well? With no effort (it is called "no pain or strain" in the service) you see a sailor running a bulldozer over on the army air strip presently. And if you watched the front of the Seabee paint shop carefully it might be that an army truck would pull up. The buck sergeant, more than conscious of his rank, would order a couple of sad dogfaces to unload the enamel, pronto. That is how they use their heads to get results.

The Seabees, who were old hands at cutting red tape in civilian life, have raised this questionable art to a high level. Some of it goes on without the officers knowing it; some is done with their help. All of it is justified in the light of results. If the army officer who lost his jeep on Pier 3 in Norfolk is still interested in its fate along about 1950, will he please call SYlvan 0-1311 on the Pasadena, California, exchange? I may be able to give him a little inside information!

Door Makers Plan Prefit Machined Interior Doors

DOUGLAS FIR door makers are now introducing factory-fit and machined closures as stock interior doors.

The prefit feature was introduced in the line of heavy 1¾ in. entrance doors in 1939 and the success of this innovation suggested expanding the program to include the entire line of house doors.

These doors, rather than being made oversize to be hand-trimmed on the job, are cut to exact dimensions by precision machinery and are ready to hang when they leave the mass-production door factories.

The machining of stock doors is now also often done at the factory. This would include boring or mortising for locks and gaining or routing for hinges.

While both the pre-fitting and machining of the interior doors is now done only to special order, it is the ultimate objective to bring out a line of stock pre-fit and machined doors.

Considerable research and study has been given the problem of standardized dimensions for pre-fitting and standard specifications for boring, mortising and gaining. Cooperation with frame manufacturers indicates that no insuperable difficulties will be encountered in pre-fitting to width and length, although thickness of finish floor coverings determines whether or not it is as universally applicable now as it may be in future when the advantages of standardization have been extended to all factors in the building trade.

War Housing Units Will Be Moved When Possible

AS A RESULT of experiments that have proved temporary war housing can be quickly dismantled and moved to new sites, the Federal Public Housing Authority will make such shifts to meet all possible assignments from the National Housing Agency and only undertake new construction where re-use of existing structures is not feasible, FPHA Commissioner Philip M. Klutznick has announced.

He virtually created a "national pool" of vacant temporary and demountable housing to meet future needs, with the explanation that FPHA's experiments have shown that some temporary housing "never considered suitable as demountable" can be dismantled and reused.

This re-use of temporary war housing is made possible by development of techniques for sawing into panels convenient for shipment virtually all types of frame temporary housing, even those that were not originally intended to be moved, and making it possible to re-use these houses at distant locations at a cost as low or lower than that at which new construction could be provided.

The purpose of pooling the housing on a national basis, however, is not cost alone but also to keep to a minimum the amount of temporary housing that the Government will have to dispose of after the war and to insure maximum conservation of lumber and other materials.

The Government has approximately 400,000 units of temporary war housing, more than half of all the Government-financed war units. As of August 31, a total of 6,000 temporary and demountable units had been terminated and are available, where the building types are suitable and shipment is feasible, for re-use to fulfill new war housing assignments.

In *Western Construction News* for September, another war housing conservation technique was discussed. The bodily removal of barracks 116 mi. in Nevada was described.

War Plants Listed for Postwar Sale

Official RFC listing of Western war plants to be offered for sale or lease—Negotiated purchase may be made now to permit planning for alterations and expansions after plant is unnecessary for war production

By ARNOLD KRUCKMAN
Associate Editor, Western Construction News
Washington, D. C.

THE ACTUAL official listing by RFC of the war plants in the States west of the Rockies to be offered for future lease or sale by the Defense Plant Corporation is probably the most interesting news in Washington, late in October. The list with some detail is included in this article.

Jesse H. Jones himself makes this statement: "The announcement does NOT mean that production for war is to be stopped in that plant, or that workers are to be laid off. As a result of long-range planning covering many months, the Defense Plant Corporation has made a catalog of its plants, giving size and location so that anyone who may be interested in one or more of the plants for postwar use will have the information. As a matter of fact, only one defense plant now in war production has been advertised for sale. The present operators wanted to negotiate for its purchase at this time so as to be able to plan its conversion to civilian production after it is no longer needed for the war effort. All plants will remain in war production as long as needed."

The catalog emphasizes that the properties listed are among the most modern in the country. They have been constructed during the past three or four years, using the latest and most up-to-date equipment and facilities. The data are broadcast at this time to speed conversion in order to keep in continuous employment the thousands of workers who operate the facilities. It is hoped the publication will prompt small and large industry to initiate fact-finding inquiries, to take quick action for possible purchase, and to set up plans in advance for alterations, additions, expansions, and for future operating plans. Negotiations for purchase or lease of plants and properties will be entered into, subject to contingencies of present contracts and length of time plants will continue in use. The location of offices in the West where negotiations may be conducted are listed with this article. Here are the listings:

ARIZONA

PHOENIX, **Airesearch Mfg. Co.,** 8.5 ac. and additional acreage available from lessee. Ten buildings, brick and wood construction; total area, 134,000 sq. ft. **Alcoa Housing Project,** 80 ac. owned in fee, 100 buildings, total area, 493,150 sq. ft. **Aluminum Co. of America,** 292.11 ac., 44 buildings, steel or reinforced concrete frame, brick or reinforced concrete enclosures; paved and landscaped, with Southern Pacific spur track; total floor area all buildings, 1,475,966 sq. ft. **Thunderbird II,** 720 ac. owned in fee, other acreage under lease; 21 buildings, total floor area, 144,669 sq. ft. **Housing for Aluminum Plant,** Wentton-Clarendon Avenues, 31 lots, 31 individual houses. MIAMI, **Castle Dome Copper Co.,** five tracts owned, 78.64 ac.; 19.06 ac. under lease with easements; 11 principal buildings and several smaller structures, total floor area 163,836 sq. ft. WICKENBURG, **Claiborne Flight Academy,** 60 ac. owned in fee, 2,000 ac. under lease, 23 buildings on land owned in fee; total area of all buildings, 87,681 sq. ft. **Claiborne Flight Academy Housing Project,** on part of 60 ac. owned in fee and connected with Claiborne Flight Academy, 1 building, total area, 5,400 sq. ft. McCONNICO, **General Fibre Products Corp.,** 9.3 ac.; 1 building, 7,378 sq. ft. LITCHFIELD PARK, **Goodyear Aircraft Corp.,** 299.26 ac., of which 105 are leased; 9 buildings, concrete and steel, totaling 381,200 sq. ft. MORENCI, **Phelps Dodge Corp.,** 1.61 ac.; 17 buildings; total floor area, 338,870 sq. ft. TUCSON, **Ryan School of Aeronautics,** 160 ac. owned in fee, 800 ac. under lease; 16 buildings on owned grounds, total floor area of 188,940 sq. ft. MESA, **Southwest Airways Co.,** 40 ac. under condemnation, 720 ac. under lease with option to purchase, 603.96 ac. leased; 17 buildings; total floor area, 115,411 sq. ft.

CALIFORNIA

AZUSA, **Aerojet Engineering Company,** 47.35 ac. owned in fee; 25 buildings, wood frame construction; total area, 22,692 sq. ft. RIVERBANK, **Aluminum Co. of America,** 330.10 ac.; 24 buildings with aggregate of 471,856 sq. ft. floor area. TORRANCE, **Aluminum Co. of America,** 128.675 ac.; 56 buildings; total floor area, 903,780 sq. ft. VERNON, **Axelson Manufacturing Co.,** 1.5 ac.; 1 building; aggregate floor area, 49,700 sq. ft. GARDENA, **Bohn Aluminum & Brass Co.,** 38.129 ac.; main building with annexes; total floor area, 367,314 sq. ft. ONTARIO, no land owned by Government but DPC property consists of 24 buildings; total floor area, 116,472 sq. ft. SALTUS, **California Rock Salt Co.,** 13.2 ac.; 9 buildings; total floor area, 11,240 sq. ft. PITTSBURG, **California Scrap Iron Corp.,** 6.65 ac.; 3 buildings; 1,372 sq. ft. **Columbia Steel Co.,** 43 ac.; 14 buildings; total floor area, 395,120 sq. ft. SANTA ANA, **Compak Foods, Inc.,** 1.92 ac.; 8 buildings; total floor area, 41,200 sq. ft. SAN DIEGO, **Vultee Aircraft Corp.,** 59.1 ac. owned in fee, 33.7 ac. leased; 27 buildings; total floor space, 1,863,267 sq. ft. BERKELEY, **Cutter Laboratories,** land held in lease; building; total floor space, 22,917 sq. ft. SANTA MONICA, **Douglas Aircraft Co., Inc.,** 14.72 ac.; 7 buildings; total floor area, 336,040 sq. ft. **Douglas Aircraft Co., Inc.,** 113.44 ac.; 3 buildings; total floor area, 1,600,000 sq. ft. **Douglas Aircraft Co., Inc.,** 13.83 ac.; 6 buildings; total floor area, 113,476 sq. ft.

LOS ANGELES, **Douglas Aircraft Co., Inc.,** no land owned by DPC; 21.8 ac. owned by U. S.; 6 buildings; total floor area, 105,680 sq. ft. **Aluminum Co. of America,** 79.227 ac. of surplus land. **Dow Chemical Co.,** 92.22 ac.; 62 buildings; total floor area, 200,002 sq. ft. **Goodyear Snythetic Rubber Corp,** 84.2 ac.; 35 buildings; total floor area, 400,000 sq. ft. **Pacific Tube Co.,** 16.2 ac. owned in fee; 4 buildings. **Phelps-Dodge Copper Products Corp.,** 41.3 ac.; 4 buildings; total floor space, 162,700 sq. ft. **Southern California Gas Co.,** 1.58 ac. owned in fee; 6.16 ac. leased; 12 buildings; total floor area, 9,420 sq. ft. **Western Electrochemical Co.,** 2.87 ac.; 4 buildings, approximate area of 32,300 sq. ft. DOS PALOS, **Eagle Field,** 640 ac.; 45 buildings; total floor area, 162,056 sq. ft. **Eagle Park,** 22 ac. housing consisting of 23 buildings (80 apartments). BURBANK, **Industrial Formings,** 4.75 ac.; 1 building. **Lockheed Aircraft Corp.** (Vega Plant), 36.34 ac.; 6 buildings; total floor area, 778,768 sq. ft. **Lockheed Aircraft Corp.,** 35 ac.; 4 buildings; total floor area, 286,100 sq. ft. **Menasco Manufacturing Co.,** 8.04 ac.; 5 buildings, with a total area of 101,800 sq. ft. OXNARD, **Mira Loma Flight Academy,** 143 ac.; 48 buildings; total floor area, 130,811 sq. ft. BAKERSFIELD, **Mohawk Petroleum Corp.,** 20 ac.; 16 buildings having floor area of 29,000 sq. ft. BLYTHE, **Morton Air Academy,** 710 ac. owned in fee; 37 buildings; total floor area, 171,115 sq. ft. **Morton Air Academy Housing Project,** on 710 ac. of Academy area; 6 barracks; total floor area, 62,000 sq. ft.

TORRANCE, **The National Supply Co.,** 3.6 ac.; 2 buildings; total floor area, 66,335 sq. ft. **Shell Chemical Co.,** 80 ac.; 30 buildings; total floor area, 66,785 sq. ft. INGLEWOOD, **North American Aviation, Inc.,** 10.03 ac. owned in fee, 2.5 ac. leased, 31.0 ac. under condemnation; 8 buildings; total floor area, 991,910 sq. ft. HAWTHORNE, **Northrop Aircraft, Inc.,** 50 ac.; 6 buildings; total floor area, 354,720 sq. ft. MINES FIELD, **Pacific Aviation, Inc.,** 14.864 ac.; 5 buildings; total floor area, 37,340 sq.ft. KING CITY, **Palo Alto Airport, Inc.,** 250 ac. under lease; 24 buildings; total floor area, 176,434 sq. ft. **Palo Alto Park,** land under 20-year lease to DPC; 5 buildings containing 20 apartments. MANTECA, **Permanente Metals Corp.,** 148.03 ac.; 13 buildings; total floor area, 159,773 sq. ft. LANCASTER, **Polaris Flight Academy,** 1,562.7 ac.; 46 buildings; total floor area, 185,940 sq. ft. **Polaris Housing Project,** 15 ac. owned in fee;

21 buildings; total floor area, 42,000 sq. ft. TULARE, **Rankin Aeronautical Academy,** 800 ac.; 23 buildings; total floor area, 170,691 sq. ft. CHULA VISTA, **Rohr Aircraft Corp.,** 31.99 ac.; 9 buildings; total floor area, 392,505 sq. ft. HEMET, **Ryan School of Aeronautics,** 344.64 ac. owned, 638.5 ac. leased; 75 buildings; total floor area, 166,760 sq. ft.

EL SEGUNDO, **Standard Oil Co. of California,** land leased; 8 buildings; total floor area, 28,240 sq. ft. NATIONAL CITY, **Tavares Construction Co.,** 69.20 ac. on San Diego Harbor, with deep water and all necessary facilities; 53 buildings; total floor area, 151,858 sq. ft. TWENTYNINE PALMS, 8,160 ac. under lease from Department of Interior for air academy; 31 buildings; total floor area, 54,296 sq. ft. PASADENA, **Vard, Inc.,** 2.82 ac.; 1 building; total floor area, 16,200 sq. ft. VISALIA, **Visalia-Dinuba School of Aeronautics,** 320 ac. under lease; 30 buildings; total floor area, 163,770 sq. ft. NEWARK, **Westvaco Chlorine Products Corp.,** 5 ac.; 4 buildings with total floor area of 21,621 sq. ft. **Westvaco Chlorine Products Corp.,** land held under DPC lease; 4 buildings; total floor space of 7,261 sq. ft. NORWALK, **Wilshire Oil Co.,** 20.64 ac.; 28 buildings; total floor area, 21,428 sq. ft.

COLORADO

COLORADO SPRINGS, **Aircraft Mechanics, Inc.,** 35 ac.; 1 building with total floor area of 60,000 sq. ft. DENVER, **The Bay Petroleum Co.,** 0.26 ac.; no building on property. MINNEQUA, no land owned by DPC; 1 building, 4,680 sq. ft., and extensions to old building, owned by the **Colorado Fuel & Iron Corp.** EMPIRE, **Urad Mines,** Molybdenum Corp. of America, 236.8 ac.; 7 buildings with 6,839 sq. ft. of floor space. NORTHGATE, **Western Fluorspar Corp.,** 3.45 ac.; 3 buildings with total floor space of 3,500 sq. ft.

MONTANA

COLUMBUS, **Anaconda Copper Mining Co.,** facilities completely owned by DPC for production and concentration of chromite ores. Mining claims under lease. Aside from mining facilities and concentration equipment, the property includes an electric plant, distribution system, laboratories, shops, stores, mess halls, schools, dwellings, aerial tramway, telephone lines, warehouses, hospital, nurses' home, fire protection systems, etc. COLUMBUS, a second property owned by DPC and operated by **Anaconda Copper Mining Co.,** similar in scope to the first described. BUTTE, **Domestic Manganese & Development Co.,** plant is housed in one structure of 16,527 sq. ft. of floor space.

NEVADA

LAS VEGAS, **Basic Magnesium, Inc.,** 40 ac. in fee, 10,247 ac. in lode and placer claims. The 41 buildings on the property have 226,250 sq. ft. of total floor area. **Basic Magnesium, Inc.** (Magnesium Metal Plant), consists of 4,080 ac. in fee and 14,360 ac. transferred by executive order. There are 155 buildings with 3,314,333 sq. ft. of floor space. **Manganese Ore Co.,** 31 mining claims with total area of 446 ac. The 20 buildings have a total floor space area of 69,035 sq. ft.

NEW MEXICO

CARLSBAD, **International Minerals & Chemicals Corp.,** 6.25 ac.; 11 buildings; total floor space of 52,915 sq. ft. LOS LUNAS, **Zuni Milling Co.,** 51.71 ac.; 5 buildings of 7,908 sq. ft. of floor space.

OREGON

PORTLAND, **Air Reduction Sales Co.,** 4.62 ac. in Portland; 4 buildings with 7,280 sq. ft. of floor area. **Columbia Steel Castings Co.,** 4.5 ac. and space for expansion; 5 buildings with total floor area of 76,214 sq. ft. **Iron Fireman Manufacturing Co.,** 0.69 ac. in Portland; 2 buildings with 26,000 sq. ft. of floor area.

RFC disposing agencies in the West are listed as follows: For Colorado and New Mexico: Boston Building, Denver 2, Colorado; Ross L. Hudson, manager. Arizona and Southern California: Pacific Mutual Building, Los Angeles 14, California; Hector C. Haight, manager. Wyoming: Woodmen of the World Building, Omaha 2, Nebraska; Herbert S. Daniel, manager. Idaho, Montana, Oregon: Pittock Block, Portland 5, Oregon; William Kennedy, manager. Nevada and Northern California: 200 Bush Street, San Francisco 4, California; John S. McCullough, Jr., manager. Utah: Dooly Building, Salt Lake City 1, Utah; Gerald L. Leaver, manager. Helena, Mont., sub-agency: Power Block; Leon Choquette, manager. Seattle, Wash., sub-agency: Dexter Horton Building; John S. McCullough, Jr., manager. Spokane, Wash., sub-agency: Columbia Building; O. M. Green, manager.

Northwestern Ice & Cold Storage Co., land owned by DPC, consisting of entire lots 1, 2, 7 and 8 of block 20, East Portland. **Pacific Chain & Mfg. Co.,** 1.21 ac. in the industrial section of Portland; 1 building with 20,616 sq. ft. of floor area. **Radio Specialty Mfg. Co.,** land consists of one city lot 50 x 100 ft. in the northwest wholesale district of Portland. **Shofner Iron & Steel Works,** 0.88 ac. of land in Portland and a lease on 1.38 ac. of adjacent land; 4 buildings with 13,000 sq. ft. of floor area. **Willamette Iron & Steel Corp.** (shipbuilding), 12.48 ac. on Willamette river; 2 buildings with 22,400 sq. ft. of floor area. **Willamette Iron & Steel Corp.,** 3.17 ac. with 17 buildings having 266,545 sq. ft. of floor area.

TROUTDALE, **Aluminum Co. of America,** 590 ac., 100 ac. occupied by plant. The 40 buildings, with 728,985 sq. ft. of floor space, are steel and wood frame, corrugated metal or brick enclosures, corrugated metal or built-up roofing, heating by central plant. EUGENE. **Approved Flax Co.,** 30 ac. of farm land; 4 structures under construction with 33,600 sq. ft. of floor area. CORNELIUS, **Washington County Flax Growers,** 135 ac. of improved farm land with 11 structures for various uses. JEFFERSON, **Santiam Flax Growers,** 120 ac. farm land, with 10 buildings having 65,523 sq. ft. of floor area. MARSHFIELD, **Krome Corp.,** 65.90 ac. in Coos County with 4 principal buildings and 16 smaller structures. The principal buildings have approximately 16,000 sq. ft. of floor space and the smaller structures have circa 2,000 sq. ft.

UTAH

BLANDING, **Blanding Mines,** a mill site of 5 ac. but no mining rights; improved with 11 frame buildings used for production of vanadium oxide. Mill has its own diesel power. PROVO, **Geneva Works, Columbia Steel Co.,** 1,600 ac.; 133 buildings, 4,718,866 sq. ft. of ground area. HORSE CANYON, **Geneva Coal Mine, Columbia Steel Co.,** 2,700 ac. in Emery County; 20 buildings; total floor area, 54,671 sq. ft. PAYSON, **Utah Quarry, Columbia Steel Co.,** plant to produce dolomite and limestone. No land owned by Defense Plant Corporation; 9 buildings; total floor area, 14,877 sq. ft. CEDAR CITY, **Iron Mountain Ore Mine, Columbia Steel Co.,** plant to produce iron ore. No land owned by DPC; 7 buildings; total floor area, 25,312 sq. ft. IRONTON, **Columbia Steel Co.,** blast furnace and auxiliary facilities, coke ovens near Columbia; 11.62 ac.; plant occupies approximately 513,200 sq. ft.

SALT LAKE CITY, **Eitel McCullough Inc.,** radio transmission tubes, 10 ac. in Salt Lake City; 1 building; total floor area, 104,000 sq. ft. **Kalunite, Inc.,** 79.37 ac. in Salt Lake City; 13 buildings; total floor area, 78,189 sq. ft. **Utah Oil Refining Co.,** produces 100-octane gas in Utah and Wyoming, 27.13 ac. in Salt Lake City; 22 buildings; total floor area, 58,400 sq. ft. **U. S. Vanadium Corp.,** produces tungsten concentrates, 2.92 ac. in Salt Lake City; 5 buildings; total floor area, 18,440 sq. ft. MONTICELLO, **Vanadium Corporation of America,** treats vanadium oxide ore, 263.48 ac.; 80 buildings, including staff townsite, workmen's townsite, mills, power plants, laboratories, office buildings, warehouses, shops, garages, etc., mostly of steel, wood and galvanized iron construction.

WASHINGTON

SPOKANE, **Aluminum Company of America,** 522.8 ac.; combined floor area of all buildings is 2,314,000 sq. ft. **Aluminum Company of America,** 235.2 ac.; 56 buildings, for reduction of aluminum and production of carbon electrodes, with 993,778 sq. ft. of floor area. **Electro Metallurgical Co.,** 385 ac.; 20 buildings; 474,330 sq. ft. of total floor space. **Coplen Park,** 76.21 ac.; 125 buildings with 600 apartments, community building and garage. METALINE FALLS, **American Zinc, Lead & Smelting Co.,** 7,600 sq. ft. of land; 1 building, floor area of 1,600 sq. ft. RENTON, **Boeing**

Aircraft Co., 259.3 ac.; 14 buildings with total floor area of 1,804,192 sq. ft. The flying field site consists of 165.54 ac. with necessary improvements in runways, aprons and buildings. **Pacific Car & Foundry Co.**, 5.1 ac.; 2 buildings and facilities. SEATTLE, **Boeing Aircraft Co.**, 40.7 ac.; office building of total floor area of 82,500 sq. ft.; bus terminal of 2.8 ac.; two parking areas totaling 42 ac. **Stetson-Ross Machine Co.** (pumps and gears), building is extension to corporation's plant

TACOMA, **Hooker Electrochemical Co.**, land 0.614 ac.; 2 buildings with 14,850 sq. ft. of floor area. **Olin Corporation**, production of aluminum pig, 139.46 ac.; 16 buildings and facilities. **Pacific Carbide & Alloys Co.**, production calcium carbide, 14.77 ac.; 8 buildings and facilities. **Wilkeson Products Co.**, production of metallurgical and domestic coke, 6.57 ac., located in industrial Tacoma; 7 buildings with total floor area of 6,305 sq. ft. WILKESON, **Wilkeson Products Co.**, for production of coal, no land; 4 buildings with total floor area of 13,460 sq. ft. ROCK ISLAND, **Wenatchee Alloys, Inc.**, 35.2 ac.; 10 buildings with 40,000 sq. ft. total floor area. HOUGHTON, **Lake Washington Shipyards**, 11 ac. owned by DPC, 13 buildings; total floor area of 148,604 sq. ft. **Lake Washington Shipyards**, 3 small buildings; total floor area, 2,363 sq. ft. **Bonneville Power Administration** (Spokane), 3 buildings; 14,255 sq. ft. total floor area; 6 steel oil storage tanks, 10,000 gal. each, full equipment to supply electrical energy to magnesium and aluminum plants. (Tacoma), 10 ac. owned by U. S., substation with 2 buildings having total floor area of 4,552 sq. ft., four 6,000 gal. steel oil tanks. Facilities are capable of independent operation supplying energy to Tacoma area.

WYOMING

CHEYENNE, **Frontier Refining Co.**, for production 100-octane gas, 40 ac. (ranching land) and blocks 667, 668 and 669 in City of Cheyenne, for housing project; 32 buildings on plant site, 54,831 sq. ft. total floor space; 26 frame buildings in housing project. CODY, **Polarizing Instrument Co.**, no land owned by DPC; 1 building; total floor area, 10,000 sq. ft.

The advance listing of industrial plants and plant sites also includes a number of properties owned by the War Department, to be disposed of by the Defense Plant Corporation. In the West the listing is:

CALIFORNIA

TURLOCK, **Chemurgic Corp.**, property. HUNTINGTON PARK, **Kobe, Inc.**, 1 ac., buildings with 17,850 sq. ft. floor space. TORRANCE, 1 ac., building with 7,949 sq. ft. of floor space. SAN BERNARDINO, **San Bernardino CWS Plant**, 369 ac., buildings with 77,163 sq. ft. of floor space. BENICIA, **Yuba Manufacturing Co.**, 1 ac., buildings with 43,050 sq. ft. of floor space.

COLORADO

DENVER, **Ordnance Plant, Remington Arms Co.**, 2,014 ac., buildings with 1,729,151 sq. ft. of floor space.

UTAH

OGDEN, **Ogden CWS Plant**, clothing impregnation, 2 ac. SALT LAKE CITY, **Utah Ordnance Plant, Remington Arms Co.**, 5,081 ac., buildings with 1,377,191 sq. ft. of floor space.

WASHINGTON

RENTON, **Pacific Car & Foundry Co.**, 1 ac., buildings with 50,619 sq. ft. of floor space.

California Water Works Group Meets

California Section of A.W.W.A. met Oct. 24-26 in Los Angeles. Discussion groups considered water purification, drinking water standards, water treatment, flow analyses, unaccounted meter losses and postwar planning for water utilities

THE CALIFORNIA SECTION of the American Water Works Association held its twenty-fifth anniversary meeting at the Biltmore Hotel in Los Angeles on Oct. 24, 25, and 26, 1944. Chairman Burton S. Grant was instrumental in organizing discussions and reports which proved very educational and challenging to the 682 members that were present. They listened to many interesting reports concerning the past and present problems and their solutions by the various water departments and districts, as well as many of the anticipated problems of the postwar period.

The program opened at 8:30 a.m., Oct. 24, with a golf tournament at the Oakmont Country Club. Chairman Claude T. Faw of the California Corrugated Culvert Co., of West Berkeley, and his committee awarded a number of War Bonds and Stamps as prizes. Registration began at the Biltmore Hotel at 10:00 a.m. and a review of exhibits in the hotel ballroom and foyer was conducted in the afternoon. Low net golfers were H. C. Medbery, Peter Diederich, William Gibbs, and Edward Hubbard.

The Purification Division dinner was held Tuesday evening, Oct. 24, and Major Rolf Eliassen, Repairs and Utilities Division of the Corps of Engineers, Fort Douglas, Utah, presented "Some Interesting Observations of Water Treatment Practices." Charles Gilman Hyde, Professor Emeritus of Sanitary Engineering at the University of California, told of "Water Purification—Some Reminiscences." Hyde was elected an honorary member of the section.

First general session

U. S. Public Health Service drinking water standards were discussed at the opening general session on Wednesday, Oct. 25. J. K. Hoskins, Assistant Surgeon-General of the U. S. Public Health Service, discussed the application of the revised drinking water standards to the

RECORD CROWD attended the Business Dinner. L. to r.: BURTON S. GRANT, retiring chairman; COL. RUFUS W. PUTNAM, U. S. District Engineer, Los Angeles; SAMUEL B. MORRIS, past national president and new general manager, Los Angeles Department of Water and Power; SAMUEL F. NEWKIRK, JR., national president A.W.W.A.; W. W. HURLBUT, chairman of membership committee; R. A. HEFFNER, president, Board of Water and Power Commissioners, Los Angeles; H. A. VAN NORMAN, retiring general manager, Los Angeles Department of Water and Power; E. A. DICKSON, vice-president, Board of Water and Power Commissioners, Los Angeles; RICHARD BENNETT, member executive committee; FRED S. PORTER, chairman nominating committee; and CLAUDE T. FAW, chairman golf committee.

present day requirements. C. G. Gillespie, Chief of the Bureau of Sanitary Engineering, California Department of Public Health, discussed the state's responsibility in the certification of water supplies for use on common carriers. Appreciating the responsibilities of the Federal Government in the water supply problem, he feels that its influence should be made through general rules and regulations rather than through detailed regulations that might be unnecessary in particular cases. Local governments, being closer to their own particular problems, can devise and enforce regulations that will meet the individual cases as they arise.

R. F. Goudey, Sanitary Engineer, Department of Water and Power of Los Angeles, favored a national standard for drinking water but felt that there should be friendly cooperation in its enforcement by all governmental agencies. He cited instances in which his department had not received full cooperation in the protection of its water supply by the Federal Government. In several cases war facilities had been established in locations that made possible the pollution of the city water.

Fred D. Pyle, Hydraulic Engineer of the San Diego Water Department, discussed the influence of the war on the design of the city's water facilities. San Diego, faced with the problem of doubling its water requirements, met the situation at a critical time and accepted Federal funds to help defray the expenses. He stated that the city's share would be paid back over a period of time. Later on the city will negotiate with the Federal Government in order to determine what part of the improvements were made necessary as war measures and thus the responsibility of the Federal Government. The results of these negotiations will be based on population figures, future industrial requirements, areas of growth and decline and other factors that will aid in determining the amount of water supply development that has been required by the normal growth of the city.

In the attempt to make the convention discussions more real and vital to the membership, Chairman Burton S. Grant, previous to the meeting, sent out and received replies to questionnaires asking for suggestions as to possible topics for consideration at the convention. As a result of the sending of these questionnaires, W. R. Schneider, Assistant Engineer of the Pacific Gas and Electric Company of Oakland, presented the results of a comprehensive study that had been made by the company in order to determine practical methods to use in preventing corrosion from electrolytic action. Loren E. Blakely, consulting Civil Engineer of Santa Ana, discussed the rehabilitation, cleaning and sterilization of water wells; and stated that this problem was becoming very important in view of the rapid industrial growth in his area and the attendant problems involving the disposition of industrial waste.

Robert C. Kennedy, Assistant Chief Engineer and General Manager of the East Bay Municipal Utility District of Oakland, showed photographs depicting the construction and design details of pre-stressed concrete tanks that are now in use around the Bay area. W. J. O'Connell, Jr., Technical Consultants of San Francisco, traced the history of licensing and unionizing professional and sub-professional waterworks employees from the early days up to the present day statutes and court decisions that deal with these subjects.

At the Wednesday Purification session, at which O. C. Blumberg, chairman, presided, Carl M. Hoskinson of the State Division of Water, discussed the "Operation and Maintenance of Water Treatment Plant Appurtenances." James M. Montgomery of J. M. Montgomery and Co. of Los Angeles, spoke on the "Disposal of Softening Plant Wastes." Lee Streicher of the Southern California Metropolitan Water District discussed "Operating Experiences at La Verne Softening Plant; Experimental Work." Paul F. Bovard of the California Filter Co. of San Francisco told of the "Application of Ion Exchangers." F. T. Willis of the C.C.M.O. Co. water plant at McKittrick reported on "Water for Oil Field Purposes."

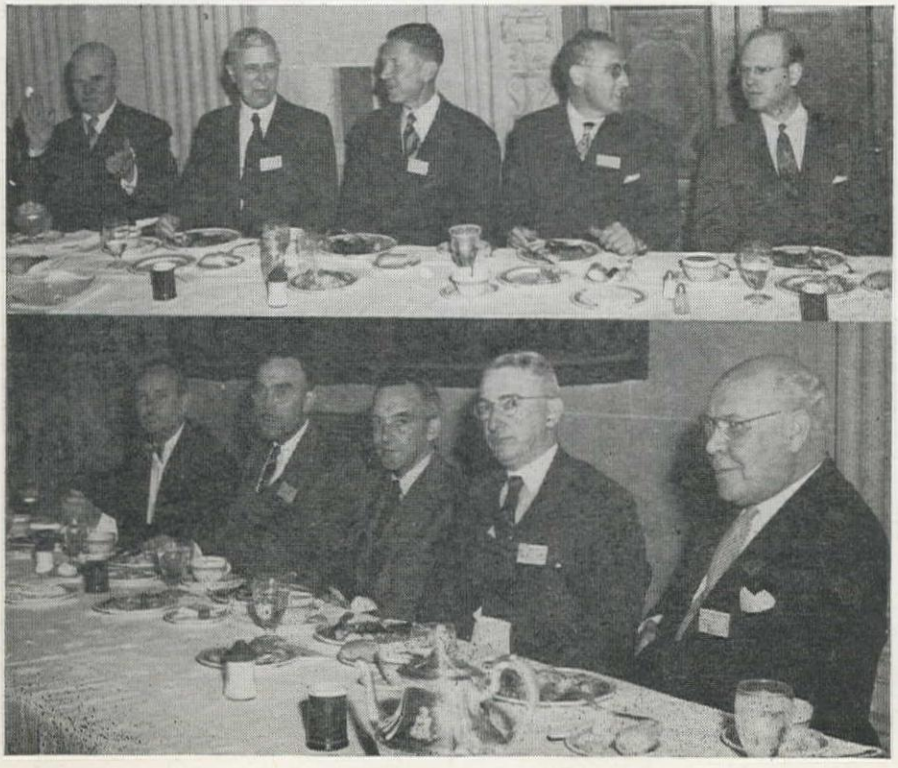
Postwar planning

"Postwar planning for Water Supply Utilities" was the main subject for study on the Thursday program. Chester A. Smith, consulting engineer for Burns and McDonnell Engineering Co. of Kansas City, Mo., emphasized the importance of the topic by pointing out the need in many areas for water facility repair which could provide employment for many workers during the coming conversion period. He recommended the immediate study of the entire water supply and development problem with particular attention paid the present facilities and organization and possible future developments in order to better the efficiency of the departments and the service rendered the public. After an opening discussion of this subject in which the manpower shortage and present plans of some districts were cited, Smith reported that the manpower shortage was easing in certain areas and that completed programs dealing with the design and financing of water facility repair and improvement were not ready in very many areas throughout the country. These improvements must take into account the possible industrial expansion as well as the future increase in population.

"Cross-Connection Control and Elimination" was presented next by W. E. Shaw, regional waterworks advisor for the Bureau of Sanitary Engineering of the State of California, who followed the history of the subject previous to the war. He felt that considerable progress in control and elimination had been made up to the time of the war but that the war necessity of making additional water available for firefighting in the event of bombing, had made the solution of the problem much more difficult.

In discussing the liability of water departments in regard to water-borne disease germs, James H. Howard, general counsel for the Metropolitan Water District of Southern California, stated that public and private water systems are liable on the grounds of negligence.

A.W.W.A. DINERS. Top, l. to r.: J. S. PETERS, retiring member executive committee; CARL M. HOSKINSON, new vice-chairman; C. P. HARNISH, new chairman; O. C. BLUMBERG, retiring chairman, Purification Div.; BLAIR I. BURNSON, secretary-treasurer; lower, l. to r.: H. ARTHUR PRICE, member executive committee; EDWARD A. REINKE, member executive committee; E. J. BUTTENHEIM; J. R. BARKER, member executive committee; ARTHUR T. CLARK, secretary-manager, Water and Sewage Works Manufacturers Assoc., Inc.



Negligence is the failure to use reasonable care and diligence. Each case must be decided on its own merits. Howard gave examples of damage cases that were allowed by the court in which the districts were liable.

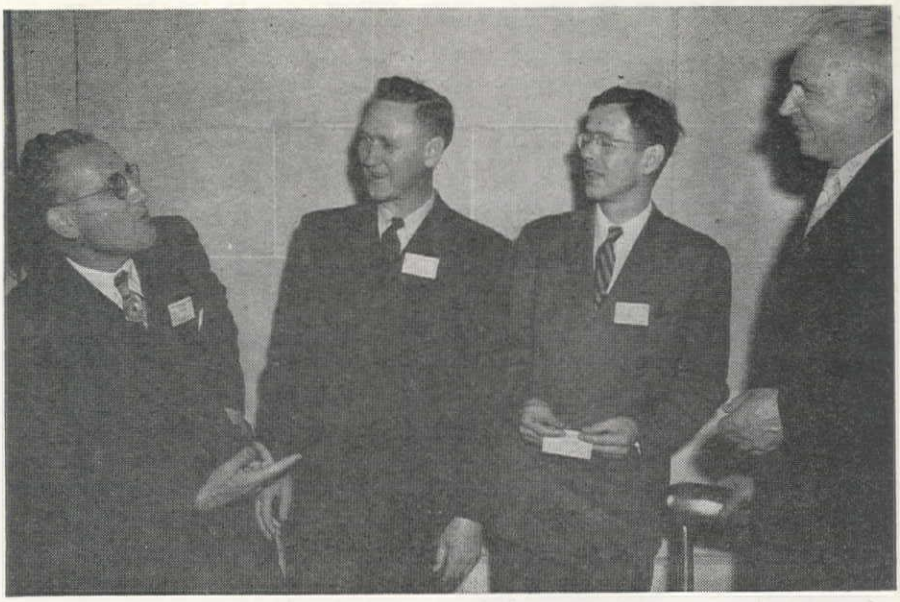
Charles J. Itter, design engineer in the Los Angeles Water and Power Department, presented a detailed illustrated study of the "Distribution System Flow Analysis Method." Weekly flow readings are taken throughout the distribution system in order to determine the mean average, maximum 24-hour and highest hourly flow for the year. After correlation with other closely allied studies, the data can be used in projecting the results into the future and thus as a basis in estimating future requirements. He said that this data does not replace but does supplement a study by engineers.

