WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

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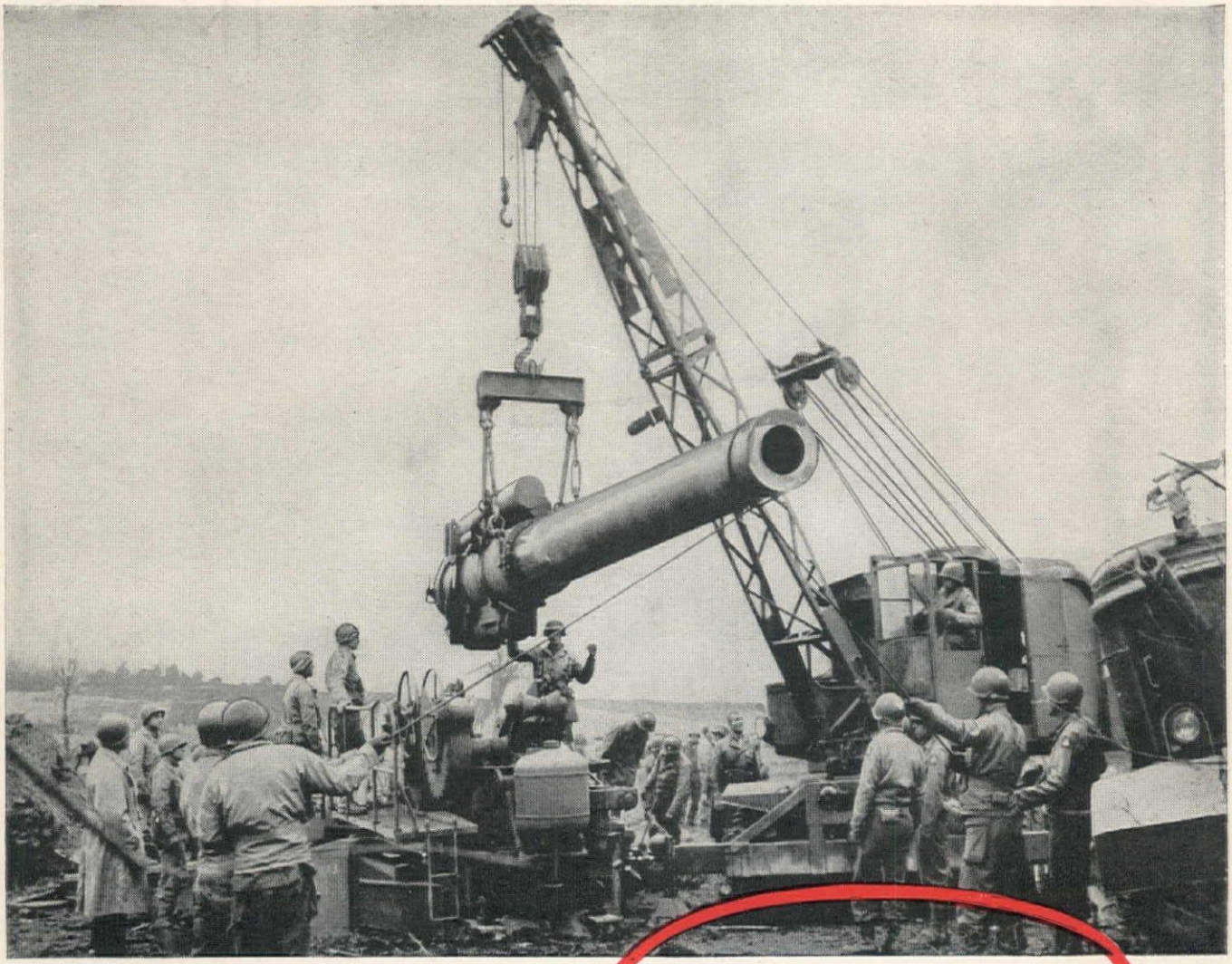
VOLUME XIX, No. 9

SEPTEMBER • 1944

35 CENTS A COPY
$3.00 PER YEAR

IN THIS ISSUE

GANTRY CRANES at Oregon Shipyard of the Kaiser Co., Portland, Ore., look like sentinels as they line up at rest over Sunday.



Roping A HOWITZER

SPEEDY field-assembly of heavy 240-mm. howitzers . . . the biggest mobile artillery short of railway guns . . . demands a high degree of team-work and "know-how." Well-conditioned wire rope also plays an important part in the ease with which these mammoth weapons are swung into position.

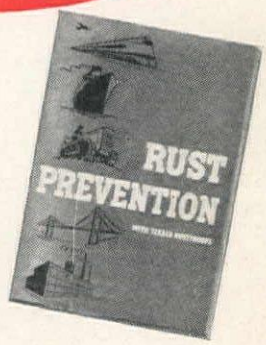
That is just one of countless jobs, in the Army and throughout industry, where wire rope helps step up performance efficiency. Contractors everywhere know that a sure way to keep their wire rope flexible and protected against wear and core-rot is lubrication with *Texaco Crater.*

Texaco Crater penetrates to the very core of wire rope, sealing each wire in a tough, viscous film that reduces internal friction, keeps out moisture, prevents corrosion, *keeps rope stronger longer.*

Used on open gears, *Texaco Crater* cushions load shocks, stops undue wear, quiets the noise. It doesn't ball up, channel or throw off, but clings to tooth surfaces, following through from gear to gear, despite heavy pressures, high temperatures and peripheral speeds.

Texaco lubricants have proved so effective in service that they are definitely preferred in many fields.

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.



FREE! 36-page booklet explains new low-cost protection against rust. Tells how to make equipment last years longer. Write for your copy.

TEXACO
CRATER

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

on the tailings | hard digging | removing overburden | feeding the grizzly

Yes—

NORTHWESTS WILL BE BUILT IN A FULL RANGE OF SIZES

18 SIZES

3/8 yard capacity and larger

NORTHWEST ENGINEERING COMPANY

1736 Steger Building, 28 E. Jackson Boulevard

Chicago 4, Illinois

NORTHWEST

After VICTORY Buy NORTHWEST

Northwest Sales Agents: ARNOLD MACHY. CO., INC., 149 W. 2nd South St., Salt Lake City, Utah; 3707 Santa Fe Avenue, Los Angeles, Calif.

Branch Offices: 255 Tenth St., San Francisco, Calif.; 1234 Sixth Ave., South, Seattle, Wash.; BALZER MACHY. CO., 2136 S.E. Eighth Ave., Portland, Oregon.

WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

Covering the Western Half of the National Construction Field

Contents for September, 1944

J. M. SERVER, JR.
Editor

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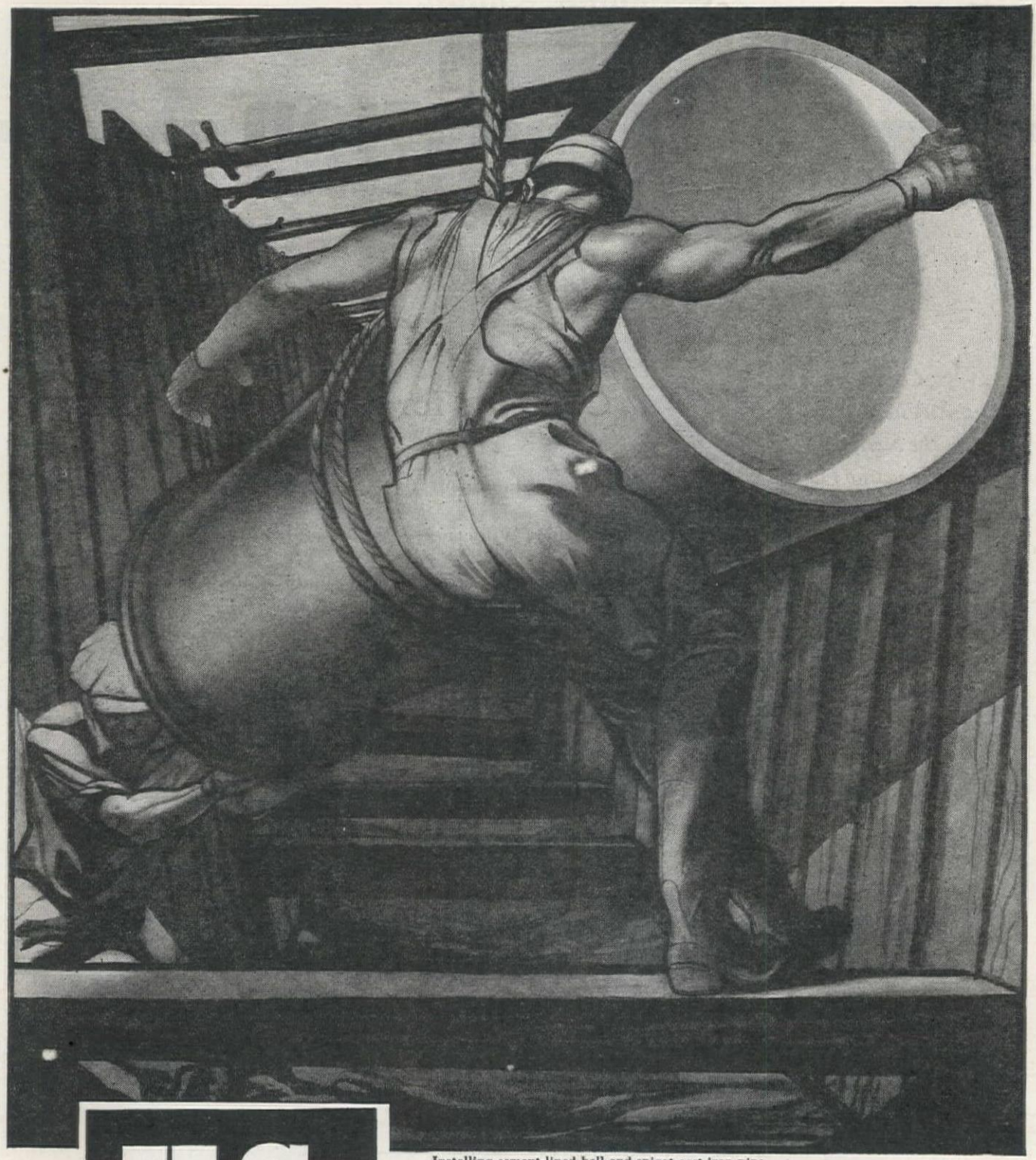


Installing cement-lined bell-and-spigot cast iron pipe.
Drawn by Rico Lebrun for U. S. Pipe & Foundry Co.

U.S. cast iron PIPE

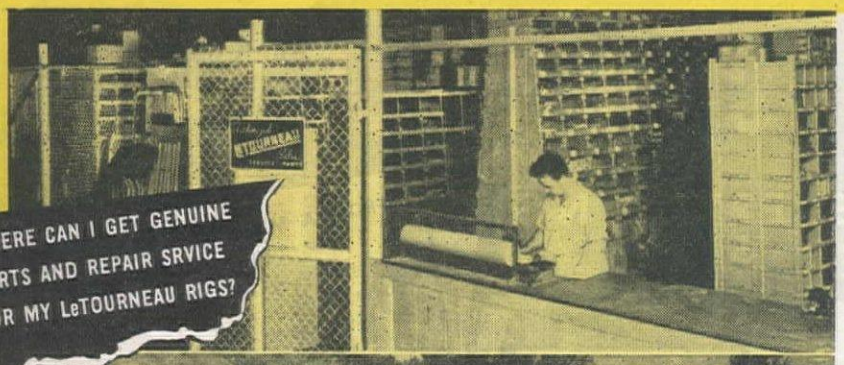
U. S. PIPE & FOUNDRY CO.
General Offices: Burlington, N. J.
Plants and Sales Offices throughout the U. S. A.

Everybody knows that cast iron pipe stubbornly resists corrosion. Century-old mains still in service prove that—and since those mains were laid under streets originally designed for horse-drawn vehicles, inherent crushing strength and impact-resistance are also proved. Current rigid metallurgical and production controls assure continuance of these essential qualities for underground mains.

4 IMPORTANT QUESTIONS AND ANSWERS ABOUT

LeTOURNEAU EQUIPMENT AND PARTS

UNDER THE NEW DISTRIBUTOR SET-UP*



WHERE CAN I GET GENUINE PARTS AND REPAIR SRVICE FOR MY LeTOURNEAU RIGS?

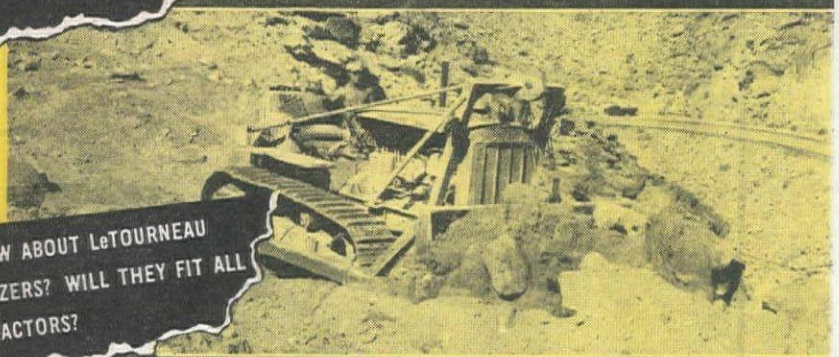
ANSWER

AT YOUR NEAREST LeTOURNEAU DISTRIBUTOR—SEE ADDRESS BELOW. He's well equipped to serve you promptly with adequate parts stocks from orderly parts rooms like the one shown. His factory trained servicemen know the answers to your problems . . . will help you keep your LeTourneau rigs working. If you have a parts or service problem — see your LeTourneau Distributor TODAY!

WILL LeTOURNEAU POWER CONROL UNITS FIT ALL MAKES OF TRACTORS?

ANSWER

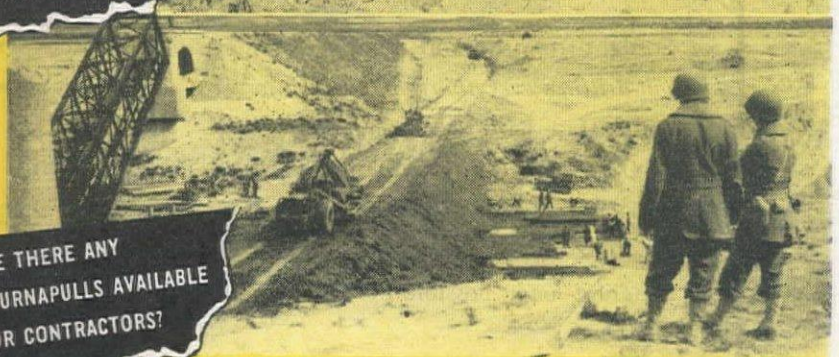
YES . . . now you can get famed LeTourneau cable-control for all "Cat" tractors from D4 to D8; Allis-Chalmers L, L-O, HD10, HD14, S, SO; International TD40, TD18, TD14; Cletrac FD, FG, DD, DG, CG. More than 45,000 PCU's have been built and shipped — many working on tractors like this one handling big loads on the Alcan Highway. Choose the leading Power Control Unit for your tractors—LeTourneau.



HOW ABOUT LeTOURNEAU DOZERS? WILL THEY FIT ALL TRACTORS?

ANSWER

NO—LeTOURNEAU DOZERS ARE DESIGNED FOR "CAT" TRACTORS ONLY. But there's no need to accept other than a LeTourneau Dozer for your "Caterpillar" tractors. You can have a rugged, fast-acting LeTourneau Dozer mounted on any "Caterpillar" tractor. Have your new tractor routed to the LeTourneau factory — Dozer and PCU will be mounted for the small freight switching charge only. See your LeTourneau distributor for full details.



ARE THERE ANY TOURNAPULLS AVAILABLE FOR CONTRACTORS?

ANSWER

YES—A FEW FOR HIGH PRIORITY JOBS. But most of these high-speed, rubber-tired rigs are going to the U. S. Army and Navy. The one shown, working for U. S. Engineers in North Africa, cut 7 days off the building of a fill to by-pass a railroad bridge demolished by retreating Germans.

Your job may have a rating high enough for Tournapull releases. See your LeTourneau distributor — he can help you with priority problems at the factory and in Washington. See him TODAY for all the facts about Tournapulls and priorities. Ask him too for the answers to any questions about LeTourneau equipment, parts and service. Make his place of business your earth-moving headquarters. It will pay you to get acquainted NOW!

PACIFIC HOIST & DERRICK CO.
3200 Fourth Avenue, South
Seattle, Washington

THE COLORADO BUILDERS' SUPPLY CO.
1534 Blake Street
Denver, Colorado

LANDES ENGINEERING CO.
171 West South Temple
Salt Lake City, Utah

CONTRACTORS' EQUIPMENT & SUPPLY CO.
Springer Building
Albuquerque, New Mexico

SOULE EQUIPMENT CO.
1750 Army Street
San Francisco, California

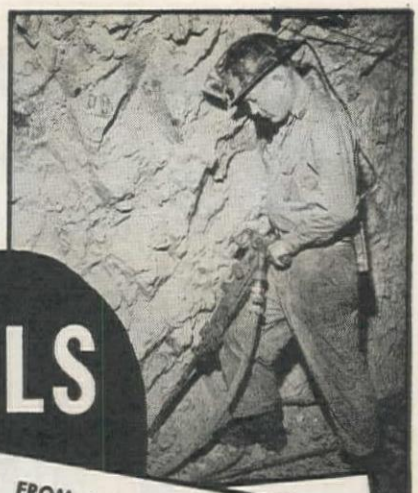
LOGGERS AND CONTRACTORS MACHINERY CO.
240 S. E. Clay St.
Portland, Oregon

CROOK COMPANY
2900 Santa Fe Avenue
Los Angeles, California

LETOURNEAU
PEORIA, ILLINOIS • STOCKTON, CALIFORNIA

* 1st in a series of advertisements designed to answer your questions about LeTourneau equipment, parts and service under the new distributor set-up. Watch this paper for answers to more questions.

We Quote - CONTRACTORS EVERYWHERE...



Thor ROCK DRILLS

"OUT-DRILL EVERYTHING ON THE JOB"

CONTRACTORS ARE *SOLD* ON THESE THOR PERFORMANCE AND MAINTENANCE FEATURES

• LOW AIR CONSUMPTION

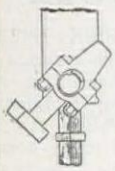
Thor Positive Short-Travel Tubular Valve uses effectively every ounce of air that enters the machine . . . measures air to a tolerance of .00025 of an inch!

• STEADY, FAST DRILLING

Extra-powerful rotation through extra sturdy rifle bar assembly and positive, non-slip ratchet action prevents stalling, even in heavy, sticky formations . . . full air power behind the piston gives the steel maximum forward and rotating power.