H. A. Harris, Jr., design engineer for the California Water Service Co. of San Jose, discussed "Water Consumption and Unaccounted Losses." He recommended the "per consumer" basis of tabulation rather than the "per capita" basis since his company serves a wide variety of communities and should have reliable information on population changes Even this basis was not always satisfactory because of the different sizes of the homes and gardens in many of the areas. He said that there was careful use of water in metered areas but in other areas the facilities could not take care of the water consumption during peak hours of the peak months. Through an educational campaign the consumers were encouraged to water their yards at certain times and thus flatten out the consumption during the peak periods. This saved a substantial investment in added facilities that would have been necessary. Unaccounted losses were defined as the difference between the water that was billed into the system and the water that was billed out. Harris stated that it is difficult to locate all of these losses and that the loss should be under 10 per cent.

Walter O. Weight presided at a round table discussion of current problems. The discussion held Thursday afternoon, Oct. 26, considered interesting cases and proved to be very valuable to the participants.

Purification program

At the Purification session, Carl Wilson, Los Angeles Consultant, reported on "Bacteriology of Water Pipes; An Introductory Note." D. W. Graham, Chief Chemist for the Los Angeles Department of Water and Power, told of the "Trends in American Water Laboratory Practice." Using better equipment, laboratories were able to provide positive assistance to agricultural and industrial water users. J. J. Connors of the Oakland East Bay Municipal Utility District discussed the "Simplification of the Soap Method of Determining Calcium, Magnesium, and Total Hardness of Water." He stated that the expanded use of this method had resulted in some disagreement and recommended a free exchange of information on the subject. Ted V. Ackerman of the Pasadena Water Department, presented a paper on the "Value of the Water Works Chemical Laboratory" from data assembled by E. I. Lynde, assistant engineer, and Frank E. Marks, chemist, of the Pasadena Water Department. He told of cases in which water analyses had been instrumental in establishing facts and in winning court decisions. Roy Coupal, Eureka City bacteriologist, explained the "Water Treatment at Eureka" and reported on his many findings.



RETIRING CHAIRMAN of the Purification Division greets the newly elected officers of the Division. L to r.: O. C. BLUMBERG, retiring chairman; H. C. MEDBERY, new vice-chairman; JOHN R. ROSSUM, new secretary-treasurer; and HARRY HAYES, new chairman.

At the annual dinner held Thursday evening, members of the section listened to committee reports. Secretary-Treasurer Blair I. Burnson, Membership Chairman William W. Hurlbut, Legislation Chairman Carl Hoskinson, Exhibit Chairman J. R. Barker and Entertainment Chairman R. W. Martindale reported satisfactory progress for their committees. National President Samuel F. Newkirk, Jr., reviewed the past work of the association and told something of its plans for the future. Col. Rufus W. Putnam of the Los Angeles District Office of the U. S. Engineers, told the story of the army water supply problems in Southern California as well as during some of the overseas campaigns. H. A. Van Norman, retiring General Manager of the Department of Water and Power, reminisced and told of interesting early day experiences. The section paid high tribute to Van Norman. Samuel B. Morris, past national president of the Association, succeeds Van Norman as General Manager of the Water and Power Department. Morris expressed his pleasure in returning to Los Angeles.

New officers

C. P. Harnish, Executive Vice-President of the Southern California Water Co., was elected section chairman for 1945. Carl W. Hoskinson, Chief Engineer and Acting Superintendent of the State Division of Water, was elected vice-chairman, Blair I. Burnson, Sanitary Engineer for the East Bay Municipal Utility District of Oakland, was elected secretary-treasurer. J. R. Barker of San Francisco, Richard Bennett of Phoenix, H. Arthur Price of Los Angeles, Edward A. Reinke of Berkeley, Howard A. Harris, Jr., of San Jose and Burton S. Grant of Los Angeles were elected members of the Executive Committee. Ray F. Goudey of Los Angeles was elected to serve as National Director.

New Officers of the Purification Division are Harry Hayes, Los Angeles, chairman; H. C. Medbery, San Francisco, vice-chairman; John R. Rossum, San Jose, secretary-treasurer.

Nazarene College Auditorium Completed Using Scrap Steel

A $200,000 AUDITORIUM to seat 4,000 people has been constructed by the Pasadena Nazarene College, Pasadena, Calif., as the initial unit of an expansion program which will cost $1,049,500, and will include girls' dormitory, boys' dormitory, Letters and Science building, and other smaller structures.

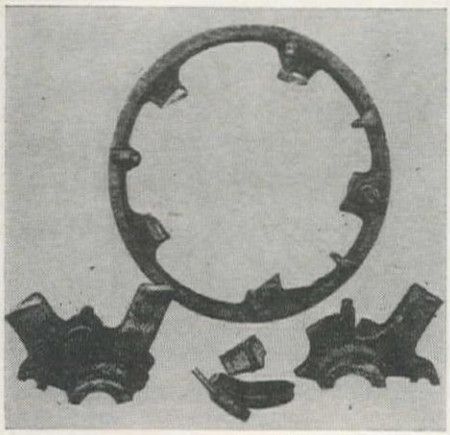
The new auditorium, which will be the largest in Pasadena, is complete with the exception of installation of seats, which are not available during war time. The building is of reinforced concrete, earthquake resistant in design, and cruciform in plan. Exterior dimensions of the building are 204 x 204 ft.

In order to complete the building during war time, many unique expedients were used. When steel became unavailable for the walls, the president of a large shipyard made non-priority high grade sash steel available. Much of the lumber that could not be purchased for the roof was cut from logs to specification. Portholes from battleship steel were made into anchor plates for roof trusses. Much of the labor was donated by students and church members.

Postwar construction will be undertaken at the rate of $125,000 annually.

HOW IT WAS DONE

JOB AND SHOP TIPS FROM THE FIELD EDITOR'S NOTEBOOK



Wooden Treads for Industrial Trucks

A WOODEN TREAD has been designed by the engineering staff of the Elwell-Parker Electric Co., Cleveland, Ohio, to be mounted on their power industrial truck wheels in case the rubber shortage becomes critical. These power trucks are used to move materials and finished products in a great number of industrial plants. They are equipped with solid rubber tires which need occasional replacement due to continual wear from war production service. Since no satisfactory substitute for rubber was available, the engineers started developing one. The tread was made up of key-stone shaped wooden blocks, tapered 10 deg. from base to top. The wheel rim was equivalent in section to a deep channel. After the blocks were assembled in the groove the flanges of the rim were pressed inward, to hold the blocks securely in place.

Working models were built and put in service on a power truck. The test data indicated a decrease in efficiency, an increase in power consumption, and a shorter life as compared to rubber. However, it did demonstrate that wooden treads could be used in an emergency.

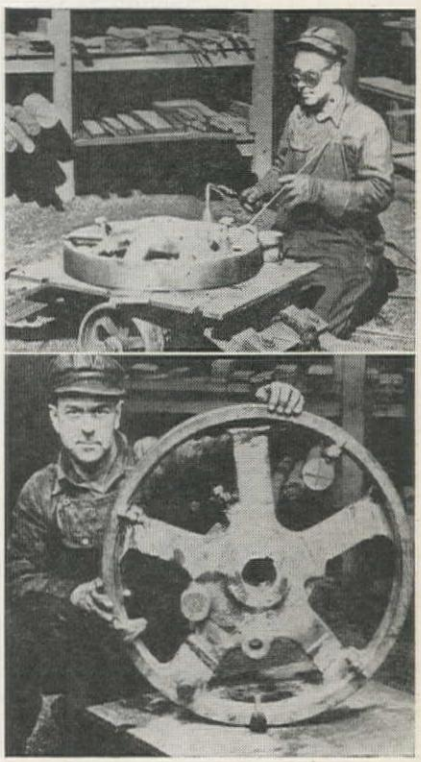
Welded Spider Kept Shovel on the Job

BRONZE-WELDING of a broken clutch spider on a gravel pit steam shovel prevented the delay required to obtain a new part and kept the construction work going. In the middle of an important construction job the clutch spider on a steam shovel in a gravel pit broke, bringing all operations to a halt. Replacement was out of the question since it would require several weeks to obtain a new part. The remaining pieces of the broken part were rushed to a welding shop 72 mi. away and in 8½ hrs., the pieces were bronze-welded and the spider was machined and returned to service as good as new.

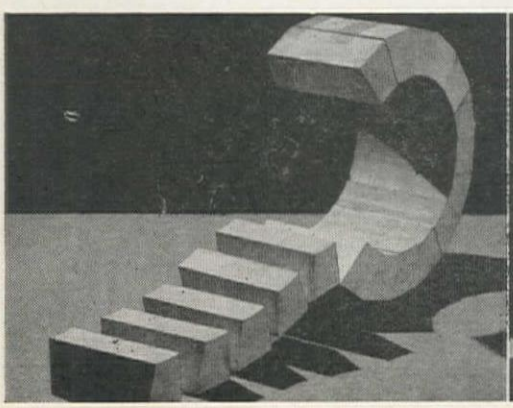
The spider, an iron casting 27 in. in diam., was badly broken (left). In fact, one of the spokes was completely missing and had to be replaced with a piece of steel bar cut to suitable dimensions. The initial step was to bevel all the parts by grinding the edges to an angle of about 45 deg. The four pieces of the hub were then lined up by placing them about a shaft of proper size and tack-welding them in their correct relative positions. They were then removed from the shaft and welded together. Since the bore of the hub was badly worn and galled, its entire inner surface was built up with a layer of bronze.

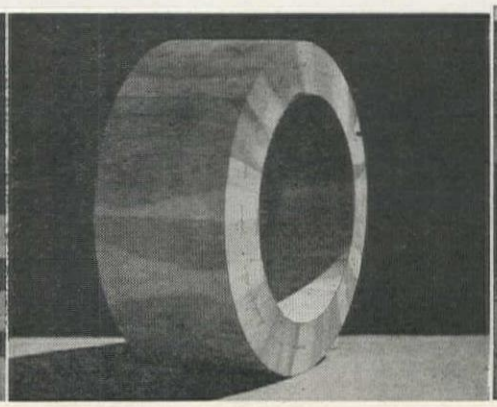
After the hub was repaired, it was placed on a flat welding table and the spokes, including the substitute steel bar, were placed in the proper positions and bronze-welded. While this repair work was in progress, the rim was being preheated in a temporary preheating furnace. The hot rim and hot hub and spoke assembly were placed in line on the table and welded together. Fourteen lbs. of ½-in. rod applied with flux, were used to make the 10 oxyacetylene welds—3 in the hub and 7 in the spokes. The completed job was then covered over and allowed to cool slowly. After cooling, the hub was rebored, a new keyway was cut and the reclaimed spiker was ready to be put back in service.

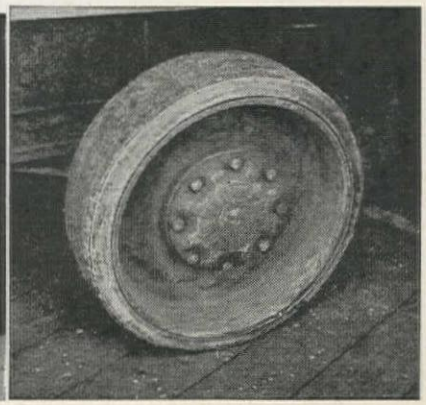
This information was sent to the *Western Construction News* by G. C. Becker of the Linde Air Products Co., a unit of Union Carbide and Carbon Corp.



BROKEN CLUTCH SPIDER for steam shovel repaired by welding. Broken pieces beveled and tacked together before welding (upper). Welded wheel ready for service (lower).







WHEEL TREAD built of key-stone shaped wooden blocks, tapered 10 deg. from base to top (left and center). After several months service, wooden treads (right) found to be less efficient, to use more power and to have shorter life than rubber.

NEWS OF WESTERN CONSTRUCTION

NOVEMBER, 1944

New Concrete Column Design Uses Less Steel, Is Stronger

A NEW DESIGN for a structural concrete column has been developed and successfully tested at Northwestern Technological Institute, Evanston, Ill., by Prof. George A. Maney, Chairman of the Department of Civil Engineering there. The new unit was developed at the suggestion of the War Production Board in its search for new materials and designs which would reduce the use of critical materials.

The new column is made of highly compressed concrete encased in a spiral of steel wire. Model tests indicate that a column 80 per cent concrete and 20 per cent steel will support loads greater than columns of equal size of solid steel. The core used in one such test failed at 83,000 lb. per sq. in., while a steel column of identical size failed at 60,000 lb. per sq. in.

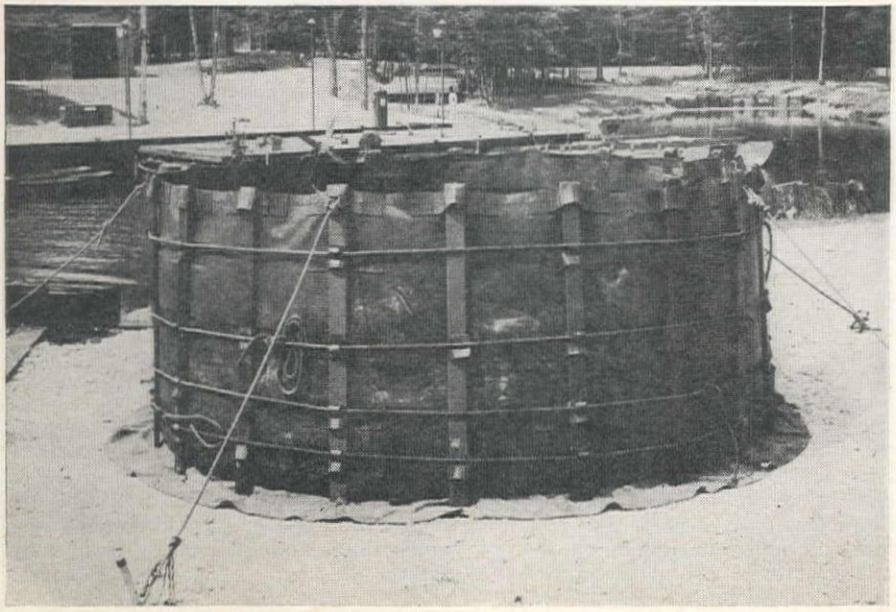
The column is constructed by placing a thin metal lining inside a spiral of steel wire and filling this with concrete specially compacted and generally dryer than commonly used, only 1 gal. of water being applied for one sack of cement to contrast with the 5 to 8 gal. ordinarily employed. After compaction by vibration a steel plunger compresses the concrete from one end of the column until it is quite firm.

This initial compression of 10,000 to 20,000 lb. per sq. in. is one of the main sources of the column's compressive resistance, in that it contributes to the strength of the concrete and also puts the spiral of steel wire under tension, this being maintained by the concrete after it hardens.

Building columns of concrete encased in steel tubes or reinforced with spirals have long been in use, but have not exhibited the strength of this new development, nor of the all-steel column. Prof. Maney believes that this was occasioned by the use of un-compressed concrete, leaving the concrete core alone to support the load. The casing did not become stressed until the concrete had commenced to fail. In the new unit, concrete and steel work together and give added strength by undergoing simultaneous stress.

GLASS AND RUBBER FOLDING TANK SERVES TROOPS WITH WATER

A COLLAPSIBLE water tank made of glass fabric coated with synthetic rubber has been developed by Army Engineers and the U. S. Rubber Co., to supply combat troops with an adequate supply of drinking water. It is not affected by rot or mildew, is light weight, strong, durable and completely watertight. It is 54 in. high, over 11 ft. in diameter and will hold 3,000 gal. water. It is easily transported and set up.



U. S. Will Build Nine New Dnieprostroi Turbines

THE WAR PRODUCTION BOARD has advised the Foreign Economic Administration of its approval of the manufacture in this country of nine hydro-electric turbine generators for the Dnieprostroi plant in the Soviet Union. These machines would replace the famed installations put into operation in 1933 and completed in 1936, and destroyed by the Russians when they retreated before the Germans in 1941.

The total capacity of the nine turbine generators is 900,000 h.p. Their manufacture and installation would require at least four years for completion. This machinery will not be provided through Lend-Lease but will be financed by the U. S. S. R., W. P. B. said.

Approval of manufacture of the equipment at this time was granted on the condition that no fixed delivery date would be promised and that manufacture would not be allowed to interfere with the production of war supplies or equipment needed for essential civilian purposes. Furthermore, manufacture of the units will not be permitted to interfere with any important phase of reconversion of our war economy to civilian production.

"The Russians have told us that the restoration of the great Dnieprostroi hydro-electric plant will contribute more than any other one thing to remedying the war damage which the Russians have suffered, and that its completion at the earliest possible moment is of vital importance to Russia," said W. P. B. Chairman J. A. Krug. "We are able to put these units into production in this country without interference with our war effort, and this is the only basis upon which the Russians asked for these machines."

Award Contract on Modoc Pump Plants

A CONTRACT has just been awarded covering the construction of three more pumping plants to reclaim some 12,500 new acres in the Modoc Unit of the Tule Lake Division of the Klamath Federal Reclamation Project, Oregon-California. This contract approximating $100,000 has been awarded to Clifford A. Dunn of Klamath Falls, Ore.

Construction work on this project has been approved by the War Food Administration and the War Production Board, and work will be speeded up in the interests of producing food for wartime consumption.

An area of 7,500 ac. or more will be opened to homestead entry in the Tule Lake Division, according to postwar plans of the Bureau. All lands in the Tule Lake Division are public lands and are opened to settlement upon completion of the irrigation works. Under public notices issued between 1922 and 1937, about 25,600 ac. were settled. No land, however, is open for entry on the Klamath Project at the present time.

Work on the Modoc Unit, a part of the Tule Lake Division of the Klamath Project, was begun in 1940. A 7,000 ft. tunnel, the main construction feature of the unit, was completed November 13, 1941, to carry excess water from Tule Lake through a range of hills to restore the Lower Klamath Lake wildlife refuge and provide water for irrigation of lands adjacent to the lake.

The three pumping plants to serve this area will be located in Siskiyou and Modoc counties, Calif. Pumping plant "A" will provide water for the irrigation of 9,000 ac. Pumping plant "B" will pump surface waste and drainage water accumulated on this acreage, and pumping plant "C" will pump waste water from the remaining 3,500 ac.

The Klamath project, which on completion will embrace 170,000 ac., 100 mi. from the Pacific Ocean, consists of the Main Division and the Tule Lake Division. All major construction work planned for the Main Division has been completed, and construction work is progressing on the Modoc Unit of the Tule Lake Division. Ultimately 24,600 ac. in this region will be reclaimed for farming.

First Earth Fill Placed In Utah Irrigation Dam

CONSTRUCTION OF the new Scofield dam in Utah is under way with the placement of the first layer of rolled earth.

The dam, being built by the Bureau of Reclamation on the Price river about 36 mi. from the city of Price, will replace an existing structure found to be in a dangerous condition. The old dam is also an earth fill, built in 1926 by a local irrigation district, and will remain in use until the new structure, about 800 ft. down stream, is completed.

The new dam will have a base width of 510 ft. and a crest width of 30 ft. It will be 575 ft. long at the crest. About 190,000 cu. yd. will be required in the fill. Both faces will be paved with rock. The outlet works will consist of a horseshoe shaped tunnel 5 ft. in diameter, with a capacity of 500 cu. ft. per sec. The concrete overflow spillway will have a capacity of 6,200 cu. ft. per sec., being 260 ft. long and 40 ft. wide. The toe of the dam is protected by a cut-off trench 56 ft. deep reaching to bedrock, and foundation grouting to a minimum of 50 ft.

The crest of the dam will be utilized for a state highway and the Pleasant Valley branch of the Denver & Rio Grande Western Railroad will be shifted about 100 ft. to make way for the right abutment of the dam.

The contract for the construction was awarded to W. W. Clyde & Co., Springville, Utah, on September 20, 1943, in the amount of $503,000. Parley R. Neeley is construction engineer for the Bureau of Reclamation on the project.

Cement Price Jump Oked For Southwestern Mills

AN INCREASE of 20 cents per barrel in the manufacturers' ceiling price of Portland cement sold in southern California, Arizona and southeastern Nevada has been announced by the Office of Price Administration.

The exact area affected by the increase, effective Oct. 14, 1944, includes all of Arizona, that part of California south of and including the counties of Santa Barbara, Kern, Inyo and Mono, and the counties of Clark and Lincoln in Nevada.

The higher ceiling applies only to sales made f.o.b. mills situated within the area mentioned and to sales made on a delivered basis to a destination within the same area. Cements affected are all types of Portland cement (except white cement) and masonry cement and other special types such as natural cement, alumina cement and slag line cement.

Today's increase may be passed on by persons who resell cement in the same form in which they purchased it.

The 20-cent increase was allowed, OPA explained, because data submitted by producers in the area mentioned indicated that earnings under present ceilings have declined and that higher manufacturers' ceilings are needed to bring industry earnings to the level of those averaged during the peacetime years from 1936 to 1939, inclusive.

No permission is given to pass on the increase in resales of ready-mixed concrete, concrete products or other products manufactured from cement, since various manufacturers of these products will be affected by the increase in varying degrees. It is provided, however, that sellers of these manufactured products who can demonstrate a need for higher ceiling prices under existing adjustment provisions may make application to the San Francisco Regional Office of OPA. The 30-day period between the issuance and effective date of the cement action will provide sufficient time for the sellers of manufactured products to present their case to the field office.

Ban Lifted on Building Houses of Pre-war Type

RELAXATION OF RESTRICTIONS on the use of materials that will permit construction of houses approximating pre-war standards has been announced jointly by the War Production Board and the National Housing Agency. This action was taken by revision of Schedules I and II of Limited Preference Rating Order P-55-c of WPB.

War Housing Construction Standards were amended to place an over-all limitation on the use of lumber two or more inches in thickness for a dwelling unit. Previous restrictions on total floor area permitted in a dwelling unit have been removed, but the maximum board-foot allowance of dimension lumber per square foot of floor area has been retained.

The relaxations, it was announced, resulted from an easing of shortages in certain critical materials and the effect of the changes will permit builders to make use of materials and equipment as they become available.

At the same time, it was announced that, under the relaxations, houses can be built to conform to the minimum construction requirements of the Federal Housing Administration of NHA under Title II of the National Housing Act.

The War Housing Critical List, which previously contained all the materials that might be permitted in residential construction, is now designed to cover only those materials for which a priority rating can be used. Any materials that can be obtained without a rating may now be incorporated in the construction, unless specifically prohibited in the list.

The principal relaxations include:

1. Removal of the limitation on the number of electrical outlets so that installations may be made in accordance with the minimum requirements of the National Electric Code.

2. Removal of the restrictions on the size of hot water storage tanks. (This change should result, it was said, in fuel savings and a longer tank life. Since electric water heaters are now being manufactured for NHA use, restrictions against such installations where there is a basement or utility room or where other fuels are available have been removed.)

3. Removal of the requirement that bathrooms and kitchens be back to back, to allow more freedom in design.

Among the provisions designed to conserve lumber that have been retained are the limitations on the use of lumber in the construction of flat-roofs and walls of houses and the general provisions requiring conservation of lumber and other materials both in the construction of housing projects and their related facilities. In addition, there has been added a definite prohibition against the use of board lumber for sheathing partitions and ceilings, and for fences. Garage walls are required to be of masonry construction.

WASHINGTON NEWS

. . . for the Construction West

By ARNOLD KRUCKMAN

WASHINGTON, D. C.—Messrs. Krug and Folger of WPB, and the gentlemen of the armed services, apparently think the people of the Central Valley, particularly of the San Joaquin valley part of the Central Valley project, need the Friant-Kern canal facilities less than the people of the Coachella Valley need the All-American canal, and the folk up in the Northwest need highways enlarged to four-lane arteries.

Obviously, it is a matter of genuine pleasure to all the people of the Pacific Coast to know that the brass hats of the WPB and the censors of the armed forces have given Southern California permission to continue to excavate the Coachella Canal; and have cleared for immediate proceeding the expansion of the main highway that runs south from Vancouver, to a four-lane boulevard, beginning the present work with the stretch from Kalama, Wash., to Woodland, Wash. It is chiefly at present a grading job, and the State Highway people are said to have been given a ceiling of 1,750 men for their highway work. The extension of the Coachella Canal was cleared for immediate work on October 2. The contractor, it is understood, got a priority to secure from the outside three tractors, and other equipment; and has been given a manpower priority to carry along the 35-mi. extension. It is understood this work is preliminary to a further extension immediately after the first of the year, which will involve the expenditure of an additional sum of $4,000,000 to $5,000,000. The present work on the Coachella Canal will cost $1,700,000.

Alert congressmen push jobs

The road work in the Northwest puts vitality into the program to make the highway from Vancouver—U. S. 99—a great four-lane artery, at least through Washington and Oregon; and probably in the not remote future the four lanes will extend all the way down the Coast. It is interesting that the WPB was jarred into acting by the insistent follow-through exerted by a Republican congressman—Fred Norman, from the Third District of Washington. Norman lives in Raymond and was a well-known and unusually capable representative in the Washington State Legislature for some years before coming to the Federal Congress. He knows the ropes of politics and he has made an impression here for his indefatigable energy in keeping after the things to which his people are entitled. This road business is another demonstration of the skill and liveliness he has shown in getting attention for several other projects, such as the alcohol conversion in connection with some Washington lumber mills; and the pilot plant to determine the economic value of the mineral deposits in Washington as a source of aluminum. It is a curious fact that Norman has been able to move these war agencies to action when some of the Democratic members got nowhere.

The Coachella Canal extension is attributed chiefly to the active push exerted in committee work by Rep. Harry Sheppard of Yucaipa, southern California. Sheppard is a Democrat, a leading Democrat in Congress. Apparently he is a leading Democrat because he cuts red tape and goes places. It was apparent the Coachella Valley project might suffer the fate of the Friant-Kern canal. The funds provided by Congress to be used by the Bureau of Reclamation for the Coachella excavation work would not be available after Jan. 1. WPB apparently was influenced in its reluctance by the WFA opinion that the canal is highly desirable, but that it was open to question as a project of immediate war necessity. The latter opinion quite obviously was founded on the judgment of the gentlemen in the armed services who urged that such work be frozen until the German war is over. Sheppard, a ranking member of the House Naval Affairs Committee, was a member of the delegation which conferred with WPB and the representatives of the armed services, and apparently convincingly proved that the extension of the Coachella canal is important, that the work would not require manpower which could be used elsewhere, and that any preference necessary to provide equipment for the contractor is amply justified by the imminent needs of the population in Southern California, which population the armed services insist is needed in increasing numbers to do the work to support the growing drive to defeat the Japanese. In other words, Sheppard made clear we need the benefits which works like the Coachella canal bring, to produce the things upon which the people who come into the State to do war work must depend, now, and when the war is over.

Friant-Kern turned down

The Friant-Kern canal, which was turned down flat by Messrs. Krug and Folger and the gentlemen of the armed services, and by Marvin Jones of WFA, apparently lost out because there was no Harry Sheppard or Fred Norman to go to the bat. From this angle of incidence, it appears that the Friant-Kern canal should have been a more natural probability than the others. The Reclamation Bureau had $8,000,000 to start the job. It required no machinery or equipment except the used apparatus in the San Joaquin Valley, which are otherwise idle. It needed no priorities for materials nor for any other supplies. The Bureau of Reclamation has made a survey and found it could obtain the 250 workers needed for excavation immediately, in the neighborhood of the job, and that these local workers would not go elsewhere to do any other work. The facts actually demonstrated that the undertaking would not place a burden upon manpower for war, would not use machinery or equipment required for war work, would need no materials that could be used for war.

Congressman Alfred J. Elliott of Tulare represents the district which would be benefited by the making of the canal. War Food Administrator Marvin Jones could testify that Mr. Elliott was everlastingly on his trail about the canal during many of the past twelve or sixteen months. Mr. Jones also might be able to testify there were people out in the San Joaquin Valley who objected to the digging of the canal until they were assured that only landowners with 160-ac. holdings or less would be entitled to its benefits.

When the time for the showdown on the canal came here in Washington, Sen. Downey and Rep. Elliott were campaigning in California. When the gentlemen of WPB made their adverse decision the appeals for reconsideration were made at long range from California. It is generally assumed here now that the Friant-Kern canal is stymied until the Japanese war is over, at least. If there is any fault to be found for the delay it should not be laid at the door of the Bureau of Reclamation.

New reclamation region

Erdman B. Debler is now director of the new field subdivision of the Bureau of Reclamation known as Region 7. The new division is made up of part of Region 6 and part of Region 5. It includes Nebraska, eastern Colorado, southern Wyoming, western Kansas and a small part of South Dakota. The new subdivision is responsible for the Colorado-Big Thompson project, and for the projects which involve more transmountain diversion of the Colorado to the eastern slope of the Rockies. It also has responsibilities in connection with the Kendrick project in Wyoming. Debler has been with the Bureau for 26 years, part of the time as chief hydraulic engineer.

The Bureau of Reclamation has been placed in charge of the designing and construction of the Hungry Horse dam project on the South Fork of the Flathead River in Montana. The power installations are to be made in cooperation with the Bonneville Power people.

Geological Survey reports for September that stream flow again receded appreciably in the central inter-mountain region and in a region adjoining the Colorado - Wyoming border. The flow of the enttire Colorado River is reported to have decreased at more than seasonal rate.

Good neighbor purchases

Nelson Rockefeller's OCIAA stresses they need over $10,000,000,000 worth of new and used equipment in South America. The South Americans are expected to buy as quickly as the supplies are available after the war. Apparently they will make deals now for postwar delivery when and as the U. S. govern-

ment permits the transactions. It has been suggested our government itself may sell the Latin Americans approximately $750,000,000 worth of used equipment from surplus stocks held by various agencies. These sales are expected to be the first to South American countries. The Latins need mostly bulldozers, tractors, trucks, electrical equipment of all kinds, power units, repair units, machine tools, cranes, landing boats, barges, river boats, ocean-going ships, locomotives, railroad cars, planes, airport equipment, and similar items.

It is estimated they seek $500,000,000 worth of building construction equipment, $1,000,000,000 worth of power and communication machinery, $1,600,000,000 worth of transportation equipment, $300,000,000 mining machinery, $1,200,000,000 manufacturing equipment and machinery. The breakdown of requirements per country is given as follows: Argentina, $1,750,000,000; Bolivia, $165,000,000; Brazil, $2,600,000,000; Chile, $750,000,000; Colombia, $700,000,000; Ecuador, $150,000,000; Paraguay, $50,000,000; Peru, $500,000,000; Uruguay, $150,000,000; Venezuela, $235,000,000; Costa Rica, $30,000,000; Cuba, $300,000,000; Dominican Republic, $70,000,000; Guatemala, $125,000,000; El Salvador, $70,000,000; Haiti, $60,000,000; Honduras, $30,000,000; Mexico, $1,700,000,000; Nicaragua, $40,000,000; Panama, $25,000,000.

Latin American engineers and construction men are to be brought to this country for highway construction training under joint auspices of the American Road Builders Association and the OCIAA. One group is to be drawn from graduate engineers with four years experience; the other from among practical construction men, foremen, superintendents, master mechanics and plant managers. The course is to include from one to three months in manufacturing plants where the students will become familiar with American construction machinery. The total cost of $900 per man for a year's training is to be borne by OCIAA, one-third; by the employers for whom the students do field work, and the ARBA.

The Fifth Pan American Highway Congress finally was postponed in October and will be held in 1945 on dates to be fixed in the future. The Congress, as originally planned, will take place in Lima, Peru.

McCarran's report

Sen. Pat McCarran's report in the name of the Senate Special Committee to Investigate Centralization of Industry, which aroused the governors and members of Congress of 11 eastern and northeastern states to violent attack upon the presumed effort of the West to wreck the Eastern economy, will be formally discussed at the deferred hearing held in San Francisco, Nov. 16, 17 and 18. McCarran's report-writer recommended that all government-owned war plants in the East and Northeast be frozen and, virtually, scrapped after the war. The report has little support among other Western members of Congress. It is regarded as disruptive of the cooperation between the East and West to find a formula which might bring the several regions together to work for the development of the West. The report already has embarrassed Westerners working with Eastern groups to solve in a friendly manner the conflicting problems of the regions. It has aroused suspicion and some ill-will. It is regarded here as dramatic politics for the campaign in Nevada, but as harmful in the effort to promote the growth of the West. Apparently, postponement of the hearings, until after election, indicated a consciousness that the discussion might be political dynamite whose repercussion might not help the Nevada campaign.

Public works planning aid

The law creating the Office of War Mobilization and Reconversion, signed by the President, Oct. 3, made operative by the appointment of Justice Byrnes as administrator ad interim, contains the following:

"Title V—Public Works. Section 501 (A) In order to encourage States and other non-Federal public agencies to make advance provision for the construction of public works (not including housing), the Federal Works Administrator is hereby authorized to make, from funds appropriated for that purpose, loans or advances to the States and their agencies and political subdivisions to aid in financing the cost of architectural, engineering and economic investigations and studies, surveys, designs, plans, working drawings, specifications, procedures and other action preliminary to the construction of such public works: Provided, That the making of loans or advances hereunder shall not in any way commit the Congress to appropriate funds to undertake any projects so planned.

"(B) Funds appropriated for the making of loans or advances hereunder shall be allotted by the Federal Works Administrator among the several States in the following proportion: 90 per cent in the proportion which the population of each State bears to the total population of all States, as shown by the latest available Federal census, and 10 per cent according to his discretion: Provided, further, That no loans or advances shall be made with respect to any individual project unless it conforms to an over-all State, local, or regional plan approved by competent State, local, or regional authority.

"(C) Advances under this section to any public agency shall be repaid by such agency if and when the construction of the public works so planned is undertaken.

"(D) The Federal Works Administrator is authorized to prescribe rules and regulations to carry out the purposes of this section.

"(E) As used in this section, the term 'State' shall include the District of Columbia, Alaska, Hawaii, and Puerto Rico."

Surplus property

Surplus property disposal, to be made effective by the recently created Surplus Property Board, which is reported here to have distressed Western contractors, because priorities are given to certain governmental agencies and other non-profit units, is expected to be amended before it is placed in operation. The Board will not be appointed until probably the first of the year. Meanwhile, actual disposal is being continued by the Defense Plant Corporation, the Reconstruction Finance Corporation, the Procurement Division of the Treasury, and other agencies, under one or more of the 121 laws already on the books legalizing disposal in some form.

Negotiated sales—which means "first come, first served"—is the yardstick of most disposal now, and will undoubtedly continue to grow in importance as the preferred method. It will be wisdom for those who wish to buy surplus goods to keep closely and continuously in touch with the agencies now doing the selling. The closer the touch, the better. Also, remember, Smaller War Plants Corporation has become one of the most powerful agencies in Government, on its own, responsible only to Congress. It is empowered to buy any surplus property and to resell it. SWPC at present plans to act as broker, to locate surplus a buyer may require, and to negotiate for it. Bear in mind, SWPC can negotiate for ANYTHING that is surplus, from a pin to a discarded battleship. Bulldozers, trucks, rock crushers, road rollers, power shovels, tractors are small change in its potential transactions. If your local or regional SWPC brass hat does not know it, tell him to communicate with Maury Maverick about it. M. M. may be a singular person but he is doing a grand job in SWPC.

Miscellaneous

The various state highway departments will be prepared with blueprints and plans for more than a billion dollars worth of highway projects by October, 1945, according to reports prepared by Charles M. Upham, engineer-director, ARBA. He anticipates an equal volume of prepared plans for projects by city, county, local road and street projects. He predicts over $10,000,000,000 in urgent highway needs must be met in the first two or three postwar years. Col. William N. Carey, chief engineer, FWA, is afraid any laggardliness on the part of city and state agencies in making ready plans may bring about another WPA experience.

Five thousand temporary family dwellings are to be built on the Pacific Coast by FPHA for Navy officers and enlisted personnel who are permanently assigned shore duty after overseas service. FPHA regional office at San Francisco is to take bids when architects have prepared plans.

FWA has been asked by the City of Fairbanks, Alaska, for clearance of a project to build a steam-heated water system, the water to be piped from wells two miles from the city and pre-heated with steam boilers before distribution. According to preliminary plans made by Black & Veatch, engineers, Kansas City, water at 38 deg. F. is essential.

OBITUARIES . . .

J. G. (Jim) Graham, for many years superintendent for Pacific Bridge Company, died Sept. 28 at the age of 57. "Jim" was superintendent of construction on the north pier of the Golden Gate Bridge and on a drydock and pier at Hunters Point, Calif. He had been associated with the company since 1920.

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Delos L. Bundy, for 16 years city engineer of Redondo Beach, Calif., died Oct. 8 in that city at the age of 55. After graduation from college he served as a hydrographic engineer in Colorado and Arizona, and became Redondo city engineer in 1918.

* * *

Arthur R. Nielsen, widely-known Utah civil engineer, has died at Salt Lake City, at the age of 57. He was with the Utah Road Commission for many years, and recently has been with the U. S. Engineer Department.

* * *

Henry Vogel, construction engineer who built the first smelter for Anaconda Copper Co. at East Helena, Mont., died in Great Falls, Mont. on Oct. 5 at the age of 86. He built many other structures in Montana copper mines and laid the first paving in Great Falls.

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Carl St. John Bremmer, chief geologist for California-Ecuador Petroleum Co., a Standard Oil Co. subsidiary, died Sept. 18 in an airplane crash in Peru. His home was in Santa Barbara, Calif. His age was 49.

* * *

Darwin Schuetz, civil engineer, died Oct. 23 at the age of 64. He had worked on the Spokane Street Viaduct and the Lake Washington Floating Bridge, and, at the time of his death, was working on the Navy's branch railroad from Bremerton to Shelton, Wash.

* * *

Macy G. Thompson, assistant Federal Public Housing Authority engineer in Portland, Ore., died Oct. 7 at the age of 55. He had practiced architecture in Indianapolis for 24 years prior to coming to Portland 2 years ago.

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Sydney W. Taylor, Jr., consulting traffic engineer on the Golden Gate bridge and other structures, died Sept. 26 in Berkeley, Calif. He was 69 years old. He had been associated with the Golden Gate structure since 1929.

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Arthur N. Fenton, 95, died recently at Salt Lake City, Utah, where he had worked in construction for 55 years. He retired two years ago, being at the time a foreman for Gibbons & Reed Co., Salt Lake City contractors.

* * *

Gilpin S. Woolley, building contractor of Salt Lake City, Utah, died at his home in that city.

James J. Burke, well-known Utah contractor and director of the national A. G. C., died Oct. 9, in Salt Lake City. He had long been active in organization activities of the contractors' organization.

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John R. Tomlinson, electrical contractor of Portland, Ore., died Sept. 19 in that city at the age of 68. He had been in the contracting business since 1903.

* * *

James Freeborn, retired civil engineer, died in Seattle, Wash., on Oct. 21 at the age of 78. He was born in the Province of Ontario, Canada, and has been a resident of the United States for the past 65 years.

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Harold L. Hansen, construction superintendent for C. H. Hansen & Son of Oakland, Calif., died on Oct. 6 at the age of 32.

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Lawrence T. Johnston died Oct. 16 at the age of 63. He was a civil engineer for the City of Los Angeles, Calif., for the past 25 years.

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Henry E. Hocker, road superintendent for Imperial County, Calif., died Oct. 5 at Huntington Beach, Calif., at the age of 61.

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John H. Plant, building and painting contractor of Pasadena, Calif., died Sept. 25 in that city, after an illness of several years.

* * *

John Rudolph Bothmann, 57-year-old construction worker of Glendale, Calif., died Oct. 8.

Water Dispute Settled After 31 Years in Court

FINAL ADJUDICATION of a legal action concerning the distribution of the water of the Truckee river in California and Nevada, was decreed in September, after having been in the Federal courts since March 3, 1913, a period of 31 years. Three men who have been involved in the case since its institution were in the court at the time of the settlement. They were W. H. Orrick, counsel for the Sierra Pacific Power Co., William M. Kearney, State Engineer of Nevada in 1913, and Roy W. Stoddard, special assistant to the Nevada Attorney General.

The litigation was inaugurated by the Interior Department, which sought more water from Lake Tahoe, which is the source of the Truckee River, for the Truckee-Carson Irrigation District in the vicinity of Fallon, Nev. No riparian rights having ever been established for the river, suit was aimed at all owners along the river. The suit involved power rights along the river and domestic water for the cities of Reno and Sparks. In 1934 an agreement was reached out of court and the stream has been operated on the basis of this agreement since that time. In 1936, Boca dam was constructed to stabilize the flow of the river. It was built by the Bureau of Reclamation for the account of Washoe county and the Washoe County Water Conservation District.

The maximum level of Lake Tahoe has now been established at 6,229.1 ft. above sea level. Harry C. Dukes, who has served as water master for the past 18 years, was appointed officially to the job under the terms of the final settlement.

Facilities Construction Growth in Four Years Summarized in WPB Report

A REPORT OF the Bureau of Planning and Statistics, Industry and Facilities Division of the War Production Board issued October 25 summarizes the expansion of facilities in the United States from July, 1940, to June, 1944, this being the period of unprecedented expansion of manufacturing plants, military installations and other facilities following the approval of the First National Defense Act. During the period, projects were initiated which committed $64.2 billion for construction or acquisition of manufacturing, service and military facilities. Of these funds $41.5 billion were earmarked for construction and $22.7 billion for equipment. Included in the total figures are non-ammunition and non-military construction, such as food processing and civilian manufacturing and service, but these have suffered sharp declines from normal values.

The following tabulation shows the cost of manufacturing, military, and housing facilities expansion, during the period in the Western States. The figures include materials, labor, engineering fees, alterations and equipment, including major replacements of either construction or equipment, but excluding maintenance and repair costs. The figures indicate millions of dollars.

State	Manuf.	Army	Navy	Housing	Total
Ariz.	99	131	0	23	253
Calif.	1,361	563	696	292	2,912
Colo.	137	170	0	6	313
Idaho	25	34	67	6	132
Kans.	323	173	28	34	558
Mont. ..	5	41	0	4	50
Neb.	102	129	55	10	296
Nev.	144	35	45	14	238
N. Mex.	17	97	0	7	121
N. Dak.	1	2	0	0	3
Okla.	224	150	109	8	491
Ore.	112	114	43	66	335
S. Dak...	1	66	0	4	71
Texas ..	1,250	715	100	106	2,171
Utah	286	113	37	29	465
Wash. ..	306	169	131	165	771
Wyo.	40	23	0	3	66

PERSONALLY SPEAKING

John C. Stevens, consulting engineer of Portland, Ore., was nominated for president of the American Society of Civil Engineers. Election will take place just prior to the society's annual meeting in January. Work with the U. S. Geological Survey took Stevens to Portland in 1906 and he soon entered private practice, specializing in irrigation and power. In 1930 he formed a partnership with R. E. Koon and the firm is now engaged in designing a new $12,000,000 sewer disposal system for the City of Portland. Stevens has been active in the affairs of the engineering society for many years and is the present chairman of the committee on hydraulic research.

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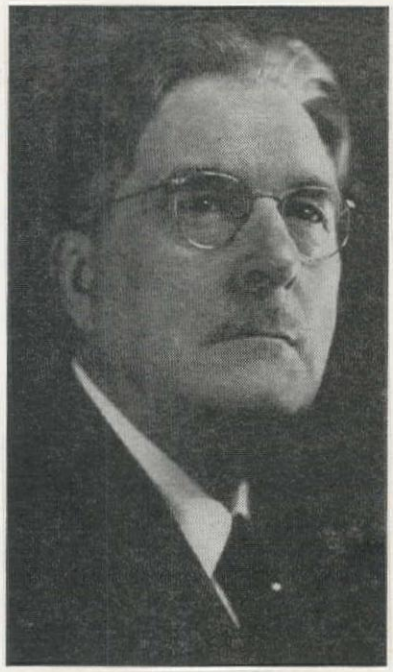
At the first annual meeting of the new Sewer Contractors Association of Southern California the following officers were elected: president, **M. F. Kemper** of the M. F. Kemper Construction Co.; vice-president, **Nick Bebek** of Bebek & Brkich; secretary, **Matthew Vukojevich** of V. C. K. Construction Co.; treasurer, **M. Ramljak** of the Ramljak Co.

* * *

Charles H. Diggs, formerly director of the Regional Planning Commission of Los Angeles County and for the past seven years associated with the F. H. A. in Washington, D. C., has accepted an appointment as engineering consultant for the planning commission of Orange County, Calif., with particular assignment to the county's postwar development.



JOHN C. STEVENS

Two standing subcommittees of OPA, dealing with the Pole and Piling Industry, have been appointed recently. The subcommittee on Ponderosa Pine Pole and Piling is composed of **J. Vander Laan,** San Francisco, Calif.; **Lester D. Brown,** Bridgeville, Calif.; and **J. S. Quinn,** San Francisco. The Lodgepole Pine subcommittee is composed of **R. C. Johnson, W. S. Broderick** and **George T. Kearns,** all of Denver, Colo.; **M. H. Sperry,** St. Paul, Minn.; and **W. E. Doan,** Portland, Ore.

* * *

Dr. Frank B. Jewett, member of the advisory council at California Institute of Technology, Pasadena, Calif., noted electrical and construction engineer, retired Oct. 21 as vice-president in charge of research and development for American Telephone & Telegraph Co. The company recently established five new research fellowships in honor of Dr. Jewett's discoveries and wartime developments.

* * *

R. R. Robertson, chief electrical engineer and deputy general manager of the Los Angeles, Calif., Department of Water and Power, retired from active service with the department on Sept. 1, after 32 years association. He has been head of the electrical work for the past two years. Ill-health was the cause of his retirement.

* * *

Stanford Paul McCasland, formerly with the Bureau of Reclamation at their Denver, Colo., headquarters, has been until recently, a Lieutenant Colonel in the U. S. Corps of Engineers. He has now mustered out of the service and is returning to the Pacific Coast.

* * *

P. E. Moase, formerly assistant field engineer for the Canadian federal government in charge of construction of the Skeena River highway at Prince Rupert, B. C., has become a partner in the Vancouver, B C. contracting firm of Farris & Nash.

* * *

Charles H. Rader, formerly with the Bureau of Reclamation on the Kennett division of the Central Valley Project in California, has been transferred to Tucumcari, N. Mex., where he is an engineer for the Bureau on the Tucumcari irrigation project.

* * *

Elliott V. Vandercook, for 24 years associated with Southern Pacific and subsidiary railroads, has been appointed chief of the U. S. Railway Mission in Mexico, to succeed **Oliver M. Stevens.** He is a native of Washington, was educated in California. He has served as railroad consultant in Ecuador and Colombia.

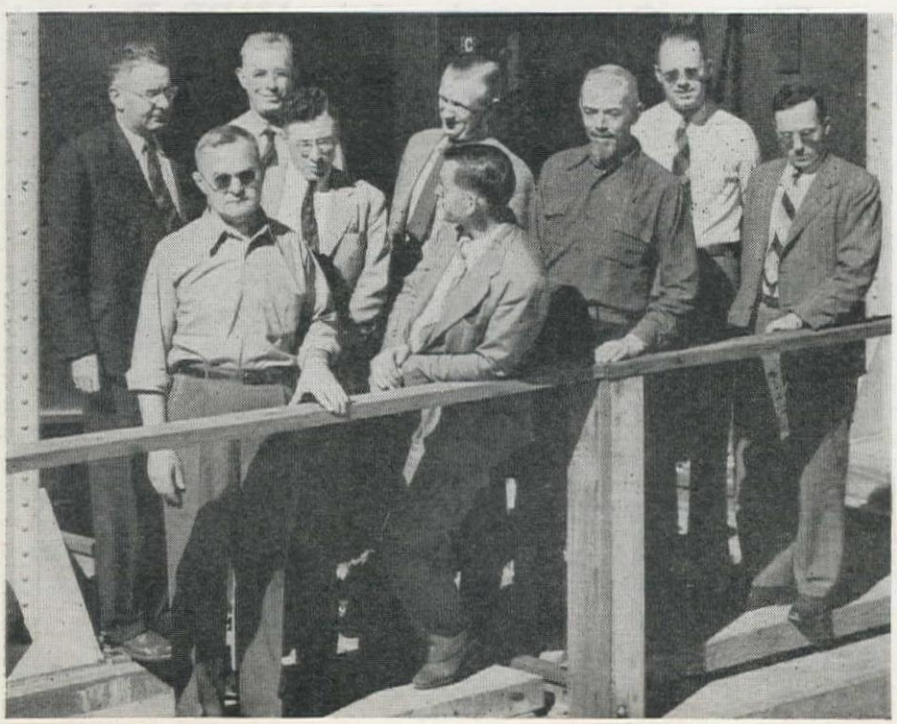
* * *

Majors Carl Anderson, John Detlie, and **Grant Gordon,** engineer officers attached to the Seattle, Wash., district office of the U. S. Engineer Department, have been temporarily assigned to the 21st general staff class at Ft. Leavenworth, Kan., and will return to their posts in Seattle in January.

* * *

Harry W. Shipman, for the past six years associated with the U. S. Engineer Office in Los Angeles, has been obliged to enter the U. S. Veterans' hospital at Sawtelle, Calif.

RUSSIAN ENGINEERS inspect Grand Coulee dam, as part of their planning for reconstruction of the huge Dnieprostroi dam, destroyed to prevent its falling into the hands of invading Germans. Front row, l. to r.: I. S. LOCKE, General Electric engineer; A. V. NATANSON, N. Y. SHPIAKIN, A. R. KUDIRSKY, M. D. KOSLOZ, all engineers with the Soviet Purchasing Commission, Dnieprostroi group, Washington, D. C. Back row, l. to r.: J. F. SPEASE, General Electric engineer; C. P. CHRISTENSEN, engineer with the Bureau of Reclamation at Grand Coulee; A. A. KEARNEY, managing engineer, Inland Empire Industrial Research, Spokane, Wash.; and J. F. GOGINS, General Electric manager at Spokane.



John Terbell, for the past 2½ years chief construction foreman at the Poston, Ariz., project of the War Relocation Authority, has been assigned to the Carson Indian Agency, Stewart, Nev., to work under **Bassett E. Vaughan,** road engineer. Terbell was formerly with the Indian Service at Pine Ridge, S. Dak.

* * *

C. J. Peterson, formerly office engineer on construction of the Shell Chemical Co. butadiene plant at Torrance, Calif., has been transferred to Houston, Tex., where he is doing refinery maintenance engineering for the same company at Cactus Ordnance Works.

* * *

S. T. Corfield, having completed his assignment as superintendent for Macco Construction Co., Clearwater, Calif., on construction of Barker dam, near Houston, Tex., is now office engineer for the company at the headquarters office.

* * *

Roland E. Nash is chief engineer for Case Construction Co. on reconditioning of the dredge "Marshall Harris" at Coronado Island, Calif. He was formerly hull foreman for Pacific Bridge Co. at Hunters Point, Calif.

* * *

Robert Lee Janes and **Carl Burdett Johnson,** instructors in civil engineering at California Institute of Technology, Pasadena, Calif., received degrees of Master of Science in Civil Engineering at graduation exercises at the Institute on Oct. 20.

* * *

Harold T. Nelson is construction engineer in charge of Bureau of Reclamation work on the Roza project in Washington, occupying the post formerly held by **C. E. Crownover,** who retired last year. Nelson comes from the Bureau's Denver office.

* * *

Donald M. Drake, president and principal owner of the firm formerly known as Drake, Wyman & Voss, Inc. of Portland, Ore., has announced that the firm will hereafter be known as the Donald M. Drake Co.

* * *

L. M. Bach, consulting engineer and general works manager for Lockheed Aircraft plants at Burbank, Calif., has been awarded a 10-year service pin by the Lockheed company.

* * *

Glenn B. Woodruff and **Raphael Sampson** are opening engineering offices at 333 Montgomery St., San Francisco, Calif., under the name of Woodruff and Sampson, Engineers.

* * *

Roy W. Johnson of Seattle, Wash., has been employed by the City Council of Ketchikan, Alaska, as construction engineer for the Beaver Falls hydroelectric project being undertaken by the city.

* * *

Werner Ruchti, formerly assistant engineer with the Los Angeles County Regional Planning Commission, has been named city planning engineer at Long Beach, Calif.

* * *

Frank Wherry is now planning engineer for Concrete Ship Constructors at their plant at National City, Calif.

RAYMOND ARCHIBALD, principal structural engineer of Public Roads Administration, who was in charge of bridge construction on the Alaska Highway, has been named Chief of the Bridge Division of PRA.

Col. Herbert G. Lauterbach of the Corps of Engineers, from Twin Falls, Idaho, has been awarded the Medal of Honor for heroism in reconnaissance work under enemy fire at Biak Island last June.

* * *

H. J. Donner, engineer with the Southern California Telephone Co., and **Robert B. Heuer** and **Harold W. Symonds,** engineers with the Los Angeles County Surveyor, started instructing classes for the University of Southern California in map drafting, on Oct. 9.

* * *

Emanuel Pavlakis is now a structural engineer for the National Advisory Committee for Aeronautics, doing research work for the army and navy at Langley Field, Va.

* * *

Herbert A. Jewett, formerly a sanitary engineer for the Los Angeles County Health Department, has been made sanitary engineer at Lockheed Aircraft Corp., Burbank, Calif.

* * *

L. E. Norelius, formerly irrigation engineer at Oroville, Wash., has been made engineer of the Wenatchee, Wash., reclamation district.

SUPERVISING THE JOBS

C. C. Wright is project manager for Robert E. McKee, Los Angeles, on buildings, hangars and warehouses at the El Toro, Calif., Marine base. **Chas. E. Jones,** a veteran on big McKee contracts, is general superintendent. The job engineers are **E. H. Thomas,** formerly in a similar capacity at Coronado, and **Henry Harbert.** Superintendents for different sections of the work are **W. M. (Eddie) Edwards, Walt Goodman** and **James Morris. B. E. Wilson** is master mechanic, **H. H. Perkins** is office manager and **Mac McLain** is concrete foreman. Other foremen on the project are **R. E. Hatchl, Richard Tatsch, C. E. Prescott, J. H. Krause, J. C. Higgins, B. E. Kunkle, E. R. Farrell, J. A. Wagner, L. W. Leland** and **L. E. Whitehorse.**

* * *

William Crane is serving as general superintendent for Allison Honer Co. of Santa Ana, Calif., on a radar building at North Island, San Diego, Calif. **O. T. (Tom) Moore** is general foreman, **Ted Wollston** is labor foreman and **George L. Stone** is carpenter foreman. The office manager is **R. H. Wallace.** The Robinson Co. has the sub-contract for steel and doors and **(Red) Turner** is that firm's superintendent. **Donald M. Stone** is superintendent for Stetson Electric Co., Los Angeles, who have the sub-contract for electrical installations.

* * *

Earl Pursell is general superintendent for Macco Construction Co., Clearwater, Calif., on construction of airstrips at North Island, San Diego, Calif., for the Navy. **Joe Seabury** is his assistant. Others on the job for Macco are **Jay E. Robeson,** master mechanic; **M. E. (Billie) Miller,** concrete superintendent; **Harry Powell,** concrete foreman; **Harry Porter,** project engineer; **E. W. Leppert,** office manager; and **Don Wilkinson** is in charge of the batching plant.

* * *

J. N. Galbraith is general manager for Hayward Lumber & Investment Co., Prefabrication division, Los Angeles, Calif., which firm has recently been awarded a contract for $4,126,255 to build 35,250 prefabricated tropical bulkheads for 20 x 56-ft. portable huts to be used by U. S. overseas troops. **A. C. Bonney** is assistant manager, **H. F. Woldenberg** is sales manager and **W. Carter Miller** is plant superintendent.

* * *

Harry Woods has charge of the construction of parking aprons and taxiways and runway and utility installation at the Fairfield-Suisun airport. Other key personnel on the job are **C. W. Barnhart,** engineer; **Everet Weatherman,** office manager, and **M. K. Young,** paving superintendent. Peter Kiewit Sons Co., Al Johnson Construction Co. and H. H. Everist of San Francisco, bidding $769,007, were recently awarded the contract.

* * *

A. J. Spindt, superintendent for general contractor S. O. Bennett of Altadena, Calif., is in charge of converting the La Vina

Girls' Preventorium, Pasadena, Calif., into the Charles Cook Hastings Home and research laboratory. The major part of the construction work consists of changing the dormitory rooms into private rooms and laboratory facilities. The home and laboratory will conduct extensive nutrition and therapeutic studies relative to the cure and prevention of tuberculosis.

* * *

Morris Derock, assisted by **H. C. Armstrong** as job engineer, and **Lyle Varley** and **Les Hayden,** foremen, is superintending the work of furnishing and installing backflow protection units and construction of concrete pits in Los Angeles Harbor. Hoagland - Findlay Engineering Co., at $125,933, was awarded the contract. **E. H. Shoultz,** at the home office in Long Beach, Calif., is in charge of purchasing for this installation.

* * *

Tobe Wight, formerly concrete superintendent for Concrete Ship Constructors, at San Diego, Calif., is now working in a similar capacity for Ford J. Twaits Co., on a 7-story warehouse at San Diego. **Emil Norman** is concrete foreman on the job. The field engineer on the project is **Harry Gray. Don Charlton** is paymaster and **Jack Reid** is chief inspector for the Navy. **Elmer Thompson** is labor foremen.

* * *

W. G. Hale, formerly general superintendent with the City Electric Co. of Boise, Idaho, and recently with the Hoosier Engineering Company, is now superintending the construction of 115-KV transmission line to Glendive and 34.5-KV line to Wolf Point, Mont., for the Rue Contracting Co. of Fargo, N. Dak., recently awarded the contract at $112,741. **Clarence Braun** is field office manager.

* * *

Eric Barclay, project manager for Ford J. Twaits, Morrison-Knudsen Co. and Ben Gerwick, is in charge of the storehouse, track, road and wharf construction and dredging work at the Naval Supply Depot at Rough & Ready Island, Stockton, Calif. **George Smith** is job superintendent and **Frank D. Barr** purchasing agent. Contract was awarded at a cost of $10,395,189.

* * *

In addition to the personnel previously announced on the Del E. Webb $2,500,000 contract for aviation facilities at El Toro, Calif., Marine base, the following are on the job: **J. H. Bear** and **A. H. Shearer,** assistant superintendents; **Ed R. Ball,** labor and concrete superintendent; **A. L. (Whitey) Thompson** and **Wes Widner,** area superintendents; and **G. T. Hanford,** engineer.

* * *

Wesley Myers is superintendent for Clyde W. Wood, Inc., Los Angeles contractor, on this company's highway work between San Bernardino line and Inyokern, Calif. Contract is for $108,079 and covers grading, blanketing with surfacing material, application of bituminous surfacing treatment to 5.4 mi. of highway and construction of 2 concrete slab timber pile bridges. Bridge foreman is **George Spaulding.**

* * *

Marlyn B. Sheik, project manager for Morrison-Knudsen Co., Inc., Boise, Idaho, on construction of the Geneva steel plant at Provo, Utah, has been transferred to New York City, where he will serve as head of the firm's eastern domestic activities and as a director of its foreign enterprises. He was the first construction man on the Geneva job, arriving there in March, 1942.

* * *

Lewis R. (Lew) Parker is project manager for Wm. C. Crowell Co., Los Angeles, on office and shop buildings being built for the Navy at San Diego, Calif. **Eddie Holmsdale** is superintendent; **Harry Twitchen** is general carpenter superintendent; **Tony Lopez** is labor foreman; **Ralph Ditto,** carpenter foreman; and **William Korth,** office manager.

* * *

L. E. Pratt is field superintendent for Bonneville Power Administration on construction of transmission lines in the vicinity of Ellensburg, Wash., the project now being in the clean-up stage. Foreman is **C. W. Paul** and other key men are **J. H. Fraser** and **V. W. Hyland. S. E. Shultz** is chief engineer and **W. C. Shirran** is resident superintendent.

* * *

Leonard C. Pulley is general superintendent for Gardner-Byrne Construction Co., Redlands, Calif., sub-contractor on the base stabilization program, said to be the largest in the country. **H. B. Arnold** is general foreman. **Charles Stewart** is superintendent for Southwest Paving Co., Roscoe, Calif., which firm holds the asphalt contract.

* * *

L. W. Hanson, who had charge of paving of the open storage areas at the Naval Supply Depot in Clearfield, Utah, for Gibbons & Reed, Salt Lake City contractors, is now in charge of this firm's $84,750 contract to construct 3.5 mi. railroad track at the same location. **R. B. Grane** is office manager and **Elmo Culbert** is timekeeper.

* * *

Dan Miller is project manager and **Joe Martinovich** is superintendent for Mike Miller Co., Los Angeles, Calif., on this firm's contract for the construction of sewers in the vicinity of Northside Drive, Los Angeles. Acting as office manager and purchasing agent is **Hanford Sax.** This is a $148,269 contract.

* * *

J. N. Wells, who was superintendent on construction at the large auxiliary airbase at Klamath Falls, Ore., is now supervising work at the Suisun-Fairfield Air Field in California. This job covers excavating and placement of sub-base material on parking apron, and contract was awarded to Morrison - Knudsen Co. at a cost of $171,471.

* * *

Nick M. Ninteman is general superintendent for P. J. Walker Co., Los Angeles, on their contract for barracks and personnel housing at the Navy magazine and net depot at Seal Beach, Calif. Assisting him are **Harry Stratford,** carpenter foreman and **J. W. Williamson,** office manager.

* * *

Bert Lee is general superintendent for Guerin Bros. Construction Co., South San Francisco, Calif., on their excavation contract in connection with the Bremerton-Shelton, Wash., Navy railroad. **Elmer Johnson** is general foreman and **Harold Walker** is night superintendent. Shop foreman for equipment is **L. L. Long.**

Floyd Downum is superintending the construction of laundry facilities at the Naval Receiving Station, Terminal Island, Calif., for the Brunzell Construction Co., Gardena, Calif., who hold the $123,904 contract for the work. **E. S. Brunzell** of the contracting firm is acting as project manager and purchasing agent.

* * *

J. P. Webber, construction foreman on above-ground work at the Metropolitan Water District's San Jacinto tunnel, near Banning, Calif., and later carpenter foreman on the Red Hill, Hawaii, defense projects, is now working with Neil Construction Co., on the Seal Beach, Calif., naval magazine and net depot job.

* * *

A. P. Jensen has been assigned by the Gaasland Construction Co., Bellingham, Wash., to superintend the building construction at the Auxiliary Air Station located at Arlington, Wash. He will be assisted by **Clyde Horik** and **W. A. Starr,** foremen. **G. V. Turner** is purchasing agent on the job. Contract is for $207,881.

* * *

C. Scott Robinson is project manager and **W. O. (Bill) Ward** is general superintendent on the joint Hull, Smale & Robinson-Baruch Corp. contract at $342,945 for loading docks at North Island, San Diego, Calif. Foremen on the project are **Lew E. Cesmat, Allen Long** and **John Israel. C. R. Griffin** is master mechanic on the job.

* * *

C. E. Ribisi is superintendent and **Karl Poss** engineer on a $477,378 contract awarded jointly to Fredrickson & Watson, Oakland, and Chas. L. Harney, San Francisco, to construct parking aprons for the Air Transport Command at Hamilton Field, Calif.

* * *

I. L. Waring is superintendent on the $324,000 contract awarded Parker-Schram Co., Portland, Ore., to construct taxiways and parking area and to stabilize shoulders at the Naval Air Station at Tillamook, Ore. **George Brown** is grade foreman and **Frank Griffiths** is office manager.

* * *

Donald H. Pravitz is project manager and **J. E. Solem** is job superintendent for Shumaker & Evans Construction Co., Los Angeles, Calif., on the $557,642 contract awarded this company for the fabrication, transporting and erection of 500 portable family dwellings at Los Angeles.

* * *

A. J. Wickstrom is general superintendent, **C. R. Irwin** is foreman and **R. J. Anderson** is office manager for Ludberg & Osberg, contractors on an irrigation canal under construction for the Bureau of Reclamation on the Roza project at Sunnyside, Wash.

* * *

Carl Lind is in charge of construction of a bus garage at San Diego, Calif., for L. C. Anderson of San Diego, winner of the $111,500 contract. Project manager is **Don Jack** and **Val Kock** is purchasing agent. San Diego Electric Railway Co. is the contracting agency.

* * *

Louis Selden, project manager for Gorelnik Co., Los Angeles, on construction of covered storage facilities at the naval

ITS GREATER ENDURANCE MEANS BETTER VALUE... Preformed "HERCULES" (Red-Strand) Wire Rope is designed and manufactured to do today's more difficult jobs quicker...better...safer...more economically. Properly selected materials, plus advanced manufacturing methods, plus the specific advantages of the preforming process are the factors which add up to its better value.

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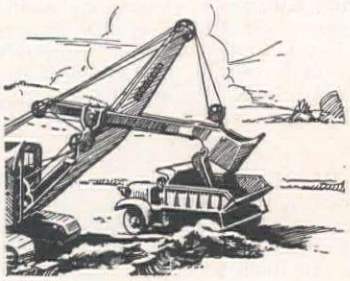

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operating base at San Diego, Calif., is assisted by **Jack A. Biely,** general superintendent and **A. M. Kennedy** and **A. E. Michael,** carpenter foremen. R. E. Hazard & Co., Los Angeles, have the grading and paving work in connection with the project and **Ollie Moyer** is supervising their work.

* * *

Walter F. Petersen is general superintendent for Manson Construction Co., Seattle, Wash., on erection of docks on the Hood Canal, to be used in connection with the Navy railroad to Bremerton, now under construction. **Mr. Edwards** is project manager and **P. A. Anderson** is timekeeper.

* * *

A. E. Rottmann is general superintendent for Royal Building Corp., Lynwood, Calif., on construction of six 60-unit nursery school buildings near San Pedro and Watts, Calif., a $80,335 job. **B. E. Werminghaus** is project manager and is also in charge of purchasing.

* * *

H. R. Morris is job superintendent at Pier 3 at the naval magazine, Port Chicago, Calif., for Puget Sound Bridge & Dredging Co., Seattle, Wash., who hold a $195,000 contract for dredging at the pier. **H. P. O'Reilly** is assistant superintendent and **E. S. Rich** is project manager.

* * *

Frank J. Keary is acting as superintendent on the $174,987 job to construct paint and storage buildings at Terminal Island, Calif. **Glen Roberts** is project manager and purchasing agent. Pozzo Construction Co., Ltd., Los Angeles, Calif., was recently awarded the contract.

* * *

Bert Norris is again superintending a bridge and highway contract for Sound Construction and Engineering Co., Seattle, Wash. This is a $213,132 contract in Grays Harbor County, Wash. **Bill Culbreth** is office manager.

W. C. Hosack is general superintendent and **Cy Prideaux** is project manager for the Austin Co. on construction of a wind tunnel for Consolidated Vultee Aircraft Co., at San Diego, Calif. Carpenter foreman is **Garry Anderson,** labor foreman is **James Dwyer** and field engineer is **Frank Cogdill. R. J. Ferrey** is project engineer, **W. J. Stillmaker** is structural engineer and **William M. Tennant** is office manager.

* * *

R. M. Stilwell will direct construction of a paint shop and other facilities at the army quartermaster depot at Mira Loma, Calif., for Alco Construction Co., Los Angeles, who received the $93,120 contract. **W. H. Metzdorf,** vice-president of the company, is purchasing agent on the job.

* * *

Harry O'Hagen is superintendent for Morrison-Knudsen Co., Boise, Idaho, who, bidding $459,103, was awarded contract to construct earthwork and structures, Sta. 85 + 73.5 to Sta. 125 + 60, Main canal, Altus Project, Okla.

* * *

Clary M. Vore is supervising the work of Lewis Construction Co., Los Angeles, on roads at the El Toro Marine base. **Dick Robbins** is the engineer for the firm and **Martin Gibbons** is office manager. **Bill Conners** has charge of the equipment and **James Hall** is master mechanic.

* * *

C. W. Johnson has been appointed by W. T. Bookout, contractor of Las Vegas, N. Mex., to superintend a contract valued at $228,188 recently awarded him for grading, surfacing and incidental work on 24 mi. of State highway 92 near Dora, N. Mex.

* * *

Andy Kucin is in charge of clearing and excavation on 2.9 mi. access road to Ah Pah Creek timber area in Humboldt Co., Calif. This contract was awarded to Mercer Fraser Co., Eureka, Calif., on a bid of $79,112.

* * *

J. W. Hess, superintendent for Louis Biasotti & Son, Stockton, Calif., is in charge of this firm's $80,759 contract to construct 0.8 mi. access road on Main St. at the Alameda Naval Air Station. **E. Metcalf** also has a key position on the job.

* * *

Norman Robinson has been appointed superintendent for Peter Kiewit Sons Co. on a contract recently awarded that firm for a mold loft and cable storage buildings at Hunters Point, Calif., Navy drydocks, a $285,132 contract.

* * *

Barney Hedberg is project manager and **Claude Elsea** is job superintendent at Alameda, Calif., for Stolte, Inc., who have received a $228,000 contract for paving certain areas at the naval air station.

* * *

S. N. Jacobsen is supervising construction of a hospital building in Ogden, Utah, for his company, which was awarded the contract at $726,370. **T. C. Jacobsen** is in charge of purchasing.

* * *

Phil Hook is superintendent for Piombo Bros. & Co., San Francisco, Calif., who hold the sub-contract for excavation, and **Albert C. (Al) Evans** is general foreman.

Everett Peters is job superintendent for Howard S. Wright Co., Seattle, on addition of a 4-story wing to S. Elizabeth's Hospital at Yakima, Wash. The contract is for $350,000.

* * *

Bob Crouch has taken over and is completing the supervision on the Vinnell Engineers Limited contract on the Coachella Canal structure work near El Centro, Calif.

* * *

George Bacus is superintendent on the $140,497 contract to construct taxiways at the Oakland Municipal Airport, recently awarded to Piazza & Huntley, San Jose, Calif.

* * *

Glenn Markham, Bert Schraeder, and **Jim Washburn,** owners of the firm formerly known as K & S Auto Parts, in San Diego, Calif., announce a name change to San Diego Motor Parts.

ECONOMY MUST BECOME THE NATIONAL WATCHWORD

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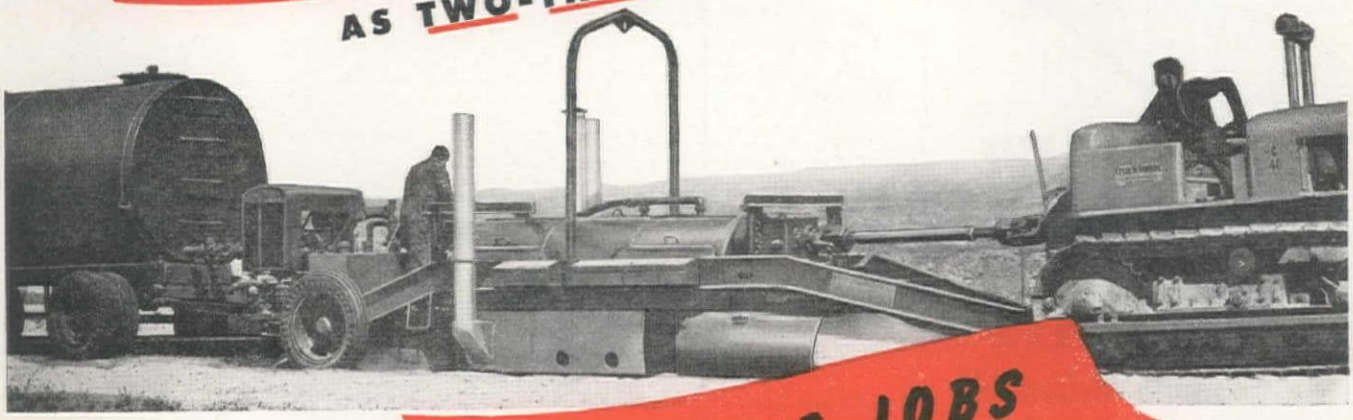

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- AIRPORTS

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- EMULSIONS
- ROAD OILS
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The Wood Roadmixer is a complete traveling mixing plant. It is pulled and powered by a standard crawler tractor and tows a binder supply truck. It uses low-cost native or local materials. It mixes in *one pass on the job.* Two men can handle an entire Wood Roadmixer unit and produce an average of 2,000 tons of mix per 8-hour day.

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UNIT BID SUMMARY

Irrigation . . .