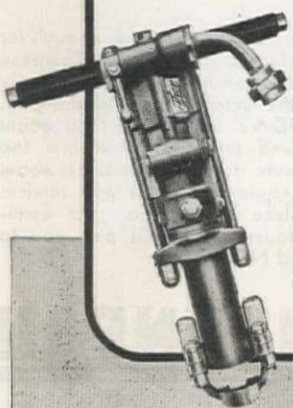
• AUTOMATIC LUBRICATION

On each reciprocation of the Thor piston hammer, oil is forced under pressure through a felt filter pad to keep every part of the machine constantly lubricated.



• OPERATING EASE

The Thor four-position throttle gives the operator complete control of drilling speeds for all operating conditions. Exclusive Thor spring retainer design provides quick, easy removal of the steel—provides longer life with fully enclosed springs that cannot clog or be over-tightened.



• POWERFUL HOLE-BLOWING

Thor air economy in turning every foot of air into power combines with powerful rotation to provide steady, maximum hole-cleaning ability.

Send today for complete information about Thor's wide range of light and heavy duty sinker, drifter and stoper rock drills and associated contractors' tools in Catalog 42-A.

FROM A MAMMOTH PENNSYLVANIA TUNNEL JOB*

"Thor Rock Drill was put through rugged stripping tests and out-drilled everything on the job, showing exceptionally powerful hole-blowing capacity by holding to steady drilling despite hitting three inches of clay every three or four feet."

FROM AN ARIZONA DEVELOPMENT*

"Thor Rock Drill used in five different veins of varied texture and hardness showed such excellent results that runners took it apart to admire fine construction."

FROM A COLORADO CONTRACTOR*

"Thor Rock Drill drilled as deep as 25 feet in clay streaked conglomerate rock with amazing hole-cleaning power...out-drilled every other tool on every operation."

Straight from the work come these reports of Thor Rock Drills *out-drilling everything on the job* in all types of underground and surface hard-rock operations.

On-the-job tests like these are making Thor Rock Drills the popular choice of contractors everywhere who *know* Thor performance . . . who *know* the low maintenance, smoother, faster handling made possible by Thor design and construction.

*Name furnished on request.

Thor *Portable Pneumatic and Electric Tools*

INDEPENDENT PNEUMATIC TOOL COMPANY

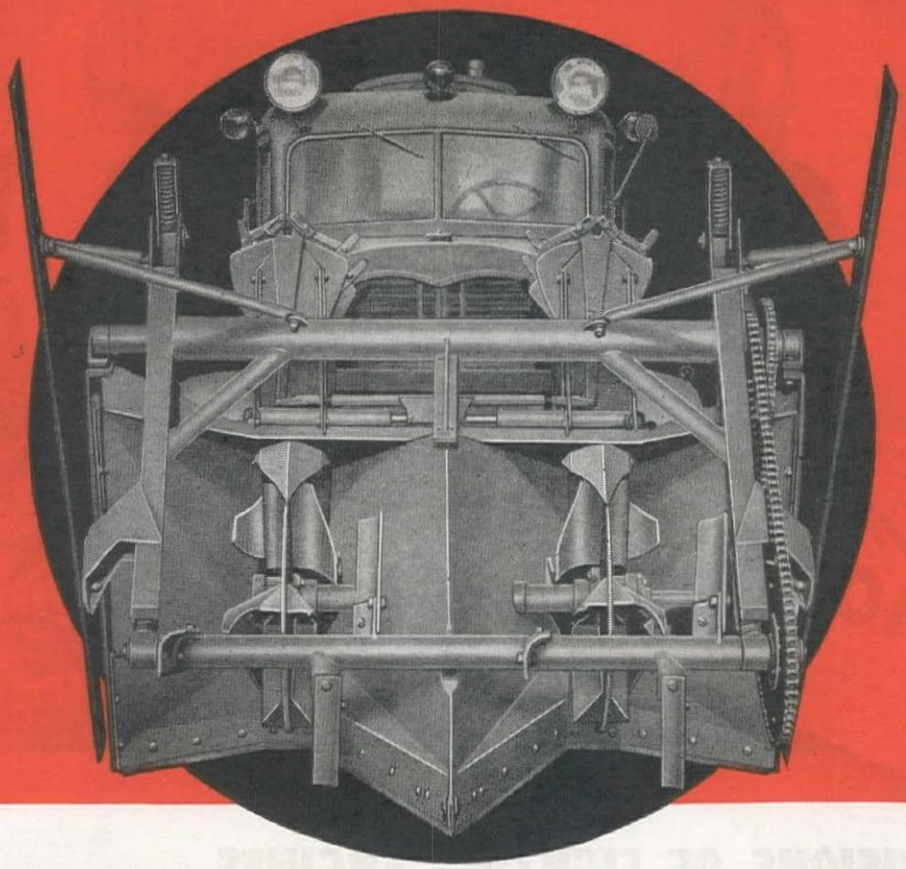
600 W. JACKSON BOULEVARD, CHICAGO 6, ILL.

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.

BROS Rotary SNOW PLOW

establishes new records in SNOW REMOVAL!



Read This Statement Slowly—A Bros Rotary Snow Plow was put to work on a stretch of road blocked by drifts 12 to 14 feet high. These drifts were so firmly packed that snow plows could travel on them, and because of successive drifting, thawing and freezing, these drifts also contained several layers of blue ice, six to eight inches thick. This was the operating condition—one of the toughest ever faced—and the Bros Rotary Snow Plow cleaned that road down to the concrete.

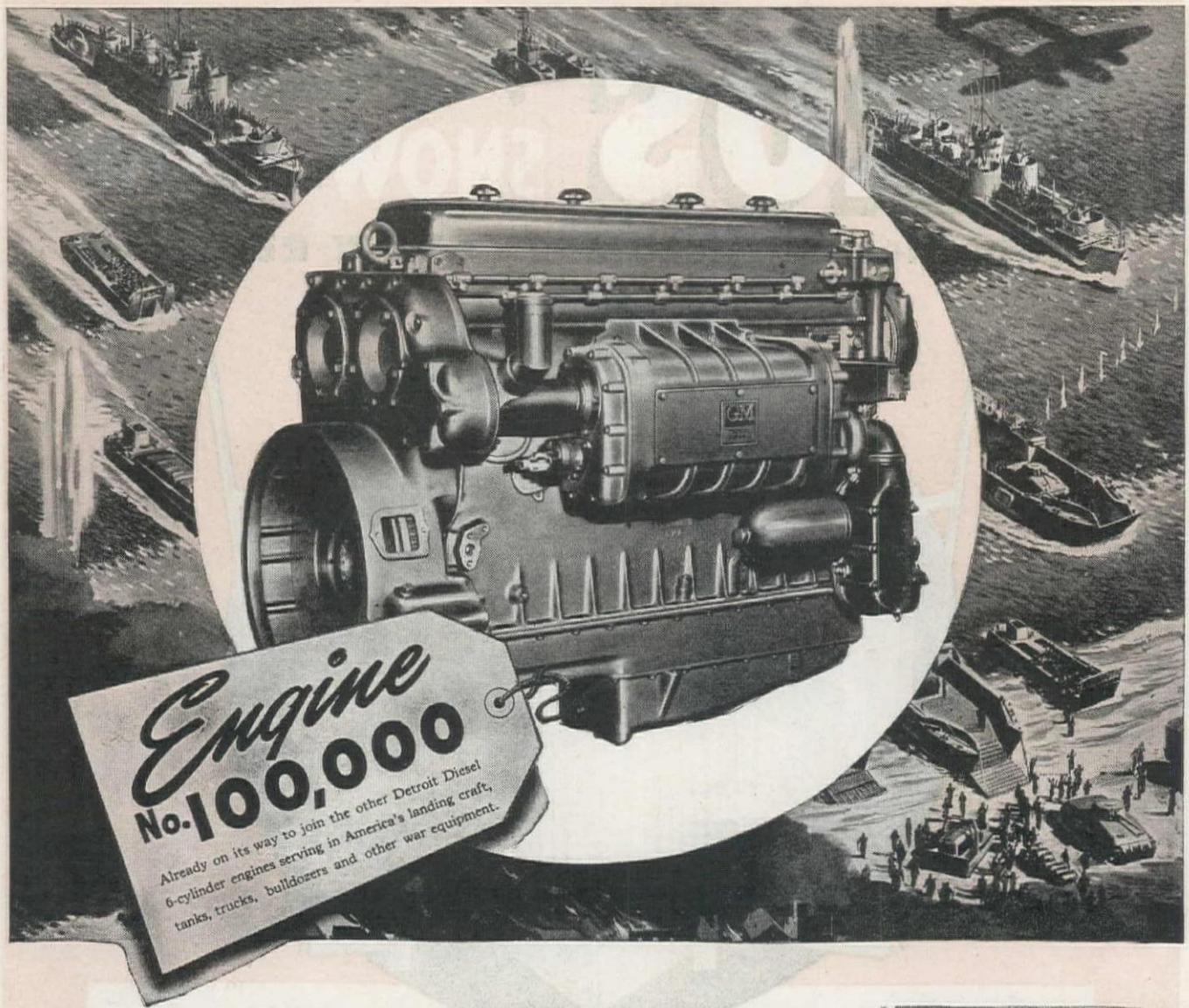
The Bros Rotary Plow does its jobs as easily and smoothly as a reaper cutting grain. The plow is not plunged into the drifts but moves ahead at a constant pace, because, *as it moves, the revolving rake chews up the snow and ice* and feeds them to the powerful rotors, which discharge the load far to either side of the road.

Because plunging and bucking are eliminated, the Bros Rotary reduces truck maintenance and fuel consumption as much as 75%. There are no shocks or strains. All operations are hydraulically controlled from the cab. The plow may be removed from truck in less than one hour making it available for other classes of work.

Write for complete specifications, illustrations and other data. Get the details on the Bros Rotary—the plow that can do any snow job anywhere, faster and at lower cost.

WM. BROS BOILER & MFG. CO. MINNEAPOLIS, MINN.

DISTRIBUTORS IN ALL PRINCIPAL CITIES



10 DIVISIONS OF FIGHTING ENGINES

MONTHS ago the Detroit Diesel Engine Division of General Motors sent engine No. 100,000 off the production line to its war job. Many more have followed since. Measured as men, more than ten divisions of these six-cylinder Diesels are actively in the fight. They're in landing craft helping to crack Fortress Europe and to cut the Nips' string of islands. They're in tanks, trucks, bulldozers and all kinds of other equipment. The reasons are, these Diesels are tough and dependable. They're easy to maintain. They burn inexpensive fuel oil.

They have been tried and proved in all sorts of war jobs on every battle front. And they've been found good.

With the coming of peace these engines will be available for all the applications where America will need reliable, low-cost power.

KEEP AMERICA STRONG
BUY MORE 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.

YES, your old friend the G.T.M. — Goodyear Technical Man — has a real 1944 solution to water suction hose failure.

It's Goodyear Style M Smooth Bore Water Suction Hose — a strong, sturdily built hose for all-round service that drinks it up in hard going.

In most water suction operations, there are particles of sand, grit, and other abrasive substances suspended in the water, which may cause early tube failure.

Style M Smooth Bore has a tube compounded to resist the abrasive action of suspended particles; and, in addition, it protects the wire reinforcement from corrosion by alkaline or slightly acid water.

Note its unique features in the blueprint at the right. This construction, time-proved over many years, is further advantaged by Goodyear's twenty years' experience in synthetic rubber that assures the highest-quality compounds.

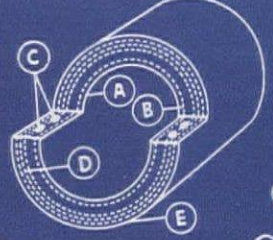
You will find all Goodyear industrial rubber products equally superior — because Goodyear has the "know-how" in synthetics to build them better — and because they are correctly specified by the G.T.M. To bring him to your office, phone the nearest Goodyear Industrial Rubber Goods Distributor.

GOODYEAR INDUSTRIAL RUBBER PRODUCTS

GTM-Specified

STYLE M WATER SUCTION HOSE

(Smooth Bore) for Heavy-Duty Service



(A)—Tough tube, resistant to abrasion, acids and alkalis

(B)—Close-woven fabric ply for extra burst resistance

(C)—High tensile steel wire helix prevents collapse under suction; increases resistance to bursting, crushing and kinking

(D)—Multiple fabric plies add extra strength against bursts and end pull

(E)—Heavy cover protects against abrasion and cutting

GOODYEAR

THE GREATEST NAME IN RUBBER

Let's all Back the Attack with War Bonds

here's why the NEW Buckeye Dozer...

...has so much push!

Look...

at all these features

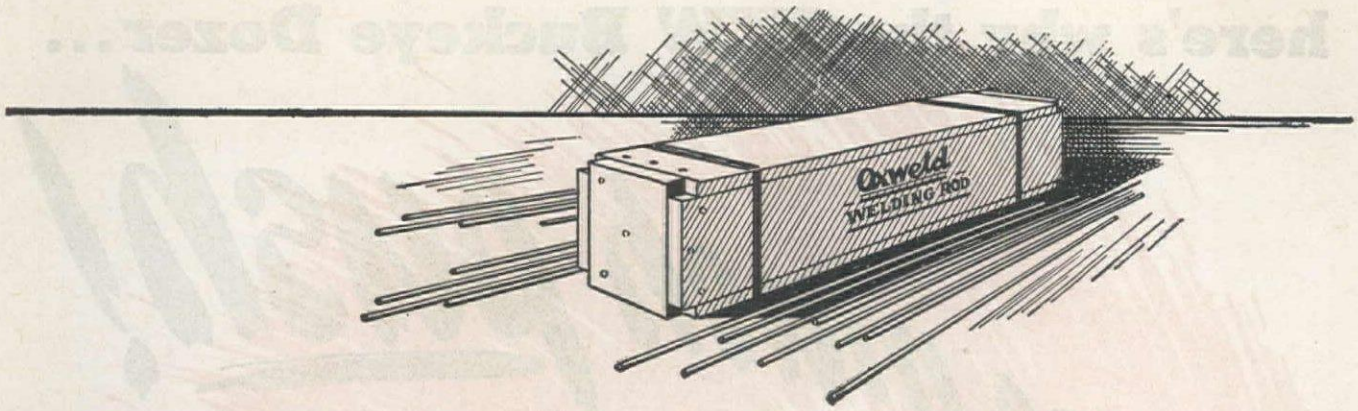
- Rugged construction
- Simple design
- Moldboard reinforced horizontally and vertically
- Sturdy push frame
- Curved blade to roll bigger loads
- No useless excess weight
- Natural digging action
- Straight direct center lift of moldboard
- Replaceable corner bits
- Reversible cutting edge
- Double trunnion tilt
- Powerful lift
- Unlimited digging depth
- Split-second, fraction-of-an-inch, finger-tip cable control
- Low friction loss
- Minimum cable wear
- Blade hugs radiator
- Heavy, closely spaced push plate supporting ribs
- High lift
- Balanced design

The new Buckeye Center Lift Dozer has them all. It's the dozer that can stay on the job, leveling, grading, back-filling, uprooting trees, clearing underbrush — rolling bigger yardage loads with minimum lost time for repairs and maintenance.

Write today for specifications

THE BUCKEYE TRACTION DITCHER CO.

Findlay, Ohio



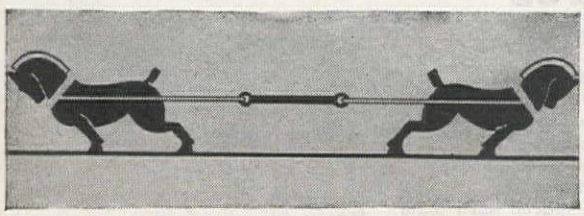
Oxweld No. 1

High-Test Steel Welding Rod

for strong, ductile welds

To make uniformly high-strength welds in steel pipe, plates, sheets, structural shapes and castings, an increasing number of operators prefer to use OXWELD No. 1 High-Test Steel Welding Rod. This rod helps them to make oxy-acetylene welds which average 11,000 pounds per square inch higher in tensile strength than they can obtain with ordinary mild-steel rods. The finished weld, when correctly made, has a high degree of ductility, an important property in the fabrication of steel products and structures. Welds made with this rod are as dependable as the base metal when subjected to such tests as longitudinal crushing, shearing, and 90-degree backward bends.

Higher Degree of Ductility



Higher in Tensile Strength

OXWELD No. 1 High-Test Steel Welding Rod is always of the same high quality. Since this rod is self-fluxing, it speeds up welding operations, lowers gas consumption, and, by properly cleaning the weld metal, helps to get better penetration.

BUY UNITED STATES WAR BONDS AND STAMPS

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

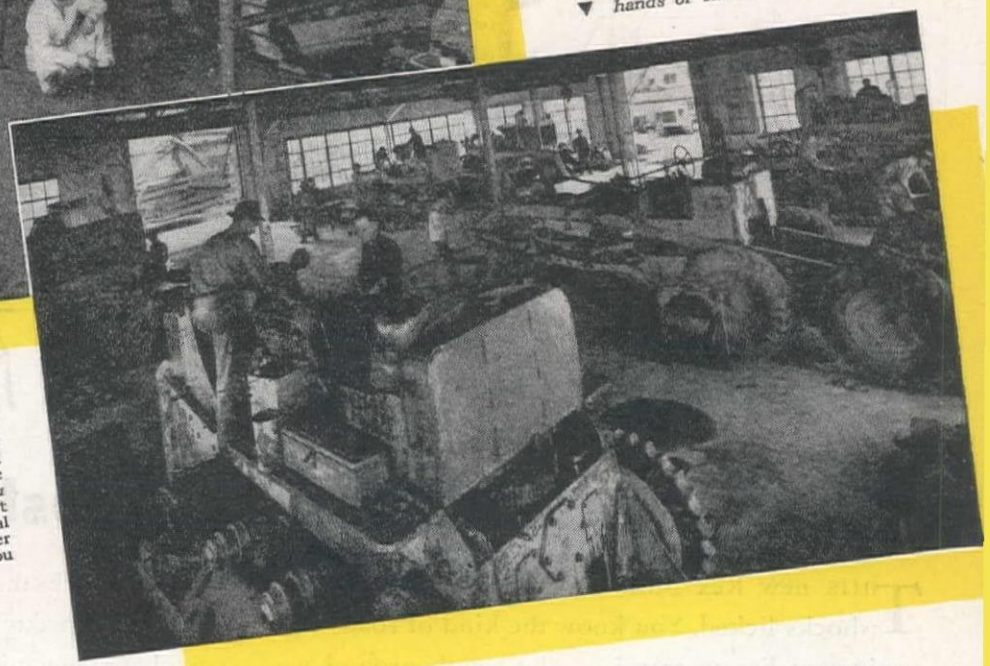
In Canada: Dominion Oxygen Company, Limited, Toronto

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

Their business is to help keep your business going

◀ *Big, well-equipped service shops enable "Caterpillar" dealers to offer their customers the last word in maintenance and repair service.*

In this dealer's repair shop, every kind of "Caterpillar" equipment receives the attention it needs in the hands of skilled mechanics. ▼



DO YOU HAVE "IDLE" EQUIPMENT? The War Production Board wants to locate usable track-type tractors, motor graders, cranes, shovels—vitally needed by mining, logging, oil-field, agriculture and other industries. What can you spare—to rent or sell? If you don't know where to contact your regional WPB officials, your "Caterpillar" dealer will gladly direct you and give you further details.

"CATERPILLAR" owners are fortunate in having a dependable service-dealer organization to which they can turn for expert inspection, adjustments and repair work at a time when obtaining new equipment is virtually out of the question—except for the most essential needs.

That your "Caterpillar" dealer is able to provide such services, despite the fact that his showrooms may be empty, is due to sensible long-range planning. His dealership has been established on the sound principle that doing business successfully is not alone a matter of making sales, but of *keeping sold equipment in good operating condition—come what may.*

During the long war years, your "Caterpillar" dealer has been steadily on the job—geared to come through for you. In fact, his shop is likely better equipped to serve you than ever before, with more factory-trained service men, finer equipment and the latest methods to save time, money and war-critical materials in keeping your machines at work. His desire now, as always, is to make your business more profitable and he is equipped to make that wish come true.

Have your "Caterpillar" service-dealer go over your equipment now—for inspection, adjustments, and replacement or repair of worn parts. In this way, not only can your operating costs be kept at a minimum, but the life of the equipment can, most likely, be prolonged by thousands of hours.

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

THE "FIGHTING FOUR"

INSPECT Look your equipment over frequently. For expert "internal" inspection of operating parts or functions, call in a trained "Caterpillar" service man. Read your Operator's Instruction Book.

LUBRICATE Use the right oil at the right time in the right place and in the right quantity. Keep the oil clean—change before it becomes dirty and deteriorated. Follow the Operator's Instruction Book.

ADJUST Tighten all bolts. Keep fan belt and tracks at proper tension. Read the Operator's Instruction Book. For fuel injection valves and other precision adjustments, let your experienced service-dealer do the work.

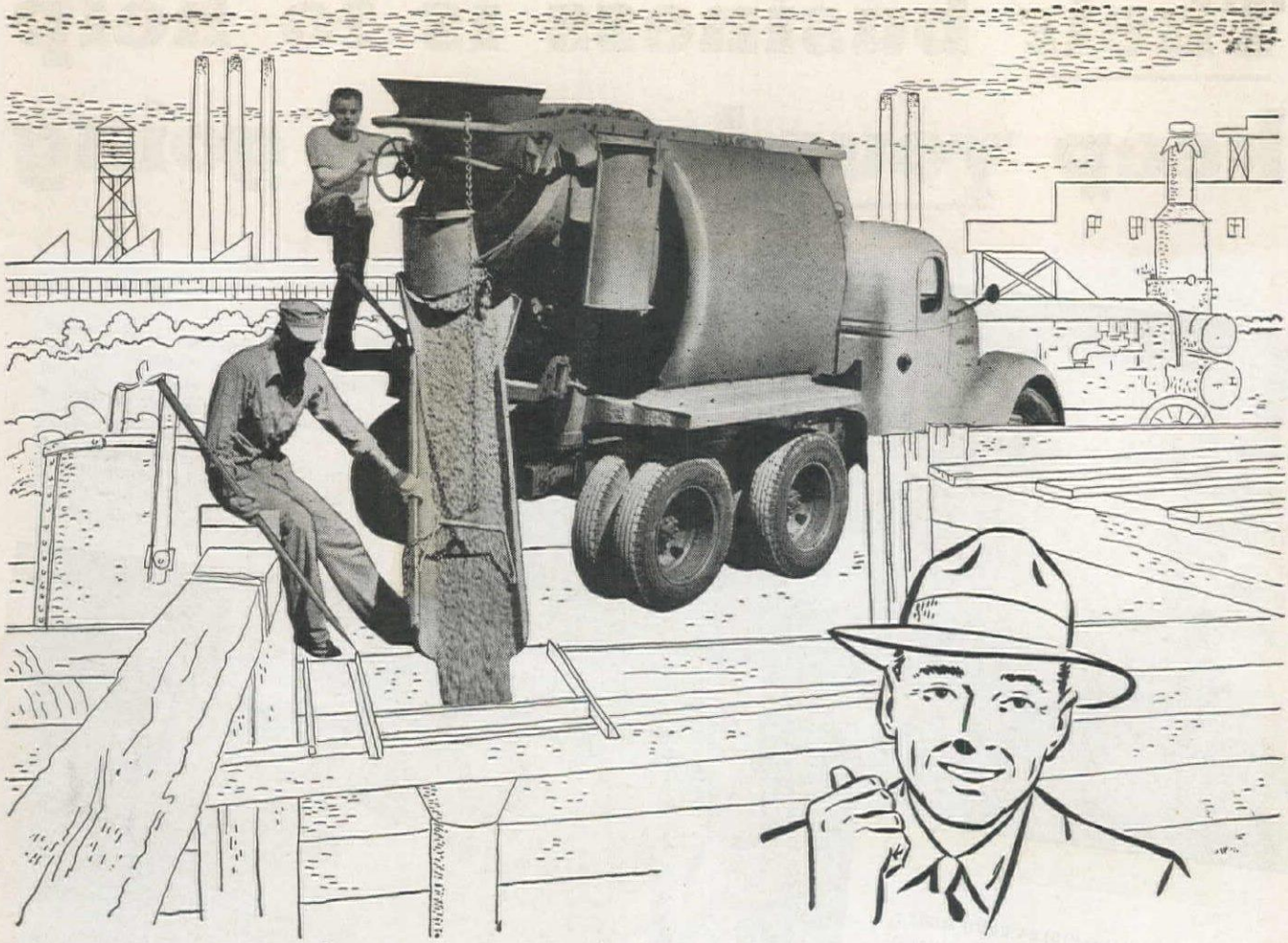
REPLACE Have your service-dealer replace or repair worn bearings, track rollers, pins and bushings, sprockets, cylinder liners, clutch linings. His service helps restore power and extend equipment life. Saves critical materials, too.

DEPENDABLE is the word for "Caterpillar" dealers

CATERPILLAR DIESEL

REG. U.S. PAT. OFF.

TRACTORS • ENGINES AND ELECTRIC SETS • EARTHMOVING MACHINERY



That drum gets a real "cushioned" ride!

THIS new Rex Moto-Mixer of mine has road shocks licked. You know the kind of roads our equipment has to travel . . . the rough ground we bounce over to reach a job. Well, that jouncing and shaking can be pretty rough on a truck mixer. It "jars" the life out of the transmission and gears of the ordinary truck mixer . . . but not a Rex Moto-Mixer.

My Rex Moto-Mixer has a chain drive that goes completely around the drum . . . acts just like a cushion and absorbs the shocks and bounces. I've traveled over some pretty tough going, and maintenance costs have been mighty low. It's sure "aces" with me.

• • •

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

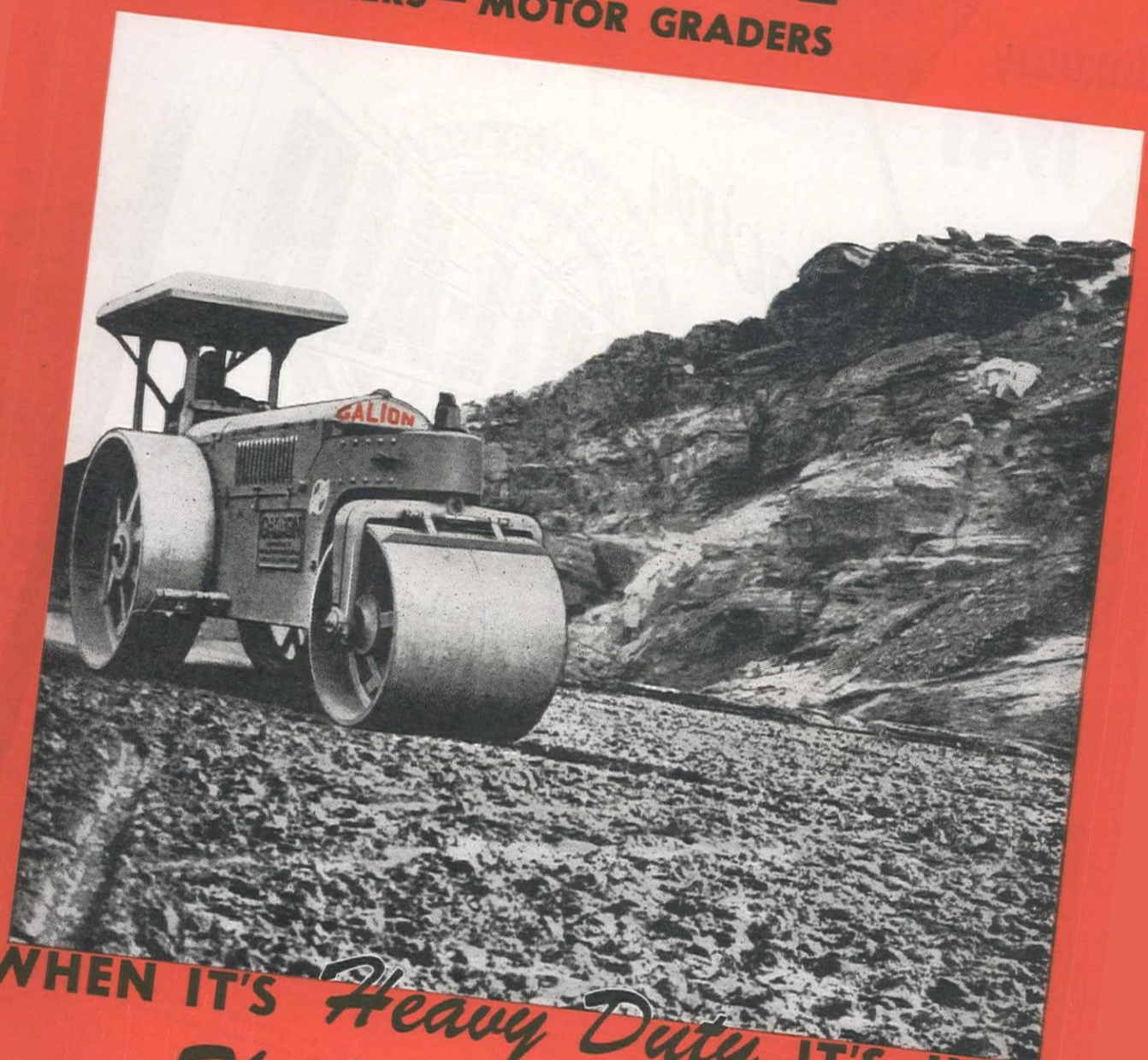
Arnold Machinery Co., Salt Lake City, Utah; Brown-Bevis Equipment Co., Los Angeles, California; Brown-Bevis Equipment Co., Phoenix, Arizona; Construction Equipment Co., Spokane, Washington; Contractors Equipment and Supply Co., Albuquerque, New Mexico; Corson Machinery Co., Ray—Denver, Colorado; Hall-Perry 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

GALION

ROAD ROLLERS — MOTOR GRADERS



WHEN IT'S *Heavy Duty* IT'S JUST

The Order of the Day

for a Galion

THE GALION IRON WORKS & MFG. CO.

GALION, OHIO

DISTRIBUTORS IN PRINCIPAL CITIES

January 1941

Designed for PEACE

Announcing

Ingersoll-Rand

MOBIL-AIR

AIR POWER

Another NEW STANDARD IN PORTABLE COMPRESSORS

A Startling New Development full of MONEY-SAVING FEATURES

The MOBIL-AIR has a Convertible Engine . . . You can change from oil to gasoline operation (or from gasoline to oil) by a simple substitution of fuel accessories . . . in your own shop . . . no changing of engines or engine heads or pistons. The engine has overhead valves, replaceable cylinder liners, non-sticking piston rings and other refinements.

As a Gasoline Engine this outstanding new development requires much less fuel . . . particularly at light loads.

As an Oil Engine it is the well-known Ingersoll-Rand Type H . . . smooth running, easy to maintain, easy to start.

DRILL-MORE Multi-speed Regulator (patented) adjusts the engine speed to the use of air . . . practically eliminates wasteful "idling." The average working speed of the engine and compressor is reduced . . . more efficient operation . . . less wear.

More Work from Air Tools . . . Jackhamers and similar air tools drill up to 15% faster when the compressor is equipped with the DRILL-MORE Regulator.

Remarkable Fuel Economy . . . up to 40% less fuel to do an average job. The new Two-Stage Air-Cooled Compressor, the new High-Economy engine, and the new DRILL-MORE regulator result in 15% more air per gallon of gasoline at full load—83% more at half load.

New-Type Clutch has automatic take-up . . . no sliding splines . . . easy to inspect and reface.

New Instrument Panel, Grouped Controls and many other distinctive features.

Lighter in Weight . . Easier to Handle . . . 15 to 33% less weight than previous models.

New Mountings . . . Both the 105- and 160- cu ft sizes are now available in the 2-wheel deluxe trailer mounting . . . the 210- and 315- cu ft sizes have a new spring mounting with automotive steering as standard.

Ask our representative for details . . . let him show you the many other points of superiority

Ingersoll-Rand

11 BROADWAY, NEW YORK, N. Y.

A Complete Line of Two-Stage Air-Cooled Portable Compressors

Sizes 60 to 500 cfm (actual free-air delivery)

THE *Right* MODEL FOR *Every* PAVING BREAKER JOB!

CLEVELAND C11

This 58-lb. tool has a long stroke and strikes a very heavy blow. It is noted for its economical air consumption.

CLEVELAND C9

Weighs 82 lbs., and is a slugger suitable for reinforced, well-seasoned concrete. A No. 85 compressor operates two.

CLEVELAND C7

This 80-lb. model is best for all around work on paving breaking and demolition jobs. Two C7's run from a No. 85 compressor.

CLEVELAND C10

This is a smaller (35-lb.) model for light work, trimming, etc. Three C10's run from a No. 85 compressor.

CLEVALOY CHISELS, MOILS, TOOLS

Moil Chisel | Narrow Chisel | Wide Blade | Digging Driver | Sheeting 7" Bar | Tamper 5" Bar | Tamper Blade | Clay Spade | Asphalt Cutter

Prompt delivery out of stock
Write for Bulletin 128

THE CLEVELAND ROCK DRILL CO.

Division of The Cleveland Pneumatic Tool Co. • 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 Avenue, Los Angeles; THE RIX COMPANY, INCORPORATED, 582 Sixth Street, San Francisco.

Signal Corps Photo

AN UNBEATABLE COMBINATION

This war has proved in a thousand ways the importance of teamwork; teamwork between army, navy and industry, between navy and air force, between artillery and infantry, between a soldier and his gun. Good men with poor equipment haven't been able to stand up to inferior men with better equipment. Good men *and* good equipment are unbeatable . . . on the fighting fronts, on the air bases, in the shipyards, in the quarries, in the metal mines, in the coal mines.

Experience and reputation in designing and building outstanding excavating equipment led to the selection of Bucyrus-Erie to work with the Army on the design and manufacture of the new 240-mm. howitzer, now in action. We're proud of that selection and of the phenomenal accuracy this weapon is demonstrating in battle. The same factors that make this largest U. S. mobile gun a leader, make your Bucyrus-Erie excavators "years ahead." In this war, all over the world, Bucyrus-Erie excavators, in the hands of good men, are shattering old production records. Post-war Bucyrus-Eries in the hands of your men will be an unbeatable combination.

V-61 C

Bucyrus-Erie

SOUTH MILWAUKEE, WISCONSIN, U. S. A.

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: Westmont Tractor & Equipment Co., 150 E. Spruce St., Missoula. ALASKA: Northern Commercial Co., 419 Colman Bldg., Seattle 4, Wash.

The Story of 4,000 RUDDERS

Since the wartime shipbuilding program got under way Bethlehem's Fabricated Steel Construction Unit has been supplying parts and subassemblies to the nation's shipbuilders.

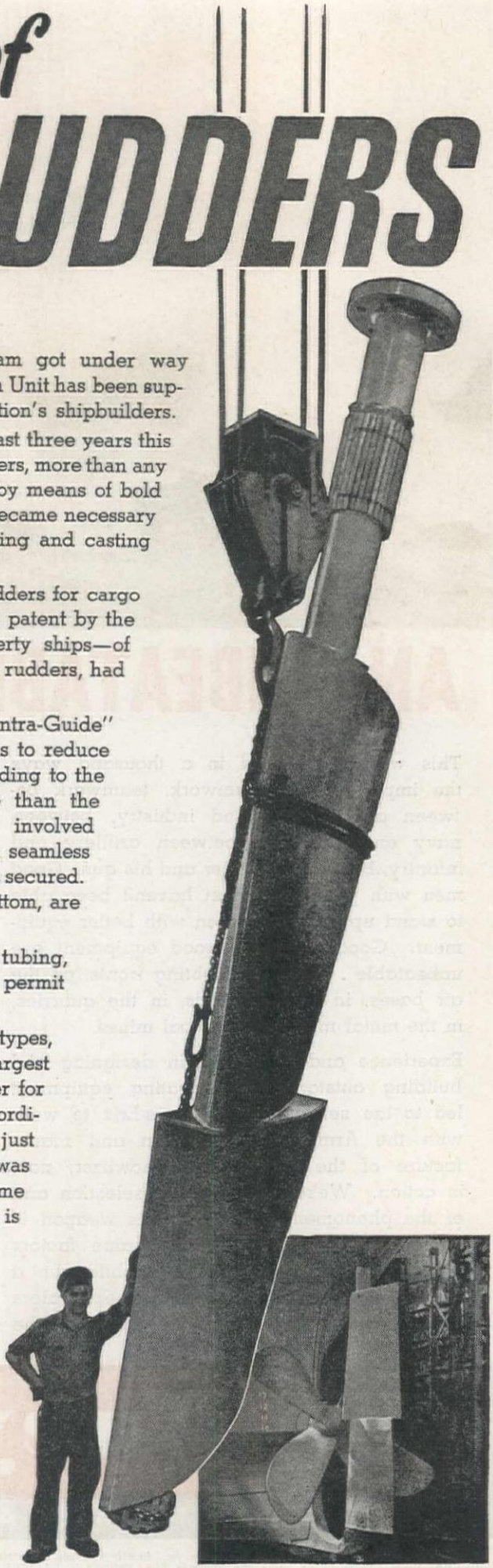
Take rudders, for example. During the last three years this organization has built about 4,000 ship rudders, more than any other single maker. And it has built them by means of bold new techniques which were evolved after it became necessary to abandon, successively, conventional forging and casting designs.

In 1941, Bethlehem began building 60 rudders for cargo ships for Britain. The same design, based on a patent by the Goldschmidt Corporation, was used for Liberty ships—of which some 2,100, all carrying Bethlehem-built rudders, had been produced by the end of 1943.