Nebraska—Dawes County—Bureau of Reclamation—Diversion Dam

Malcolm G. Long of Billings, bid low at $98,135 to the U. S. Bureau of Reclamation for the construction of the Dunlap Diversion Dam on the Mirage Flats Project. The following bids were submitted:
(1) Malcolm G. Long $98,135
(2) Midland Construction, Inc. $175,132

	(1)	(2)
Lump sum, div. and care of river during constr.	$2,000	$40,000
6,000 cu. yd. excav. for struct	3.50	3.10
900 cu. yd. excav. for compacted fills	.25	3.00
1,200 cu. yd. backfill	1.00	2.95
900 cu. yd. compact backfill	1.50	3.35
3,100 cu. yd. compact fills	.75	3.25
6,000 sta. cu. yd. overhaul	.005	.60
90 cu. yd. constr. reverse fillers	10.00	14.25
200 cu. yd. place riprap	9.00	22.35
500 cu. yd. place riprap with gravel blanket	9.00	20.45
700 cu. yd. place riprap with gravel blanket	9.00	21.30
40 sq. yd. rock paving	6.00	13.80
550 cu. yd. conc. in weir and sluiceway	36.00	32.75
150 cu. yd. conc. in upstream apron	36.00	33.00
120 cu. yd. conc. in downstream apron	36.00	31.75
350 cu. yd. conc. in struct.	37.00	48.70
2,160 lin. ft. manuf. and drive conc. sheet piles	3.75	5.30
102,000 lbs. place reinf. bars	.03	.04
540 sq. ft. place joint-filler mat.	1.00	.10
685 lin. ft. place water stops	1.00	1.00
10,600 lbs. install. gates and hoists	.10	.13
3,500 lbs. install. misc. metalwork	.10	.20

Montana—Cascade County—U. S. Bureau of Reclamation—Canal

Elmer Genger of Fairfield, bid low at $108,070 to the U. S. Bureau of Reclamation for the construction of a canal at the Sun River crossing of the Pishun Canal at sta. 40+12. The following bids were submitted:
(1) Elmer Genger $108,070
(2) Otis Williams & Co. 136,450
(3) F. B. & A. A. Anderson & Co. $168,375

	(1)	(2)	(3)
6,000 cu. yd. excav., com., for struct.	.20	4.00	7.00
7,800 cu. yd. excav., rock, for struct.	6.00	4.00	7.00
4,800 cu. yd. backfill	.50	1.00	1.00
300 cu. yd. compact backfill	2.00	1.00	1.50
1,145 cu. yd. conc. in struct.	36.00	50.00	40.00
355,000 lbs. place reinf. bars	.04	.05	.05
5,000 lbs. place water stops	.10	.10	.15
1,500 lbs. install blow-off valve	.10	.10	.15
Lump sum, remove pipe and bridge	$1,000	500.00	$2,000

Bridge and Grade Separation . . .

Washington—Grays Harbor County—State—Bridge & Pave

Sound Construction & Engineering Co. of Seattle, submitted the lowest bid of $213,132 to the Department of Highways and was awarded the contract to clear, grade, pave and build bridges and culverts on 5.7 mi. of Secondary State Highway No. 13-A between Stas. 0+00 and 54+06, and 180+00 and 422+00. Bids were:

(1) Sound Constr. & Engr. Co. $213,132
(2) L. Coluccio Co. 226,324
(3) Northwest Constr. Co. 238,616
(4) Erickson Paving Co. 243,054
(5) Fiorito Bros. $248,729
(6) Rush-Baird 263,262
(7) F. E. Wilder 302,789

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
36.0 acres clear.	290.00	300.00	300.00	250.00	300.00	375.00	400.00
26.9 acres grubbing	280.00	300.00	350.00	250.00	300.00	375.00	400.00
82,080 cu. yd. unclass. excav.	.44	.36	.45	.50	.40	.50	.55
1,670 cu. yd. common trench excav.	.90	1.50	1.50	2.50	2.00	2.50	2.50
94,880 cu. yd. sta. overhaul	.02	.02	.03	.02	.02	.03	.02
578.25 M. cu. yd. sta. overhaul	4.00	7.50	7.00	15.00	10.00	8.00	8.00
2,170 cu. yd. spec. rdwy. ditch excav.	.80	.65	1.00	2.00	2.00	2.00	2.50
1,080 cu. yd. struct. excav.	1.75	2.00	2.00	3.00	2.00	2.00	2.50
1,220 cu. yd. channel change excav.	.60	1.50	1.00	5.00	2.00	2.00	2.00
5,400 lin. ft. slope treat.	.15	.12	.12	.15	.15	.15	.15
206.8 stas. (100 ft.) finish roadway	13.00	12.00	8.00	15.00	15.00	15.00	15.00
68,775 cu. yd. rdwy. borrow in pl.	.83	.89	.95	.75	1.00	1.10	1.30
655 cu. yd. ballast for backfill	2.15	4.00	4.00	5.00	3.00	2.50	3.00
14,005 cu. yd. ballast on roadway	2.00	2.30	2.00	2.50	2.65	2.25	3.00
3,810 cu. yd. cr. stone top course	2.45	2.60	2.50	2.75	3.00	2.50	3.00
330 cu. yd. sand filler in place	1.00	2.00	2.50	1.00	3.00	2.25	3.00
557 M. gal. water	2.00	3.00	2.00	2.50	3.00	2.00	3.00
1,545 cu. yd. cr. cover stone in stockpile	2.20	2.50	3.00	2.00	2.25	2.25	3.00
LIGHT BITUMINOUS SURFACE TREATMENT METHOD "A"							
5.7 mi. prep., construct. and finish	250.00	400.00	400.00	350.00	350.00	300.00	500.00
174.5 T. bitum. cement MC-2	25.00	38.00	40.00	35.00	35.00	30.00	40.00
1,545 cu. yd. crushed cover stone	2.00	2.00	2.00	1.70	1.70	2.00	1.75
MISCELLANEOUS ITEMS							
37 only conc. right of way markers	3.00	4.00	2.00	3.50	2.50	2.00	5.00
950 lin. ft. std. guard rail type No. 5	1.40	1.50	1.50	2.50	2.00	5.00	1.75
800 lin. ft. spec. wood gutter design No. 3	.75	.75	1.50	2.25	.50	2.00	1.50
85 lin. ft. spec. wood spillway	1.00	1.00	1.50	2.25	1.00	.75	2.00
170 lin. ft. std. open wood flume	1.15	1.00	2.00	2.25	1.25	1.00	2.00
105 lin. ft. cedar pipe cradle	17.00	8.50	16.00	15.00	10.00	1.50	10.00
6 only reflector units	10.00	10.00	25.00	12.00	10.00	15.00	10.00
Lump sum, remove exist. log bulkhead	50.00	150.00	150.00	200.00	500.00	$1,000	200.00
39 lin. ft. relay conc. pipe 12-in. diam.	.75	.60	1.00	.50	1.00	.75	1.00
36 lin. ft. relay conc. pipe 14-in. diam.	.80	.75	1.00	.75	1.25	1.00	1.00
30 lin. ft. relay conc. pipe 18-in. diam.	1.10	.90	1.25	1.00	2.00	1.50	1.50
192 lin. ft. conc. or V.C. drain pipe 6-in. diam.	.65	.50	.75	.70	.75	.75	1.00
255 lin. ft. conc. or V.C. culvert pipe 12-in. diam.	1.50	1.25	1.25	1.40	1.30	2.00	1.50

(Continued on next page)

This is *One* of 896 MOTO-CRANE JOBS

Since Moto-Crane Service, Inc., Detroit, started in 1940, they've completed 896 separate jobs covering every phase of material handling, excavating and rigging.

Some jobs lasted only a few hours, others up to 17 months; one was 240 miles from Detroit. To handle the steadily increasing demand for Moto-Crane service, this organization has built up a fleet of 6 Lorain Moto-Cranes.

Similar reports from hundreds of other Moto-Crane owners—Service Companies, Contractors, Steel Erectors, Industrials — are further proof that Moto-Crane *mobility, speed-in-transit and ready convertibility to* Shovel, Crane, Dragline and Clamshell provide the profitable answer to many postwar excavating and material handling problems.

Quick Facts About the Moto-Crane

THE CRANE

1. Simplified Center Drive direct-to-the-point power application.
2. Balanced turntable design, to provide the greatest capacities per pound of weight.
3. Steel erector's precision boom hoist with positive power control of boom lowering.
4. 2-piece, pin-connected all-welded boom with center sections and straight or gooseneck tips.
5. Cab type tagline which functions efficiently at all boom angles and digging depths.
6. Convertible to Crane, Shovel, Dragline, and Clamshell.

THE CARRIER

1. 3-axle mounting on 10 rubber tires. Both tandem rear axles drive.
2. High speed transmission range for road travel — low range for off-the-road travel.
3. Close-coupled, 175" wheelbase for better maneuvering.
4. Steering gear designed for soft ground travel.
5. Special chassis frame. No Moto-Crane frame has ever failed.
6. 10 speeds forward—and 2 reverse. Unit will climb a 30% grade.

Ask your Lorain distributor for the big 32-page catalog showing 78 ways to speed work — save money with a Lorain Moto-Crane.

THE THEW SHOVEL COMPANY · Lorain, Ohio

LORAIN DISTRIBUTORS:

***Le Roi-Rix Machinery Co., Los Angeles 11; Cate Equipment Co., Salt Lake City 4; *Liberty Trucks & Parts Co., Denver 1; *Coast Equipment Co., San Francisco 1; Wilson Equipment & Supply Co., Cheyenne, Wyo.; *A. H. Cox & Co., Seattle 4, Wash.; *Columbia Equipment Co., Portland 14, Ore., Spokane, Wash.; Bunting Tractor Co., La Grande, Ore.—Boise & Twin Falls, Ida.; State Tractor & Equipment Co., Phoenix, Ariz.; Connelly Machinery Company, Billings & Great Falls, Mont.; Sanford Tractor & Equipment Co., Reno, Nevada; The Mountain Tractor Company, Missoula, Mont.; The Tractor & Equipment Co., Sidney, Mont.**

Carries a representative stock of spare parts.

2 Moto-Cranes, with 90' booms lifting a 6½-ton bottle washer to the 6th floor level.

Reg. Trade Mark

thew-Lorain

It's not a MOTO-CRANE unless it's built by THEW-LORAIN

CRANES · SHOVELS · DRAGLINES · MOTO-CRANES

489 lin. ft. conc. or V.C. culvert pipe 18-in. diam.	2.50	2.25	2.50	2.16	2.50	3.00	2.00
51 lin. ft. conc. or V.C. culvert pipe 24-in. diam.	5.00	4.00	3.50	3.81	5.50	5.00	4.00
519 lin. ft. std. rein. conc culv. pipe 18-in. diam.	3.00	2.75	3.00	2.80	3.00	3.50	3.00
30 lin. ft. std. rein. conc culv. pipe 24-in. diam.	5.00	4.25	4.00	3.85	6.00	6.00	4.00
15 lin. ft. std. reinf. conc. culv. pipe 30-in. diam.	7.00	5.50	6.50	6.31	10.00	6.00	5.00
120 lin. ft. std. reinf. conc. culv. pipe 36-in. diam.	9.00	8.50	8.00	10.00	12.00	7.00	7.00
33 lin. ft. ex. str. reinf. conc. pipe 36-in. diam.	13.00	12.50	11.00	13.00	15.00	11.00	10.00
BRIDGES							
70 cu. yd. struct. excav.	3.00	2.00	6.00	3.60	2.00	2.00	4.00
95.0 M.F.B.M. timber and lumber (creo. tr.)	150.00	150.00	150.00	150.00	147.00	147.00	150.00
4.3 M.F.B.M. timber and lumber (salts tr.)	160.00	230.00	240.00	220.00	218.00	218.00	150.00
4,200 lin. ft. furn. timber piling (creo. tr.)	.90	1.10	1.10	.80	1.04	1.04	1.00
97 only driv. timber piles (creo. tr.)	14.00	15.00	20.00	18.00	13.30	13.30	39.00
3 only furn. and driv. timber test piles	100.00	200.00	200.00	100.00	160.00	160.00	150.00
Lump sum, remove exist. struct.	500.00	700.00	900.00	500.00	600.00	600.00	$3,000
DETOUR BRIDGES							
34.0 M.F.B.M. Timber & lumber (untr.)	115.00	120.00	120.00	110.00	114.00	114.00	110.00
1,940 lin. ft. furn. timber piling (untr.)	.25	.28	.40	.25	.24	.24	.40
48 only drive timber piles (untr.)	13.00	15.00	20.00	13.50	13.30	13.30	39.00

Montana—Prairie County—State—Bridge

W. P. Roscoe Co., Billings, submitted the low bid of $202,552 to the State Highway Commission and was awarded the contract to build a 5-span 632-ft. steel and concrete bridge across the Powder River. Bids were:

(1) W. P. Roscoe Co. $202,552
(2) F. B. & A. A. Anderson & Co. 209,105
(3) Otis Williams & Co. $225,727

	(1)	(2)	(3)
33,681 cu. yd. unclass. excav. and borr	.26	.30	.27
3,034 cu. yd. select matl.	1.25	.80	1.00
700 M. gal. watering	2.00	3.00	3.00
15 ea. conc. right of way mon.	5.00	5.00	5.00
36 ea. wood guide posts	5.00	5.00	5.00
100 sq. yd. grouted riprap	6.50	5.00	5.00
926,400 lbs. struct. steel	.102	.095	.105
11,350 lbs. cast steel	.102	.20	.25
133,300 lbs. reinf. steel	.102	.08	.07
1,718 cu. yd. class A conc.	25.00	33.00	35.00
4,414 cu. yd. class D conc.	40.00	30.00	37.00
1,100 lin. ft. treated timb. piling	1.25	2.00	1.50
2,280 cu. yd. struct. excav.	4.00	7.00	9.00
Lump sum, remove exist. struct.	$7,109	$4,500	$2,500

Highway and Street...

Washington—King County—State—Surf.

Northwest Construction Co. of Seattle, Wash., was awarded a contract by the Washington Department of Highways, Olympia, with a low bid of $181,819 to construct access roads from Seattle to the Boeing Aircraft Plant at Renton. The following bids were submitted:

(A) Northwest Construction Co. $181,819
(B) L. Romano Engineering Co. 189,921
(C) D. F. Whittaker Co., Inc. 223,996
(D) Rumsey & Co. 225,393
(E) Fiorito Bros. $238,989
(F) Axel Osberg 239,972
(G) Bay Construction, Inc. 246,168
(H) N. Fiorito Co. 341,109

(1) Lump sum, clear. and grub.
(2) 110,980 cu. yd. com. excav. incl. haul.
(3) 45,200 cu. yd. solid rock excav. incl. haul.
(4) 510 cu. yd. com. trench excav. incl. haul.
(5) 1,045 cu. yd. struct. excav. incl. haul.
(6) 54.0 stas. (100-ft.) finish road.
(7) 105 cu. yd. gravel backfill.
(8) 13,340 cu. yd. select road. borrow, incl. haul.
(9) 4,790 cu. yd. crush. stone surf. top course.
(10) 490 cu. yd. sand filler incl. haul. in place on rdwy.
(11) 70 M. gal. water.
(12) 4,180 sq. yd. cem. conc. pavt. high early st.

Bitum. Surf. Treat. "Plant Mix" Type—
(13) 19,786 sq. yd. prep. untreated road.
(14) 201 cu. yd. plac. new fine aggregate.
(15) 28.4 T. bitum. cement MC-2 (prime coat)
(16) 2121 T. mix. & plac. bitum. mixt.

Non-Skid Single Seal Treatment—
(17) 23.5 T. bitum. cement RC-5.
(18) 225 cu. yd. place coarse cr. screenings.
(19) 70 cu. yd. place fine cr. screenings.

Miscellaneous Items—
(20) 3.0 cu. yd. conc. Class "A".
(21) 470 lb. steel reinf. bars.
(22) 2 only reflector units.
(23) 40 only conc. right-of-way markers.
(24) 582 lin. ft. std. conc. gutter and spillway.
(25) 4,059 lin. ft. std. guard rail, Type No. 5.

(26) 2,450 lin. ft. asph. gutter.
(27) 3,529 lin. ft. Type "A" reflect. curb.
(28) 1,638 lin. ft. Type "C" reflect. curb.
(29) 12 only reflect. curb nosing.
(30) 80 only asph. conc. traf. buttons.
(31) 29 cu. yd. hand placed riprap.
(32) 4 only std. conc. or brick manhole.
(33) 24 only special conc. catch basin.
(34) 1,057 lin. ft. reset. & repaint exist. cable gd.
(35) 190 sq. yds. remov. conc. or brick pavt.
(36) 1 only remov. conc. catch basin.
(37) 2 only remov. conc. pipe headers.
(38) 582 lin. ft. remov. conc. gutter & spillways.
(39) 100 lin. ft. remov. & relay. galv. iron wtr. pipe.
(40) 109 lin. ft. relay. conc. culv. pipe.
(41) 100 lin. ft. plain conc. or V.C. sewer pipe, 6-in. diam.
(42) 1,591 lin. ft. plain conc. or V.C. culv. pipe, 12-in. diam.
(43) 292 lin. ft. plain conc. or V.C. culv. pipe, 18-in. diam.
(44) 192 lin. ft. std. reinf. conc. culv. pipe, 12-in. diam.
(45) 192 lin. ft. std. reinf. conc. culv. pipe, 18-in. diam.
(46) 27 lin. ft. std. reinf. conc. culv. pipe, 30-in. diam.
(47) 123 lin. ft. std. reinf. conc. culv. pipe, 36-in. diam.
(48) 150 lin. ft. bitum. coated corr. metal culv. pipe.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
(1)	$3,000	$6,500	$4,000	$3,000	$10,750	$1,500	$3,500	$3,000
(2)	.45	.40	.67	.70	.67	.89	.85	1.00
(3)	1.00	.80	1.20	1.00	1.25	.90	1.12	1.50
(4)	1.00	2.00	2.00	1.00	2.00	1.25	2.00	2.00
(5)	1.50	2.00	2.00	2.00	1.75	1.25	1.50	2.00
(6)	10.00	10.00	10.00	25.00	10.00	25.00	19.00	10.00
(7)	4.00	5.00	1.50	3.00	5.00	2.50	4.00	5.00
(8)	1.00	1.35	1.50	1.25	1.25	1.25	1.24	1.20
(9)	1.70	3.00	3.00	3.00	2.95	3.15	2.70	2.90
(10)	1.70	3.00	3.00	1.50	2.00	2.50	.95	2.00
(11)	2.00	4.00	2.00	5.00	3.00	5.00	3.85	4.00
(12)	3.00	3.50	2.80	3.00	3.25	3.50	3.00	3.25
(13)	.10	.10	.04	.06	.05	.05	.05	.05
(14)	3.60	3.60	3.00	4.00	3.50	3.60	3.50	3.50
(15)	42.00	34.00	32.00	35.00	32.50	35.00	35.00	32.50
(16)	7.50	8.00	6.00	9.00	8.00	8.50	8.25	8.00
(17)	42.00	34.00	35.00	40.00	37.50	40.00	37.50	37.50

(Continued on next page)

SCHOOL FOR SKILL

SOUTH PACIFIC—A 20-B unloads a jeep.
(Official Navy Photo)

(Signal Corps Photo)

ADAK—A 15-B crane erects a hangar.
(Official Navy Photo)

The men who are doing such an effective job of using today's fine excavators as weapons against the Axis, will be ready to apply their war-developed skill to the operation of tomorrow's better machines. The combination will make excavating a vital factor in building a **better** peacetime world.

As in war, Bucyrus-Eries, operated by war-trained men, will produce outstanding results on your postwar work.

V-68C

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

ALGIERS—A 10-B dragline widens a drainage ditch.
(Signal Corps Photo)

ALEUTIANS—A 15-B crane unloads supplies.
(Official Navy Photo)

WASHINGTON: Bucyrus-Erie Co., 3408 First Ave. So., Seattle 4; Clyde Equipment Co., 3410 First Ave. So., Seattle 4; Construction Equipment Co., 1118 Ide Ave., Spokane 1. OREGON: Clyde Equipment Co., 17th and Thurman Sts., Portland 9. CALIFORNIA: Bucyrus-Erie Co., 390 Bayshore Blvd., San Francisco 24; Crook Co., 2900 Santa Fe Ave., Los Angeles 11. UTAH: The Lang Co., 267 W. First So., Salt Lake City 9. COLORADO: Ray Corson Machy. Co., 1646 Wazee St., Denver 2. IDAHO: Intermountain Equipment Co., Broadway at Myrtle, Boise. NEW MEXICO: R. L. Harrison Co., 209 North Fourth St., Albuquerque. ARIZONA: O. S. Stapley Co., 723 Grand Ave., Phoenix. MONTANA: Westmount Tractor & Equipment Co., 150 E. Spruce St., Missoula. ALASKA: Northern Commercial Co., 419 Colman Bldg., Seattle 4, Wash.

(18)	4.25	4.75	3.15	4.50	4.10	4.50	4.10	4.10
(19)	4.25	4.75	3.15	4.50	4.10	4.50	4.10	4.10
(20)	40.00	40.00	60.00	45.00	50.00	40.00	22.50	50.00
(21)	.10	.10	.10	.10	.15	.25	.10	.10
(22)	25.00	10.00	10.00	10.00	10.00	10.00	15.00	15.00
(23)	2.00	4.00	2.00	3.00	5.00	2.00	3.20	4.00
(24)	.60	1.25	.50	1.00	.50	1.50	1.00	1.25
(25)	1.00	1.00	1.00	1.50	1.35	1.25	1.30	1.20
(26)	.60	.90	.50	.60	.50	.60	.50	.50
(27)	1.50	2.00	1.35	1.50	1.50	1.30	1.75	1.60
(28)	2.00	2.50	1.80	2.00	2.00	1.80	2.10	2.00
(29)	25.00	15.00	10.00	10.00	10.00	10.00	15.00	10.00
(30)	2.00	1.00	1.50	1.25	1.50	1.70	1.50	1.50
(31)	10.00	4.00	6.00	10.00	15.00	10.00	5.00	30.00
(32)	125.00	150.00	300.00	150.00	125.00	150.00	185.00	150.00
(33)	60.00	75.00	75.00	60.00	75.00	75.00	85.00	75.00
(34)	.80	.50	.50	1.25	1.00	1.00	.70	.60
(35)	1.00	.50	1.00	1.00	1.50	.50	.30	2.00
(36)	25.00	5.00	20.00	15.00	25.00	10.00	10.00	40.00
(37)	15.00	1.00	10.00	15.00	25.00	25.00	10.00	15.00
(38)	.30	.40	.25	.25	.30	.25	.40	.40
(39)	.65	.50	.40	.25	.50	.35	1.25	1.00
(40)	1.00	.50	1.00	.75	1.00	1.00	1.10	1.00
(41)	.60	.50	.70	.75	.50	.60	.90	.70
(42)	1.25	1.25	1.50	1.25	1.25	1.25	2.00	1.15
(43)	2.50	2.00	2.00	2.25	2.85	1.60	3.15	1.70
(44)	1.50	1.25	1.85	1.50	1.40	1.45	2.85	1.35
(45)	3.00	2.50	2.80	3.25	3.50	3.00	3.50	2.40
(46)	4.50	6.00	4.50	4.50	8.00	4.50	5.75	6.50
(47)	6.00	8.00	7.00	7.00	10.00	7.00	8.00	10.40
(48)	1.50	2.50	.80	1.50	1.50	1.50	4.00	1.40

New Mexico—Santa Fe & San Miguel Counties—State—Surf.

Brown Bros., Albuquerque, New Mexico, was awarded a contract by the New Mexico Highway Department with a low bid of $95,660 to construct 8.7 mi. of highway on U. S. 84 and 85 between Santa Fe and Las Vegas. Bids were:

(1) Brown Bros. ..... $ 95,660
(2) Henry Thygesen & Co. 108,478
(3) G. I. Martin ..... Partial Bid
(4) Skousen Construction Co. $107,980

SCHEDULE No. 1	(1)	(2)	(3)	(4)
2,000 cu. yd. excav., unclass.	.40	.60	.75	.50
70 cu. yd. excav. for pipe culv.	2.00	1.00	1.50	2.00
25 hr. rolling, Sheepsfoot	6.00	5.00	4.00	4.00
32 M. gal. water	4.00	2.50	2.00	3.00
13 cu. yd. Class "A" conc.	40.00	25.00	30.00	30.00
16 cu. yd. Class "A" conc., check dams	40.00	25.00	30.00	30.00
34 cu. yd. Class "A" conc. cutoff walls	40.00	25.00	25.00	30.00
818 sq. yd. Class "A" conc. rundowns	5.00	3.50	3.50	3.00
570 lb. reinf. steel	.20	.15	.15	.20
76 lin. ft. reinf. conc. culv. pipe, 24-in. diam.	8.00	3.75	4.00	6.00
228 lin. ft. reinf. conc. culv. pipe, 36-in. diam.	10.00	6.00	7.00	9.00
97 hr. mechanical tamp.	6.00	6.00	5.00	6.00
3,449 lb. wire fabric reinf.	.18	.10	.12	.20
1,342 T. ballast	1.50	2.00	1.00	.90
1,187 T. base course surf.	1.80	2.00	1.40	1.20
3,336 bbl. cutback asph. Type RC-2	4.50	4.40	5.00	5.00
138,000 sq. yd. process base course surf.	.08	.05-3/10	.05	.07
2,528 lin. ft. oil process curb	.40	.30	.50	.90
SCHEDULE No. 2				
280 hr. roll., steel tire	5.00	5.00	5.00	.....
6,276 T. blended rock asph. surf. course	9.25	9.40	9.60	.....
14 bbl. 200-300 asph.	4.50	5.00	10.00	.....
18 T. aggreg., seal coat	4.00	8.00	10.00	.....
SCHEDULE No. 3				
369 hr. roll., steel tire	5.00	5.00	.....	6.00
9,413 T. hot plant asph. surf.	3.00	4.50	.....	4.00
3,288 bbl. 200-300 asph., asph. surf.	4.20	5.00	.....	4.20
762 bbl. 200-300 asph.	4.50	5.00	.....	6.00
1,273 T. aggreg., seal coat	4.00	6.00	.....	7.00

Arizona—Yavapai County—State—Grade & Drain

W. E. Orr, Phoenix, Arizona, submitted the low bid of $95,013 to the Arizona Highway Commission to grade and drain 5¼ mi. of roadway on the Hillside-Bagdad Mine Highway about 50 mi. west of Prescott. Bids were as follows:

(1) W. E. Orr ..... $ 95,013
(2) Phoenix-Tempe Stone Co. 104,207
(3) W. J. Henson 106,276
(4) Fisher Contracting Co. $123,345
(5) Wallace & Wallace Contractors 124,909
(6) N. G. Hill & Co. 155,839

	(1)	(2)	(3)	(4)	(5)	(6)
107,459 cu. yd. road. excav.	.57	.56	.60	.74	.76	1.06
785 cu. yd. drain. excav.	1.00	.75	1.00	1.25	2.50	1.50
1,335 cu. yd. struct. excav.	2.00	2.50	2.50	2.00	2.50	2.50
127,651 sta. yd. overhaul	.02	.02	.03	.02	.03	.02
359 cu. yd. mi. haul	.35	.50	.30	.30	.30	.60
436 cu. yd. Cl. "A" conc.	28.00	35.00	32.00	38.00	33.00	37.50
47,335 lb. reinf. steel	.07	.15	.08	.08	.075	.07
2,512 lin. ft. 18-in. plain conc. pipe	3.00	3.30	4.00	3.85	3.60	3.50
142 lin. ft. 24-in. reinf. conc. pipe	5.50	6.30	6.00	6.85	6.00	7.50
194 lin. ft. 36-in. reinf. conc. pipe	7.70	11.00	10.00	13.00	9.00	11.00
2 ea. cattle guards	400.00	600.00	750.00	750.00	550.00	500.00
16,620 lin. ft. standard line fence	.09	.15	.10	.15	.20	.12

Wyoming—Sheridan County—State—Surf.

Big Horn Construction Co., Sheridan, submitted the low bid of $49,242 to the State Highway Department for the grading, draining, base course surfacing, oil treatment, stone chip seal coat and miscellaneous work on 1.6 mi. of the Sheridan-Airport Road. The bids were:

(1) Big Horn Construction Co. $49,242
(2) H. W. Read 55,133
(3) N. W. Engineering Co. $58,506
(4) Woodward Construction Co. 63,202

	(1)	(2)	(3)	(4)
26,700 cu. yd. excav.	.40	.40	.40	.32
13,800 cu. yd. mi. haul	.20	.30	.18	.50
220 M. gal. watering	2.00	3.00	2.00	3.00
80 hr. Sheepsfoot roller	4.00	4.00	3.50	6.30

(Continued on next page)

Ready Now!

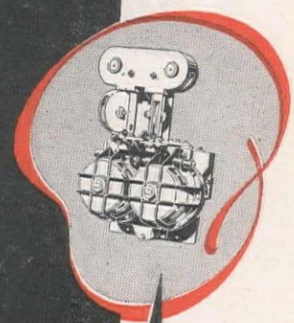
TOMORROW'S KARRY-SKRAPER

KEEPING PACE WITH YOUR DEMANDS FOR FASTER DIRT MOVING, WE PRESENT A LINE OF KARRY-SKRAPERS THAT WILL MEET YOUR EVERY DEMAND FOR . . .

Fine Performance
Heaping Loads
Maneuverability

HERE ARE FEATURES YOU WANT IN TOMORROW'S SCRAPER

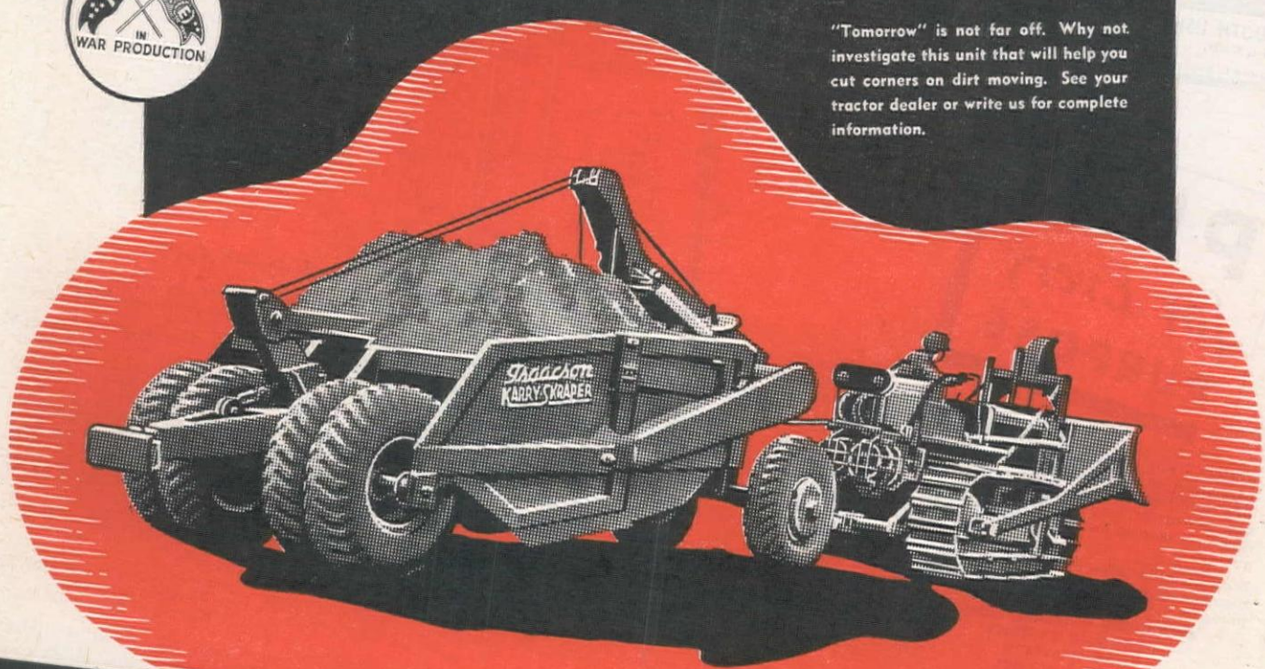
- Positive Ejection Gate that will not jamb when operating in clay or adobe.
- Front Apron not affected by raising or lowering the bowl while on way to fill.
- Cable protection against spill-over dirt no matter how high load is crowned. Insures long cable life.
- New Multiple Sheave Arrangement that gives true cable alignment. An effective cable and sheave saver.
- Ejection Gate that indicates the end of its stroke and eliminates a source of undue cable strain.
- Fairlead System on front of Karry-Skraper really leads fair no matter how short the turn.
- Neat Appearance and performance. We are proud of tomorrow's Karry-Skraper. You will be proud of it, too.



The Kable Power Unit that holds adjustment over longer periods of continuous operation. It's simple and dependable.

16 AWARDS IN WAR PRODUCTION

"Tomorrow" is not far off. Why not investigate this unit that will help you cut corners on dirt moving. See your tractor dealer or write us for complete information.



ISAACSON

Iron Works
SEATTLE

ENGINEERED TRACTOR EQUIPMENT

70	hr. pneumatic tired roller	4.00	4.00	4.00	6.00
300	hr. mechanical tamp	4.28	3.50	3.50	5.00
350	cu. yd. struct. excav.	1.27	3.00	2.50	3.00
280	cu. yd. excav. for pipe culv.	1.27	3.00	2.50	2.50
500	cu. yd. sewer excav.	.94	.60	3.00	3.00
330	cu. yd. backfill	2.50	1.25	3.00	1.00
4,400	T. gravel base (¾-in. max.)	.64	1.30	1.00	1.65
110	M. gal. watering	2.00	2.00	2.00	3.00
60	hr. roller operation	6.77	4.50	4.50	6.30
51	T. base treatment	30.53	36.00	25.00	30.00
1,850	T. gravel surf. (¾-in. max.)	.78	1.30	1.00	1.65
100	T. MC liq. asph. Dist. MC-3	30.53	36.00	25.00	30.00
25,500	sq. yd. process. roadway	.07	.06	.10	.07
44	T. seal coat RC-3	30.96	36.00	27.00	32.60
250	T. stone chips	3.62	3.50	4.75	3.85
1,850	lin. ft. shape & tamp. oil tr. gutter	.30	.40	.30	.40
202	cu. yd. Class A conc.	35.29	32.00	50.00	46.00
10,500	lb. reinf. steel	.10	.10	.07	.12
945	lin. ft. 8-in. vitr. clay sewer pipe	.95	1.25	2.50	1.08
560	lin. ft. 15-in. stand. reinf. conc. pipe	2.52	2.50	4.00	3.20
496	lin. ft. 18-in. stand. reinf. conc. pipe	3.12	3.25	4.50	4.10
450	lin. ft. remove & reset r/w fence	.10	.20	.10	.10
25	ea. fence posts	1.06	1.00	1.50	.75
6	ea. end panels	7.04	15.00	10.00	10.00
5	ea. brace panels	5.80	10.00	8.00	10.00
2	ea. timber proj. markers	17.20	20.00	10.00	15.00
78	lin. ft. relay pipe	1.75	1.50	2.00	1.50
5	ea. drop inlets	74.49	50.00	75.00	75.00
80	lin. ft. straight curb	1.00	1.25	1.75	1.45
935	lin. ft. 2-ft. comb. curb and gutter	2.00	1.40	2.75	2.00
145	sq. yd. conc. double gutters	5.37	3.50	2.00	3.60
485	sq. yd. conc. sidewalk	2.38	2.70	2.50	3.00
3	ea. conc. manholes	46.38	25.00	150.00	100.00
1	ea. adjust manholes	87.00	50.00	15.00	15.00
Lump sum, remove & reset garage		150.00	600.00	150.00	250.00

Sewerage . . .

California—Los Angeles County—County—Water & Sewer

Mike Miller Co., Los Angeles, Calif., submitted a low bid of $148,270 to the Los Angeles County Board of Supervisors and was awarded the contract to construct sanitary sewers, water mains, appurtenances and trench and street resurfacing in the vicinity of Northside Drive. Bids were as follows:

(A) Mike Miller Co. $148,270
(B) Martin Constr. Co. 161,362
(C) V C K Constr. Co. 164,035
(D) Bebek & Brkich 165,052
(E) Bob Bosnyak 169,643
(F) R. A. Wattson Co. $171,731
(G) Artukovich Bros. 181,330
(H) Steve P. Rados 183,462
(I) Mike Radich & Co. 189,075
(J) Tom L. Gogo 195,636

(1) 1730 lin. ft. 10-in. extra strength vitr. clay pipe
(2) 2850 lin. ft. 10-in. standard strength vitr. clay pipe.
(3) 3450 lin. ft. 8-in. extra strength vitr. clay pipe.
(4) 31,680 lin. ft. 8-in. standard strength vitr. clay pipe.
(5) 1980 lin. ft. 6-in. extra strength vitr. clay pipe.
(6) 12,670 lin. ft. 6-in. standard strength vitr. clay pipe.
(7) 158 brick sewer struct.
(8) 6 standard strength vitr. clay pipe chimney sewers.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
(1)	4.00	4.00	2.97	3.25	4.00	3.75	4.55	3.50	4.10	3.50
(2)	3.00	3.80	2.74	3.00	3.90	3.55	3.25	3.30	3.90	3.30
(3)	3.50	3.00	2.81	2.50	3.00	3.55	4.00	3.25	3.50	3.40
(4)	2.15	2.60	2.50	2.40	2.60	2.65	2.66	2.75	3.40	3.20
(5)	3.00	2.50	2.88	2.40	2.50	3.60	3.00	2.75	1.75	2.50
(6)	1.75	2.00	2.61	2.35	2.00	2.30	2.25	2.50	1.65	2.40
(7)	150.00	130.00	145.00	200.00	180.00	143.00	200.00	205.00	165.00	200.00
(8)	50.00	4.00	32.00	6.00	10.00	4.00	5.00	10.00	40.00	7.00

California—Los Angeles County—City—V.C.P.

Sanitary Construction and Engineering Co. of Long Beach, Calif., submitted low bids totalling $73,120 to the city manager at Long Beach for the construction of sanitary sewers in 4 municipal districts. Bids were as follows:

	Dist. 21-B	Dist. 21-C	Dist. 21-D	Dist. 21-E
(A) Sanitary Construction & Engineeriing Co.	$20,112	$19,383	$12,977	$20,648
(B) Vick Construction Co.	23,028	27,012	17,844	34,295
(C) Leko & Radich	25,967	25,018	19,365	33,646
(D) Steve Pizula	28,160	29,518	19,030	.....
(E) Bebek & Brkich	29,261	29,625	20,233	36,895
(F) R. A. Wattson & Co.	30,158	32,376	23,214	32,446
(G) Edward Green	36,873	39,879	24,818	36,895
(H) Artukovich Bros.	.....	27,644	.....	.....
(I) Shipyard Construction Co.	.....	53,439	30,884	38,405

DISTRICT No. 21-B
(1) 5,709 lin. ft. 8-in. std. strength vit. clay pipe.
(2) 35 std. type A manholes, complete.
(3) 2,810 sq. ft. rock and oil surf. with disintegrated rock base.
(4) 4,175 sq. ft. rock and oil surf. with plant-mix base.
(5) 2.1 cu. yd. concrete removal.
(6) 1.65 T. disintegrated rock base for conc. pave.
(7) 2.1 cu. yd. Port. cement conc. pave.

DISTRICT No. 21-C
(1) 7,513 lin. ft. 8-in. std. strength vit. clay pipe.
(2) 24 std. type A manhoes, complete.
(3) 12,540 sq. ft. rock and oil surf. with disintegrated rock.

DISTRICT No. 21-D
(1) 5,709 lin. ft. 8-in. std. stregnth vit. clay pipe.
(2) 16 std. type A manholes.
(3) 360 sq. ft. rock and oil surf. with disintegrated rock base.
(4) 3,305 sq. ft. rock and oil surf. with plant-mix base.

DISTRICT No. 21-E
(1) 6,499 lin. ft. 8-in. std. strength vit. clay pipe.
(2) 22 std. type A manholes.

DISTRICT 21-B

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
(1)	1.63	2.15	2.40	1.95	2.80	3.20	3.00	.....	.....
(2)	160.00	150.00	175.00	185.00	175.00	175.00	200.00	.....	.....
(3)	.30	.30	.30	1.00	.35	.10	1.00	.....	.....
(4)	.40	.30	.35	1.00	.40	.12	1.25	.....	.....
(5)	40.00	20.00	30.00	150.00	40.00	10.00	20.00	.....	.....
(6)	10.00	9.00	10.00	25.00	12.00	3.00	10.00	.....	.....
(7)	40.00	20.00	30.00	100.00	40.00	15.00	20.00	.....	.....

(Continued on next page)

WINNING THE BATTLE AT HOME

FORTUNATE indeed is the man who has a Carco Hoist these days.

Manpower shortages in the woods plus the unprecedented demand for more and more lumber emphasizes to every owner of Carco Hoists and Yarders the savings made possible by this valuable equipment.

Built of tough, high quality Carcometal—now used in Carco General Sherman Tanks and Tank Retrievers in every battle zone—these Hoists and Yarders render dependable, trouble-free service month after month and year after year under the worst possible conditions, saving man power and doing a superior job.

Hundreds of Carco Hoists are fighting for you in the Army, Navy and Marines —just as they are in the woods here at home. See your nearest tractor dealer.

CARCO

SUM UP THESE ADVANTAGES:

1. Simplicity of design.
2. Lightness of weight.
3. Minimum number of parts.
4. Carcometal.
5. Workmanship.
6. Stamina and dependability.
7. Versatility.
8. Oil, water and dust tight one-piece transmission case.
9. Line saving cable drum
10. Free wheeling brake.
11. Strength beyond the power of the tractor.
12. Freedom from maintenance.

Total—Dependable, Trouble Free Service.

The "know-how" gained in building rugged Carco Logging Equipment is paying dividends in these Battling Carco M-4 Tanks and Tank Retrievers.

PACIFIC CAR AND FOUNDRY COMPANY

RENTON, WASHINGTON

Carco's "know-how" and production are going (in whole or part) into: bridges, hoists, cargo ships, corvettes, cranes, aircraft carriers, lighters, mine sweepers, gun emplacements, yarders, power line equipment, aircraft, railroad equipment, structural steel, logging equipment, motor coaches, diesel engines, machine guns, dry docks, steel castings, seaplane tenders, trucks.

DISTRICT 21-C

(1)	1.60	2.50	2.35	2.15	2.80	3.55	3.00	2.95	5.72
(2)	150.00	160.00	150.00	165.00	175.00	175.00	200.00	150.00	180.00
(3)	.30	.35	.30	.75	.35	.12	1.00	.15	.49

DISTRICT 21-D

(1)	1.61	2.50	2.75	1.95	2.80	3.50	3.00	.....	4.57
(2)	145.00	150.00	150.00	150.00	175.00	175.00	200.00	.....	175.00
(3)	.40	.50	.30	1.50	.35	.10	1.00	.....	.49
(4)	.40	.30	.35	1.50	.40	.12	1.25	.....	.55

DISTRICT 21-E

(1)	2.50	4.60	4.50	.....	5.00	4.40	5.00	.....	5.30
(2)	200.00	200.00	200.00	.....	200.00	175.00	200.00	.....	180.00

Airport . . .

California—Marin County—U.S.E.D.—Aprons

Fredrickson & Watson Construction Co., Oakland, and Chas. L. Harney, San Francisco, submitted the low bid at $477,378 to the U. S. Engineer Office, San Francisco, to construct Air Transport Command aprons at Hamilton Field, Calif. The bids were:

(1) Fredrickson & Watson and Chas. L. Harney $477,378
(2) J. A. Terteling & Sons $535,993
(3) Union Paving Co. 585,266

		(1)	(2)	(3)
20,100	T. crushed rock	2.10	2.55	2.40
81,000	cu. yd. select matl.	1.33	1.52	1.85
2,100	M. gal water	1.60	2.50	2.00
56,520	sq. yd. 12-in. conc. pave.	3.90	4.10	4.80
210,000	lbs. reinf. steel	.055	.07	.06
50,000	sq. yd. wire mesh	.50	.75	.50
6	T. bitum. prime coat	30.00	40.00	25.00
3	T. bitum. seal coat	35.00	40.00	25.00
15	T. aggre., seal coat	4.50	5.00	8.00
370	hrs. roller	4.50	6.50	5.00
370	hrs. shptf. roller	5.75	8.50	5.75
3	ea. abandon M.H.	30.00	27.50	20.00
12	ea. catch basin steel grate	345.00	330.00	350.00
12	ea. catch basin and inlet jct.	115.00	495.00	300.00
2	ea. raise MH, L2 and L3	375.00	357.50	350.00
5	ea. raise MH, L1 and catch basins	265.00	253.00	275.00
1	ea. raise catch basin	115.00	110.00	110.00
2,300	lin. ft. continuous inlet	9.00	8.80	9.75
550	ea. tie down anchors	1.00	1.50	1.00
1,700	lin. ft. 15-in. reinf. conc. pipe	4.15	4.00	4.50
1,000	lin. ft. 18-in. reinf. conc. pipe	5.15	5.00	5.50
850	lin. ft. 21-in. reinf. conc. pipe	5.75	5.50	6.25
250	lin. ft. 24-in. reinf. conc. pipe	7.00	6.60	7.50
340	lin. ft. 27-in. reinf. conc. pipe	8.60	8.25	9.50
280	lin. ft. 30-in. reinf. conc. pipe	10.00	9.60	11.00
470	lin. ft. 36-in. reinf. conc. pipe	12.90	12.30	14.00
380	lin. ft. 3-in. single elect. duct	1.50	1.50	1.50
360	lin. ft. 3-in. elect. duct	3.60	4.50	4.00
11	ea. elec. serv. outlet	95.00	125.00	100.00
Lump sum, water outlets		365.00	350.00	400.00

Miscellaneous . . .

California—Yuba & Sutter Counties—U.S.E.D.—Flood Control

H. Earl Parker of Marysville, Calif., bid low at $268,486 to the U. S. Engineer Department and was awarded a negotiated contract to enlarge 6.0 mi. of levee on the Bear River, 4.0 mi. upstream from the Western Pacific Railroad along Dry Creek and the railroad intercepting channel. The following bids were submitted:

(A) H. Earl Parker $268,486
(B) Clyde W. Wood 323,462
(C) Guy F. Atkinson 330,312
(D) Rhoades Bros. & Shofner 383,689
(E) Frederickson Bros. $435,242
(F) Guerin Bros. 476,183
(G) Piombo Bros. 609,369

(1) 975,000 cu. yd. excav.
(2) 30,000 gal. water compact. and sprinkling.
(3) 14,000 tons crush. rock.
(4) 20 cu. yd. class A struct. conc.
(5) 1500 F.B.M. struct. grade lumber.
(6) 15 lin. ft. soil proofed 4-in. steel pipe.
(7) 18 lin. ft. 8-in. soil proofed steel pipe.
(8) 12 lin. ft. soil proofed steel pipe, 12-in.
(9) 72 lin. ft. CMP, 12-in.
(10) 238 lin. ft. CMP, 18-in.
(11) 20 lin. ft. CMP, 24-in.
(12) 139 lin. ft. CMB, 30-in.
(13) 6 lin. ft. reinf. conc. pipe, standard strength, 30-in.
(14) Lump sum, remove and waste 12 ft. 12 in. conc. pipe north levee.
(15) Lump sum, move gravel bunker and remove and save load. ramp south levee.
(16) Remove and reinstall 60-ft. 4-in. steel pipe south levee.
(17) Remove and waste exist. standpipe and 18 lin. ft. 12-in. conc. pipe south levee.
(18) Remove and waste 6-ft. 18-in. conc. pipe north levee of South Dry Creek.
(19) Remove and waste 45 ft. 18-in. conc. pipe and reinstall 40 ft. 18-in. CMP north levee of South Dry Creek.
(20) Remove and waste 54 ft. of 12-in. conc. pipe and headwalls, and install government furn. 12-in. Calco gate south levee North Dry Creek.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)
(1)	.188	.242	.266	.31	.33	.38	.54
(2)	1.50	1.50	.75	1.25	1.90	2.00	1.50
(3)	2.60	2.75	3.00	2.75	3.75	3.00	2.50
(4)	50.00	75.00	105.00	60.00	62.50	50.00	70.00
(5)	.....	.....	.....	200.00	.....	.....	.....
(6)	1.50	2.00	1.40	1.50	1.25	2.00	1.00
(7)	3.00	2.00	2.50	3.00	1.25	2.00	1.00
(8)	4.00	2.00	3.00	4.50	2.50	3.00	1.00
(9)	2.25	1.50	6.00	4.50	1.875	3.00	1.00
(10)	3.00	1.50	9.40	5.00	3.75	3.00	1.50
(11)	3.50	2.00	9.50	6.00	3.75	3.50	2.25
(12)	4.50	2.50	9.60	7.00	5.00	4.00	2.50
(13)	10.00	10.00	12.00	12.00	12.50	20.00	10.00
(14)	25.00	50.00	20.00	15.00	18.75	25.00	10.00
(15)	250.00	300.00	120.00	250.00	125.00	250.00	200.00
(16)	250.00	100.00	80.00	120.00	75.00	180.00	100.00
(17)	50.00	50.00	30.00	50.00	50.00	50.00	50.00
(18)	400.00	200.00	125.00	325.00	467.00	300.00	300.00
(19)	250.00	150.00	75.00	245.00	375.00	200.00	200.00
(20)	100.00	200.00	100.00	125.00	75.00	200.00	175.00

California—Contra Costa County—Navy—Classification Yard

MacDonald & Kahn, Inc., San Francisco, Calif., was awarded the contract with a low bid at $1,303,567 to the U. S. Bureau of Yards & Docks to construct a classification yard, barricaded siding and services at the Inland Storage Area, Naval Magazine, Port Chicago. Bids were:

(A) MacDonald & Kahn, Inc. $1,303,567
(B) Ford J. Twaits Co. 1,355,300
(C) J. A. Terteling & Sons 1,386,777
(D) Barrett & Hilp 1,397,764
(E) Fredrickson & Watson 1,437,940
(F) Chas. L. Harney $1,489,388
(G) Al Johnson Construction Co. 1,503,903
(H) Guerin Bros. 1,544,376
(I) Macco Construction Co. 1,569,347
(J) Guy F. Atkinson Co. 1,667,464

EARTHWORK

(1) Lump sum, preparation of site.
(2) 330,000 cu. yd. excav., filling and grading, unclass.
(3) 2500 hrs. rolling with 12-ton power roller.
(4) 3000 hrs. rolling with 8-ft. sheepsfoot tamper roller.
(5) 500 hrs. rolling with 500-lb. hand roller.
(6) 500 hrs. tamping with 2 compr's'd air tampers.
(7) 60,000 cu. yd. sub-base.
(8) 650,000 sq. ft. stabilized fill 2 in. thick, incl. prime coat and seal coat.
(9) 500 tons riprap.

PAVING

(10) 19,000 tons cement treated bases, exclusive of portland cement.
(11) 4700 bbls. portland cement in cem. tr. base.
(12) 45 tons emulsified asph. for curing seal.
(13) 8800 tons asph. conc. paving, exclusive of asph. cement.
(14) 440 tons asph. cement in asph. conc. paving.
(15) 2 tons liquid asph., ROMC-1, for seal over ballast.
(16) 7300 cu. yd. portland cem. conc. pave.
(17) 10,000 lin. ft. painting traffic stripe, 4 in. wide.
(18) 765 lin. ft. conc. curb.
(19) 60 guide posts.

WATER SYSTEM

(20) 50 lin. ft. 6-in. cast iron pipe incl. fittings.
(21) 5000 lin. ft. 8-in. cast iron pipe, incl. fittings.
(22) 835 lin. ft. 12-in. cast iron pipe, incl. fittings.
(23) 7 ea., 6-in. hub end gate valves incl. boxes and covers.
(24) 4 ea., 8-in. hub end gate valves, incl. boxes and covers.
(25) 1 ea., 12-in. hub end gate valves incl. boxes and covers.
(26) 7 ea., fire hydrants.
(27) 4 ea., hose cart shelters.

DRAINAGE SYSTEM

(28) 660 lin. ft. 12-in. conc. culv. pipe.
(29) 418 lin. ft. 18-in. conc. culv. pipe.
(30) 50 lin. ft. 25-in. conc. culv. pipe.
(31) 125 lin. ft. 36-in. conc. culv. pipe.
(32) 48 lin. ft. 48-in. conc. culv. pipe.
(33) 2 ea., headwalls for 12-in. pipe.
(34) 24 ea. headwalls for 18-in. pipe.
(35) 4 ea., headwalls for 24-in. pipe.
(36) 10 ea., headwalls for 36-in. pipe.
(37) 2 ea., headwalls for 48-in. pipe.
(38) 4 triple reinf. conc. box culverts, 28 ft. in length.
(39) 155 add'l length of triple box culv.

RAILROAD SYSTEM

(40) 48,580 lin. ft. railroad track excl. of earthwork and sub-base.
(41) 49 turnouts, excl. of earthwork and sub-base.
(42) 26 derails, incl. 15-ft. guard rails.
(43) 30 pairs steel car stops.
(44) 1 sign "1000 ft. to bridge."
(45) 6 "Fouling Point" and "Yard Limit" signs.
(46) 2 whistling boards.
(47) 4 crossing signs.
(48) Lump sum for open joint tile drain system in classif. yard complete incl. cast iron cleanouts.
(49) Mov. and recond. 704.25 lin. ft. of exist. spur and raising and recond. a portion of main line of Bay Point and Clayton R.R., excl. of earthwork and sub-base.
(50) 300, replace ties.

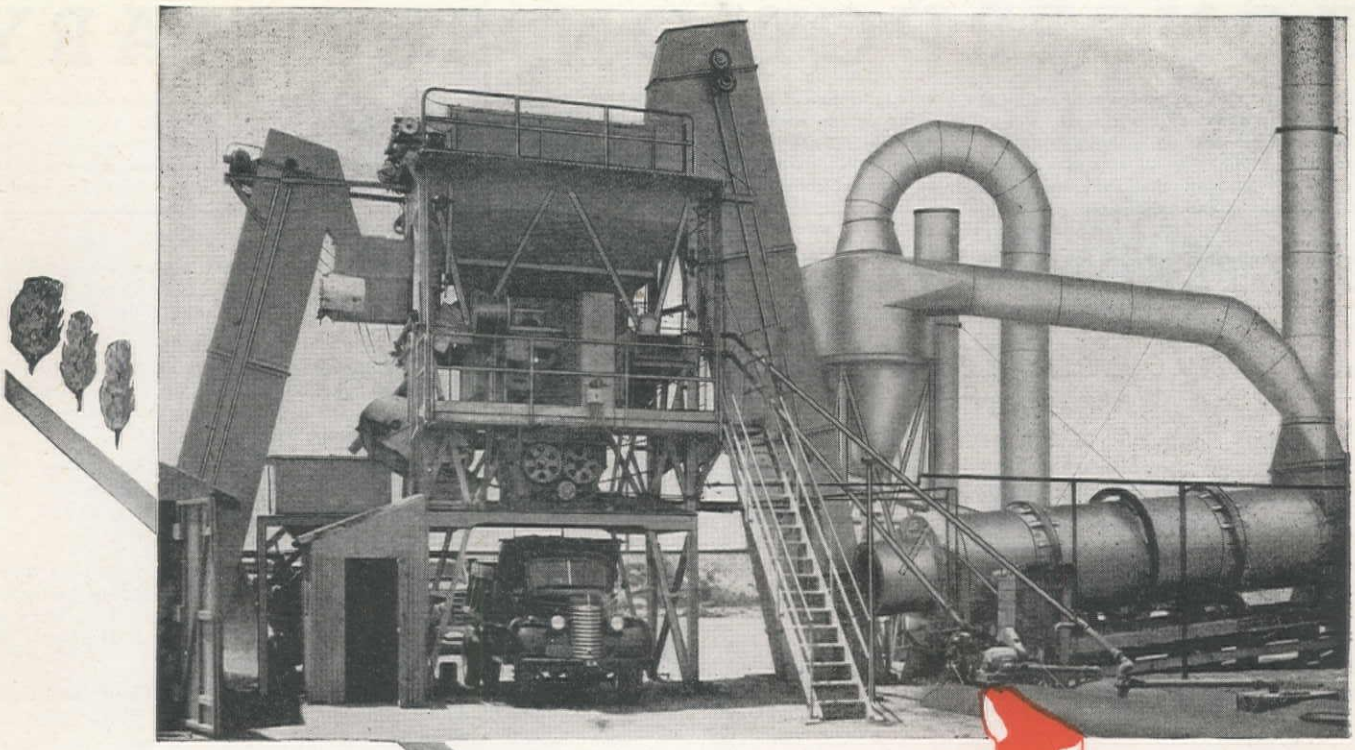
GENERAL

(51) Lump sum, truck scales and pit, track scales and pit, pole, conduits, wiring and lighting fixtures.
(52) 30 ea., retain. walls, open joint drain and cast iron cleanouts.
(53) 100 cu. yd. concrete in extra depth of retain. walls over standard depth, incl. forms and reinf. steel.
(54) 1 splash apron for blow-off pipes.
(55) Lump sum, $1000 allowance for mov. poles.
(56) Lump sum, relocat. exist. water lines and fence.

ALTERNATE BID ITEMS

(57) 650,000 ice plants.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
(1)	$22,500	$43,565	$35,000	$27,490	$26,000	$13,010	$39,175	$44,675	$100,200	$38,400
(2)	.38	.358	.38	.70	.41	.43	.41	.55	.60	.58
(3)	6.00	7.20	6.00	6.10	5.85	5.30	4.73	6.00	5.80	7.00
(4)	8.00	9.40	8.00	8.50	7.90	8.30	5.68	8.70	9.40	9.00
(5)	3.50	3.50	4.00	3.00	4.00	4.00	4.22	4.10	3.50	4.00
(6)	6.00	10.00	6.50	6.60	6.25	7.80	9.47	7.00	5.50	9.00
(7)	.60	.51	.70	.70	.88	.43	.773	.72	1.25	.60
(8)	.065	.064	.07	.06	.06	.07	.062	.06	.06	.08
(9)	7.00	7.70	5.00	10.00	8.50	5.00	10.15	12.50	15.00	7.00
(10)	2.13	2.25	2.50	2.90	2.65	2.45	2.336	2.50	2.40	2.50
(11)	2.20	1.86	2.20	2.00	2.50	2.40	2.37	2.50	2.40	2.25
(12)	24.00	27.00	25.00	18.00	27.00	22.00	30.84	32.00	28.00	30.00
(13)	4.20	4.00	4.10	3.90	4.50	4.50	4.84	4.15	4.00	4.00
(14)	18.00	18.00	16.00	18.00	15.00	18.00	19.35	20.00	17.00	18.00
(15)	25.00	32.00	40.00	35.00	45.00	50.00	60.46	40.00	50.00	36.00
(16)	12.00	12.80	15.00	12.00	13.50	14.00	11.354	12.50	12.50	14.00
(17)	.05	.025	.05	.10	.04	.04	.089	.07	.08	.05
(18)	1.35	1.50	1.75	2.00	1.20	1.20	1.294	2.25	2.00	1.80
(19)	2.00	3.20	5.50	10.00	3.00	3.00	2.18	5.00	5.00	5.00
(20)	2.15	2.40	2.20	2.00	2.30	2.20	2.60	2.25	2.25	2.50
(21)	2.65	3.00	2.50	2.70	2.75	2.65	3.25	2.50	2.75	2.80
(22)	3.95	4.50	4.00	4.00	4.65	4.20	4.98	4.00	4.50	4.00
(23)	79.00	90.00	55.00	55.00	60.00	53.00	62.18	65.00	60.00	75.00
(24)	104.00	115.00	80.00	80.00	80.00	75.00	86.73	100.00	80.00	110.00
(25)	140.00	160.00	135.00	135.00	150.00	150.00	168.50	150.00	150.00	150.00
(26)	152.00	170.00	140.00	130.00	150.00	135.00	156.23	150.00	150.00	150.00
(27)	318.00	320.00	400.00	400.00	315.00	375.00	231.28	400.00	500.00	350.00
(28)	2.10	2.00	2.50	3.00	2.00	2.50	3.01	2.50	2.60	3.00
(29)	2.90	4.00	3.90	3.50	3.90	4.00	4.91	3.50	4.50	5.00
(30)	4.55	6.00	6.00	5.00	5.70	5.70	6.84	5.50	6.00	7.00
(31)	8.90	9.70	10.00	11.00	9.90	9.00	10.98	11.00	10.00	12.00
(32)	13.50	15.00	15.00	12.00	15.30	15.00	16.76	15.00	16.00	20.00
(33)	31.00	36.00	40.00	50.00	30.00	50.00	30.61	50.00	35.00	50.00
(34)	32.50	32.00	50.00	50.00	35.00	30.00	41.50	60.00	40.00	60.00
(35)	40.00	45.00	70.00	70.00	43.00	38.00	57.31	75.00	50.00	75.00
(36)	72.00	54.00	90.00	100.00	60.00	45.00	83.34	100.00	75.00	100.00
(37)	82.00	84.00	110.00	110.00	85.00	65.00	129.36	150.00	100.00	125.00
(38)	$4,080	$5,060	$6,000	$6,000	$5,500	$6,050	$4,853	$4,000	$5,500	$7,000
(39)	87.00	130.00	155.00	120.00	125.00	126.00	119.25	130.00	150.00	160.00
(40)	5.30	4.75	4.75	5.00	5.00	4.35	5.31	4.80	4.60	5.00
(41)	388.00	660.00	710.00	600.00	368.00	650.00	711.55	650.00	650.00	$1,000
(42)	147.00	58.00	143.00	150.00	175.00	130.00	157.47	150.00	135.00	160.00
(43)	85.00	23.50	82.50	80.00	64.00	75.00	80.23	100.00	80.00	90.00
(44)	28.00	18.00	25.00	30.00	25.00	25.00	29.65	25.00	27.00	30.00
(45)	34.00	30.00	35.00	20.00	25.00	30.00	34.65	25.00	32.00	20.00
(46)	22.50	18.00	25.00	20.00	25.00	20.00	24.65	25.00	21.00	30.00
(47)	34.00	38.00	35.00	35.00	52.00	30.00	35.24	75.00	32.00	60.00
(48)	$3,225	$20,850	$7,000	$5,000	$5,400	$7,000	$14,440	$9,000	$16,000	$11,000
(49)	$8,620	$3,780	$8,500	$5,000	$2,500	$7,700	11.35	$5,000	$8,000	$4,500
(50)	1.15	1.60	1.10	1.70	1.15	1.00	1.20	2.00	1.00	1.20
(51)	$25,500	$34,404	$30,000	$24,000	$28,500	$36,800	$29,270	$23,000	$45,000	$30,000
(52)	$15,454	$15,750	$16,000	$14,000	$18,310	$21,100	$19,400	$20,000	$16,500	$21,700
(53)	34.00	32.00	30.00	25.00	23.00	29.50	22.00	40.00	50.00	65.00
(54)	56.00	66.00	75.00	100.00	35.00	75.00	74.00	100.00	125.00	100.00
(55)	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000
(56)	$1,130	$1,760	600.00	$1,000	900.00	630.00	$1,480	$3,500	700.00	700.00
(57)	.05	.049	.035	.055	.04	.04	.035	.04	.04	.035



Ready for the Nation's 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

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...

R. E. Hazard Contracting Co., San Diego, Calif., was awarded a $739,400 contract to grade and pave at the Naval Air Station, Coronado, Calif., by the Bureau of Yards and Docks, Washington, D. C.

W. T. Bookout, Las Vegas, New Mexico, received a $228,188 contract to grade and place base and top surface, oil and construct minor drainage structures on 24.42 mi. of Highway 92, near Dora, New Mexico, by the State Highway Department, Santa Fe, New Mexico.

M. B. Killian and Co., Fredericksburg, Texas, were awarded a $275,000 contract to construct a new 12 mile stretch of road from Cherry Springs to Beaver Creek, in Gillespie County, Texas, by the State Highway Department of Austin, Texas.

W. P. Roscoe Co., Billings, Montana, received a $202,552 contract to construct a 5-span, 632 feet, steel and concrete bridge over the Powder River, in Prairie County, Montana, by the State Highway Department, Montana.

L. H. Hoffman, Portland, Oregon, was awarded a $303,715 contract to reconstruct and redeck the Hawthorne Street bridge and approach at Portland, by the County Council, Portland, Oregon.

Fredrickson, Watson and Harney Construction Co., Oakland, Calif., received a $477,378 contract to construct air transport command aprons at Hamilton Field, Calif., by the U. S. Engineer Office, San Francisco, Calif.

Parker-Schram Co., Portland, Oregon, was awarded a $324,000 contract to construct taxiways and parking area and to stabilize runway shoulders at Naval Air Station, Tillamook, Oregon, by the Bureau of Yards and Docks, Washington, D. C.

Lebeauf and Doherty Co. and **J. D. Proctor, Inc.,** San Francisco, Calif., received a $450,000 contract to remove wreckage in Port Chicago Channel, Calif., by U. S. Engineer Office, Sacramento, Calif.

Macco Construction Co., Clearwater, Calif., was awarded a $489,139 contract to manufacture reinforced concrete piling and to drive bearing piling and sheet piling for wharf at Berths 4 to 7 in Long Beach Harbor, by the Long Beach Harbor Commission, Long Beach, Calif.

Twaits, Morrison-Knudsen and Gerwick, San Francisco, Calif., received a $1,676,965 contract to construct cellular pier and crane runway foundations at the Naval Dry Docks, Hunters Point, Calif., by the Bureau of Yards and Docks, Washington, D. C.

Robert E. McKee, Glendale, Calif., was awarded a $1,188,000 contract to construct 5 storehouses and cafeteria at Marine Corps Air Station, El Toro, Calif., by the Bureau of Yards and Docks, Washington, D. C.

Gorelnik Co., Los Angeles, Calif., received a $659,074 contract to construct additional storage facilities at Naval Repair Base,

San Diego, Calif., by the Bureau of Yards and Docks, Washington, D. C.

Jacobsen Construction Co., Salt Lake City, Utah, was awarded a $726,370 contract to construct a hospital building in Ogden, Utah, by the Order of St. Benedict of St. Joseph, Minn.

MacDonald and Kahn, San Francisco, Calif., received a $1,599,361 contract to construct personnel buildings, reservoir water and sewer systems, roads and railways at Inland Storage Area, Naval Magazine, Port Chicago, Calif., by the Bureau of Yards and Docks, Washington, D. C.

American Bridge Co., Pittsburgh, Pa., was awarded a $1,392,535 contract to construct a bridge crane runway at Naval Dry Docks, Hunters Point, San Francisco, by the Bureau of Yards and Docks, Washington, D. C.

Ford J. Twaits, Morrison-Knudsen Co., Inc., and Ben Gerwick, San Francisco, Calif., received a $10,395,189 contract to construct storehouses, tracks, roads and wharf and to dredge at Naval Supply Depot, Rough and Ready Island, Stockton, Calif., by Public Works Office, San Francisco, Calif.

Ebasco Services, Inc., New York City, New York, was awarded a $2,500,000 contract to build an extension to Mountain Creek Power Plant, by the Dallas Power and Light Co., Dallas, Texas.

Columbia Construction Co., Vancouver, Wash., received a $2,279,000 contract to construct a 14,000 ton floating dry dock, by the U. S. Maritime Commission, Washington, D. C.

B. Landon, Casper, Wyoming, was awarded a $186,000 contract to construct 29 miles of 6 inch and 8 inch pipe line in the vicinity of Casper and Sinclair, Wyoming, by the Sinclair Oil Co., Casper, Wyoming.

Highway and Street . . .

California

ALAMEDA CO.—**Stolte, Inc.,** 8451 San Leandro Blvd., Oakland—$228,000 to pave area near Interim Overhaul Bldg., Naval Air Sta., Alameda—by Bur. of Yards & Docks, Washington, D. C. 10-3

CALAVERAS CO.—**H. Sykes,** Box 626, Patterson—$47,650 to surf. with imported base material 7 mi. of hwy. near J. P. Lodge Road—by Div. of Hwys., Sacramento. 10-16

CONTRA COSTA CO.—**Underground Construction Co.,** 75th & San Leandro Blvd., Oakland—$54,610 to build 6,360 ft. of new road, to surf. 5,950 ft. of exist. road and to improve other roads at Naval Fuel Annex, Point Molate, Richmond—by Bur. of Yards & Docks, Washington, D. C. 10-19

CONTRA COSTA CO.—**Union Paving Co.,** 212 Babcock Bldg., San Francisco—$18,440 to repair roads at St. Mary's Pre-Flight School, Moraga—by Bur. of Yards & Docks, Washington, D. C. 10-17

HUMBOLDT CO.—**E. B. Bishop,** Orland—$69,673 to stabilize slide area at Benbow, 0.1 mi. long—by Div. of Hwys., Sacramento. 10-19

KERN CO.—**R. W. Hampton Co., Inc.,** 1105 North Main St., Santa Ana—$44,359 to grade & surf. with imported surfacing material & bituminous surf. about 1 mi. betw. N. Reservation Gate & Muroc School—by Div. of Hwys., Sacramento. 10-11

LASSEN CO.—**Harms Bros.,** Rt. 4, Box 2220, Sacramento—$15,774 to repair surf. area near Honey Lake—by Div. of Hwys., Sacramento. 10-16

LOS ANGELES CO.—**Frontier Construction Co. & D. A. Williams,** 510 Bank of America Bldg., Whittier—$25,792 to pave portions of several streets at Los Angeles Port of Embarkation, Wilmington—by U. S. Engr. Ofc., Los Angeles. 10-13

LOS ANGELES CO.—**Griffith Co.,** 502 Los Angeles Railway Bldg., Los Angeles—$11,142 to resurf. with plantmix 0.5 mi. of Elena Ave. near Torrance Blvd., Redondo Beach—by City Council, Redondo Beach. 10-3

LOS ANGELES CO.—**Griffith Co.,** 502 Los Angeles Railway Bldg., Los Angeles—$64,344 to grade and surf. with plantmix, asph. conc. and Portland cement conc. a total of 2.3 mi. on Woodley Ave. and Saticoy St., Los Angeles—by Div. of Hwys., Sacramento. 9-28

LOS ANGELES CO.—**Vido Kovacevich,** 5400 Imperial Hwy., South Gate—$39,234 to place asph. conc. surf. on Washington Blvd. in Montebello—by County Board of Supervisors, Los Angeles. 10-4

LOS ANGELES CO.—**Schroeder & Co., Inc.,** 8140 Tujunga Ave., Roscoe—$10,286 to resurf. 7,340 lin. ft. of Washington St., betw. Arroyo Blvd. & Mentone Ave., Pasadena—by City Council, Pasadena. 10-19

LOS ANGELES CO.—**T. E. Sherlock,** 1103 W. 40th Place, Los Angeles—$41,417 to construct conc. curb & gutter in Crenshaw Villa, east of Hawthorne—by County Board of Supervisors, Los Angeles. 10-18

LOS ANGELES CO.—**Tomei Construction Co.,** 4737 Orion St., Van Nuys—$59,529 to surf. Torrance Blvd. betw. Border & Madrid Aves., Torrance—by City Council, Torrance. 10-9

LOS ANGELES CO.—**Ford J. Twaits Co.,** 451 S. Boylston St., Los Angeles—$158,944 to lay 90,000 sq. yds. of asph. conc. pave. on prepared base and construct chain link fencing and hose cart bldg. at Lockheed-Navy Service Center, Van Nuys—by Lockheed Aircraft Corp., Burbank. 10-6

ORANGE CO.—**Norman I. Fadel,** Box 206, N. Hollywood—$23,552 to grade approaches, place plantmix surf. and apply bitum. surf. treat. to 0.2 mi. of road and place concrete deck on timber bridge across Carbon Creek—by Div. of Hwys., Sacramento. 10-13

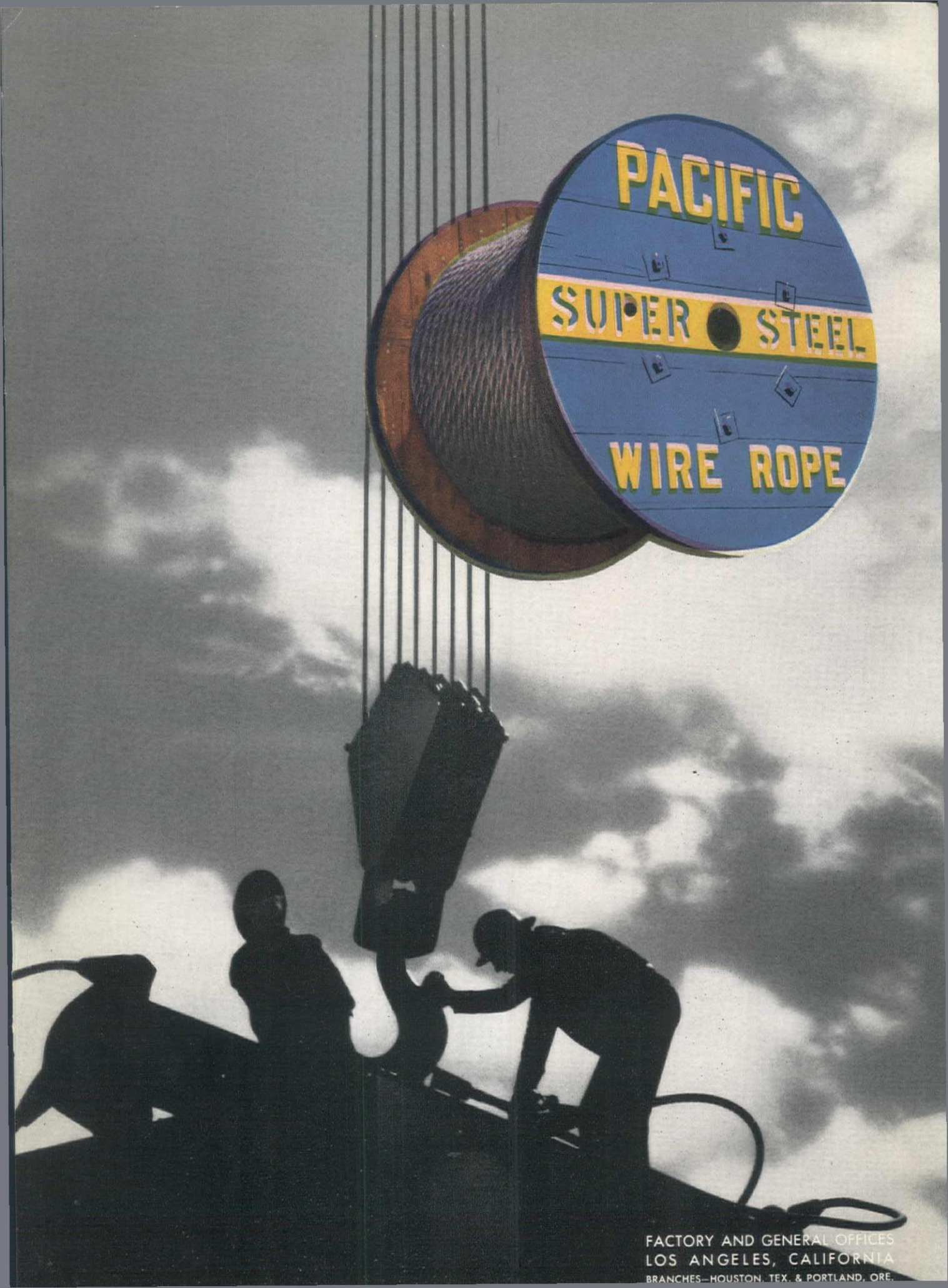
SAN BERNARDINO CO.—**Carson Frazzini,** 456 South St., Tonopah, Nev.—$42,331 to repair, place roadmix surf. and apply seal coat to 53.5 mi. of hwy. betw. Riverside Co. line and State Hwy. 58—by Div. of Hwys., Sacramento. 10-13