These 8-ton, 18-ft. rudders are of the "Contra-Guide" type, with two sections so shaped and related as to reduce rudder drag caused by propeller action, thus adding to the ship's speed. Lighter and cheaper to produce than the standard pre-war streamlined rudder, which involved forging operations, the Contra-Guide consists of a seamless steel tube, and horizontal ribs to which skin plating is secured. The rudder stock at the top, and the pintle at the bottom, are castings.

The whole rudder is built up by welding the plates, tubing, castings, etc., in special jigs and positioners which permit rapid production of identical, interchangeable units.

Bethlehem has built hundreds of rudders of other types, for naval as well as merchant vessels. But its second largest rudder job has been to produce a Contra-Guide rudder for tankers, which is built on extra-large steel frames that ordinarily would be cast. However, casting facilities being just as tight as those for forging, an all-welded rudder was evolved, constructed entirely of rolled steel. This became the basis for a rudder for the new Victory ship—and it is now being produced in quantity in Bethlehem shops.



★ ★ ★ BETHLEHEM STEEL ★ ★

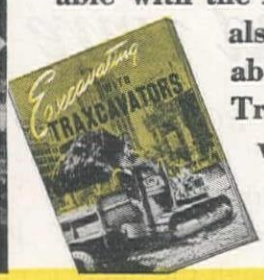
Loading Gravel from Stock Pile

Basement Excavation

Road Widening

MASTER OF ALL JOBS

TRAXCAVATORS are the world's most versatile earth and material moving machines. In addition to digging and loading, they ditch, cast, carry, spread, backfill, level, and do a host of other tasks. Highly mobile, TRAXCAVATORS travel around jobs under their own power at speeds up to six miles per hour . . . 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, and other attachments also available. Get the facts now, about TRAXCAVATORS from your Trackson-"Caterpillar" dealer or write for informative booklet to TRACKSON COMPANY, Milwaukee 1, Wisconsin.



TRAXCAVATOR

The Original Tractor Excavator

BACK OF EVERY ATTACK...

Preformed wire rope

GIVES BOMBER PILOTS SPLIT-SECOND CONTROL

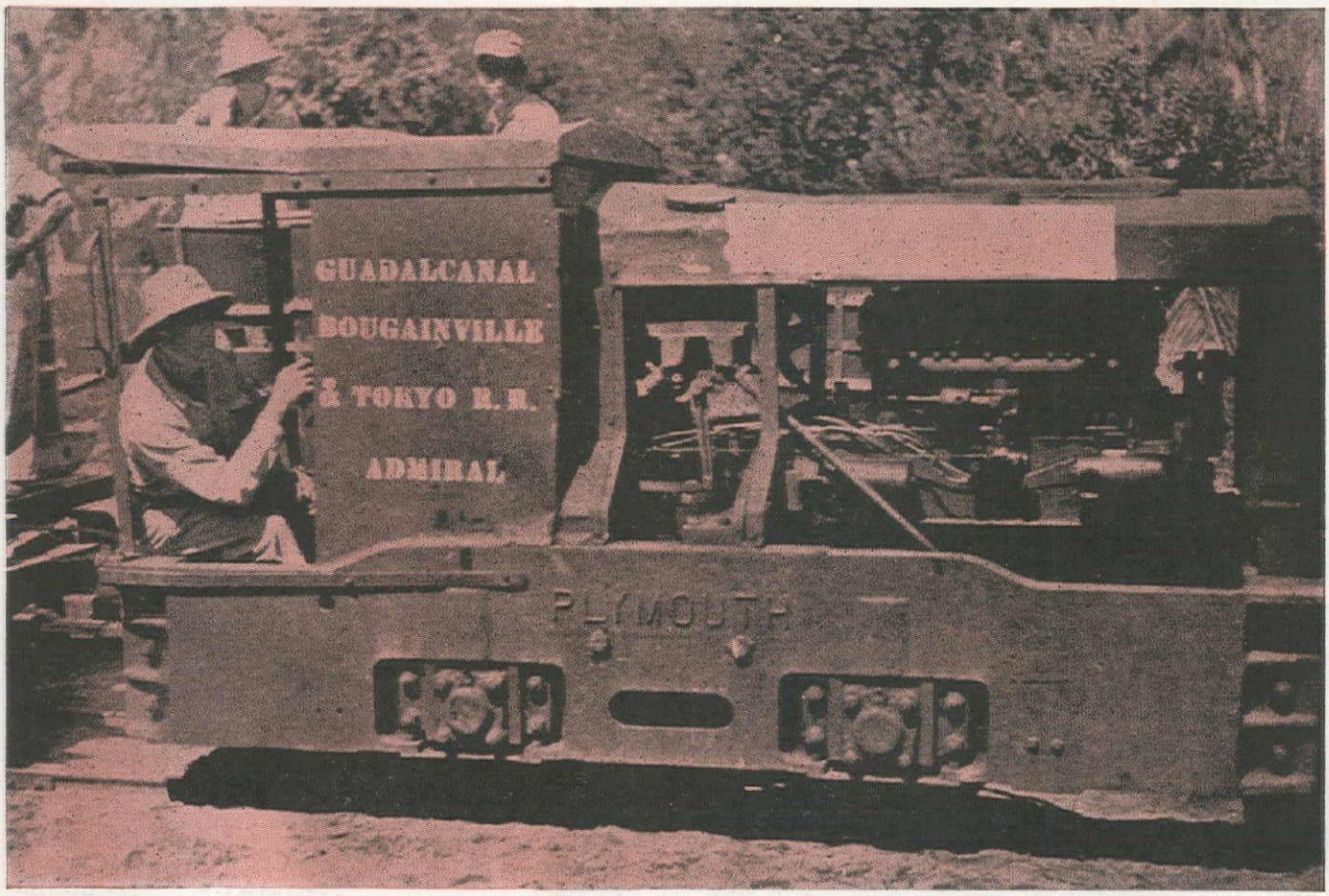
A pilot flies his bomber through black bursts of flak toward an enemy target. Suddenly the bombardier's voice comes through the intercom, *"On target!"* Then, *"Bombs away!"*

From take-off to target, the bomber's engines, rudders, bomb releases are controlled to split seconds by Preformed wire rope. Thousands of feet of it go into the rigging of a bomber.

Every foot of it on all our fighting planes is Preformed—because only this superior wire rope gives the long life, the never-failing action airplane controls must have.

Preformed is proving in the sky—as it has proved on sea and land—that it is the tough wire rope for the tough war jobs. Back of every attack, Preformed is in there fighting.

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



Working on the Guadalcanal, Bougainville & Tokyo

. . . Where dependability really counts—PIERCE GOVERNORS!

● Railroading is rough and tough on the G. B. & T. Sturdy dependability in equipment is a most blessed—and most needed—characteristic. And there, on the army service force rail line in the South Pacific islands, gasoline-powered Plymouth locomotives are equipped with Pierce Governors.

Rugged, long-term, trouble-free dependability is built into Pierce Governors with the finest materials, by expert craftsmen, in the factory of the world's largest governor manufacturer. Maximum performance efficiency and protection of the engine is assured by the time-proven, mechanical, flyball principle. Wherever gas, gasoline or Diesel engines are used for industrial power, Pierce Governors are adding to their reputation for accuracy in control of engine speed—and long service with minimum trouble.

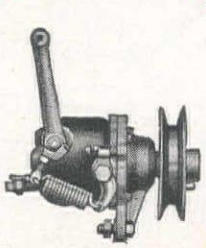
These are the reasons Pierce Governors are original equipment on many of the world's leading industrial engines. Specify Pierce on the new equipment you buy.

And if your present equipment is not Pierce-governed, write for the new Pierce Catalog.

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

Manufacturers of Pierce Precision Governors and Sisson Automatic Chokes

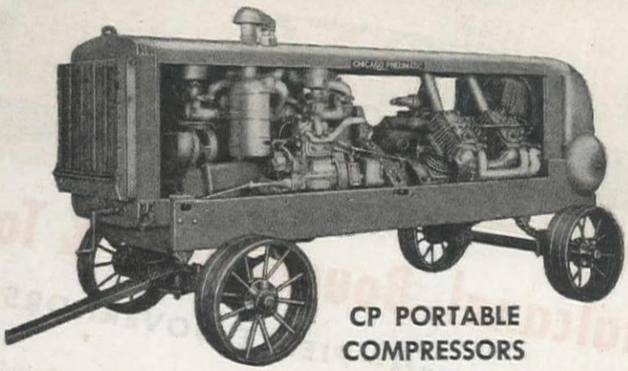
Canadian Manufacturer and Distributor:
BURLEC LIMITED, Toronto 13, Canada



PIERCE GOVERNORS

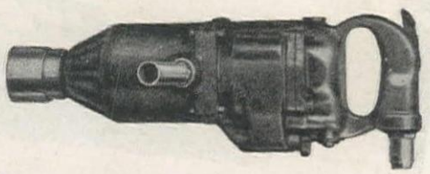
Every type of time-saving and labor-saving equipment

For 45 years, CP has been a familiar symbol to contractors . . . an identifying mark of efficient, dependable air compressors . . . low air consumption and low maintenance rock drills, concrete vibrators . . . clay spade . . . backfill tampers . . . time-saving wagon drills . . . equipment that doesn't have to be handled with kid gloves or babied on the job. CP knows the needs and understands the problems of the contractor and builds CP equipment to help him to greater profit.



CP PORTABLE COMPRESSORS

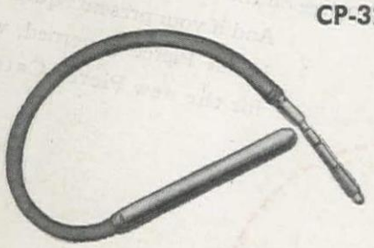
Hundreds in world-wide use have proved the exceptional smoothness, economy and sturdiness of CP's 500-ft. Caterpillar Diesel driven, two-stage, air-cooled portable compressor. CP features include: gradual speed regulation, Simplate Valves, pressure lubrication, self-adjusting clutch, etc. Other Chicago Pneumatic Portable Compressors are available in sizes of 60 c.f.m. to 315 c.f.m., Diesel or gasoline powered.



CP 365-RP PNEUMATIC WRENCH

Speedy, powerful. CP 365-RP (Impact Type) Wrenches remove or apply nuts, bolts, lag screws, studs, in a fraction of the time required to do either job by hand. Capacity: 1¼" bolt size. There are five other CP wrenches for bolts, nuts, studs, etc., from ⅜" up to 1¾" bolt size.

CP-325 PNEUMATIC VIBRATOR

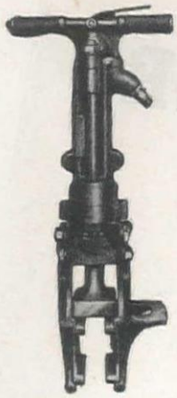


For reinforced concrete under 3" slump. Powerful, easily handled by one man, the CP-325 is ideal for walls and columns over 15" thick, for heavy floor and roof slabs and for appurtenances on heavy construction projects.

CP CLASS "Y" 'PACKAGE TYPE' COMPRESSOR

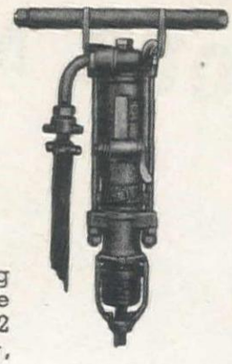
Shipped intact, all ready for external connections, CP Type Y Compressor is easily and quickly installed. Requires only minimum floor space. Available with built-in or direct-coupled motors or with V-belt drive, in capacities of 500 c.f.m. to 900 c.f.m. at 80 to 125 pounds pressure; other sizes are available for higher and lower pressures.

Catalog No. 600, "CP Construction Equipment", contains essential data concerning the latest CP equipment. Write for your copy.



CP-116
SHEETING DRIVER

Essentially the popular CP-116 Demolition Tool with a special front head for driving sheet piling. CP Sheeting Driver has only one moving part, the piston, which strikes a fast powerful blow. Does not "broom" — sheeting can be used over and over.

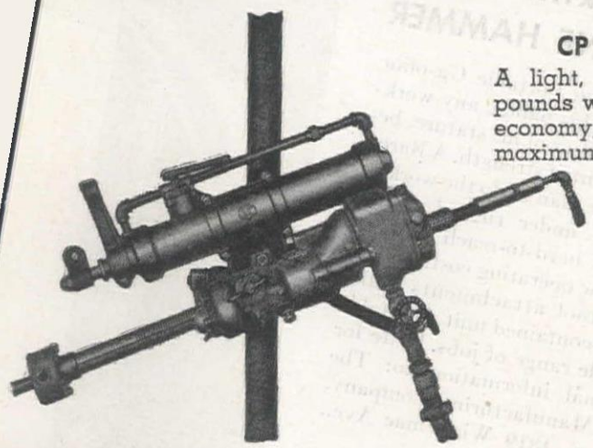


CP-32 SINKER DRILL

Fast drilling speed, strong rotation and good hole cleaning makes the CP-32 ideal for shaft sinking, quarry drilling, general excavation and road work.

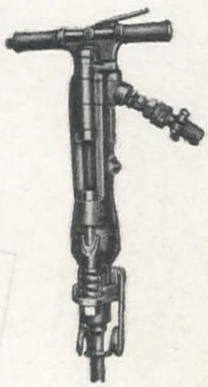
CP-60
MOTORDRIFTER

Recommended for drilling in hard, seamy or ravelly formations, or tunneling from Jumbo drill carriages. The CP-60's outstanding feature, the MOTORfeed, speeds up the drilling cycle, lessens operator fatigue and reduces accident risks, overall time and costs.



CP NO. 5 DIAMOND CORE DRILL

A light, one-man drill that weighs only 160 pounds without rod puller. Combines power, air economy, ease of handling, high drilling speeds, maximum core recovery and low cost per foot drilled. Drills to 500 feet depth with EX fittings. CP No. 5 works on any standard saddle, in any position from a column, arm or crossbar.



CP-117 DEMOLITION TOOL

Indispensable as a time and money-saver in tearing out dense concrete and similar medium-to-extremely hard materials. CP-117 strikes a heavier, slower blow than the CP-116, but handles with the same ease.

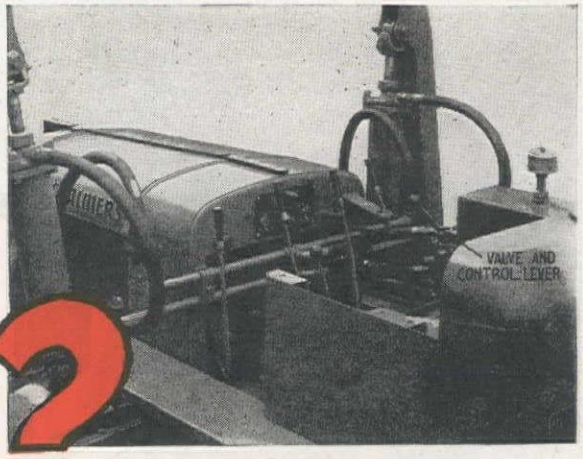
★★★★★★★★
PNEUMATIC TOOLS
ELECTRIC TOOLS
HYDRAULIC TOOLS
ROCK DRILLS

CHICAGO PNEUMATIC TOOL COMPANY

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

★★★★★★★★
AIR COMPRESSORS
VACUUM PUMPS
DIESEL ENGINES
AVIATION ACCESSORIES

Ever Operate a BAKER?

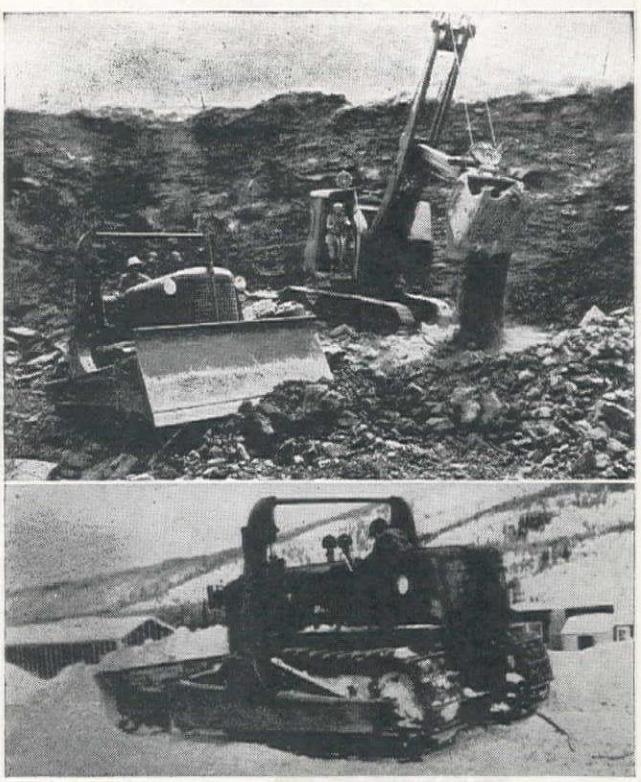


If you did, we need not tell you how simple it is. We've been talking about direct hydraulic lift and full down pressure on the blade and about the ease and low cost of maintaining Baker bulldozers and gradebuilders. But, as a contractor who operates five Bakers pointed out to George Phares, our No. 1 field man—"Baker's ease of control is something to write home about."

Operator faces forward—no need to sit askew. Control lever is within convenient reach. Four lever positions—*float, down, hold, raise*. Fast, positive action. That *hold* is important—you can put the blade in a cut and hold it there! On many occasions, especially where the going is tough, hydraulic down pressure is the operator's "ace in the hole."