SAN BERNARDINO CO.—**D. A. Williams & Frontier Construction Co.,** Bank of America Bldg., Whittier—$28,000 to pave at Marine Corps Supply Depot, Barstow—by Bur. of Yards & Docks, Washington, D. C. 9-29

SAN DIEGO CO.—**Griffith Co.,** 502 Los Angeles Railway Bldg., Los Angeles—$54,797 to resurf. with plantmix and sealcoat portions of 10.4 mi. of hwy. in San Diego on Pacific Hwy. and Rosecrans St.—by Div. of Hwys., Sacramento. 9-28

SAN DIEGO CO.—**R. E. Hazard Contracting Co.,** Box 1951, San Diego—$739,400 to grade & pave at Naval Air Station, Coronado—by Bur. of Yards & Docks, Washington, D. C. 10-2

SOLANO CO.—**H. O. Rutherford & E. E. Lowell,** Box 148, Vallejo—$117,600 to fill with 140,000 cu. yd. of material & grade



FACTORY AND GENERAL OFFICES
LOS ANGELES, CALIFORNIA
BRANCHES—HOUSTON, TEX. & PORTLAND, ORE.

at Mare Island—by Fed. Pub. Housing Auth., San Francisco. 10-23

VENTURA CO.—**Norman I. Fadel,** Box 206, North Hollywood—$15,057 to restore embank., to construct Portland cement conc. pave. and to place plantmix surf. & stone riprap on 0.1 mi. of hwy. betw. Moorpark & Chatsworth—by Div. of Hwys., Sacramento. 10-10

Idaho

ADA CO.—**Triangle Construction Co.,** P. O. Box 2617, Boise—$54,667 to apply plantmix bitum. surf. on 2.3 mi. of pave. on Overland & Vista Aves.—by Comm. of Public Works, Boise. 10-10

New Mexico

BERNALILLO CO.—**D. D. Skousen,** Albuquerque—$18,908 to surface & oil 3.7 mi. on Hwy. 194, betw. Albuquerque & Alameda—by State Hwy. Dept., Santa Fe. 10-25

CURRY CO.—**G. I. Martin,** Albuquerque—$17,040 to blade & reshape roadbed, water, roll, place base course and surf. 6.0 mi. betw. Broadview & Bellview—by State Hwy. Dept., Santa Fe. 9-15

MORA CO.—**Henry Thygesen & Co.,** Albuquerque—$18,684 to surf. 7.5 mi. of road at Holman & Chacon—by State Hwy. Dept., Santa Fe. 10-13

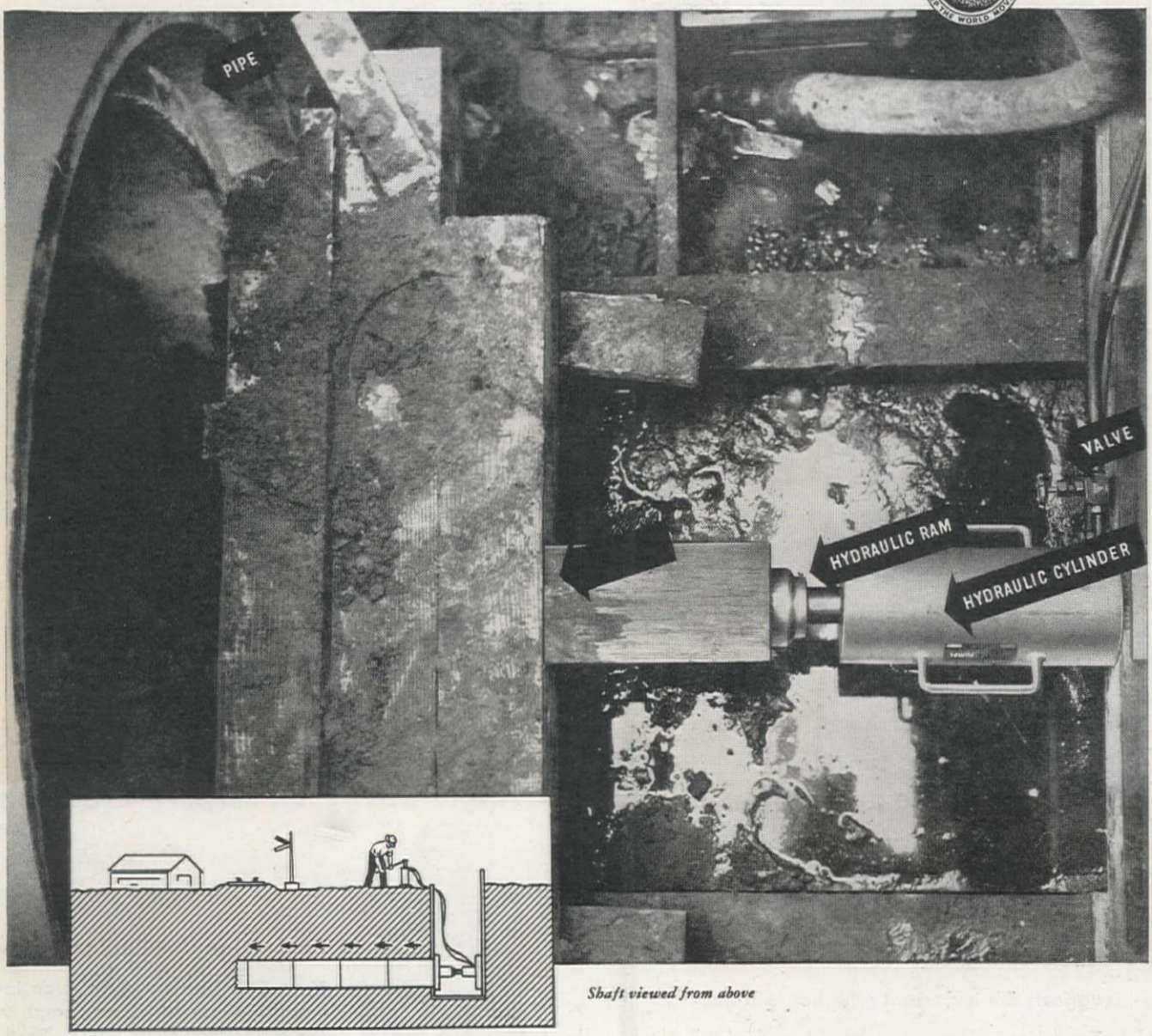
QUAY CO.—**G. I. Martin,** Albuquerque—$19,313 to construct an 11 mi. road. Hauling & placing oil treated surf., cover material & asph. on San Jon road—by State Hwy. Dept., Santa Fe. 9-15

QUAY CO.—**J. G. Shotwell,** Box 888, Albuquerque—$49,183 to prepare conc. aggregates at Tucumcari—by Bur. of Reclamation, Washington, D. C. 10-23

ROOSEVELT CO.—**W. T. Bookout,** Las Vegas—$228,188 to grade, place base and top surf., oil and construct minor drainage structures on 24.42 mi. of Hwy. 92 near Dora—by State Hwy. Dept., Santa Fe. 10-17

SANDOVAL CO.—**F. D. Shufflebarger,** Albuquerque—$35,513 to place base course and surf. 14.0 mi. of Hwy. 44, betw. Bernalillo & Bloomfield—by State Hwy. Dept., Santa Fe. 10-25

NO. 21 OF A "READY-WITH-A-RODGERS" SERIES



Shaft viewed from above

"DRIVING PIPE FOR THIS STORM SEWER WAS DUCK SOUP WITH OUR RODGERS UNIVERSAL"

"We had to go under a freight house and railroad tracks, pushing 6-foot concrete tile through sand for 40 feet. But our Rodgers Universal Press handled it slick as a whistle . . . at 1/10 of what it would have cost without your equipment.

"Headed by a steel bonnet, the tile was inched through without a hitch. And it was a big help to pump that 150-ton pressure from the surface, instead of a cramped space 16 feet underground."

This was reported by a Wisconsin municipality. The all-purpose Rodgers Universal Press saved them both time and money. It can do the same for you. For complete information and prices, write or wire Rodgers Hydraulic, Inc., Dept. E-11, St. Louis Park, Minneapolis 16, Minnesota.

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Gear Pulling • Wheel Press Work • Jacking Pipe • Erecting Machinery • Relocating Machinery • All-Purpose Jack

RODGERS HYDRAULIC, Inc.

SAN MIGUEL CO.—**Hayner & Burns,** Las Cruces—$42,284 to grade, drain and construct drainage structures on 40.7 mi. of Hwys. 65 & 104 betw. Las Vegas and Conchas Dam—by State Hwy. Dept., Santa Fe. 9-27

SANTA FE CO.—**Walter L. Denison,** Albuquerque—$26,757 to surf. grade, construct minor drainage facilities 4.17 mi., betw. Hwy. 85 & Santa Fe Airport—by State Hwy. Dept., Santa Fe. 10-25

Texas

BEXAR CO.—**Collins & Bland Construction Co.,** Box 1158, Austin—$82,910 to repair appr. 12 mi. of street system in Depot Area—by U. S. Engr. Ofc., San Antonio. 10-18

DALLAS CO.—**Texas Bitulithic Co.,** Box 5297, Dallas—$35,-184 to const. street improv. and drain structures on Shorecrest Drive—by State Hwy. Dept., Austin. 9-22

GILLESPIE CO.—**M. B. Killian & Co.,** Fredericksburg—$275,000 to const. a new 12 mi. stretch of road from Cherry Springs to Beaver Creek—by State Hwy. Dept., Austin. 10-18

Utah

SALT LAKE CO.—**Young & Smith Construction Co.,** 1678 Browning Ave., Salt Lake City—$24,990 to construct channelized intersection on U. S. Hwy. 91 at Beck St., Salt Lake City—by State Road Comm., Salt Lake City. 10-13

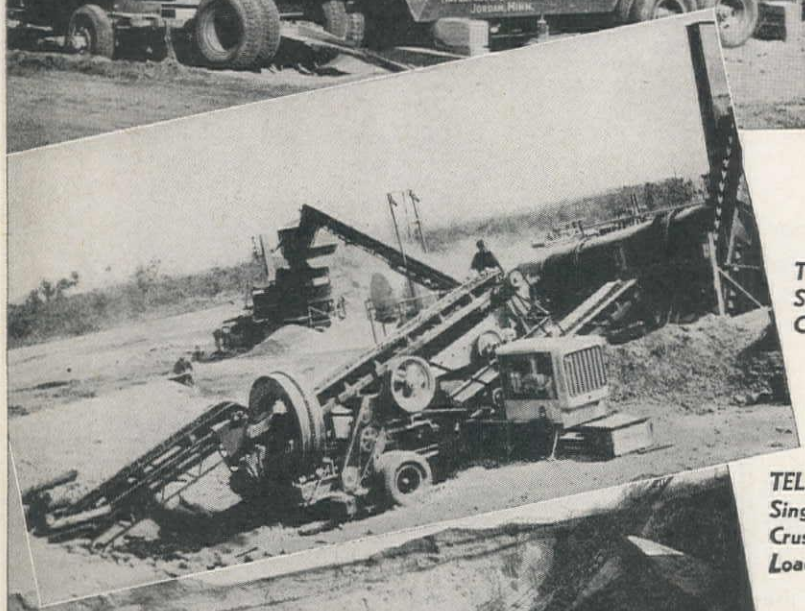
WEBER CO.—**Chytraus Construction Co.,** 436 S. Fourth St., Salt Lake City—$47,629 to construct conc. aprons at Igloo Magazine, Ogden Arsenal Depot, Ogden—by U. S. Engr. Ofc., Salt Lake City. 10-9

Washington

CHELAN CO.—**Sound Construction and Engineering Co.,** Northern Life Tower, Seattle—$44,615 to surf. with crushed stone 6.2 mi. of State Hwy. 15 C & D and establish stockpiles in vicinity of Lake Wenatchee—by Dir. of Hwys., Olympia. 10-18

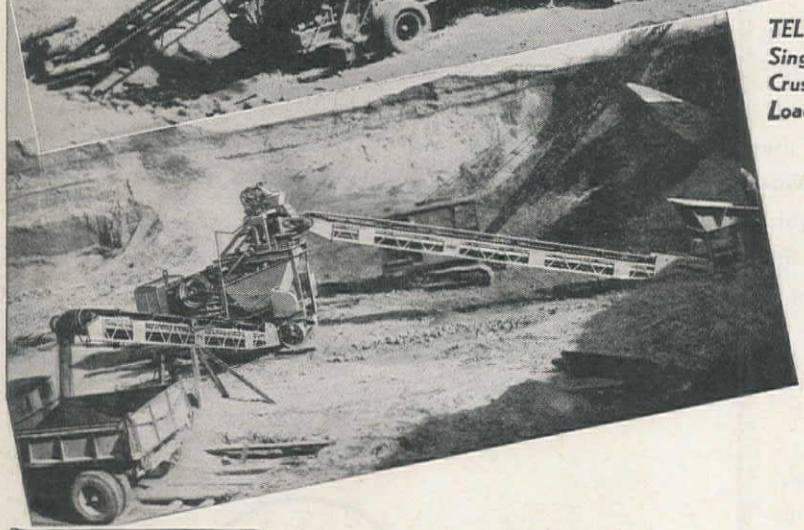
COWLITZ & WAHKIAKUM COS.—**D. F. Whittaker Co., Inc.,** 839 Central Bldg., Seattle—$69,628 to ballast, surf. and

TELSMITH Dual Portable
Crushing-Screening-Loading Plant

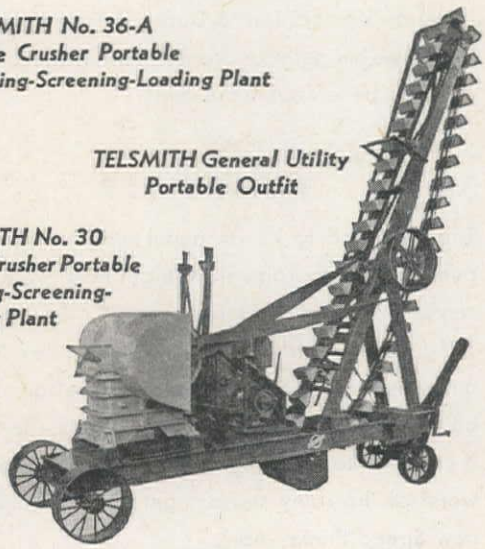


TELSMITH No. 36-A
Single Crusher Portable
Crushing-Screening-Loading Plant

TELSMITH General Utility
Portable Outfit



TELSMITH No. 30
Single Crusher Portable
Crushing-Screening-
Loading Plant



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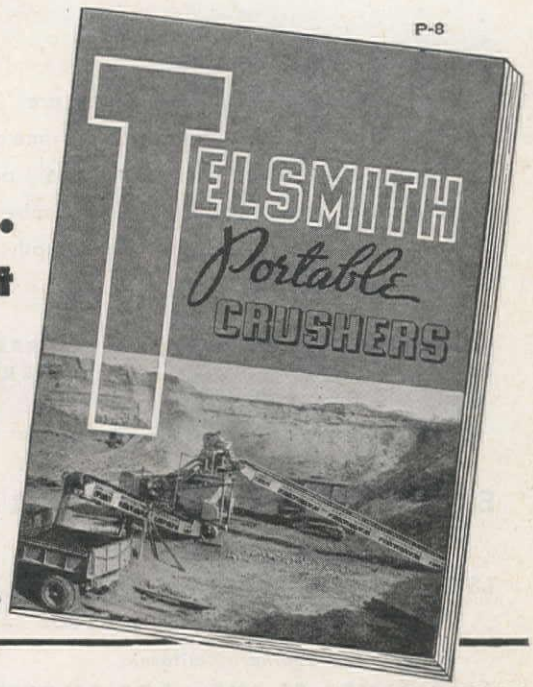

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Mines Engineering & Equipment Company, 369 Pine St., San Francisco 4—811 W. 7th St., Los Angeles 14

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.

stockpile surf. materials on State Hwy. 12—by Dir. of Hwys., Olympia. 10-2

DOUGLAS, GRANT & OKANOGAN COS.—**Leo J. Lavin,** Coulee City, Wash.—$31,550 to stockpile mineral aggr. for non-skid single seal treatment on State Hwys. 2, 7 and 10—by Dir. of Highways, Olympia. 10-18

KING CO.—**Northwest Construction Co.,** 3950 Sixth Ave., N. W., Seattle—$26,830 to pave Pier E storage area, Seattle Port of Embarkation, Seattle—by U. S. Engr. Ofc., Seattle. 10-6

KING CO.—**Western Asphalt Co.,** Seattle—$24,132 to surf. with cr. stone 2.07 mi. & to place bitum. surf. treatment, Cl. F, on State Hwy. 2 betw. Issaquah & Highpoint—by Dir. of Hwys., Olympia. 10-25

KITSAP CO.—**Rush-Baird,** 4039 Fauntleroy St., Seattle—$93,633 to grade, drain, constr. asph. conc. pave & sidewalks, and cement conc. curbs & gutters on 1.7 mi. of State Hwy. 14, Blackjack Creek in Port Orchard to Orchard Heights War Housing Project—by Dir. of Hwys., Olympia. 10-18

LEWIS CO.—**Holmberg & Norman, Inc.,** Port Orchard—$35,745 to grade, drain & surface 1.3 mi. State Hwy. 5 from Glenoma to Christian's Store & surface 3.2 mi. from Kosmos to Lindberg—by Dir. of Hwys., Olympia. 10-18

Wyoming

SHERIDAN CO.—**Big Horn Construction Co.,** Sheridan—$49,241 to grade, drain, base course, surf., oil treatment, stone chip seal coat on 1.5 mi. near the Sheridan Airport, Sheridan—by State Hwy. Dept., Wyoming. 10-12

Bridge & Grade Separation...

California

LOS ANGELES CO.—**S. A. Marshall,** 2653 Thirteenth St., Sacramento—$40,170 to excavate the Los Angeles River channel, involving 187,370 cu. yd. downstream and 150,672 cu. yd. upstream, btw. Yolanda Ave. & Owensmouth Ave.—by County Board of Supervisors, Los Angeles. 10-25

P&H truck cranes

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Wherever the job may be — in congested business areas or out at the edge of town — you can get there with a P&H Truck Crane almost as quickly as you'd drive your own car.

It's the kind of mobility that avoids delays, speeds work, and cuts costs on all kinds of construction and materials handling jobs.

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LOS ANGELES CO. — **Oberg Bros.,** Box 640, Inglewood, Calif.—$15,300 to construct reinf. conc. bridge on Redondo Beach Blvd., vicinity of Torrance and Gardena—by County Board of Supervisors, Los Angeles. 10-18

MARIN CO.—**Fred D. Kyle,** 816 W. Fifth St., Los Angeles—$19,533 to remove bridge decks on movable spans & replace with steel flooring, across Richardson Bay, at Manzanita & across Corte Madera Creek, at Greenbrae—by Div. of Hwys., Sacramento. 10-19

SHASTA CO.—**Freethy-Kimball Co.,** 406 Montgomery St., San Francisco — $62,770 to furnish material and construct bridges on access road to Deschutes Lumber Company—by Pub. Roads Admin., San Francisco. 10-14

Colorado

GRAND CO. — **Larson Construction Co.,** 3001 Welton St., Denver—$62,601 to construct earthwork and bridges at Grand Lake-Shadow Mountain Lake connecting channel, Colorado-Big Thompson Project, near Granby—by Bur. of Reclamation, Washington, D. C. 10-17

Idaho

CANYON & OWYHEE COS.—**A. D. Stanley,** Boise—$48,992 to redeck the Pickle Butte Bridge at Marsing—by Dept. of Pub. Works, Idaho.

Montana

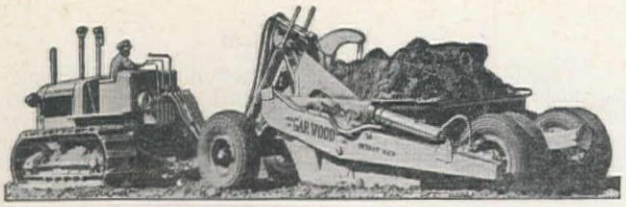
PRAIRIE CO.—**W. P. Roscoe Co.,** Box 633, Billings—$202,552 to construct 5-span, 632-ft. steel and conc. bridge over the Powder River—by State Hwy. Comm., Helena. 9-29

New Mexico

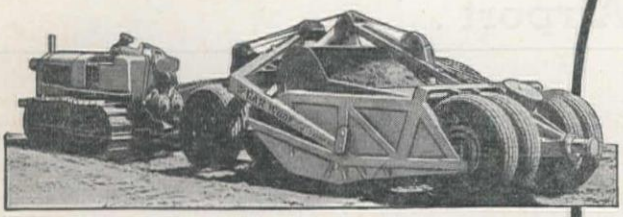
OTERO CO. — **Gaastra & Gilbert,** Albuquerque — $38,636 to construct 5.10 mi. bridge, including surf. and cattle guards, on the Jim Lewis Canyon Road—by State Hwy. Dept., Santa Fe. 10-13

Oregon

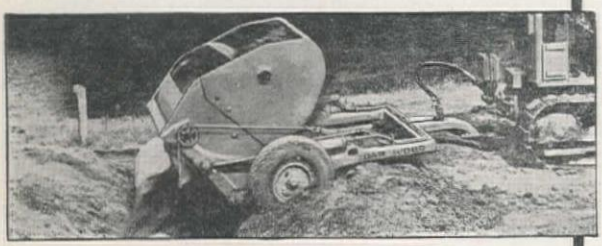
MULTNOMAH CO.—**L. H. Hoffman,** 715 S. W. Columbia, Portland—$303,715 to reconst. & redeck Hawthorne St. bridge



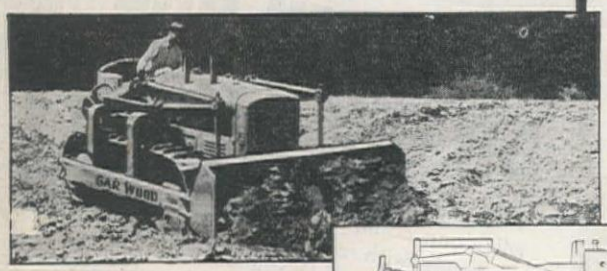
2A 4-wheel hydraulically operated Scrapers for earth moving, specifically constructed for fast digging, easy loading, accurate spreading.



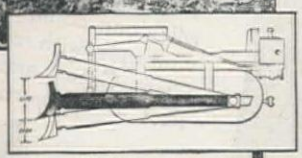
2B 4-wheel cable operated Scrapers for earth moving provide less power to load; greater clearance; flexibility for fast hauls; positive rolling ejection; precision spreading.



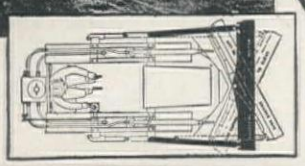
2C 2-wheel hydraulic Scrapers for low-cost, earth moving—dig, load, haul, back dump, make short turns.



2D Bulldozer: Blade fixed for pushing loads ahead.



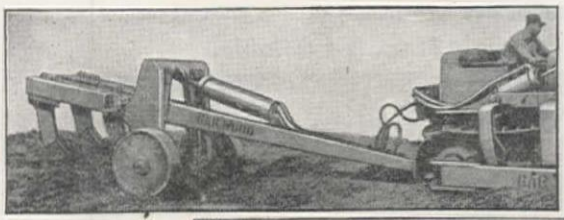
2E Roadbuilders: Blade set to push loads ahead, sidecast loads to left or right.



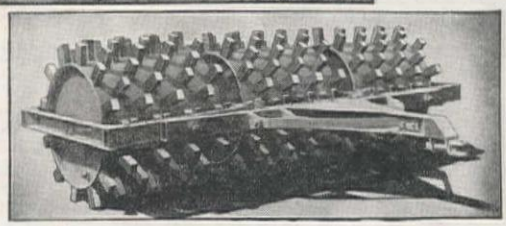
GAR WOOD Road Machinery

Gar Wood Industries, Inc., manufactures a complete line of heavy-duty, earth-moving machinery: two-wheel Hydraulic Scrapers in 3, 5, 6, and 8 cubic-yard capacities; four-wheel Hydraulic Scrapers in 8, 10, and 15 cubic-yard capacities; four-wheel Cable Scrapers in 11, 15, 20, and 25 cubic-yard capacities; Bulldozers; Roadbuilders; Tamping Rollers; Rippers. Accepted by leading contractors and governmental agencies throughout the world, as meeting all requirements for heavy earth-moving equipment.

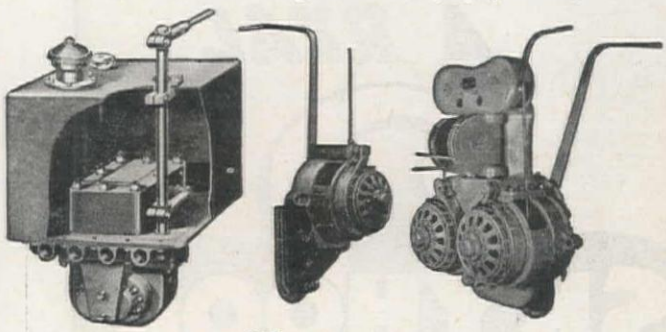
Refer to picture number when ordering literature



2F Rippers rip compacted earth, shale, rock, roots, old pavements, old roads.



2G Sheep-foot Tamping Rollers built with interchangeable drums (single, double, triple).



2H Hydraulic Control Unit

2J Cable Control Single Drum.

2K Cable Control Double Drum

Hydraulic and Cable Control Units for operation of Scrapers, Bulldozers, Roadbuilders, Rippers, for heavy-duty service with track-type tractors.

GW ROAD MACHINERY is Sold Through ALLIS-CHALMERS Dealers Everywhere

ROAD MACHINERY DIVISION

GAR WOOD INDUSTRIES, Inc.

DETROIT 11, MICHIGAN

& approach at Portland—by County Bd. of Supervisors, Portland. 10-24

Washington

CLALLAM CO. — **Sound Construction & Engineering Co.,** Northern Life Tower, Seattle—$138,932 to surface with crushed stone, 9.4 mi. of hwys., reconst. exist. culverts and construct reinf. conc. girder bridge 88 ft. long near State Hwy. 9 in vicinity of Lake Crescent—by Dir. of Hwys., Olympia. 10-18

KING CO.—**Beal & Roberts,** Seattle—$22,176 to const. reinf. conc. slab bridge 68-ft. long Sec. 2, & const. 12 x 4-ft. reinf. conc. box culvert 49 ft. 6 in. long at Jenkins Creek—by Dir. of Hwys., Olympia. 10-25

Airport . . .

California

ALAMEDA CO.—**Piazza & Huntley,** Box 708, San Jose—$140,497 to construct a new runway at Oakland Municipal Airport, Oakland—by U. S. Engr. Ofc., San Francisco. 10-19

MARIN CO.—**Fredrickson & Watson, Harney Construction Co.,** 873 81st Ave., Oakland—$477,378 to construct air transport command aprons at Hamilton Field—by U. S. Engr. Ofc., San Francisco. 9-4

SACRAMENTO CO.—**Morrison-Knudsen Co., Inc.,** 411 W. Fifth St., Los Angeles—$181,241 to grade apron and taxiway area, place base course and drainage facilities at Fairfield- Suisun Aux. Air Field, near Fairfield—by U. S. Engr. Ofc., Sacramento. 9-4

SAN DIEGO CO.—**V. R. Dennis Construction Co.,** Box F, Hillcrest Station, San Diego—$113,700 to improve runway & taxiway systems at Aux. Air Field, Reams Field, San Diego—by Bur. of Yards & Docks, Washington, D. C. 10-19

SANTA BARBARA CO.—**J. F. Cummins,** 245 E. Olive, Burbank—$67,000 to constr. maintenance hangar, latrine & appurt. facils., Army Airfield, Santa Maria—by U. S. Engr. Ofc., Los Angeles. 10-25

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Cedarapids aggregate producing and crushing equipment will help you produce better aggregate for ballast, highways, airports and other construction jobs, and it will cost you less too. Remember this — the Cedarapids line is complete and will meet any aggregate production problem either from the standpoint of output or character of materials for either an entire plant or a single piece of equipment. You'll be way ahead if you come to Iowa now for your essential needs and be one of the first in line for postwar deliveries. See your Iowa dealer right away or write direct.

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Phoenix, Ariz.

R. L. HARRISON CO., INC.
Albuquerque, N. M.

SIERRA MACHINERY CO.
Reno, Nev.

SOLANO CO.—**Moore & Roberts, Williams & Burrows,** 693 Mission St., San Francisco—$592,645 to construct barracks, to pave and to install utilities at Fairfield-Suisun Airport—by U. S. Engr. Ofc., Sacramento. 10-9

Colorado

PUEBLO CO.—**Brown Bros. Construction Co.,** Box 315, Pueblo—$61,898 to construct taxiways, aprons, including drainage, paving and appurtenant work at the Pueblo Municipal Airport, Pueblo—by Civil Aeronautics Admin., Kansas City, Mo. 10-4

New Mexico

OTERO CO.—**Skousen Construction Co.,** 201 Springer Bldg., Albuquerque—$135,158 to construct additional facilities at Army Air Base, Alamogordo—by U. S. Engr. Ofc., Albuquerque. 10-17

Oregon

COOS CO.—**Newport, Kern & Kibbe,** 42, S. E. Salmon, Portland—$298,943 to construct stabilized shoulders on runway at Aux. Air Sta., North Bend—by Bur. of Yards & Docks, Washington, D. C. 10-6

TILLAMOOK CO.—**Parker-Schram Co.,** Couch Bldg., Portland—$324,000 to construct taxiways and parking area and to stabilize runway shoulders at Naval Air Station, Tillamook—by Bur. of Yards & Docks, Washington, D. C. 10-6

Texas

WARD CO.—**Uvalde Construction Co.,** 2400 Uvalde St., Dallas—$220,684 to constr. add. parking aprons at Airfield—by U. S. Engr. Ofc., Albuquerque. 9-21

Water Supply . . .

California

CONTRA COSTA CO.—**Stockton Construction Co.,** 40 W. Clay St., Stockton—$10,217 to construct reinforced conc. water tank at County Farm near Clayton—by County Board of Supervisors, Martinez. 10-17

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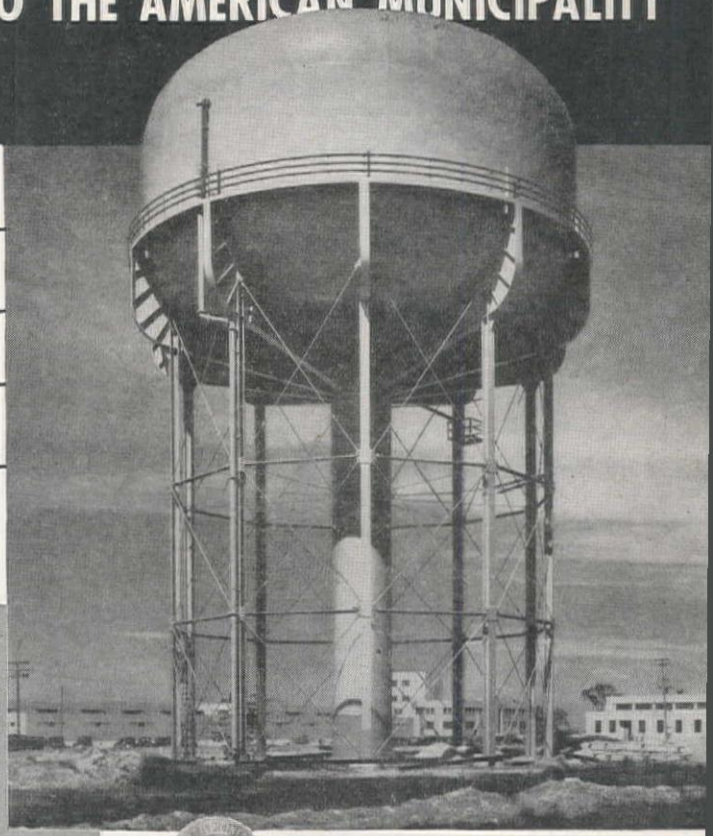

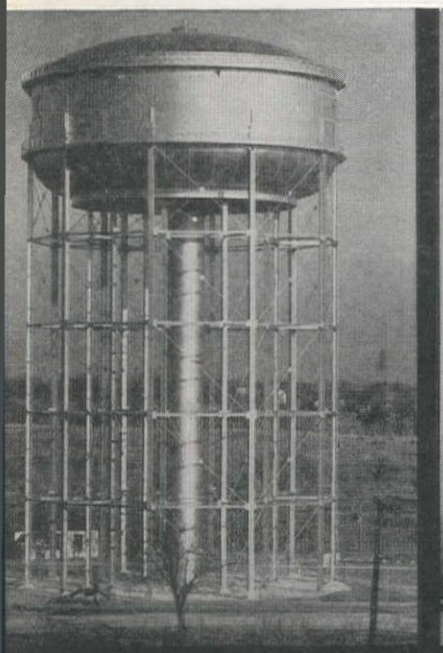

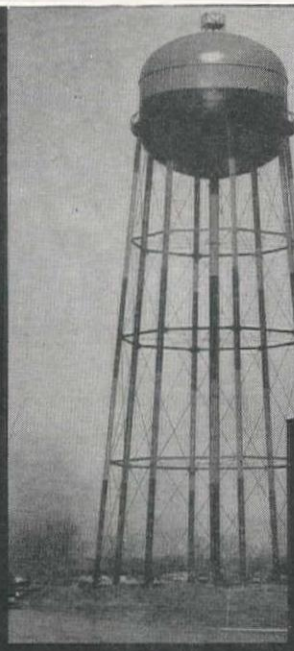

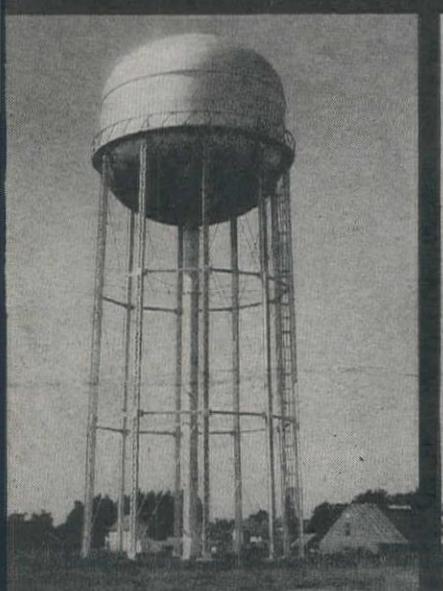

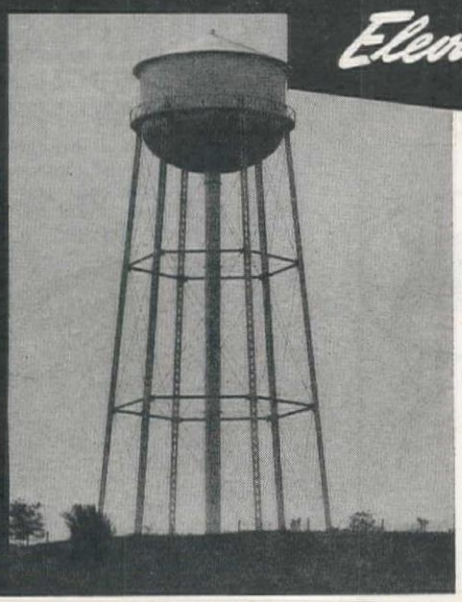

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SEATTLE, 528 EIGHTH AVENUE, SOUTH

LOS ANGELES CO.—**Edward R. Green,** 3001 Coolidge Ave., Los Angeles—$68,685 to install 2,500 ft. of 12 to 24-in cast iron water pipe in Burbank—by City Council, Burbank. 10-5

SAN FRANCISCO CO.—**J. G. Grattan,** 1995 Oak St., San Francisco, Calif.—$9,745 to make test borings at Sutro Reservoir Site in San Francisco—by Public Utilities Commission, San Francisco. 10-18

Texas

McLENNAN CO.—**Layne-Texas Co., Ltd.,** Houston—$15,878 to construct a water well at Bluebonnet Ord. Plant, McGregor —by U. S. Engr. Ofc., Galveston. 9-20

Washington

SNOHOMISH CO.—**Argentieri & Colarossi,** 1819 Weller St., Seattle—$60,874 to construct cement pipe water system in Alderwood Water District—by Engrs. Sievers & Duecy, Seattle. 10-16

These advantages make TRANSITE PIPE *Easy to handle!*

MORE FOOTAGE can be carried per truck load because Johns-Manville Transite Pipe is light in weight...fewer men are needed for handling...and mechanical equipment is not needed except for the larger sizes.