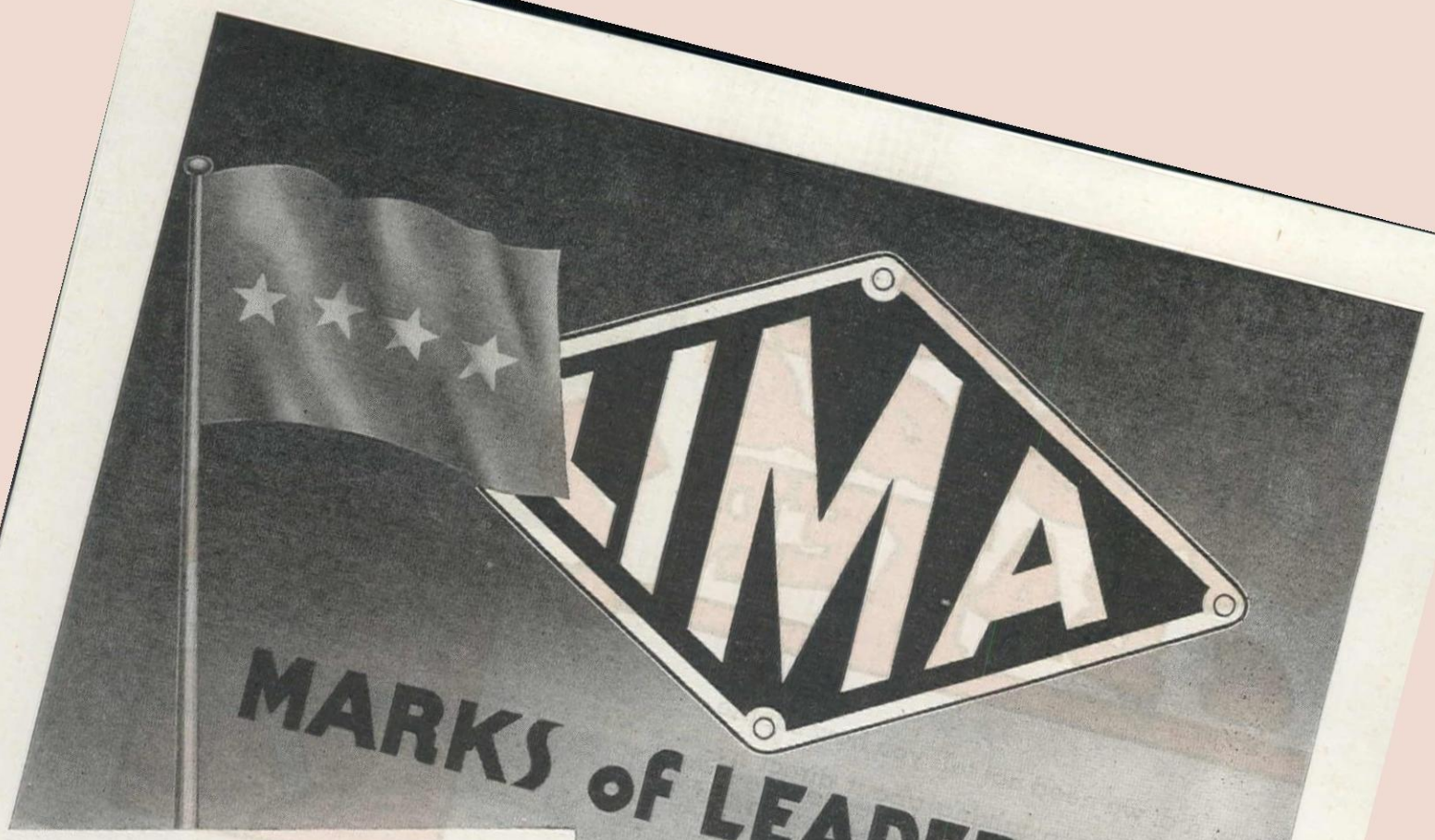
Baker Bulldozers on Allis-Chalmers 2-cycle diesel tractors are making it easier for our fighting forces on every front.

THE BAKER MFG. CO.
524 Stanford Ave., Springfield, Ill.
"If it concerns Victory, it concerns us"



Top: Baker Bulldozer on Allis-Chalmers tractor clears floor of pit for buried fuel tank in South Pacific.
Bottom: Private Wally Saner, former Baker employee, removing snow at Alaska air base with Baker Gradebuilder which helped build base.

BULLDOZERS SNOW PLOWS **BAKER** CONSTRUCTION EQUIPMENT



MARKS of LEADERSHIP

The name LIMA on a shovel, crane or dragline is recognized as a mark of *leadership* by users who keep abreast with the latest in power excavator design and performance. LIMA has always been a *leader* in the designing and perfecting of new and practical features to help increase production and to lower operating cost on earth moving projects. This continuous search for new and better methods of doing things has been responsible for many outstanding advancements in excavator design. When you buy your next shovel, crane or dragline be sure it is a LIMA and get these modern distinctive features:

1. Anti-friction bearings at every vital bearing point for greater power and efficiency.
2. Independent clutches—hoist, swing, travel, boom up or down simultaneously.
3. Big wide drums for maximum cable economy.
4. All shafts on which are mounted sliding members are splined for accuracy in fit and elimination of backlash.

These advantages plus the extra power and ruggedness of LIMA shovels, cranes and draglines are qualities you must have for greater output day in and day out.

Keep Buying WAR BONDS

LIMA LOCOMOTIVE WORKS, INCORPORATED
Shovel and Crane Division
LIMA, OHIO, U. S. A.

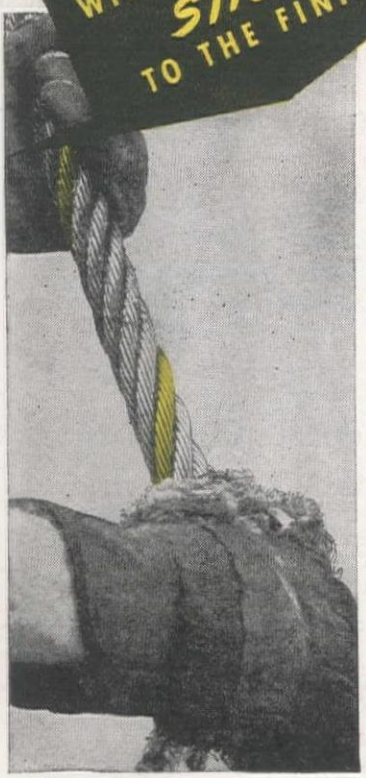
SHOVELS, ¾ YD. TO 3½ YD. CRANES, 13 TONS TO 65 TONS
DRAGLINES, VARIABLE

See Distributors below

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. McGoy 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 Building, P. O. Box 456, Albuquerque, New Mexico.

Our troops inspect a captured Axis tank, looking for booby traps.
INTERNATIONAL NEWS PHOTO

OVER HERE
WIRE ROPE MUST
STICK
TO THE FINISH



Every battle is a showdown . . . our men, weapons and equipment against the enemy's . . . *wire rope* included. That's why our forces need the best rope they can get . . . *and lots of it.* Below are some of the ways in which *you* can help to send more wire rope over there by making your own rope *last longer* over here:

1. Start with the correct wire rope. If uncertain about size, grade or construction for your specific job, ask us or any distributor.

2. Check equipment thoroughly. Repair or replace worn, corrugated or wobbly sheaves. Line up sheaves with each other and with drums, making sure rope does not rub against flanges. Inspect drums for roundness.

3. Install rope carefully. Avoid kinking when unreeling and handling. Never drag rope across concrete or gravel. Wrap rope snugly and evenly on drum, avoiding cross-winding.

4. Break in rope cautiously, gradually increasing speeds and loads. And break in the operator, if inexperienced. Instruct him in the importance of smooth starts and stops . . . reasonable loads . . . frequent examination of rope, sockets, clips and splices.

5. Care for your rope. Clean and lubricate regularly. On many installations rope can be cut off or shifted to distribute wear. Get better acquainted with ropes by sending for our free Industrial Wire Rope Hand Book and Riggers' Hand Book.

One thing more: Use wire rope of known stamina and dependability. *Preformed* Yellow Strand combines flexibility, toughness, elasticity and strength in proper balance. It stays on the job . . . curtails replacements . . . helps you keep manpower and equipment producing . . . for Victory.

Broderick & Bascom Rope Co., St. Louis

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

YELLOW STRAND
PREFORMED WIRE ROPE

One of These Three May Be Your Answer to Lower Maintenance Costs

Q **Does "on-the-job" power lubrication add "M. P. T."* to machines?**

A You bet it does! It can cut lubrication time up to 75% over hand gun lubrication, leaving more time for work. In one typical case, Alemite Portable Service Stations cut "cat" track roller wear by one-third — keeping machines on the job longer between overhauls. And that, friend, is adding "M. P. T."* to machines.

**More Productive Time*

Q **Are portable service stations just for lubrication?**

A No. They have many uses. For high pressure power lubrication of all bearings equipped with pressure gun fittings. This covers practically every type of machine. For rapid filling of gear housings, final drives, rear axles, transmissions and crank cases. For tire inflation, engine cleaning, paint spraying, etc. Versatile outfit, isn't it?

Q **Does "on-the-job" lubrication save on lubricants?**

A Definitely. Here's the experience of one organization: using the "barrel to bearing" application of lubricants from an Alemite Portable Service Station, a saving of 19% was made in the consumption of grease and oil. And every bearing and gear got clean, uncontaminated lubricants. Interested in a saving in lubricants?

Alemite Portable Service Stations Put Power Lubrication "On-the-Job"

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

This type of "on-the-job" lubrication has proved its efficiency on construction projects everywhere. Its increasing use shows that it is destined to play an important role in peacetime competition. Write for catalog. Alemite, 1819 Diversey Parkway, Chicago 14, Illinois, or Belleville, Ontario.

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.

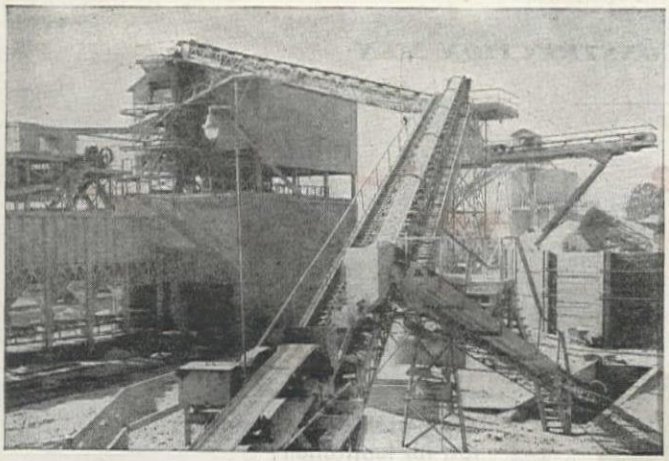
He's ready to go to work for you now, backed by the world's most experienced organization in the handling and application of lubricants. Call him. Or, if you prefer, write, wire or phone Alemite for his address.

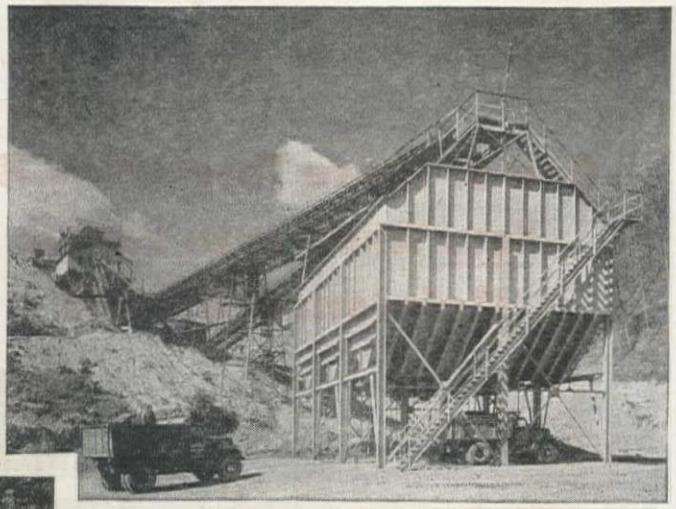
Another Product of STEWART WARNER

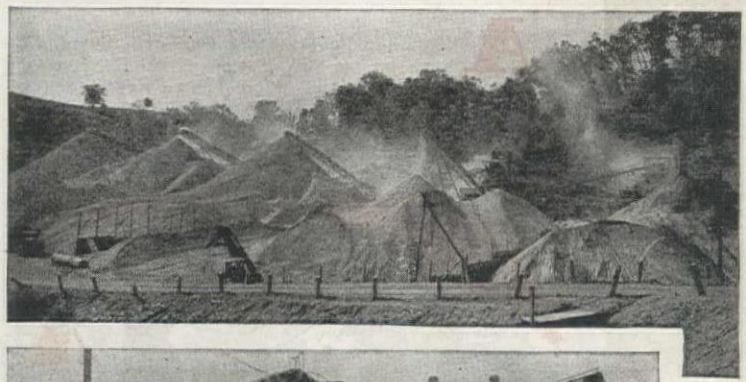
ALEMITE

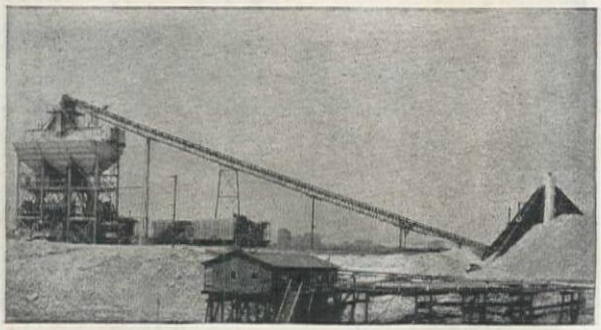
First in Modern Lubrication

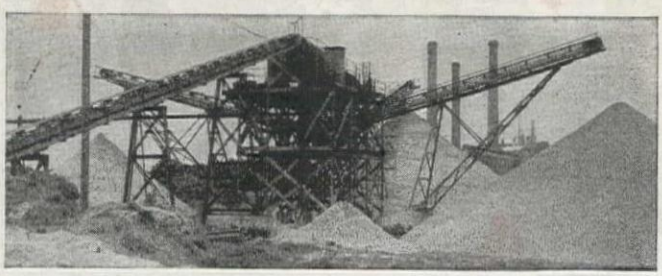
CONSULTATION • ENGINEERING • EQUIPMENT • LUBRICANTS • MAINTENANCE

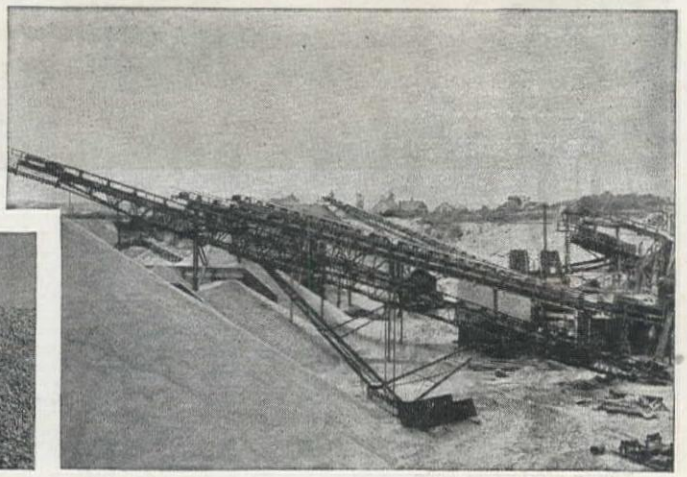












CUSTOM BUILT

With Standard Units....

Typical of the Barber-Greene concept of Standardized Sectional Conveyor construction are the installations shown here. The belt conveyors used in these plants consist, for the most part, of standard units, pre-engineered and designed for production manufacture. These standard terminals, trusses, carriers, A-frame supports, and take-ups are available in a wide range of sizes and horsepower to meet a custom engineered application.

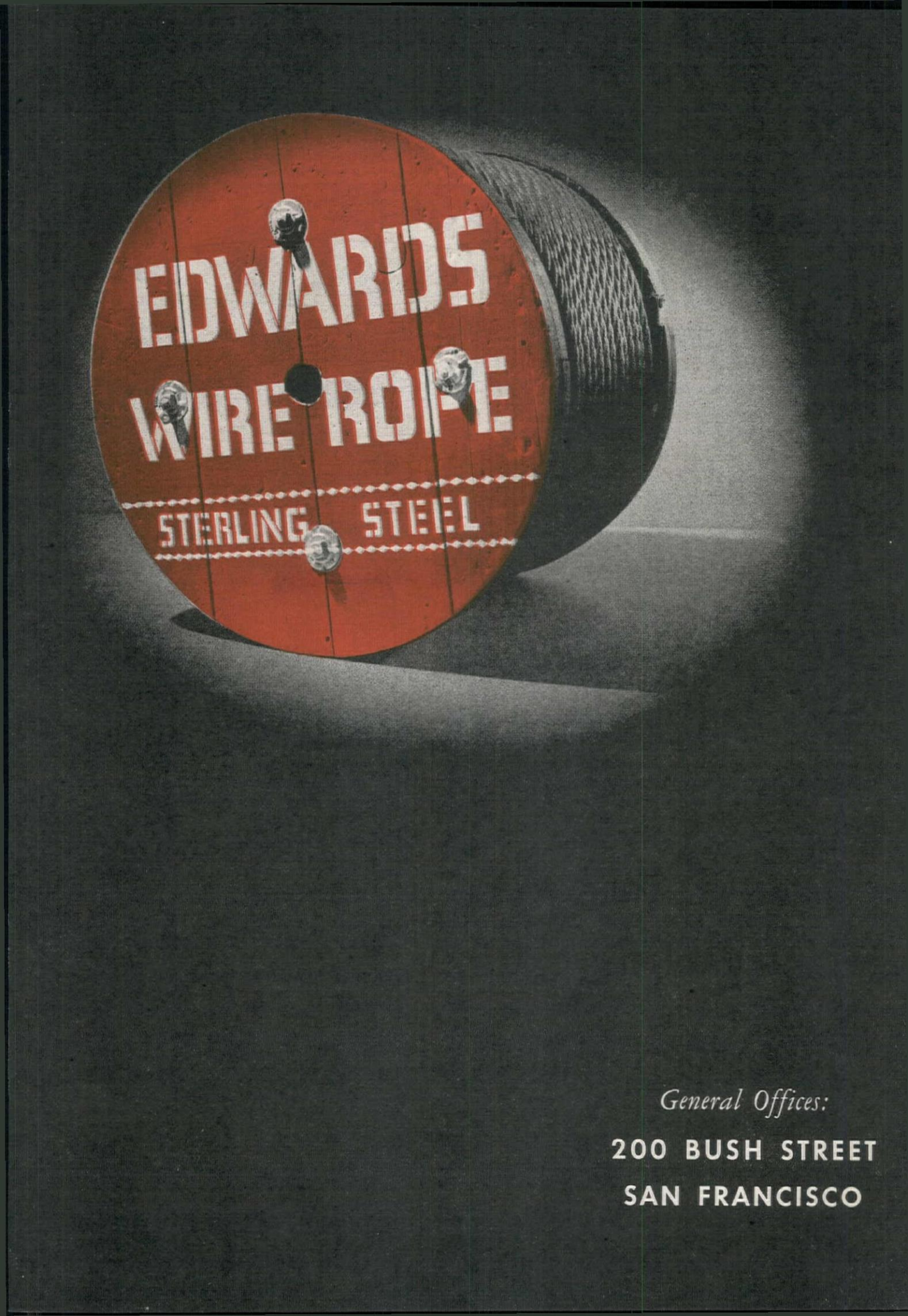
The Barber-Greene Engineering Department will assist you in utilizing this equipment to best advantage. It is equipment that can be expanded as your plant grows merely by adding standard units. Barber-Greene Co., Aurora, Ill., U. S. A. 44-26

BARBER-GREENE

ARMY E NAVY

AURORA, ILL., U. S. A.

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.



General Offices:

200 BUSH STREET

SAN FRANCISCO

TYPICAL DIESEL LUBRICATION PROBLEMS:

3. Ring-Sticking

Ring-sticking usually results from deposits formed by the combination of the residues of oxidized lubrication oil and fuel with fuel soot.

In four separate ways, RPM DELO prevents the formation of these deposits:

1. RPM DELO is manufactured from a carefully selected base oil containing natural inhibitors highly resistant to oxygen. It contains no heavy residues which may be left behind to act as a binder for the fuel soot.

2. RPM DELO contains an added oxidation inhibitor which greatly reduces the rate at which the oil absorbs oxygen.

3. RPM DELO has chemical detergent properties. The compounding material reacts with the oxyacids to render them essentially inert so that they are no longer able to polymerize to form gums and lacquers.

4. RPM DELO has peptizing properties which enable it to maintain soot and oxidation products in suspension in minute particles. This prevents these materials from settling from the oil and forming engine deposits.

RPM DELO, moreover, is non-corrosive to all types of bearings, does not foam and has very high metal adhesion qualities at both high and low temperatures.

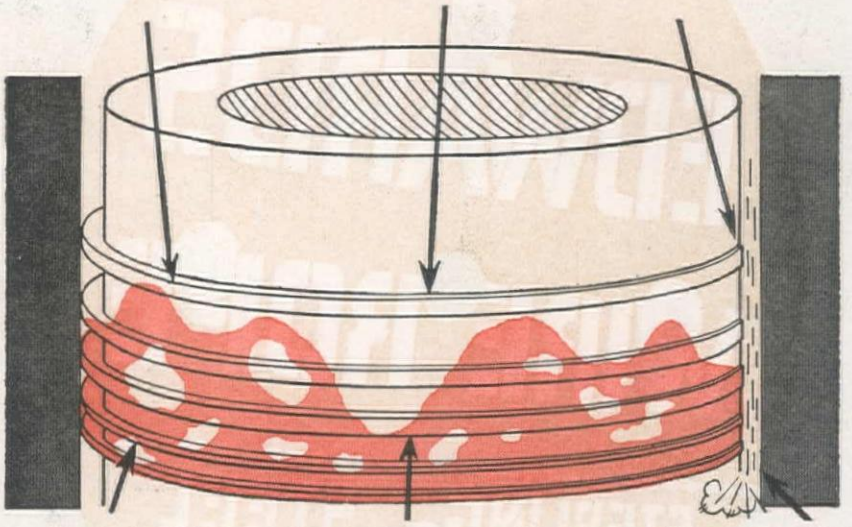
Standard Fuel and Lubricant Engineers are always at your service. They'll gladly give you expert help—make your maintenance job easier. Call your Standard Representative or write to Standard of California, 225 Bush Street, San Francisco 20, California.

HOW RING-STICKING OCCURS

Decomposition products of fuel and lubricating oil deposit in ring groove, behind ring and in side-clearance space.

Rings stick in grooves, no longer expanding to form tight seal between piston and cylinder wall.

With seal broken, hot, high pressure gases "blow-by" stuck ring.



Escape of gases reduces compression, overheats piston, increases oil deterioration.

Blow-by pressure removes lubricating oil from rings and cylinder, leaving dry spots.

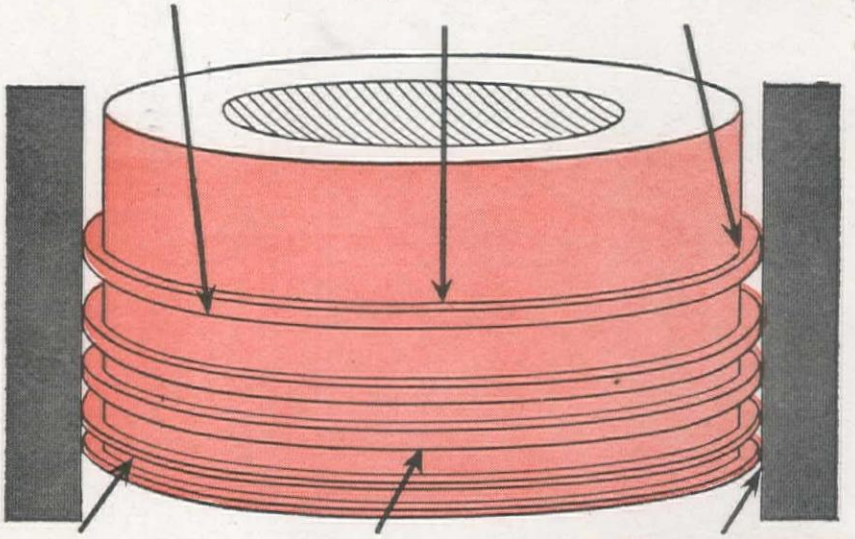
Lack of lubrication results in high ring and liner wear and scratching.

HOW RPM DELO PREVENTS RING-STICKING

Detergent in RPM DELO prevents deposition of oxidation products.

Ring grooves are kept clear, allowing ring tension to maintain tight seal.

RPM DELO clings to ring surface, maintaining lubricant film and seal.



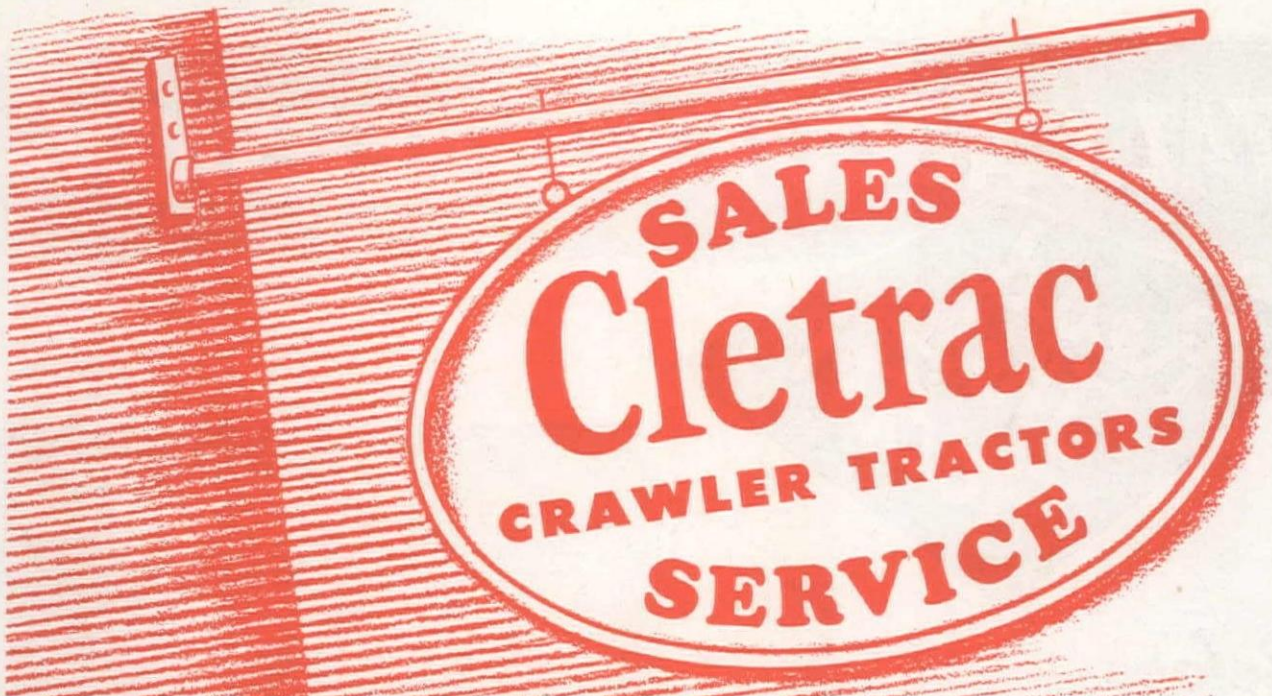
Tight seal eliminates blow-by, maintaining compression and power.

RPM DELO adheres to hot surfaces, protecting entire surface of rings, piston and liner.

RPM DELO lubrication results in minimum ring and liner wear, eliminates scratching.

RPM DELO

STANDARD OF CALIFORNIA



Your CLETRAC dealer CAN HELP YOU

Keep your Tractor Fit . . . or help you get a New CLETRAC for essential use

KEEPING your Cletrac fit . . . helping you get the most from your equipment . . . that's the aim of your Cletrac dealer.

He is proud of Cletrac's part in the war. Wherever there's a tough job of movement . . . bulldozing . . . building military highways . . . constructing airfields . . . moving wheeled vehicles . . . jockeying grounded warplanes . . . aiding Engineers and Seabee crews opening communication lines, and keeping them open . . . in scores of difficult jobs Cletracs are a vital part of the "sinews of war."

And on the home front, your Cletrac dealer is doing his utmost to help keep Cletracs in fighting trim so that the fighting fronts may be supplied with the materials of war.

Here's how your Cletrac dealer can help you:

1. Assist you in obtaining necessary repair parts, and supply trained, expert service men to aid you in maintaining your Cletracs for dependable, economical performance.

2. Aid you in securing new Cletracs for essential uses.

A substantial number of Cletracs are being released for essential civilian uses—allocated according to government regulations. Your Cletrac dealer will gladly assist you in making application for a new Cletrac if you can qualify as an essential user.

The folder illustrated at the right tells briefly of Cletrac's part in the war effort. A copy will be mailed on request.

THE CLEVELAND TRACTOR COMPANY • CLEVELAND 17, OHIO

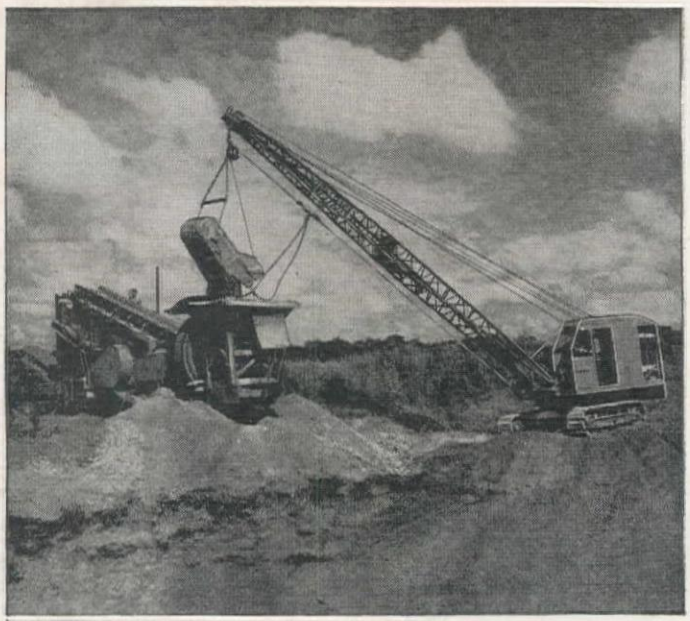
CLETRAC *Tru-Traction* TRACTORS

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.

TALK ABOUT CONVERSION—

Read These Facts!



Before—

Beu & Sons, Sumner, Iowa, "190-G" Universal crushing, screening and loading plant with 10"x36" jaw crusher, is shown producing aggregates near Pine Lake State Park, Hardin County, Iowa. Output averaged 1,500 yards per 10½ hour day from an unusually deep pit and ran as high as 2,200 yards in a 12½ hour day.

This progressive contractor recently took a contract for agricultural limestone in northern Iowa.

After—

The jaw crusher on the "190-G" was readily replaced by a Universal No. 4 hammermill and a Universal primary unit consisting of a 20" x 36" roller bearing jaw crusher with apron feeder was added providing a "tailor made" plant capable of handling the new contract. The revamped plant is shown operating near Ackley, Iowa. As much as 125 tons of aglime per hour have been turned out, averaging better than 100 tons per hour.

This is another case where standard Universal units were economically used to readily convert a plant. There is no end to the variety of combinations that are possible using standard Universal "packaged units."

Handle aggregates today, riprap tomorrow, ballast next month.

Universal engineers and field men have the answers to your conversion problems.

UNIVERSAL ENGINEERING CORP.
323 8th Street, West Cedar Rapids, Iowa

ARMY E NAVY

UNIVERSAL

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

Start Post-War Planning Now!

Acid-proof vest with 10,253 buttons

SHOWN HERE under construction is a refinery tower designed to remove undesirable tar materials from high-octane gasoline.

Because the steel shell of the tower will not withstand the corrosive action of separation acids, a chrome alloy lining was specified. 10,253 separate plug welds, each one impervious to acids and able to stand extreme pressures and temperatures, were necessary to secure the tower lining.

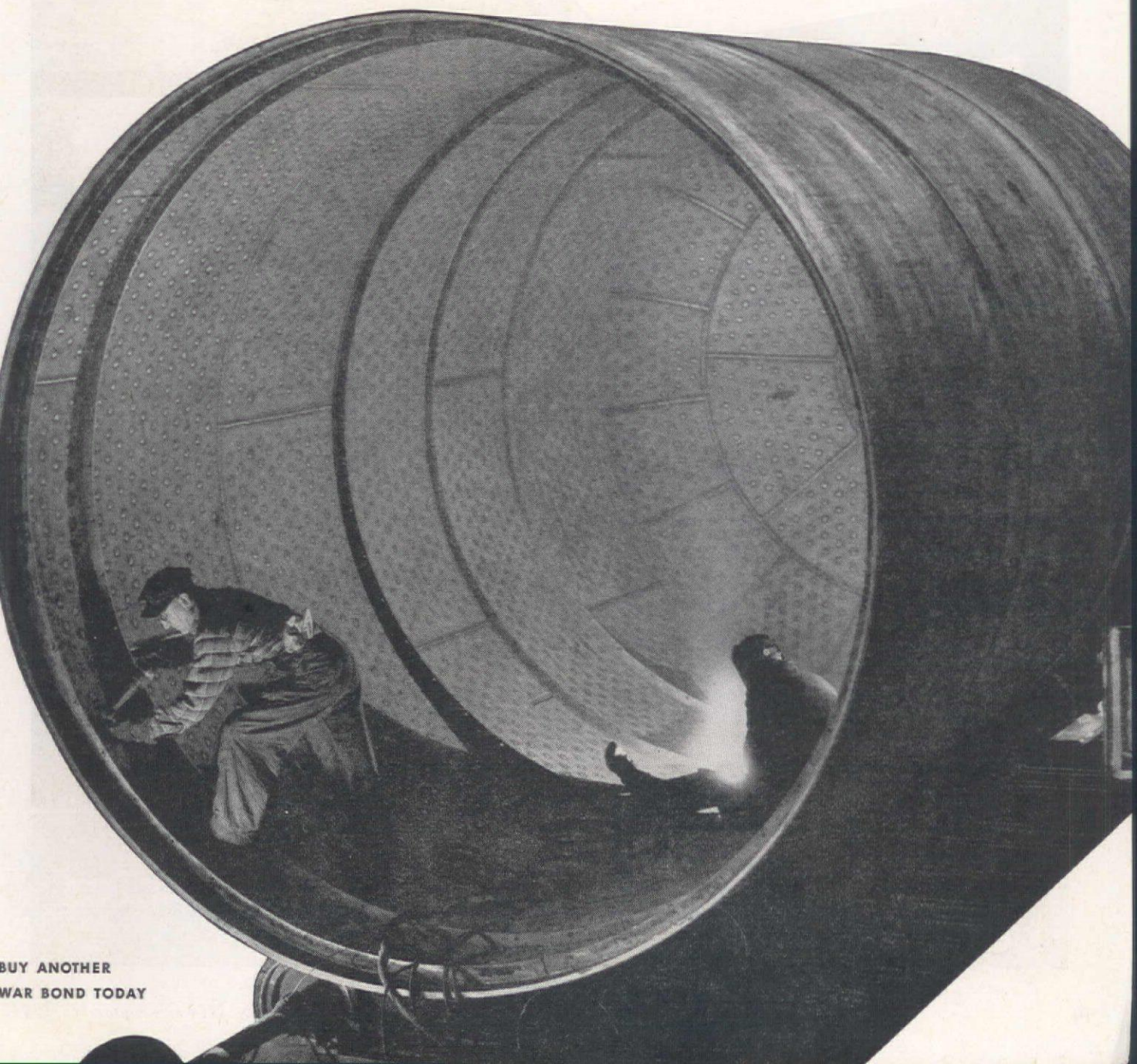
An unusual fabrication job, it is another of the missions completed by Consolidated Steel Corporation for war industries and armed services. It is an example of the craftsmanship Consolidated Steel will devote to the construction needs of peacetime America. Inquiries looking to future construction are solicited. Address the president.

Consolidated Steel

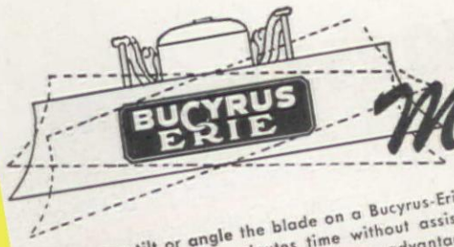
FABRICATORS · ENGINEERS · CRAFTSMEN

CONSOLIDATED STEEL CORP., LTD., LOS ANGELES, LONG BEACH, WILMINGTON, CAL.; ORANGE, TEX.

LARGEST INDEPENDENT IN THE WEST



BUY ANOTHER WAR BOND TODAY



Make the TILT Work for YOU

One man can tilt or angle the blade on a Bucyrus-Erie Bullgrader in just a few minutes time without assistance. That's why it's so easy to take advantage regularly of blade tilt to do your work in the fastest and most efficient way possible. Here's how you can use the tilt:

1

WHEN TRACKS MUST TRAVEL ON A SLOPE AND YOU WANT TO ESTABLISH A LEVEL CUT: Tilt in with the advance corner low, which starts a leveling cut and throws the material out along the angled blade, overcasting the excavated material. As tracks move onto the section you have notched into the bank and filled on the slope, continue with the tilted blade only long enough to get tracks on the desired grade level. Then adjust back to a level blade but continue to lead with the inside corner in order to plow the material out to fill on the side slope.

2

WHEN TRACKS MUST TRAVEL ON THE LEVEL AND YOU WANT TO ESTABLISH A SLOPING CUT: With front corner tilted down, take a cut along the centerline of your ditch until you have a track length. Then level the blade and, working your tractor on the slanted bank, continue to angle your material up the slope and into your spoil pile. If you are opening a V-ditch, repeat on the opposite side at proper slope to make the desired cut.

3

PEELING (OR SLOPING DOWN) VERTICAL OR STEEP BANK: Tilting the forward corner of the blade up and raising it high, use the end to "peel" or shave off the material. Continue the operation until you bring the bank to the desired slope, or until you have a slope on which the tractor can operate.

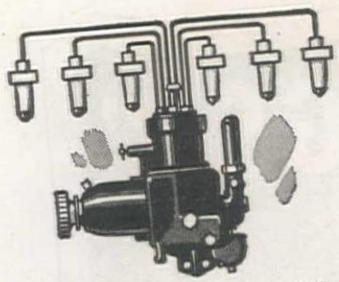
Find out about the complete line of Bucyrus-Erie Tractor equipment from your nearest International TracTracTor distributor. There are blades, scrapers, rippers, rollers, and grubbers that will give you speed and economy.

In all blade work, reduce backing up moves whenever you can. Plan all possible work to dig both ways not only to apply more of your time to moving dirt, but also because excessive back-up makes for excessive tractor maintenance.