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Another outstanding feature of this pipe is that it is non-metallic and, therefore, its high flow rate can never be choked off by tuberculation. Transite's high corrosion-resistance contributes to its low maintenance cost.

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Pipe Wt. Lb. Per Lin. Ft. Including Coupling and Rubber Rings	Pipe Size (I.D.)→	3"	3½"	4"	4½"	5"	6"	7"	8"	10"
	Class 50*	3.9	4.6	5.2	6.0	6.8	8.3	10.1	12.6	16.5
	Class 100	4.2	4.8	5.5	6.2	7.0	8.5	10.6	12.8	21.3
	Class 150	5.0	5.9	6.7	8.0	9.4	11.6	15.2	18.0	29.9
	Class 200	7.3	8.3	9.3	10.9	12.8	16.6	20.9	25.2	39.7
	Pipe Size (I.D.)→	**12"**	**14"**	**16"**	**18"**	**20"**	**24"**	**30"**	**36"**	
	Class 50	21.3	26.8	33.0	38.6	45.6	60.1	96.2	136.0	
	Class 100	29.4	39.3	50.4	62.5	76.4	107.5	164.2	230.5	
	Class 150	41.1	55.5	69.8	87.2	106.8	152.1	241.7	346.5	
	Class 200	52.7	71.7	93.8	119.6	149.2	213.3	333.0	466.8	

*Class designation represents maximum working pressure.

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An asbestos product for efficient, economical water lines

Sewerage . . .

California

ALAMEDA CO.—**Oakland Sewer Construction Co.,** Box 282, Walnut Creek—awarded contract for approx. $30,000 to construct storm water trunk line outfall sewer in Hayward—by Oro Loma Sanitary Dist., Hayward. 10-12

ALAMEDA CO.—**John Pestana,** 4039 Fruitvale Ave., Oakland—$59,208 to construct sanitary sewer system in Eden Township near San Leandro—by Oro Loma Sanitary Dist., Hayward. 9-15

CONTRA COSTA CO.—**Oakland Sewer Construction Co.,** Box 282, Walnut Creek—$236,888 to improve sewer facilities in El Sobrante—by San Pablo Sanitary District, San Pablo. 10-11

GLENN CO.—**Oakland Sewer Construction Co.,** Box 282, Walnut Creek—$26,251 to install 9,000 ft. of 15-in. sanitary sewer in Orland—by City Council, Orland. 10-5

IMPERIAL CO.—**J. S. Barrett,** Box 278, Newport Beach—$36,574 to repair outfall sewer, El Centro—by City Council, El Centro. 10-9

LOS ANGELES CO.—**Tom L. Gogo,** 10024 S. Figueroa St., Los Angeles—$18,399 to construct a sanitary sewer in District 13D-2—by City Council, Long Beach. 10-20

LOS ANGELES CO.—**George Miller,** 2147 West Silver Lake Drive, Los Angeles—$18,096 to construct lateral sewers in Long Beach—by City Council, Long Beach. 10-6

LOS ANGELES CO.—**V. C. K. Construction Co.,** 629 S. Atlantic Blvd., Los Angeles—$11,636 to construct vitrified sewer in vicinity of Elmvale Ave., Los Angeles—by County Board of Supervisors, Los Angeles. 10-11

LOS ANGELES CO.—**Paul Vukich Construction Co.,** 112 W. Ninth St., Los Angeles—$19,804 to constr. a sanitary sewer in District 13D-1—by City Council, Long Beach. 10-20

LOS ANGELES CO.—**Paul Vukich Construction Co.,** 112 W. Ninth St., Los Angeles—$19,594 to constr. a sanitary sewer in District 13E-1—by City Council, Long Beach. 10-20

MONTEREY CO.—**Granite Construction Co.,** Box 900, Watsonville—$62,580 to construct additional drainage at Monterey Airport—by U. S. Engr. Ofc., San Francisco. 10-16

SAN MATEO CO.—**E. J. Tobin,** 1132 Longridge Rd., Oakland—$40,572 to construct approx. 8,850 lin. ft. of 18-in. and 24-in. conc. or vitr. pipe outfall interceptor, in San Bruno—by City Council, San Bruno. 10-20

SOLANO CO.—**Younger Construction Co.,** Cheda Bldg., San Anselmo—$141,920 to construct sewers for north housing project at Navy Yard, Mare Island—by Bur. of Yards & Docks, Washington, D. C. 10-17

Idaho

BEAR LAKE CO.—**Reynolds Construction Co.,** Springville, Utah—$11,827 to construct drainage facilities at Bear Lake Airport near Paris—by U. S. Engr. Ofc., Sacramento, Calif. 9-21

Here's a Torch Specifically Designed for Modern Silver Brazing

No wonder skillful silver brazing operators are so enthusiastic over this new VICTOR torch.

Here are their reasons . . .

(1) The Model J27 Welding Torch has ample gas capacity, but its weight is light, its balance perfect.

(2) Adequately long flexible nozzles can be provided with single or multiple flames for light or heavy silver brazing operations.

(3) The built-in AIRADIATOR section assures a cool handle without interfering with proper flame characteristics.

(4) It is the most perfect arrangement for silver brazing of Walworth type of fittings, flanges, collars, and "L's" such as are encountered in marine work.

(5) It can be held conveniently and sturdily by both hands, far enough from the work yet kept in constant and controlled motion. The valve positioning clears the operator's hands, makes for accessibility.

(6) It produces just the right kind of feathery, soft flame—single flame for some operations, multiple flame for heavier sections. And its flexibility allows bending into the most advantageous shapes.

It is the ideal equipment for modern silver brazing operations.

VICTOR EQUIPMENT COMPANY

Ad 88 **844 FOLSOM STREET · SAN FRANCISCO 7**

Nevada

LINCOLN CO.—**E. H. Thomas & Co.,** Box 549, El Centro, Calif.—$37,254 to construct a sewer main and a sewage treatment plant at Pioche—by Federal Works Agency, Los Angeles. 10-19

Texas

BEXAR CO.—**C. H. Harrison,** Waco—$51,950 to build additions to sewage disposal plant at Kelly Field—by U. S. Engr. Ofc., San Antonio. 10-16

DALLAS CO.—**E. H. Reeder Construction Co.,** 4013 Glendora St., Dallas—$34,046 to constr. storm sewer improvements on Collett Ave. from alley S. of Worth St. to N. line Swiss Ave.—by City Council, Dallas. 10-26

Utah

SALT LAKE CO.—**Young & Smith,** 1678 Browning Ave., Salt Lake City—$11,078 to construct a vitrified sewer in E. Vine, Virginia and Benbow Sts., Murray—by Board of Commrs., Murray. 10-23

Washington

KING CO.—**Matt Malaspina & Co.,** 1901 23rd Ave., S.—$41,825 to install sewers in California Ave. and other sts.—by Board of Public Works, Seattle. 10-20

SPOKANE CO.—**Chas. A. Power,** Box 1220, Spokane—$12,606 to construct drainage sewer in Perry St. and Newark Ave., near 10th Ave., Spokane—by City Council, Spokane. 10-14

Waterway . . .

California

ALAMEDA CO.—**Macco Construction Co.,** Freight & Ferry Sts, Oakland—$176,990 to construct a levee at the Oakland Municipal Airport—by U. S. Engr. Ofc., San Francisco. 10-4

CONTRA COSTA CO.—**Lebeauf & Doherty Co.** and **J. D. Proctor, Inc.,** Monadnock Bldg., San Francisco—$450,000 to remove wreckage in Port Chicago Channel—by U. S. Engr. Ofc., Sacramento. 10-9

CONTRA COSTA CO.—**Puget Sound Bridge & Dredging Co.,** Freight and Ferry Sts., Oakland—$195,000 (est.) to dredge for Pier 3 at Naval Magazine Depot, Port Chicago—by Bur. of Yards & Docks, Washington, D. C. 9-29

CONTRA COSTA CO.—**San Francisco Bridge Co.,** 503 Market St., San Francisco—contract awarded to dredge 1,000,000 cu. yd. at Yard 3, Richmond—by Engr. Dept., Kaiser Shipbuilding Co., Richmond. 10-19

LOS ANGELES CO.—**Ansco Construction Co., Inc.,** 2725 Atlantic Ave., Long Beach—awarded contract at $4.25 per T. or $29.50 per lin. ft. to construct 225 lin. ft. of rock sea wall near 4th Place, Redondo Beach—by City Council, Redondo Beach. 10-3

LOS ANGELES CO.—**Ralph A. Bell,** 1615 Euclid Ave., San Marino, Calif.—$36,160 to construct a conc.-lined section of Arroyo-Seco Channel, South Pasadena, Calif.—by County Board of Supervisors, Los Angeles. 10-18

LOS ANGELES CO.—**Ralph A. Bell,** 1615 Euclid Ave., San Marino—$60,520

Construction Plant and Equipment From Shasta Dam, California

Available For Sale **Immediate Delivery**

Listed below are a few of the items of plant and equipment used in the construction of this dam. Most of the equipment purchased new for this project. Most items available for immediate shipment, F.O.B. Shasta Dam, California, subject to prior sale.

AIR COMPRESSORS

4—Sullivan Model WN4, size 22—13 x 14 twin angle compound. Complete with all regular equipment, after cooler, syn. motor 500 h.p. direct connected, motor generator set, auto starter panel, air receiver. 2—Available Now. 2—In Dec.
1—Sullivan Model WN31 with G.E. synch. motor, 250 h.p. outo starting panel, after cooler, air receiver.
1—C-200 Fuller single stage rotary compressor Westinghouse motor 100 h.p.

CABLEWAYS

3—Lidgerwood, 3-drum electric hoists with 500 H.P. G.E. Motors. Ward Leonard control, complete with controls and all electrical equipment.
3—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—1790 ft. pcs. of 3" dia. locked coil cable, new.
12,000 lin. ft. of used 3" dia. locked coil cable in length from 500 to 2600 lin. ft.
50,000 lin. ft. of used 7/8" and 1 1/8" wire rope.
20,000 lin. ft. of new 7/8" and 1 1/8" wire rope.
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. (Available in December).
2—Fuller-Kinyon Pumps—type "D" 125 h.p. complete with air hose power control cable, control cabinets.
1—Sly Dust Filter—#51 Type "D" 360.
6—8" Valves, 2—two-way, 4—three-way.
360 lin. ft. 8" Fuller Kinyon Conveying System license.

CONVEYORS

1,000 troughing rolls for 36" belt.
300 return idlers for 36" belt.
2—Complete sets, including 42" tandem drive pulleys, 42" head pulleys, 36" tail pulleys.
6—150 h.p. Westinghouse gear motors, 144 r.p.m., 2300 volts, 3-phase, 60-cycle.
3—75 h.p. Westinghouse gear motor, 194 r.p.m., 2300 volt, 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.
200 lin. ft. 18" dia. screw conveyor with 25 & 40 h.p. gear unit drives.

DRILLING EQUIPMENT

10—I-R drifters DA35.
5—I-R Wagondrills—pneu. tires, hoists, X71 drifters mounted.
2—I-R-54 Drill Sharpeners.
1—I-R-50 Drill Sharpener.
10—I-R Jackhammers.

PUMPS

2—Byron-Jackson 400 h.p. 12 in. deepwell.
3—Bingham type SVD submersible pumps.
1—Bingham 100 h.p. 18 in. deepwell.
1—Byron-Jackson 150 h.p. 10 in. deepwell.
1—Gardner-Denver grout pump model FD-FS, 10" x 2 1/2" x 10", with case-hardened liners and Calmex pistons and rods, 1,000 lb. pressure at 90 lb. air.
2—Gardner-Denver grout pumps model FG-AG, 6" x 2 1/2" x 6", with case-hardened liners and Calmex pistons and rods, 500 lb. pressure at 90 lb. air.
Other pumps complete with motors from 1 1/2 h.p. to 200 h.p., also several 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. 3—Available Now.
1—Rex 160 Pumpcrete, gas or electric.
12—Chicago Pneumatic C.P. 417 Model A Elec. Vibrators.
4—Chicago Pneumatic C.P. 518 Elec. Vibrators.
35—Chicago Pneumatic C.P. 519 Elec. Vibrators.
18—Malan Pneumatic Vibrators.

MISCELLANEOUS

1—Broderick 86 h.p. horizontal locomotive type fire box boiler with #5 Ray burner.
1—Gardner-Denver #9 mine car loader, 24" gauge.
4 ea. #6671 Mattison mine cars, body size 29" x 47" x 32".
2—Special built sheepsfoot rollers with floating frames, extra heavy duty.
1—Bodinson 60" x 16' trommel screen complete with motor drive, feed chutes.
Pipe—used, 3, 4, 6, 8, 10, 12, 16-inch.
Valves—1, 2, 3, 4, 6, 8, 10, 12, 16-inch.
10,000 ft. Type S rubber covered cord cable.
Pole line hardware.
Floodlites—500 to 1500 w.
Structural Steel—all shapes and sizes—girders 48 and 72 inch—28 to 50 ft.
1—LeTourneau Heavy Duty 3-Point Rooter.
1—1 1/4 cu. yd. Heavy Duty Clam-shell Bucket.
12—Muck Skips, 7—14 cu. yds.
3—Hot water storage tanks, two at 3' 6" x 10' and one at 3' 6" x 12'.
1—9500 bbl. A.P.I. 48' diam. x 30' high Steel Water Tank with Cover.
1—5400 bbl. A.P.I. 36' diam. x 30' high Steel Water Tank with Cover.
10—Sand Blast Tanks 24" x 72" incl. fittings.
5—8 cu. yd. Steel Hoppers.
1—Kelley Power Floating Machine Model 20.
10—Lincoln Electric Arc Welders 400 amp. 3-phase 60-cycle 440 volt.

THE GREATER PORTION OF THE FOLLOWING EQUIPMENT TO BE RELEASED IN THE NEXT 60 DAYS

2—48B Bucyrus-Erie shovel and dragline combinations—Diesel Power.
1—Model 18 Northwest shovel and dragline combination—Gas Power.
5—D8 Caterpillar Diesel Tractors with LeTourneau Angle Dozers.
1—Model 22 Caterpillar Tractor with Kay-Brunner hydraulic bull dozer.
1—RD-6 Caterpillar Diesel Tractor with LeTourneau bulldozer.
1—Model 12 Caterpillar road grader.
16—White Dump Trucks—Model 1580 (691) 24 cu. yd. capacity.
5—B.F. Mack 7 cu. yd. Dump Trucks—(3 Available now).
2—International Flat racks, capacity 10 tons.
6—B.F. Mack Flat racks, capacity 10 tons (3 Available Now).
20—Ford V-8 1 1/2 ton flat racks 1938 to 1942 models.
15—Ford V-8 Pickups, '38 to '42 models.
1—Ford V-8 Fire Truck with fire equipment.
2—Callahan trailers—one 35 ton capacity; one 40 ft. semi.
Complete line of Machine Shop and Garage Equipment including lathes, presses, shapers, bolt and pipe threaders, ironworker, welders, drills, vulcanizers, wrenches and tools.
Complete stock of Warehouse supplies.
Complete stock of Mess hall and Dormitory equipment and furnishings.
Complete line of transformers and electric motors.

Commitments for future delivery will be accepted on any of the above items not immediately available.

PACIFIC CONSTRUCTORS, INC.

GENERAL CONTRACTORS—SHASTA DAM, CALIFORNIA **PHONE 512 REDDING**

to grade and repair portions of Arroyo Seco Channel, betw. S. Pasadena and 300 ft. S. E. from San Pascual Ave. & Orange St.—by Board of Public Works, Los Angeles. 10-19

LOS ANGELES CO.—**Case Construction Co.,** Box 6, San Pedro—negotiated contract to dredge 875,000 cu. yd. of material from southwest slip of the west basin and deposit it near Bixby Slough, 2 mi. away—by Bur. of Yards & Docks, Washington, D. C. 9-29

LOS ANGELES CO.—**Chas. A. Dutro Assoc.,** 307 West 8th St., Los Angeles—$143,200 to pour conc. jacket around piling at berths 1, 2 & 3 at Pier A, Long Beach Outer Harbor—by Long Beach Harbor Comm., Long Beach. 10-10

LOS ANGELES CO.—**Hoagland-Findlay Engr. Co.,** 3254 Cherry Ave., Long Beach—$125,933 to furn. and install backflow protection units and construct conc. pits in Los Angeles Harbor—by Los Angeles Harbor Dept., San Pedro. 10-6

LOS ANGELES CO.—**Macco Construction Co.,** 815 Paramount Blvd., Clearwater—$489,139 to manuf. reinf. conc. piling and to drive bearing piling and sheet piling for wharf at Berths 4 to 7 in Long Beach Harbor—by Long Beach Harbor Comm., Long Beach. 10-2

LOS ANGELES CO.—**Edward R. Siple Co.,** 2545 San Fernando Rd., Los Angeles—$55,638 to erect structures to protect channel of Los Angeles River at Laurel Canyon Blvd.—by Board of Pub. Works, Los Angeles. 10-2

LOS ANGELES CO.—**Standard Dredging Corp.,** 800 Central Bldg., Los Angeles—$105,600 (est.) to construct submerged clay dike at Pier E, Long Beach Harbor—by Long Beach Harbor Comm. 9-29

LOS ANGELES CO.—**Sharp & Fellows Contracting Co.,** Central Bldg., Los Angeles—to construct a reinf. conc. streambed protection under the Santa Fe railway bridge over the Santa Anita Wash, betw. Arcadia & Monrovia—by Santa Fe Railway Co., Los Angeles. 10-3

SAN FRANCISCO CO.—**Healy-Tibbetts Construction Co.,** 1100 Evans Ave., San Francisco—$54,132 to dredge at South Pier, U. S. Naval Training & Distri. Center, Treasure Island—by Bur. of Yards & Docks, Washington, D. C. 10-19

SAN FRANCISCO CO.—**Twaits, Morrison-Knudsen & Gerwick,** 391 Sutter St., San Francisco—$1,676,965 to const. cellular pier & crane runway foundations at the Naval Dry Docks, Hunters Point—by Bur. of Yards & Docks, Washington, D. C. 10-24

SAN JOAQUIN CO.—**Lord & Bishop,** Box 812, Sacramento—$68,250 to furnish and deliver riprap stone to twelve locations along the San Joaquin River—U. S. Engr. Ofc., Sacramento. 10-23

VENTURA CO.—**Rhoades Bros. & Shofner,** 3869 Medford St., Los Angeles—$10,725 to excavate 0.5 mi. of Santa Clara River bed channel near Saticoy—by the County Bd. of Supervisors, Ventura. 10-3

Texas

BEXAR CO.—**Holland Page,** Georgetown Rd., Austin—$14,700 for water basin for cooling tower, cold water well & clear well—by U. S. Engr. Ofc., San Antonio. 10-3

Washington

WHATCOM CO. — **Cal Branham,** Anacortes—$46,668 to construct pile breakwater at Bellingham—by Port of Bellingham. 10-23

Building . . .

Arizona

MARICOPA CO.—**Bethlehem Steel Co.,** E. Slauson, Vernon, Calif.—Negotiated award to construct steel hangar at Aux. Air Field, Litchfield Park., Phoenix—by Bur. of Yards & Docks, Washington, D. C. 10-18

MARICOPA CO. — **A. Farnell Blair,** 9 Main St., San Francisco—Negotiated award for const. of fountains & completion of steel hangar at Aux. Air Field, Litchfield Park, Phoenix—by Bur. of Yards & Docks, Washington, D. C. 10-19

California

CONTRA COSTA CO.—**Fred J. Early, Jr.,** 369 Pine St., San Francisco—$60,500 to construct barracks for U. S. Coast Guard in Richmond—by Engr. Dept. of U. S. Coast Guard, San Francisco. 10-4

IMPERIAL CO.—**Shumaker-Evans Co.,** 832 W. 5th St., Los Angeles—$58,647 to fabricate, transport & erect 50 portable family dwellings in El Centro—by Fed. Pub. Housing Auth., Los Angeles. 10-17

KERN CO. — **Drycemble Houses, Inc.,** Architects Bldg., Los Angeles—$90,000 to transport & erect 24 prefabricated cemesto dwellings at the U. S. Naval Petroleum Res. No. 1, Elk Hills, near Tupman—by Bur. of Yards & Docks, Washington, D. C. 10-3

LOS ANGELES CO. — **S. O. Bennett,** 1215 E. Calaveras St., Altadena—$142,000 to remodel the LaVina Girls Preventorium into the Charles Cook Hastings Home & Research Laboratory at Pasadena — by LaVina Sanitorium, Pasadena.

LOS ANGELES CO.—**James B. Donaldson,** Los Angeles — $61,036 to construct Wac housing, Aux. Air Field Redistribution Center, Santa Monica—by U. S. Engr. Ofc., Los Angeles. 10-16

LOS ANGELES CO. — **C. W. Driver, Inc.,** 111 W. 7th St., Los Angeles—$132,578 to convert bldg. 130 into two sheet metal shops at the Naval Dry Docks, Terminal Island, San Pedro—by Bur. of Yards & Docks, Washington, D. C. 9-29

LOS ANGELES CO.—**Drycemble Houses, Inc.** and **Wesco Construction Co.,** 816 W. 5th St., Los Angeles—$557,642 to fabricate, transport and erect 500 portable family dwellings in Los Angeles—by Fed. Pub. Housing Auth., San Francisco. 10-11

LOS ANGELES CO. — **Howard Hastings, Inc.,** 1135 N. Las Palmas Ave., Los Angeles — awarded contract to construct garage and mechanical bldg. at Todd Shipyards, San Pedro—by Bur. of Yards & Docks, Washington, D. C. 9-15

LOS ANGELES CO.—**Shumaker and Evans Construction Co.,** 832 W. 5th St., Los Angeles—$557,642 to fabricate, transport and erect 500 portable family dwellings in Los Angeles—by Federal Public Housing Auth., San Francisco. 10-11

LOS ANGELES CO.—**Wesco Construction Co.,** 2000 Hyperion Ave., Los Angeles—$407,240 to build 1,000 family units

& community bldg. at Los Angeles—by Federal Pub. Housing Auth., Washington, D. C. 10-7

ORANGE CO.—**P. J. Walker Co.,** 3900 Whiteside Ave., Los Angeles—$452,556 to construct addtl. barracks & personnel struc. at Naval Magazine & Net Depot, Seal Beach—by Bur. of Yards & Docks, Washington, D. C. 10-9

ORANGE CO.—**Robert E. McKee,** Box 350, Glendale—$1,188,000 to construct 5 storehouses & cafeteria at Marine Corps Air Sta., El Toro—by Bur. of Yards & Docks, Washington, D. C. 10-10

RIVERSIDE CO.—**Alco Construction Co.,** 5423 Flemish Village Lane, Los Angeles—$93,120 to construct paint shop, extend railroad track and build storage facilities at Mira Loma Quartermaster Depot, Mira Loma—by U. S. Engr. Ofc., Los Angeles. 10-13

SACRAMENTO CO.—**Lawrence Construction Co.,** 3020 V St., Sacramento—$64,231 to constr. reinf. conc. addition to Pub. Works Bldg., approx. 9,200 sq. ft.—by Div. of Architecture, Sacramento. 10-26

SAN BERNARDINO CO.—**Lewis W. Hunt Co.,** 427 S. Hill St., Los Angeles—$57,100 to improve sites for 125 trailers in Needles—by Fed. Public Housing Auth., San Francisco. 10-24

SAN DIEGO CO.—**Griffith Co.,** 502 Los Angeles Railway Bldg., Los Angeles—$701,900 to construct additional facilities for enlisted men at Naval Repair Base, San Diego—by Naval Pub. Works Ofc., San Diego. 9-29

SAN DIEGO CO.—**Gorelnik Co.,** 1220 S. La Brea, Los Angeles—$659,074 to construct addl. storage facilities at Naval Repair Base, San Diego—by Bur. of Yards & Docks, Washington, D. C. 10-19

SAN DIEGO CO.—**John Keith,** 8517 W. 3rd St., Los Angeles—$175,000 to construct Frontier Elem. School, San Diego—by Fed. Works Agency, Washington, D. C. 10-4

SAN DIEGO CO.—**Shumaker & Evans Construction Co.,** 3000 N. Central Ave., Phoenix, Ariz.—$166,666 to constr. Barnard Elem. School, San Diego—by Fed. Works Agency, Washington, D. C. 10-4

SAN DIEGO CO.—**Shumaker & Evans Construction Co.,** 3000 N. Central Ave., Phoenix, Ariz.—$194,642 to construct Midway Elem. School, San Diego—by Fed. Works Agency, Washington, D. C. 10-4

SAN FRANCISCO CO.—**Cahill Bros.,** 206 Sansome St., San Francisco—$314,779 to construct a 4-story reinf. conc. & steel optical bldg. at Naval Dry Docks, Hunters Point—by Bur. of Yards & Docks, Washington, D. C. 10-10

SAN FRANCISCO CO.—**Peter Kiewit Sons Co.,** 442 Post St., San Francisco—$285,132 to construct mold loft & cable storage buildings at Naval Dry Docks, Hunters Point, San Francisco—by Bur. of Yards & Docks, Washington, D. C. 10-11

SAN FRANCISCO CO.—**M. J. King, Inc.,** 231 Franklin St., San Francisco—$59,447 to construct gymnasium bldg. at Hunters Point, San Francisco—by Fed. Pub. Housing Auth., San Francisco. 10-16

SAN MATEO CO.—**Ford J. Twaits Co.,** 451 S. Boylston St., Los Angeles—$147,992 to constr. officers' quarters and Wave housing at U. S. N. A. B. P. D., San Bruno—by Bur. of Yards & Docks, Washington, D. C. 10-19

SOLANO CO. — **James I. Barnes Construction Co.**, Russ Bldg., San Francisco —$92,200 to construct battery repair and truck repair bldg. at Naval Ammunition Depot, Mare Island—by Bur. of Yards & Docks, Washington, D. C. 10-3

SOLANO CO.—**J. A. Bryant**, 1000 Main St., Vallejo—$84,357 to construct 40-bed infirmary bldg. at Vallejo—by Fed. Pub. Housing Auth., Vallejo. 10-19

Colorado

PUEBLO CO. — **Robert M. Morris**, 518 Empire Bldg., Denver—$125,990 to construct a cadet nurses' dormitory for St. Mary's Hospital, Pueblo — by Architect Walter DeMordaunt, Pueblo. 10-4

Oregon

CLATSOP CO. — **Waale-Camplan**, 2100 S. W. Jefferson, Portland—$265,685 to construct wooden truss-arch land plane hangar at Naval Air Station, Astoria—by Bur. of Yards & Docks, Washington, D. C. 10-17

COOS CO.—**Drake, Wyman & Voss, Inc.**, Lewis Bldg., Portland—$287,651 to const. Class C overhaul bldg. at North Bend—by Bur. of Yards & Docks, Washington, D. C. 10-24

TILLAMOOK CO.—**Drake, Wyman & Voss, Inc.**, 904 Lewis Bldg., Portland—$77,120 to construct gunnery training bldg. at Tillamook—by Bur. of Yards & Docks, Washington, D. C. 10-13

WASCO CO. — **Mid-State Construction Co.**, The Dalles — $75,000 (est.) to construct 9-bin grain elevator at Condon—by Condon Grain Growers Cooperative, Condon. 10-9

Texas

BEXAR CO.—**F. L. Scott & Son**, San Antonio—$52,762 to alter & make additions to warehouses for San Antonio Army Service Forces Depot — by U. S. Engr. Ofc., Fort Sam Houston. 10-20

DALLAS CO.—**Carl M. Brown**, 1505 El Campo—$2,000,000 to erect shopping center, Buckner Rd. & Garland Rd., on a 31-acre site—by Landscape Archts., Hare & Hare, Kansas City. 10-26

DALLAS CO. — **Cowdin Bros.**, 411 S. Haskell St., Dallas—$125,500 to constr. office & warehouse with brick, tile & reinf. conc.—by Southwest Wheel, Inc., Dallas. 9-20

ECTOR CO.—**Bacon & Davis**, New York —$500,000 to construct two black plants 6 mi. west of Odessa—by Defense Plant Corp. & leased to United Carbon Black Co. of Charleston, W. Va. 10-26

EL PASO CO. — **Ponsford Bros.**, Box 1412, El Paso—$64,535 to constr. a recreation bldg. & to alter the Red Cross bldg. at the Wm. Beaumont General Hospital, Fort Bliss—by U. S. Engr. Ofc., Albuquerque, N. Mex. 9-4

HIDALGO CO. — **Alamo Products Co.**, C/o John T. Burkhart, Alamo—$61,000 to remodel processing plant at 102 E. First St. with reinf. conc., frame & sheet metal constr.—by self, Alamo. 10-25

NUECES CO.—**M. W. Watson**, c/o E. B. Jackson, 238 Nixon Bldg.—$99,833 to constr. 4-room school on Hedden St. & one 8-room school on Sam Rankin St.—by Independent School, Corpus Christi. 9-20

TARRANT CO.—**R. F. Ball Construction Co.**, Box 1451, Houston—$396,000 to

constr. two 100,000 sq. ft. service bldg. & garage for Consolidated Bomber Plant, Convair Div. — by Consolidated Vultee Aircraft Corp. 9-14

Utah

WEBER CO.—**Edw. L. Eckman,** 6000 S. State St., Salt Lake City—$239,051 to construct a nurses' home in Ogden—by Order of Catholic Sisterhood of St. Benedict of Saint Joseph, Minn. 10-3

WEBER CO. — **Jacobsen Construction Co.,** 724 S. 3rd E., Salt Lake City—$726,370 to construct hospital bldg. in Ogden —by Order of St. Benedict of Saint Joseph, Minn. 10-9

Washington

CLALLAM CO.—**Nettleton & Baldwin & Anderson,** 1109 N. 36th St., Seattle—$188,315 to overhaul bldg., gunnery training bldg., storage facilities & two commanding officers' quarters at the Naval Airport, Quillayute—by Bur. of Yards & Docks, Washington, D. C. 10-3

KING CO.—**American Builders,** Seattle—$443,350 to construct 450 temperate-zone 20 x 48-ft. wooden barracks — by U. S. Engr. Ofc., Seattle. 10-12

LEWIS CO.—**Rowe & Thompson,** Chehalis—$313,863 to construct 600 portable precut tropical-zone 20 x 48-ft. wooden barracks and 60 portable precut tropical-zone 20 x 8-ft. units—by U. S. Engr. Ofc., Seattle. 10-12

YAKIMA CO. — **Howard S. Wright & Co.,** Box 3106, Seattle, Wash.—$350,000 to construct 4-story addition to St. Elizabeth's Hospital, Yakima — by Sisters of Providence, Yakima. 10-18

Hawaii

HONOLULU—**Byrne Organization,** Washington, D. C.—negotiated award to construct aluminum type bldg., Naval Air Station — by Bur. of Yards & Docks, Washington, D. C. 10-24

British Columbia

VANCOUVER — **E. H. Shockley,** 5611 Elm St., Vancouver—$475,000 to constr. addition to Shaughnessy Military Hospital at 30th Ave. and Laurel St.—by Public Works Dept., Ottawa. 10-20

Miscellaneous . . .

California

ALAMEDA CO.—**M. J. King, Inc.,** 231 Franklin St., San Francisco—$285,356 to supplement personnel facilities, receiving barracks at Camp Shoemaker—by Bur. of Yards & Docks, Washington, D. C. 10-2

ALAMEDA CO. — **MacDonald & Kahn, Inc.,** Financial Center Bldg., San Francisco—$79,100 to construct swimming pool and bath house at U. S. Naval Hospital, San Leandro—by Bur. of Yards & Docks, Washington, D. C. 9-29

CONTRA COSTA CO.—**MacDonald & Kahn,** 200 Financial Center Bldg., San Francisco — $1,599,361 to construct personnel bldgs., reservoir water and sewer systems, roads and railways at Inland Storage Area, Naval Magazine, Port Chicago —by Bur. of Yards & Docks, Washington, D. C. 10-17

CONTRA COSTA CO.—**Parker, Steffins & Pearce,** 135 South Park, San Francisco —$353,035 to construct segregation bldg., roads, tracks and services at the U. S. Naval Magazine, Port Chicago—by Bur. of Yards & Docks, Washington, D. C. 10-2

KERN CO.—**R. A. Wattson Co.,** 5528 Vineland Ave., North Hollywood—$85,-663 for reconst. of electric distribution system at Army Air Field, Muroc, Calif. —by U. S. Engr. Ofc., Los Angeles. 10-19

LAKE CO.—**L. H. Leonardi,** Box 89, San Rafael—$43,415 to construct a 54.5 mi. transmission line—by Sunrise Valley Electric Corp., Alturas. 10-17

LOS ANGELES CO.—**Brunzell Construction Co.,** Box 432, Gardena—$123,904 to construct laundry facilities at disciplinary barracks, Naval Receiving Station, Terminal Island—by Bur. of Yards & Docks, Washington, D. C. 10-9

LOS ANGELES CO.—**H. B. Nicholson,** 572 Chamber of Commerce Bldg., Los Angeles—$56,426 to build additional trackage, Wilmington—by U. S. Engr. Ofc., Los Angeles. 10-24

SAN DIEGO CO.—**Gorelnik Co.,** 1220 So. La Brea Ave., Los Angeles—$659,074 to construct additional storage facilities at Naval Repair Base, San Diego. Work includes construction of wood frame storehouses, paving of certain areas, track work, fencing and other services—by Bur. of Yards & Docks, Washington, D. C. 10-13

SAN FRANCISCO CO.—**American Bridge Co.,** Frick Bldg., Pittsburgh, Pa. —$1,392,535 to construct bridge crane runway at Naval Dry Docks, Hunters Point —by Bureau of Yards & Docks, Washington, D. C. 10-10

SAN FRANCISCO CO.—**Walter W. Johnson Co.,** Balfour Bldg., San Francisco —$250,000 to construct two pontoon ferry floats in San Francisco Bay Area—by Bur. of Yards & Docks, Washington, D. C. 10-17

SAN JOAQUIN CO.—**Ford J. Twaits, Morrison-Knudsen Co., Inc., and Ben C. Gerwick,** 391 Sutter St., San Francisco—$10,395,189 to constr. storehouses, tracks, roads and wharf and to dredge at Naval Supply Depot, Rough and Ready Island, Stockton—by Bur. of Yards & Docks, Washington, D. C. 10-18

Colorado

LAS ANIMAS CO.—**Frank M. Kenney,** Denver—$67,560 to convert existing facilities at Trinidad Internment Camp—by U. S. Engr. Ofc., Denver. 9-4

Oregon

LANE & DOUGLAS COS.—**Tri-State Construction Co.,** Portland—$100,000 to string a 33,000-volt transmission line for 43 mi. Thirty-three mi. will be done in Lane Co. and 10 mi. in Douglas Co.—by Bonneville Power Admin., Portland. 10-2

Texas

DALLAS CO.—**Ebasco Services, Inc.,** New York—$2,500,000 for an extension to Mountain Creek Power Plant—by Dallas Power & Light Co. 10-25

TARRANT CO.—**Texas Bitulithic Co.,** Box 5297, Dallas—$136,123 to constr. a conc. pavement & railroad tracks at Aircraft Plant 4, Benbrook, near Fort Worth —by U. S. Engr. Ofc., Denison. 10-16

Utah

DAVIS CO.—**Gibbons & Reed,** 259 West 3rd South St., Salt Lake City—$84,750 to construct 3.5 mi. railroad track at U. S. Naval Supply Depot, Clearfield—by Construction Officer, U. S. N. R., Clearfield. 10-16

Washington

CLARK CO.—**Columbia Construction Co.,** Vancouver—$2,279,000 (est.) to construct 14,000 T. floating dry dock—by U. S. Maritime Comm., Washington, D. C. 9-28

GRAYS HARBOR CO.—**Sound Construction & Engr. Co.,** 1403 W. 45th, Seattle—$213,132 to grade, construct bridges and other work—by Dir. of Hwys., Olympia. 10-9

KING CO.—**Rushlight Automatic Sprinkler Co.,** Portland—$84,444 to constr. an automatic sprinkler system at Auburn Depot, Auburn—by U. S. Engr. Ofc., Seattle. 10-16

KITSAP CO.—**Winslow Marine Railway & Shipbuilding Co.,** Winslow—$1,000,000 (est.) to construct 12 steel tugs for Navy—by U. S. Maritime Comm., Washington, D. C. 9-29

Wyoming

NATRONA CO.—**B. Landon,** Casper—$186,000 to construct 29 mi. of 6-in. and 8-in pipe line in the vicinity of Casper and Sinclair—by Sinclair Oil Co., Casper. 10-2

PROPOSED PROJECTS

Water Supply . . .