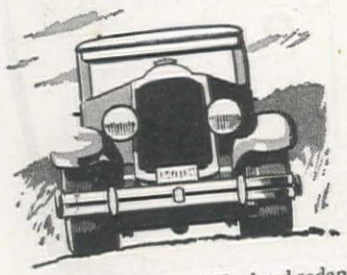
N-58

BUCYRUS ERIE TRACTOR EQUIPMENT

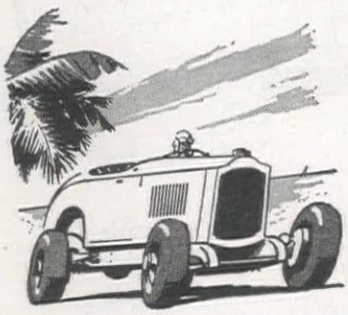
SEE YOUR INTERNATIONAL TRACTRACTOR DISTRIBUTOR



Dependable diesels are not built in a day. For instance, in perfecting the *exclusive* Cummins Fuel System, now an accepted model of simplicity and efficiency, 3,000 different injection mechanisms were developed and tested between 1923 and 1927 before Cummins engineers were satisfied. Insistence on "making it right," regardless of cost, explains why Cummins Diesels are known everywhere as *the dependable diesel.*



A Cummins-powered Packard sedan was the world's first diesel-propelled automotive vehicle. Driven in 1930 from Columbus, Ind., to New York City by designer-president C. L. Cummins at a fuel cost of only $1.38, the car was barred from the New York Auto Show and, later, the Atlantic City Road Show. Today, Cummins Diesels are found in practically all leading makes of heavy-duty trucks and construction equipment.



In 1930, under AAA sanction, the world's first official record for diesel-powered vehicles was established at Daytona Beach, Florida, by a Cummins Diesel installed in a Packard roadster—83 mph. The engine was a "dolled up" Model U designed for marine service. Although built to operate at 800 rpm., it was revved up as high as 1900 rpm. during the run, without any difficulties developing.

CUMMINS DEPENDABLE DIESELS

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

★ ★ ★

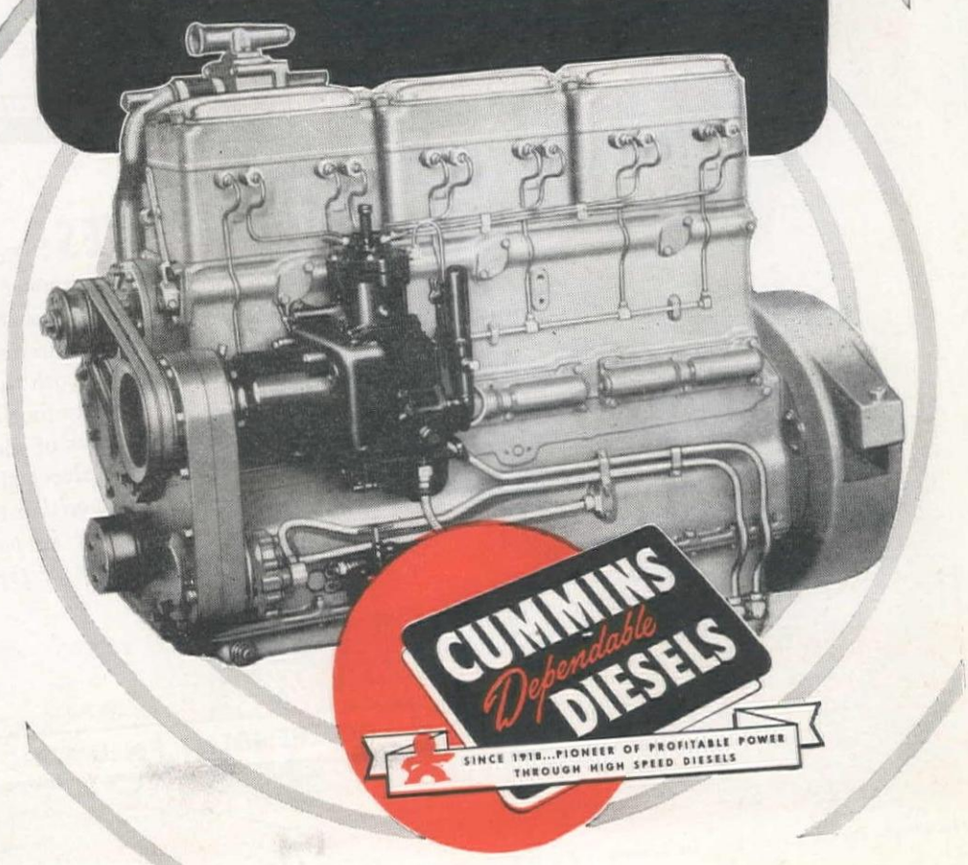
Industrial Models: Portable and stationary engines, power units, and generating sets for service in any industry requiring heavy-duty power.

★ ★ ★

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

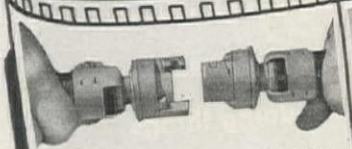
Makers and Breakers of Precedents in Power

In the early 20's, most authorities conceded 600 rpm. to be "tops" for a diesel. Cummins conceded nothing—bumped the Cummins Diesel of that early day up to 900 rpm. and kept right on bumping. That's how the modern, high speed diesel was created . . . by making *and breaking* one precedent after another . . . by doing things in design, construction and metallurgy "that couldn't be done." As a result, today's high speed Cummins Dependable Diesels are doing tough, heavy-duty jobs scarcely dreamed of twenty, or even ten, years ago. Not only doing them, but doing them cheaper, better and faster than they were ever done before. CUMMINS ENGINE COMPANY, INC., Columbus, Indiana.

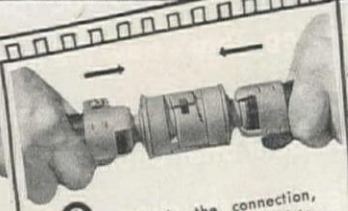


"WATCH THE LUGS!"

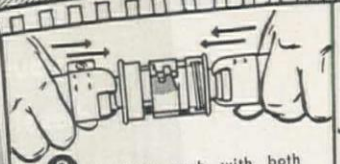
for the Simple Secret of SAFER, POSITIVE-LOCK Thor HOSE COUPLINGS



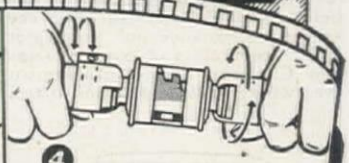
1 This is the Thor Air Hose Coupling about to be quickly assembled. Note the operation is so simple and easy that the operator needs only to hold the hose —not the coupling.



2 To begin the connection, both ends are simply touched together in proper position.

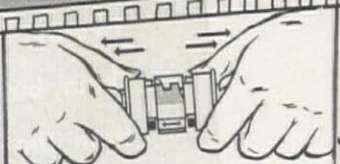


3 A slight push with both hands recedes the sliding sleeves against inner springs (phantom view) and moves the beveled jaws (gray) into position with their respective slots.



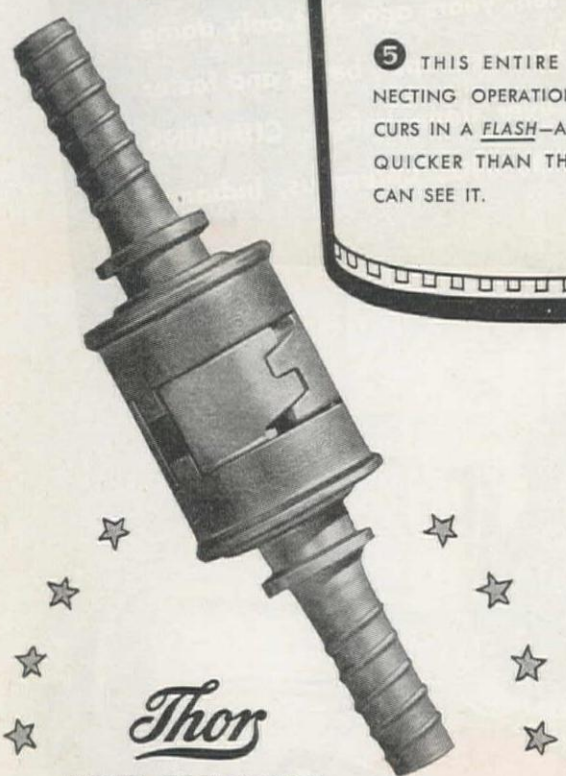
4 Presto!—with a slight twist the beveled jaws snap into position, the springs recoil, and the lugs (black) slide up and into positive-lock position.

5 THIS ENTIRE CONNECTING OPERATION OCCURS IN A *FLASH*—ALMOST QUICKER THAN THE EYE CAN SEE IT.



6 Now, to disengage the Thor coupling, all the operator does is pull back the spring-enclosing sleeves to release the lugs from locking position.

7 Now unlocked, with the lugs free of the connection, the beveled jaws automatically release and the coupling comes apart.



Thor
HOSE COUPLINGS

. . . interchangeable between all sizes and combinations up to ¾ inches, inclusive. Each hose end is identical with the other—no right or left . . . no male or female—making a universal coupling. Write today for complete information in Thor Catalog 42-A.

SIMPLE? YES! But in this simplicity of spring-operated locking lugs controlling the beveled jaws lies the *positive-lock* feature that makes the Thor Hose Coupling the *safer . . . perfect* connection. Easy to operate, this Thor coupling will save you both time and money.

Positively locked, it cannot be accidentally disconnected to endanger the operator of the tool. Even if one hose end strikes a snag and the sleeve slides back, the sleeve on the opposite side *stays in position* to retain the connection . . . *because the sleeves must be pulled in opposite directions simultaneously to disengage the locking lugs!*

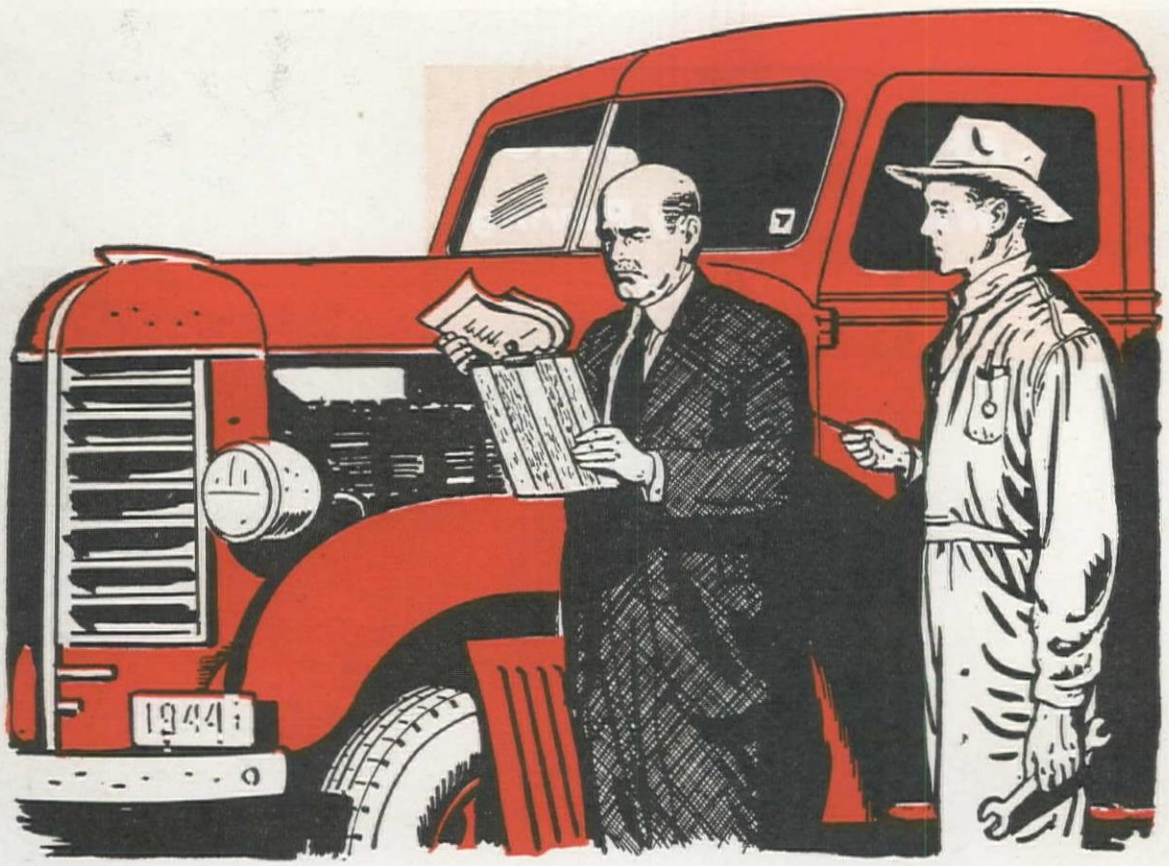
Thor Portable Pneumatic and Electric Tools

INDEPENDENT PNEUMATIC TOOL COMPANY

600 W. JACKSON BOULEVARD, CHICAGO 6, ILL.

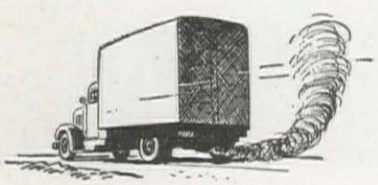
Branches in Principal Cities

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.



Since when does grief start with a "C"?

Every truck owner has a certain amount of trouble keeping his equipment in good working order. But the man who really has his worries is the one who has to fight a constant battle with CARBON. For carbon is *grief*—starting with a capital "C"!



Carbon makes engines knock, waste gas, and lose their efficiency. And worse than that—it can actually cut many months off of the life of your equipment.

But don't think for a minute that carbon can't be licked. It can—*provided* you use the *right motor oil.* For instance, you'll find that Unacal Truck-Bus Oil forms a minimum of carbon. And why? Simply because it contains a *minimum of carbon-forming elements.* It's a solvent-refined, 100% pure paraffin-base motor oil—the finest type of lubricant money can buy.

On top of that, Unacal Truck-Bus Oil has a lot of other advantages.

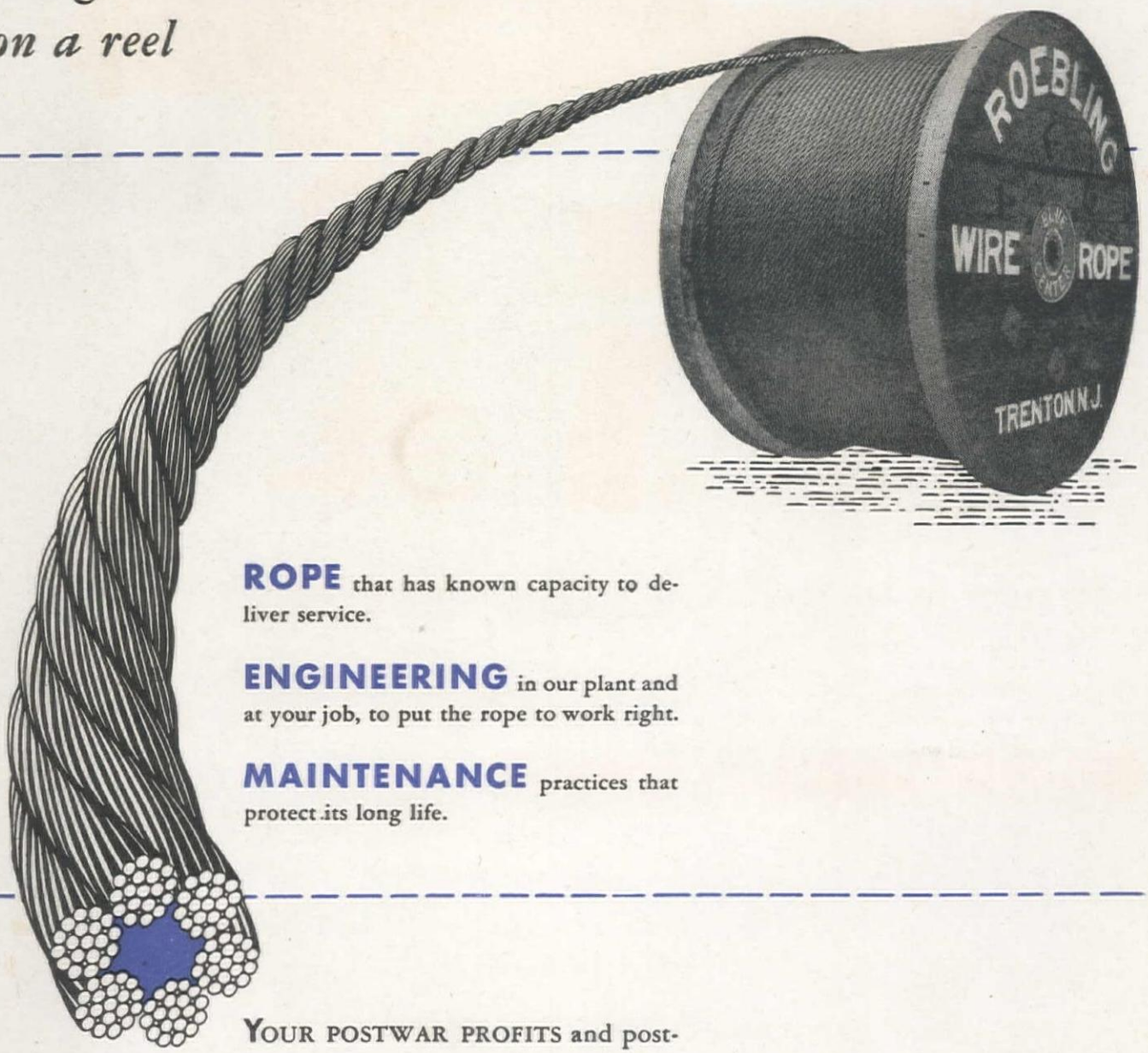
UNACAL
TRUCK-BUS OIL

Another
UNION OIL
Success-Tested Product

It is fluid enough at low temperatures for easy starting, has sufficient body at high temperatures to insure adequate lubrication, and is so tough and stable it gives top-notch protection under every operating condition.

If you've been looking for a lubricant that is equal to the extra load your equipment is carrying today—call your Union Oil Resident Manager for a supply of Unacal Truck-Bus Oil—now.

When you say, **"Make it ROEBLING *'Blue Center'*"** *you buy a lot of things that can't be wound on a reel*



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 possible cost. You can leave that part to Roebling.