Alaska

FAIRBANKS—Federal Works Agency, Washington, D. C., is considering plans and specifications prepared by Engineers Black & Veatch of Kansas City, Mo., for the construction of a new water and sewer system at Fairbanks at an estimated cost of $1,750,000. 10-9

Building . . .

Oregon

MULTNOMAH CO.—Federal Works Admin. allotted $149,850 for construction of $299,700 nurses' home for the Emmanuel Hospital in Portland. Building is being designed by Architects Sutton, Whitney & Aandahl of Portland. 10-14

MULTNOMAH CO.—War Production Board authorized the construction of a $516,307 whole milk powder processing plant for the Dairy Cooperative Association of Portland. 10-14

Washington

PIERCE CO.—Federal Works Admin. has allotted $187,000 for the construction of $375,000 nurses' training home at Tacoma General Hospital. Architects Mock & Morrison of Tacoma are preparing plans. 10-9

TRADE WINDS

News of Men Who Sell to the Construction West

CALIFORNIA

Paul Fornaciari has recently joined the BERT B. FORNACIARI organization as a Sales and Service Engineer. He has finished a training course at the BUDA COMPANY and the BARCO MANUFACTURING COMPANY plants in the East, where he studied the use, operation and repair of BUDA Earth Drills, Chore Boys, Railway Equipment and Jacks, and the BARCO Gasoline Hammers and Flexible Ball Joints. The Fornaciari sales and service plant is located at 2416 E. 12th St., Los Angeles, Calif.

☆ ☆ ☆

Paul R. Dolson, former service foreman at the Los Angeles Branch of the INTERNATIONAL HARVESTER COMPANY, Truck Division, has been appointed to the recently created position of Branch Service Manager. Dolson will be in charge of retail service operations at the Los Angeles Branch and the Western Los Angeles, Glendale and San Diego Sub-branches. He will be available for consultation by International truck dealers in Southern California and Arizona. **B. G. Ferrell** will succeed Dolson as service foreman at Los Angeles and **Eric Lindblom** will succeed Ferrell at Western Los Angeles. **William A. Bisig** is service foreman at Glendale and **F. W. Smalley** is the foreman at San Diego.

☆ ☆ ☆

The FRIDEN CALCULATING MACHINE COMPANY, INC., San Leandro, Calif., has opened enlarged New York City offices in the newly acquired Friden Building at 336 Madison Ave. These offices house the New York City and Eastern sales and service division as well as a service training school. **Carl M. Friden** is president of the company, **J. Arthur Russell** is New York City agency manager and **Larry Taylor** is the Eastern division manager. The company was organized ten years ago to produce calculating machines and now operates through 250 company-controlled sales agencies in the United States and Canada.

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THE LAMINATED SHIM COMPANY has appointed the SALES ENGINEERING ASSOCIATES, INC., 7904 Santa Monica Blvd., Los Angeles, as sales agents for An-cor-lox lock nuts. **Robert De Leon** will head the Engineering firm and its territory will include all of the Southern California area.

☆ ☆ ☆

H. J. Wilson is the new manager of the Marine Department, Associated Division, TIDE WATER ASSOCIATED OIL COMPANY. He succeeds **George Zeh**, who retired after 42 years with the company. Wilson joined the construction department of the company in 1919. He soon became District Engineer for the San Joaquin Valley and in 1923 was made Assistant Superintendent of Sales Construction and Maintenance with offices in San Francisco. In 1925 he was appointed Supervisor of Fire Protection for the entire Associated Division. He has been active as a member of the Petroleum Industry War Council in the organization of Pacific Coast committees for the protection of petroleum facilities.

☆ ☆ ☆

THE ENERGY CONTROLS AND EQUIPMENT COMPANY opened offices at 618 Mission St., San Francisco, Calif., under the management of **L. J. Spohrer**. The head office of the company is in Los Angeles. As well as manufacturing its own line of automatic valves, gauges and other engineering specialties, the firm represents various Eastern manufacturers. The San Francisco office is equipped to provide complete repair services.

☆ ☆ ☆

Beal Shaw has recently disposed of his business in Chillicothe, Missouri, and has established the SHAW SALES & SERVICE COMPANY at 2027 Santa Fe Ave., Los Angeles, Calif. The company will maintain branches in San Diego and Santa Barbara, Calif. Shaw Service is a new distributor for Allis-Chalmers tractors and also represents several other equipment companies. The company is equipped to sell and service the complete line of dozers and cable and hydraulic power control units for the BAKER MANUFACTURING COMPANY; Allis-Chalmers tractor loaders and sweepers built by the FRANK G. HOUGH COMPANY; cable dozers, angle dozers and power control units for the BUCKEYE TRACTION DITCHER COMPANY; cable and hydraulic scrapers and dozers, power control units, rippers and sheepsfoot rollers for GARWOOD INDUSTRIES, INC.; formed and preformed wire rope for UNION WIRE ROPE CORPORATION and lubricating equipment for the ALEMITE COMPANY. The Service Company will distribute Allis-Chalmers tractors in 11 counties in Southern California, in Clark County in Nevada and in Yuma County in Arizona. The following key men have had years of experience in the equipment field: **J. E. Conlin**, sales manager; **W. E. Riddle**, office manager, and **H. I. Hickman**, in charge of the parts and service department. This department is equipped to give day and night service on tracks for all makes and models of tractors.

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James B. Black of San Francisco, Calif., was recently appointed a member of the Board of Directors of the UNITED STATES STEEL CORPORATION. Black is president of the PACIFIC GAS & ELECTRIC COMPANY of San Francisco.

☆ ☆ ☆

CARLSON AND SULLIVAN, located in temporary leased quarters in Monrovia, Calif., plan to erect their own buildings as soon as materials are available. **Fred O. Carlson** and **Andrew Sullivan**, formerly associated with the firm of Jack & Heintz in Cleveland, are key executives of the firm, which manufactures steel tape rules.

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PACIFIC NORTHWEST

Willard R. Yeakel, owner of the NORTHWEST BOLT & NUT CO. of Seattle, Wash., has purchased the construction material and equipment firm of CHARLES R. WATTS & CO. The name and the entire organization of the construction firm will be maintained. **Tom Pickering**, manager, aims to continue to afford the construction industry of the Pacific Northwest and Alaska the best possible service and the highest standards in materials and products.

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THE STAR MACHINERY COMPANY, Seattle, Wash., has been appointed distributor in the State of Washington for the WISCONSIN MOTOR CORPORATION air-cooled, heavy duty engines. Jack Hatton, manager of the construction division of Star Machinery, states that his company will maintain a complete parts and service department for the engines that will range in size from 1 to 4 cylinders and from 1 to 35 h.p. These engines have flexible power to meet the highly diversified needs of modern industry and, being air-cooled, have no water packing or hose connections to be replaced. They have no grease cups or oil fittings and no fan belts.

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FRED M. VILES & COMPANY, formerly located at 1007 W. Second St., Spokane, have moved to new quarters at East 124 Trent Ave., Spokane, Wash. The company is distributor for P & H excavators for the state of Washington and handles gasoline and Diesel-powered machines of ⅜ to 1½ cu. yd. capacity, including shovels, draglines, clamshells, and cranes, and maintains complete sales and service facilities.

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The ALASKA-PACIFIC SUPPLY COMPANY, 64 Marion St., Seattle, Wash., has been appointed as agent for Hendy marine and stationary Diesel engines and parts, which are built by the JOSHUA HENDY IRON WORKS of Sunnyvale, Calif. The Supply Company will have exclusive territory in the state of Washington for stationary and marine Diesels, along the Oregon coast and Columbia River for marine engines and in Alaska for stationary, marine and generator units to be used in commercial vessels and canneries. **Leon F. Sutter** is president and manager and **C. Fain Sutter** is secretary-treasurer of the Supply Company, which was established in 1939. **Ray Johnson**, who for 17 years was associated with the JOHNSON MANUFACTURING COMPANY of Seattle, is a member of the sales force. The firm specializes in engines and engine room supplies, and is equipped to make complete installations, supplying full service through its service organization.

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The CONSTRUCTION EQUIPMENT COMPANY, with warehouse and offices at W. 1118-1124 Ide, Spokane, Wash., purchased the two-story, full basement, Grimmer warehouse at W. 1212 Ide. The warehouse has 45,000 sq. ft. of floor space, freight elevator equipment, heavy brick and mill type construction, and is on the Great Northern Railway right of way. The equipment company, organized in 1927, supplies contract supplies and equipment to the Pacific Northwest. President-manager **C. A. Burnette** is preparing the company to meet the postwar construction needs of this region.

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INTERMOUNTAIN

The SAWTOOTH COMPANY, 710 Front St., Boise, Idaho, has been appointed exclusive distributor for products of R. G. LeTOURNEAU, INC., of Peoria, Illinois, and Stockton, California. Sawtooth, with a branch at Twin Falls, Idaho, will direct Le Tourneau sales and service in the following Idaho counties: Custer, Butte, Adams, Valley, Lemhi, Washington, Boise, Payette, Gem, Canyon, Ada, Elmore, Camas, Blaine, Lincoln, Gooding, Owyhee, Twin Falls, Jerome, Minidoka, Cassia and part of Idaho. In Oregon, the firm will sell and service in Malheur, Baker, Union and Wallowa counties. The company will serve mining, construction, logging, agricultural and industrial fields and is fully prepared to offer a complete service for the Tournapull, Carryall Scraper, 'Dozer, Rooter, Tournatrailer and other Le Tourneau products. Officers of the Sawtooth company are: **A. H. Burroughs, Jr.**, president; **B. K. Burroughs**, vice-president; **S. Bocking**, secretary and treasurer; **J. R. Field**, general manager; **James Dunn**, sales manager; **Fred Murdock**, service manager; and **Ken D. Shook**, branch manager at Twin Falls.

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The POWER EQUIPMENT COMPANY of Denver, Colo., is representing the FOOTE COMPANY in the state of Colorado. The Equipment Company will sell and service the Adnum Black Top Paver and the Multifoote Paver.

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The OLSON MANUFACTURING COMPANY of Boise, Idaho, will manufacture metal bodies for trucks and trailers as a postwar product. General Manager **Harold Agee** states that the enlarged facilities and working crews at Olson City, now making similar products for the marines and army ordnance department, will be employed to manufacture civilian truck and trailer bodies after the war. The company has built streamlined tanker truck bodies for gasoline and oil distributors and logging trailers as well as heavy duty machinery trailers for the construction field.

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AMONG THE MANUFACTURERS

J. R. (Jack) Randle has been appointed Field Service Engineer for the SHUNK MANUFACTURING COMPANY of Bucyrus, Ohio. For 28 years he was field engineer for the INGERSOLL-RAND COMPANY. For two years he was manager of Contractors' Division of the ILLINOIS POWDER MFG. COMPANY and for the past two years he has been field engineer for the CLEVELAND ROCK DRILL COMPANY. In his new position, Randle will organize and develop distribution methods and new uses for Shunk's manufacturing facilities. The company produces blades for construction and maintenance equipment, snow plows and ice removal.

☆ ☆ ☆

Because of the excellent war production record of the employees of JENKINS BROS., the company recently received its fourth gold star for its U. S. Maritime Commission's "M" pennant. These men and women manufacture valves that are a vital part of every fighting ship sailing under the American flag.

The INTERNATIONAL HARVESTER COMPANY, Chicago, Ill., has formed a new Foreign Operations organization to be in charge of all foreign activities of the company, except Canadian operations. **G. C. Hoyt** will head the new organization as vice president. **C. N. King**, past manager of foreign sales, becomes director of foreign operations and will be assisted by an executive staff of specialists who will be designated as managers of foreign manufacturing, sales, engineering, accounting, supply and inventory, merchandising services, and treasury with offices in Chicago. **A. M. Rode**, past European comptroller and assistant treasurer of the company, becomes director-general of European operations with residence in Europe after the war. **J. L. Camp**, past executive of the International Harvester Company Argentina, becomes director-general of Latin-American operations. This new organization will be instrumental in increasing efficiency and simplicity in the handling of the company's overseas business, both now and after the war.

☆ ☆ ☆

W. K. COX

W. K. Cox is the new assistant general sales manager of the CATERPILLAR TRACTOR COMPANY of Peoria, Illinois. Cox joined the company in 1928 as a special representative on logging sales and has since worked in the industrial, sales and advertising departments. During the early part of the war he was manager of the newly-formed expediting division which was set up to expedite the delivery of purchased raw materials. **William S. Ziegler**, a company field representative since 1929, is now sales manager of the eastern sales division and **F. D. Haberkorn**, a company representative in Texas and Oklahoma, has been appointed assistant sales manager of this division.

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The ASSOCIATED EQUIPMENT DISTRIBUTORS of Chicago, Ill., will hold their 26th annual meeting at the Edgewater Beach Hotel, Chicago, January 21-24, 1945. The growth of A. E. D. has made it necessary to form a committee on hotel reservations for the coming meeting. Address your reservation requests to A. E. D. Hotel Reservation Committee, Edgewater Beach Hotel, Chicago 40, Illinois.

☆ ☆ ☆

R. G. LE TOURNEAU, INC. of Peoria, Ill., and Stockton, Calif., presented a general discussion of the company affairs in its "Annual Report for 1943." The report contains a short history of the company and its developments, the president's personal message, president's report to stockholders and employees, comparative consolidated balance sheet and photographs and stories of the employees at work and at play.

R. G. LeTOURNEAU, left, president, and GORDON S. McKENTY, chief engineer of R. G. LeTourneau, Inc., inspect the 50,000th power control unit manufactured by the well-known equipment firm.

R. W Mothershed, chief warehouse auditor of the PITTSBURGH PLATE GLASS COMPANY of Pittsburgh, Pa., and **A. W. Smiley**, general auditor, are now assistant comptrollers of the company. Mothershed joined the company in 1918 and soon became a traveling auditor. Since 1937 he has acted as general supervisor of all traveling auditors. Smiley has served the company for 15 years in the accounting and auditing departments. Since 1942 he has been general auditor of all company operations except those of the commercial department.

☆ ☆ ☆

John W. Sands is back again with the Development and Research Division of THE INTERNATIONAL NICKEL COMPANY, INC., at New York, N. Y. Since 1942 Sands has been with the Conservation Division of the War Production Board at Washington, D. C.

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Ed. P. Phillips, a construction equipment engineer, is now the director of the construction machinery and farm equipment section of the Treasury's Surplus Property Division. He is the senior partner of PHILLIPS MACHINERY COMPANY, and is active in trade and engineering organizations.

Paul R. Dupree, past traffic manager for AMERICAN LUMBER & TREATING COMPANY, Jacksonville, Florida, has been appointed General Traffic Manager for the wood-preserving company. Dupree will manage traffic problems involving ten wood-preserving plants scattered from Oregon to Florida and up to New Jersey. He has had years of experience in various phases of freight traffic with the NORFOLK & WESTERN.

☆ ☆ ☆

Edward B. Yancey was elected vice president and a member of the executive committee of E. I. DU PONT DE NEMOURS & COMPANY, Wilmington, Del. **William H. Ward**, past assistant general manager, succeeds Yancey as general manager of the explosives department. Yancey joined the company as a chemist in 1908 and spent his entire business life in the Du Pont explosives department. Under his direction the department has developed a large organization during the last 4 years to operate many of the Government's explosive plants. Ward began as a chemist in 1915 and transferred to the sales department in 1928. He has had a leading part in organizing the military explosive division which operates the Government-owned ordnance plants.

Clarence M. Brown, Philadelphia attorney, has been appointed chairman of the PITTSBURGH PLATE GLASS COMPANY, Pittsburgh, Pennsylvania, to fill the post left vacant by the sudden death of **H. S. Wherrett**. General Counsel **Leland Hazard** was elected vice-president, President **H. B. Higgins** was named chairman of the executive committee, and Secretary **H. B. Brown** was elected to the board. The company is expecting little difficulty in reconverting to peacetime work after the war ends and plans to add several new lines that have been developed during the search for substitute materials to replace those cut off by war restrictions. All-glass tanks for industrial purposes, which originally were designed as a substitute for critical materials, have been satisfactory for pickling solutions and strong acids. The paint division has found satisfactory substitutes for Asiatic oils which were cut off by the war.

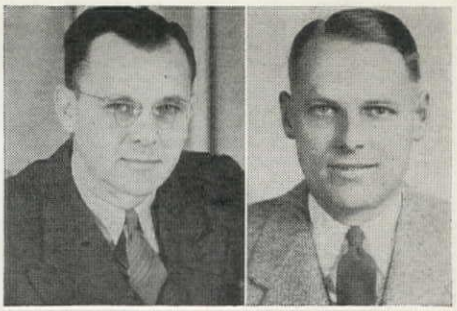
☆ ☆ ☆

A. F. Sprankle is the new Metallurgical Engineer in the Timken Steel and Tube Division of the TIMKEN ROLLER BEARING COMPANY of Canton, Ohio. He was formerly manager of the Alloy Bureau of the CARNEGIE - ILLINOIS STEEL CORPORATION in the Pittsburgh district. He joined Timken in 1934 and specialized in bearing and high temperature steels. Sprankle is active on a number of technical committees.

Orval "Bud" Ohnstad, after being away for two years, has returned to the employ of the PIONEER ENGINEERING WORKS, Minneapolis, Minn. In 1942 he worked as a quarry superintendent for JOHNSON, DRAKE & PIPER COMPANY and built and operated a large Pioneer quarry plant at Eritrea in East Africa. During 1943 he was employed by the McWILLIAMS DREDGING COMPANY and built and operated two Pioneer crushing plants in Greenland.

☆ ☆ ☆

Evelyn S. Carlson is the new sales and production coordinator at the Newark, New Jersey, plant of the WICKWIRE SPENCER METALLURGICAL CORPORATION, subsidiary of the WICKWIRE SPENCER STEEL COMPANY. The Metallurgical Corporation manufactures fine drawn molybdenum and tungsten wires, tungsten carbides and dies for electronic industries. Miss Carlson has been in charge of Molybdenum Wire Allocation for the War Production Board in Washington, D. C., since 1942. Prior to this she was assistant to the Technical Director of the SEALED POWER CORPORATION, Muskegon, Michigan, and in charge of costs and scheduling for the THOMAS FOUNDRIES, Birmingham, Alabama. In her new position she will be responsible for the coordination of production and sales of both tungsten and molybdenum wire.



GLEN M. EDE PHILIP S. HILL

Philip S. Hill, past assistant manager of the HYSTER COMPANY Eastern Division at Peoria, has been appointed General Sales Manager at Portland. He joined **Hyster** in 1933 and has had considerable experience in various sales positions. **Glen M. Ede**, formerly general purchasing agent for the company, is the new Assistant Manager of the Industrial Truck Division. Ede is familiar with truck markets and sales all over the United States. **C. B. Bamberg** has been advanced from assistant purchasing agent to Purchasing Agent. He joined Hyster in 1937 in the cost department. **B. G. Nordling** is now Manager of the Parts Department after having had four years' experience in the department.

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Because of outstanding achievement in producing materials essential to the war effort, the employees of the BARBER-GREENE COMPANY, Aurora, Illinois, have been awarded the Army-Navy "E" for the fourth time. The company manufactures ditchers, bucket loaders, asphalt mixers and finishers, and other construction equipment for the Armed Forces and Lend-Lease agencies.

☆ ☆ ☆

Since the DRESSER MANUFACTURING COMPANY, 13 Fisher Ave., Bradford, Pennsylvania, comprises a number of related companies, its name has been changed to the DRESSER INDUSTRIES, INC. Effective Nov. 1, 1944, Dresser will acquire the properties of INTERNATIONAL-STACEY CORPORATION. Dresser manufactures equipment for the oil, gas and water industries.

☆ ☆ ☆

Twenty-three deans and professors from a number of the nation's engineering schools met recently in Chicago with the Diesel Engine Manufacturers Association. **Prof. Paul E. Mohn** of the University of Illinois told of the need for modern, smaller type diesel engines, of from 100 h.p. down, for students to dismantle and study and characterized many existent texts that deal with diesel engines as being very inadequate and frequently erroneous. **Prof. Robert B. Rice** has been engaged by the Manufacturers Association as educational consultant. The group gave consideration to the amount of diesel specialization the mechanical engineering courses should include, the facilities for doing research work, the desirability of manufacturers establishing fellowships and the nature of post-graduate work.

☆ ☆ ☆

Matthew P. McCullough has been appointed president of the board of directors of the MASONITE CORPORATION of Chicago, Ill., to fill the vacancy created by the death of **Ben Alexander**. **Charles J. Winton, Jr.** was named to succeed McCullough as treasurer and **John M. Coates**, legal counsel of the corporation, was appointed a director. The new president has been treasurer of the corporation since 1928. He is also chairman of the board of the EMPLOYERS MUTUAL LIABILITY INSURANCE COMPANY, Wausau, Wis.; president of the ALEXANDER & YAWKEY LUMBER COMPANY, Prineville, Ore., and a director of the MARATHON CORPORATION, Wausau.

☆ ☆ ☆

The LA PLANT-CHOATE MANUFACTURING CO., INC. of Cedar Rapids, Iowa, published recently its 1944 "Annual Report to Stockholders." The President's Report presents a clear picture of the earnings and dividends, plant facilities, net working capital, employment, taxes and renegotiation and employee relations. The report also contains profit and loss statements and the balance sheet for the year ending June 30, 1944.

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THE MENGEL COMPANY AND UNITED STATES PLYWOOD CORPORATION formed to operate an extensive plywood warehouse chain, has opened a third plywood distributing unit at Atlanta, Georgia. This warehouse will be managed by J. P. Burford, who has been the Southern sales representative for THE MENGEL COMPANY. The unit will stock all types of plywood manufactured by Mengel and U. S. Plywood in hardwood and softwood lines. The plant is located at 519 Whitehall St., Southwest, Atlanta, Georgia.

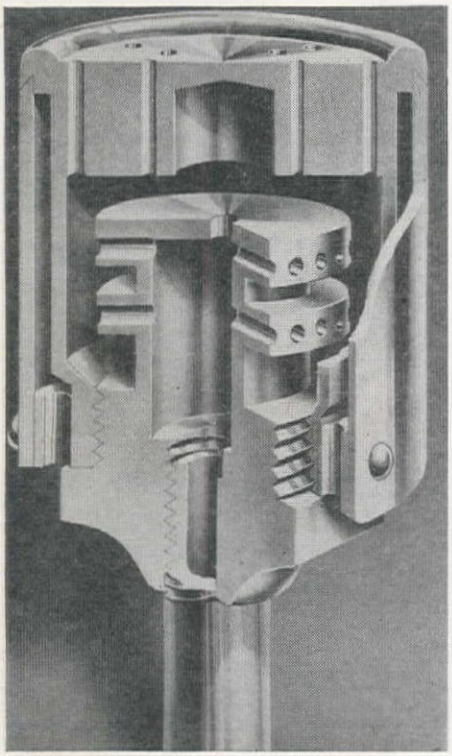
NEW EQUIPMENT

Heating Nozzles

Manufacturer: Victor Equipment Co., San Francisco, Calif.

Equipment: Multi-flame heating nozzle.

Features claimed: The nozzle is designed for use with oxygen and the liquefied petroleum gases or natural gas, and it fits all standard Victor welding torch butts. The nozzle head is protected against deflected heat by an outer air mantle. The cool and



pre-mixed gases carry away much of the accumulated heat and thus become preheated for proper combustion. Numerous sizes are available also for use with oxy-acetylene systems. Large multi-flame heating nozzles are recommended for flame priming and descaling in inaccessible areas. They can be employed for various silver brazing operations and for preheating and bending.

Slide Rule

Manufacturer: The Charles Bruning Co., New York, N. Y.

Equipment: Pocket slide rule.

Features claimed: This new Bruning 2401, 5-in. pocket slide rule is a high-precision and a high-quality rule, designed for rapid and simple operation. The molded-in graduations will not lose visibility through use. To facilitate reading, the graduations and numerals of the CI scale are in red. Three screws in the back of the rule provide a simple adjustment for the tension on the slide. The glass indicator, which is easy to replace, is enclosed in a stainless steel frame that holds it firmly in place and eliminates wobble. The A, B, CI, C, D, K, S, L and T scales are shown and the beveled edges are in graduated scales of both inches and centimeters.

Paint Pump

Manufacturer: Stephenson Air Brush Paint Co., Oakland, Calif.

Equipment: R. M. S. Junior Model paint pump.

Features claimed: The pump is air motor-driven and pressure-controlled. It will supply from 1 to 5 guns with an ample and uniform flow of material. Pressure is developed in the pump tube, not in the container, so it works just as well with the paint container top open. Thus you can refill while spraying and pump from an original paint container. In operation, delivery of material is smooth and uniform at all times and there is no line surge. Only moderate air pressure is required to operate the unit at full capacity, it is easy to clean, the parts are interchangeable and the unit is compact and easy to handle. The unit is 32 in. high, 15½ in. in diam. and weighs 45 lbs. complete.

Auxiliary Drum

Manufacturer: Hyster Co., Portland, Ore. and Peoria, Ill.

Equipment: D4 P. C. U. Auxiliary drum.

Features claimed: The new power control unit auxiliary drum for use with the D4 Towing Winch is made for the "Caterpillar" D4 tractor. Although designed as a bulldozer power control unit, the unit provides many additional hoisting and towing services. It is simple, quick acting and has only one lubricating fitting.

Power Shovel

Manufacturer: Koehring Co., Milwaukee, Wis.

Equipment: Half-yard shovel.

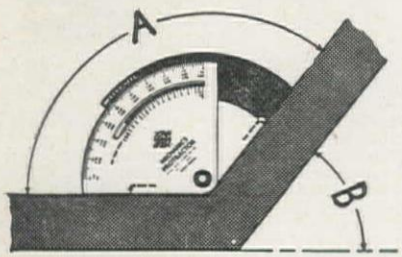
Features claimed: This half-yard shovel is convertible to a crane, dragline or pull shovel. It is available as a cruiser crane mounted on rubber tires and can be furnished for truck mounting. The outstanding design improvements on the Model 205 are: the same boom is used for shovel or pull shovel operation, trigger-fast dipper trip, independent unit traction gear case, easily removable machinery units, instant travel reverse, spacious walk-around area and head room in all parts of cab.

Protractor

Manufacturer: Interstate Sales Co., New York, N. Y.

Equipment: Mechanic's protractor.

Features claimed: Made of Vinylite plastic, the 3¼ x 3¼-in. protractor will not warp or burn. It is light and sturdy and will fit into a pocket or tool box. Calibrations are widely spaced and easy to read and the patented instrument gives the outside angle, inside angle and in. per ft. against degrees at one setting.



Termite and Dry Rot Barrier

Maunfacturer: Hollywood Termite Control Co., Inc., Los Angeles, Calif.

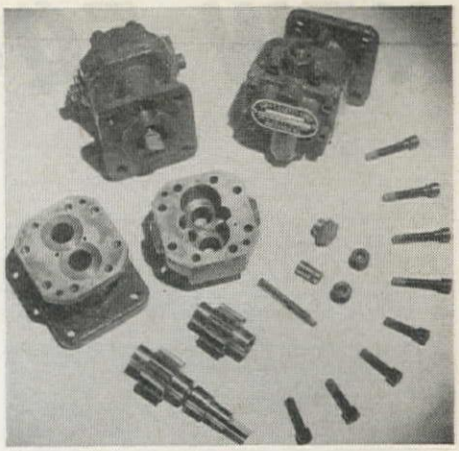
Equipment: Termitrol Patent.

Features claimed: New unit-system building frame is an economically feasible method to prevent serious damage to property by dry rot fungi and termites. Through a principle of blockade similar to that used in fire-control building design, and through the proper placing of treated lumber, the Termitrol Patent isolates and confines infestations to relatively small areas. The use of the patent adds about 2 per cent to the building costs and saves from 15 to 20 per cent on later repair bills.

Rotary Pump

Manufacturer: John S. Barnes Corporation, Rockford, Illinois.

Equipment: Rotary pump.



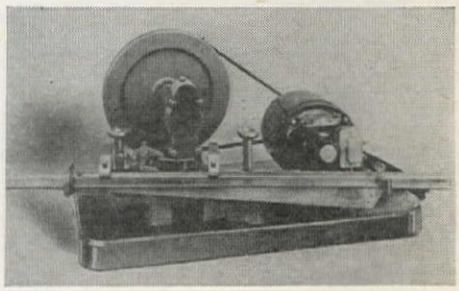
Features claimed: This low pressure, rotary pump is designed for industrial applications and affords an efficient and economical method for pumping all types of liquids that have lubricating qualities. It is adapted for use as a lubricating booster pump for oil lines, a gasoline dispensing pump and for oil pressure systems on automotive, truck or tractor equipment. Its capacity ranges from 1 gal. per min. at 600 r.p.m. to 4 gals. per min. at 2,400 r.p.m. The patented spur gear tooth construction eliminates excessive sliding and reduces slippage of the fluid to a minimum; each tooth completely fills the mating space, as the gears mesh, and this permits excellent sealing. Protection against excessive pressure is afforded by a relief valve, which is adjusted and set at the factory for optimum operation under each particular service requirement. The pump is self priming, self lubricating, precision machined and easily assembled and taken apart. The maximum pressure range is 200 lbs. per sq. in. and a vacuum of 26 in. mercury gauge is possible. The pump weighs 3½ lbs. and can handle efficiently and economically benzine, cocoanut oil, cotton seed oil, lubricating oils, mineral oils, naphtha, olive oil, quenching oils, vegetable oils and turpentine.

Handsaw Retoother

Manufacturer: Burr Manufacturing Co., Los Angeles, Calif.

Equipment: Automatic handsaw retoother.

Features claimed: The improved retoother will punch a perfect set of new teeth in an old handsaw in less than 1 min. The new teeth can then be set and filed. The machine consists of a punch and die mechanism, a drive wheel, a feed mechanism and



guide blocks and clamps with adjustable spring tension, all assembled and mounted on an 11 x 24-in. base. A ¼ h.p. electric motor furnishes the necessary power and 5 index bars provide any desired cutting for either crosscut or rip saws.

LITERATURE FROM MANUFACTURERS . . .

Chain Belt Co., Milwaukee, Wis.—A 20-page booklet explains the "facts you should know about Rex Speed Prime Pumps." Illustrations and cutaway diagrams picture the construction and operation of pumps from 1½ in. to 8 in. sizes. Tables contain information dealing with the capacity, installation and operation of the various pumps. The Rex impeller is of the flanged, semi-enclosed type and handles solids up to one-quarter the size of the intake. The flange increases the wearing surface between impeller and volute and helps maintain the close fit necessary for good efficiency during thousands of hours of pumping time.

Ladish Drop Forge Co., Cudahy, Wis.—The company has recently issued a catalog that gives a complete listing of its products. The book contains also full descriptions and specifications of the Ladish line of controlled quality forged steel flanges

as well as valuable engineering information, conversion tables and performance data. It provides refinery, heating and piping men and shipbuilders with a ready reference full of useful material.

Preformed Wire Rope Information Bureau, Chicago, Ill.—The bureau has published a colored, loose-leaf booklet telling how preformed wire rope can be a "powerful influence for you and your business." The rope has become an industry-wide product rather than a single-company controlled product. The preforming process tends to eliminate internal torsional stress and thus frees the rope from kinking. The wire is flexible, spools uniformly, resists rotating and twisting in sheave grooves, withstands fatigue of reverse bending and is safe to handle.

Air Reduction Co., New York, N. Y.—A 14-page pamphlet, "Rebuilding Worn Valves by Hardfacing," tells how to meet the critical wartime situation when worn valves can not be replaced and must be reclaimed. Damaged valves are successfully reclaimed by filling the cracks and building up the face with new metal of proper qualities and then machining to the original contour. The new material, which is highly resistant to wear, heat and corrosion, is deposited by oxyacetylene welding. Illustrations, diagrams and photographs depict the several steps in the reclaiming process.

Marmon-Herrington Co., Indianapolis, Indiana—"Ten Years Before Pearl Harbor" is a 26-page booklet recently published by the company describing the development of military and civilian vehicles during the decade 1931-1941. The company designed and built armored cars in 1934, all-wheel drive trucks in 1935, half-track trucks in 1936, tanks and track-laying tractors in 1937 and amphibian jeeps in 1941. Since 1941 the company has engaged exclusively in war production and has built many types of tanks and trucks.

Cannon Electric Development Co., Los Angeles, Calif.—The company has issued a 34-page booklet discussing "Direct Current Solenoids." The bulletin contains photographs and diagrams of the company's full line of direct current solenoids, together with tabular data, dimensional drawings, wiring diagrams and response characteristic charts. D-C solenoids are adaptable for film winding mechanics and cameras and have many applications in the aircraft industry.

Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.—A 26-page pamphlet, "An Engineering Guide of the Moduflow Control System for Home Heating and Air Conditioning," deals with the engineering phases of the various Moduflow methods, including the new reset method. After discussing the theory of human comfort the booklet presents typical applications of the principles required to provide the ultimate in residential heating. Descriptions are given of the Moduflow control system for gravity hot water heating equipment, for forced hot water heating equipment and for radiant hot water heating equipment as well as others. A detailed description of the engineering of the control instruments is given.

Charles Bruning Co., Inc., Chicago, Ill.—"Two-way Reproduction Advantages — for Copyflex Materials—for BW Prints" discusses the uses of the new Bruning machine. It is claimed that the machine has flexibility, simple operation, adequate capacity, space-saving compactness, attractive appearance and low cost. Specifications and descriptions are given of the different types of equipment.

Lidgerwood Manufacturing Co., Elizabeth, N. J.—Bulletin G-313 pictures the complete line of Lidgerwood products. Seventy years of progress through research, invention and experience has resulted in greatly improved equipment for the engineering, marine and construction fields. Illustrations are given of various kinds of hoists, cableways, marine auxiliaries, heavy construction equipment, stokers and steam power units.

Lombard Governor Corporation, Ashland, Mass.—The corporation recently issued a folder describing the engineering features of the new Lombard variable speed drive. A cutaway diagram pictures the internal gear, planet gears, spiral gear, V-belt and other parts of the drive. The folder discusses the compact design of the unit, the low weight and small size, positive drive, wide range of sizes and speed ratios, fine control, high efficiency, long life, straight line drive, low maintenance and remote control.

Fuller Manufacturing Co., Kalamazoo, Mich.—The company has recently issued a 24-page booklet on the "Operation, Lubrication and Maintenance Instructions — Fuller 5-A-920 Transmission." The model 5-A-920 is designed for heavy duty equipment where the most severe operating conditions are encountered. By means of diagrams and photographs, the booklet explains in considerable detail the operation, lubrication, disassembly and re-assembly of the transmission and lists a number of general precautions to be considered in the work. Sections are devoted to discussions of the shift, overdrive, riding the clutch pedal, overloading, clutch release bearing, oil change, removing control cover, removing mainshaft rear bearing, dismantling the clutch shaft and drive gear, removing mainshaft assembly, dismantling the reverse gearing, re-assembly and other phases of the operations necessary for the care and maintenance of the transmission.

Syntron Co., Homer City, Pa.—Bulletin 9-44 describes the operations of gas hammers which are used as paving breakers and spike drivers. No air compressor, air hose, fittings, battery, cable or springs is necessary to use with these self-contained gasoline hammers. A number of photographs show the hammer in operation. The unit is easy to start, has simple design, is portable, one man can operate it and it runs cool.

General Electric Co., Schenectady, N. Y.—A 56-page illustrated booklet, "Instrument Transformer Accuracy Standards," has been made available by the company. The first part of the pamphlet explains the ASA accuracy standards for potential and current transformers, and shows how they differ from the NEMA standards. Several tables and graphs simplify the use of Part I in respect to classifying transformers for accuracy, evaluating the effects of transformer errors on meter readings and explaining the significance of accuracy classes and burdens. The second part of the booklet consists primarily of a handy guide for the selection from a complete line of standard indoor and outdoor current and potential transformers. It contains approximately 60 illustrations of transformers with ratings and ASA and NEMA accuracy classifications for each type.

Caterpillar Tractor Co., Peoria, Ill.—A 32-page illustrated booklet describes the "Caterpillar Diesel Engines for Dependable Power." The pamphlet tells of service stations and roadside stands that are powered 24 hours a day by a "Caterpillar" D4400 electric set. It discusses the work of the diesels in industries, institutions, sawmills, municipal installations, oil field applications, cotton gins, flour and feed mills, pumping water, mines, marine installations, construction and refrigeration.

Garlinghouse Bros., Los Angeles, Calif.—A colored, illustrated pamphlet describes the "Gar-Bro Splicing Rig." It is a self-contained unit for plant or field use which takes care of all necessary operations in the splicing of wire cable. The entire rig is portable and weighs 325 lbs. It has an overall size of 96 x 45 in. and can be set up for operation in 10 min.

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