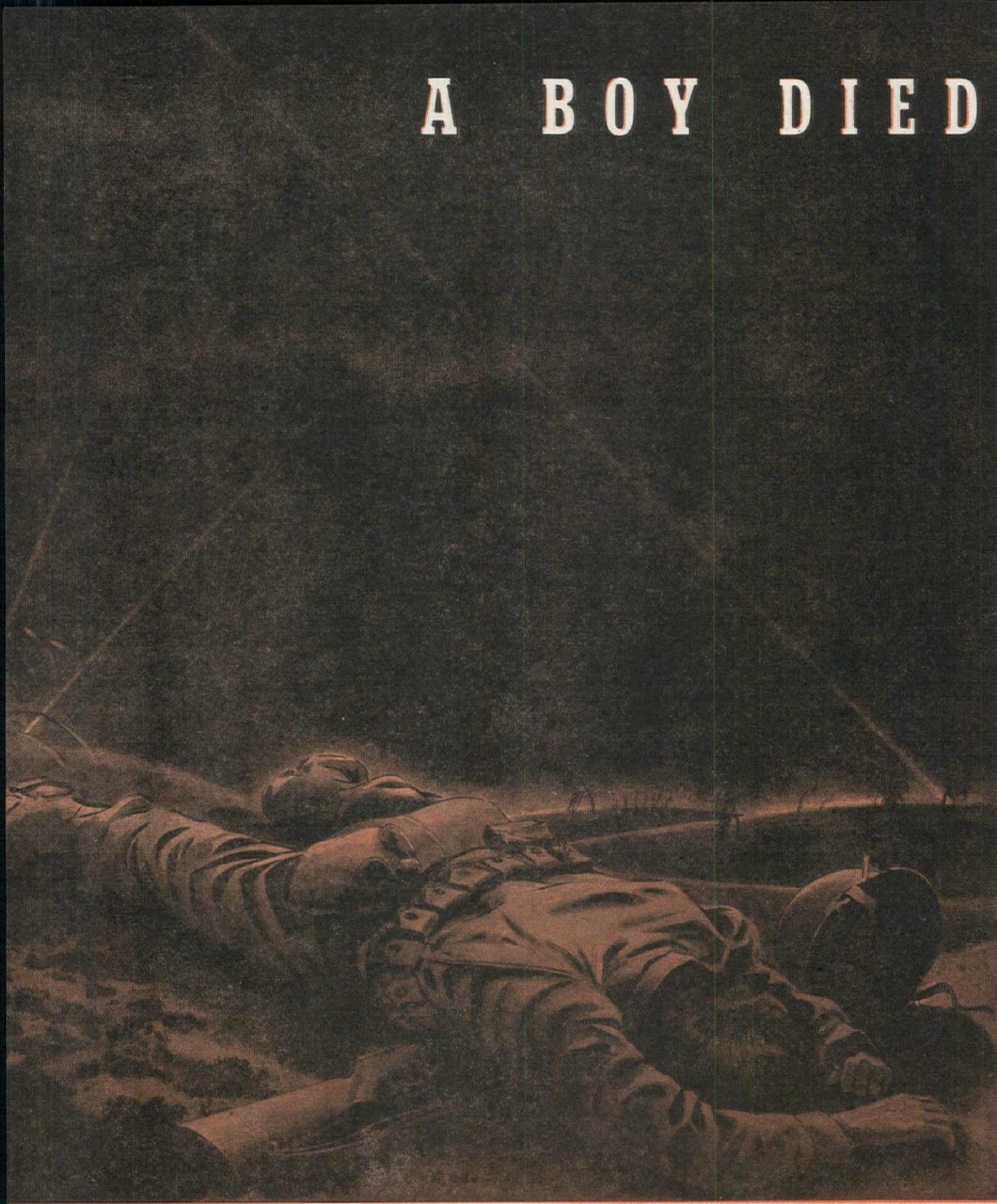
JOHN A. ROEBLING'S SONS COMPANY OF CALIFORNIA
San Francisco • Los Angeles • Seattle • Portland

ROEBLING

PACEMAKER IN WIRE PRODUCTS

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

A BOY DIED



HOW TO HELP WIN THE VICTORY.... AND PEACE:

- Place idle equipment in essential industries
- Make your machines last by keeping them repaired
- Urge completion of plans for postwar projects
- Help plan jobs for returning service men

LAST NIGHT..

A BOY died last night. It doesn't make much difference now about his name. It might have been your son, your brother, your husband. The important thing is that he died, in poignant and awful loneliness out somewhere on a waste of sand, out in a starless silence, 10,000 miles from home.

"Missing in action" read an obscure line in this morning's communique. That was all. Now he lies there, a crumpled, twisted mass of flesh, that yesterday was his body. The fine head and the shining face and the broad shoulders remain only in a picture that looks out upon a quiet living-room on a shaded street an eternity away.

Last night, in those agonizing hours of unspeakable isolation, he went through a thousand deaths without the one thing that might have helped a little — the sound of a familiar voice, the pat of a friendly hand. Many people died last night in their beds at home, surrounded by those who cared. Last night he died in utter desolation in an unimaginable loneliness.

The pain was terrible enough. But then there had to be that dreadful burden of thought in those endless last hours. Mom and Pop. The flowers blooming again in the backyard. The good old roadster in the driveway. That last sweetheart kiss at the station. Those dances last summer. That half-finished letter in his blouse. All those plans for the future. Couldn't somebody find him, please? The wracking pain again.

Too much for you, all this? But it really happened last night, just like that. It's going to happen a thousand times — ten thousand times, and perhaps a million times in the nights to come. If people could only understand it. If they would just grind deep into their thinking the stark, terrible reality of it, every petty, selfish interest would be swept away. They would sacrifice anything and everything just to make themselves worthy of that boy.

He died last night, you see. There's no way to get around that.

— John H. Hoagland in the Louisville Courier-Journal

Reprints of this advertisement available on request

Donate your blood . . . Buy and keep War Bonds . . . Turn in scrap metal . . . Save waste paper . . . Never pay over ceiling prices!

ALLIS-CHALMERS

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

Specify AIRCO quality welding supplies

"Tops" for every gas and arc welding need

AIRCO GAS WELDING RODS

Airco No. 1 Alloy Steel Rod

Developed especially for gas welding of steel plate and pipe comparable to Grade A and Grade B pipe analyses. Outstanding among its features are the high ductility of deposits, smooth flowing qualities, and resistance to heating. Five sizes from 1/16" to 1/4"—36" lengths

Airco No. 7 Mild Steel Rod

A smooth flowing, copper-coated rod of dependable, uniform quality for general gas welding of steel plates, sheets, pipe, etc. Seven sizes from 1/32" to 1/4"—36" lengths.

Airco No. 9 Cast Iron Rod

A very high quality cast iron rod, free from sand or scale. It flows freely and produces clean, sound, soft machineable welds. Sizes, 3/16", 1/4", 3/8" in 24" lengths and 1/8" in 18" length.

Stoody Hard Facing Alloys

A complete line of alloys for building up wearing surfaces by oxy-acetylene flame and electric arc welding. These alloys are furnished in types to meet every service condition.

Save buying time

use AIRCO'S illustrated price list of gas and arc welding supplies

This handy booklet gives full details on Airco's comprehensive line of accessories for every gas and arc welding need. Rods, fluxes, brazing alloys, hose, goggles, gloves and many other welding essentials are listed with prices, sizes, and shipping details. Mail the coupon for your free copy.

WCN

Air Reduction Sales Co.
60 E. 42nd St.,
New York 17, N.Y.

Please forward as soon as possible:

☐ Airco Gas and Electric Supplies Price List.
☐ Airco Electrode Price List.

Name.....
Company.....
Address.....
City..... State.....

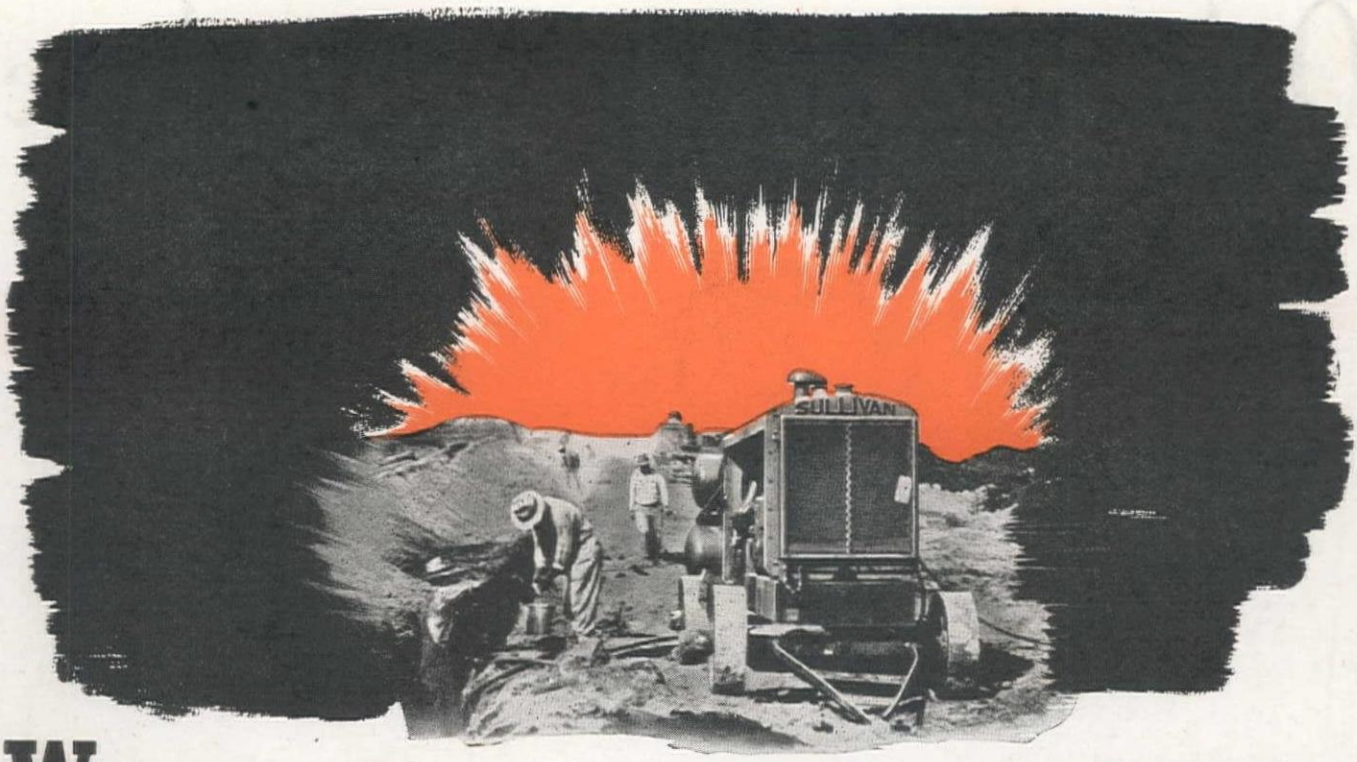
★ BUY UNITED STATES WAR BONDS ★

AIRCO WILSON

AIR REDUCTION

General Offices: 60 East 42nd Street, New York 17, N. Y.

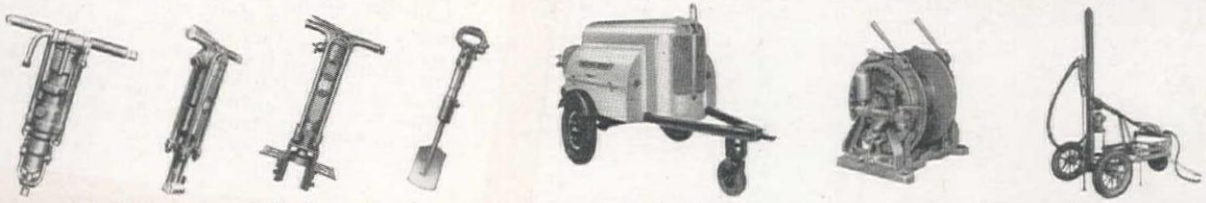
Western Offices: San Francisco, Calif.; Emeryville, Calif.; Portland, Oregon; Los Angeles, Calif.; Seattle, Washington



Where will you stand if you DON'T insist on this margin of Superiority?

Big though the post-war construction boom promises to be, the signs all point to contracts awarded on the basis of narrowly figured costs. And where will you find a margin over competition if not in the equipment that turns blueprints into finished jobs? Where will you stand if you *don't insist on* the equipment with the utmost speed, economy, and dependability? That is why shrewd contractors are opening up the question of "*what* equipment?" all over again, and this time making the choice on the basis of cold and factual comparisons. If *you* do *that,* you will come out with the same answer as a growing number of other contractors. 92 years of Sullivan "know-how" is more than just a catch phrase. It means extra footage drilled, extra economies in maintenance, extra length of service...jobs finished faster. Arrange *now* to be high on a priority list that later will be crowded. . . . SULLIVAN MACHINERY COMPANY, Michigan City, Ind. In Canada: Canadian Sullivan Machinery Co., Ltd., Dundas, Ont.

OFFICES: Birmingham, Ala. • Boston, Mass. • Butte, Mont. • Chicago, Ill. • Claremont, N. H. • Dallas, Tex. • Denver, Colo. • Duluth, Minn. • El Paso, Tex. • Huntington, W. Va. • Knoxville, Tenn. • Los Angeles, Calif. • Middlesboro, Ky. • New York, N.Y. • Pittsburgh, Pa. • Portland, Ore. • Salt Lake City, Utah • San Francisco, Calif. • Seattle, Wash. • St. Louis, Mo. • Washington, D. C.



From left to right: Sullivan L-57 drill, K-81 Paving Breaker, Q-81 Sheeting Driver, M-2 Spader. Through most of the line the famous Sullivan Dual Valve is used . . . self evident proof of this exclusive feature's functional superiority.

Toughest compressor test is use in rental fleet. Choice of Sullivan Zephair Compressors by largest fleet owners testifies to Zephair's construction, design, dependability.

Power, compactness, long life feature Sullivan "Turbinair" hoists, for all construction work. Positive brakes. Oversize drums. Simple design.

Maneuverability, positive brakes, hydraulic drill positioning are some of reasons contractors prefer Sullivan Wagon Drills . . . outperforming others on every job.

There Is No Substitute for Experience • Sullivan Experience Is 92 Years Long and World-Wide

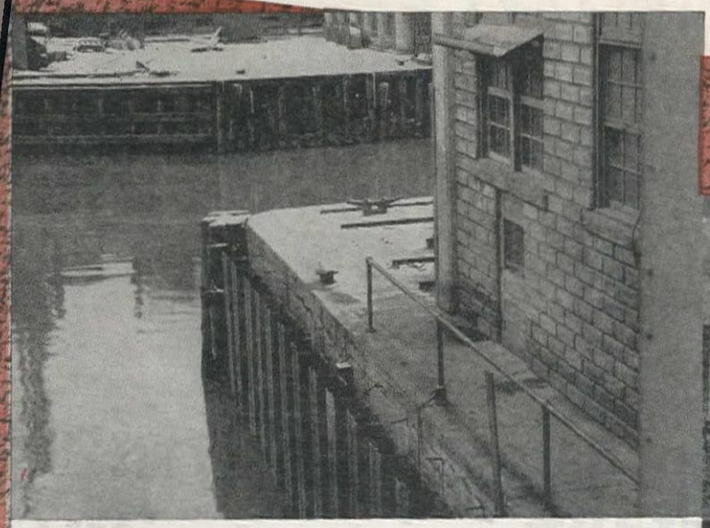
PRODUCTS

PORTABLE COMPRESSORS • STATIONARY COMPRESSORS • ROCK DRILLS • WAGON DRILLS • CORE DRILLS • PORTABLE HOISTS • SPADERS • PAVING BREAKERS • TRENCH DIGGERS • SHEETING DRIVERS • *AND OTHER PNEUMATIC TOOLS.*

SULLIVAN

CONTRACTORS' EQUIPMENT PROVED THE WORLD OVER

Only *Steel* can give you these



STEEL Piling keeps earth and water in its place—economically

In cut-off and core walls for dams and dikes, in wharves, slips, seawalls, jetties and groins, in bridge pier retaining walls and in railroad and highway abutments, U·S·S Steel Sheet Piling offers easily driven construction that is strong, rugged and lasting. Driven in single units it forms a wall that is sand-tight and continuous and that can be made water-tight—an invaluable and versatile construction medium for any project involving the retention and control of earth or water, it offers the double advantage of speed and economy.

U·S·S Steel Sheet Piling is produced in straight-arch, arch-web, and Z-sections in a complete range of dimensions and sections.

Deep driven roots of STEEL provide safe permanent foundations

In U·S·S Steel H-Bearing Piles, engineers have found lasting safety and economy for every type of foundation job. On large jobs and small, in fresh and salt water, under buildings, bridges and viaducts, dams, piers and docks, these strong, permanent, easily driven H-beam piles have proved their ability to provide a secure means of supporting substructures in unstable materials of great depth. They provide valuable protection against high water and scour.

Their capacity for high unit loads, both vertical and horizontal, permits fewer piles and fewer driving operations for a given load. They are readily handled in the field by ordinary equipment, are easy to splice, eliminate jetting and withstand rough handling. They drive without heaving and insure extremely high resistance to extraction.

More than 12,000,000 feet of U·S·S Steel H-Beam Bearing Piles have been applied in foundation projects of every size and on some of the toughest piling jobs ever undertaken.

Lightweight STEEL bridge flooring reduces deadload

U·S·S I-BEAM-LOK Open Flooring, weighing only 18.6 lbs. per sq. ft. reduces deadload on this bridge 7,296,000 lbs.—saving nearly 4000 lbs. per lineal foot as compared to 8″ reinforced concrete floor of equivalent strength.

This all-steel flooring is recommended wherever deadload must be kept to a minimum and where snow removal is a problem. Fire-safe, anti-skid, and self-cleaning, this smooth-riding floor goes down easily and rapidly and stays down in service. It is very strong. The carrying I-beams are a full 5″ deep which makes secondary supports unnecessary. I-Beam-Lok Open Flooring can be applied directly to the bridge stringers in spacings up to 4′ and 4′ 6″ centers to permit H-20 loadings. Also available in concrete-filled form. Our engineers will gladly discuss its economic possibilities with you.

USS

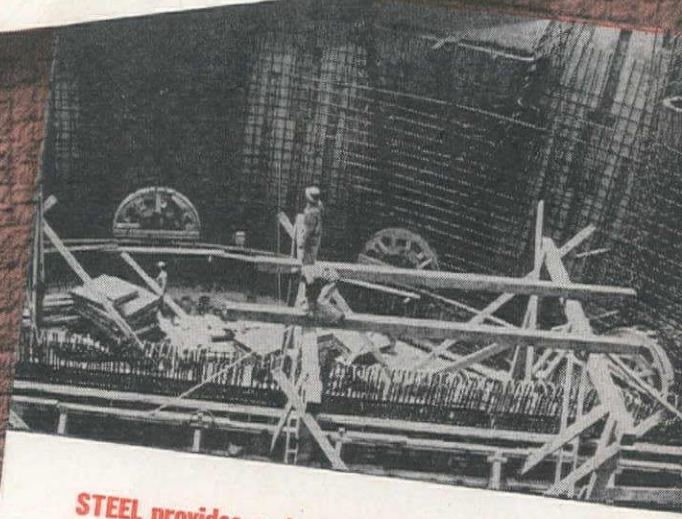
six structural advantages:

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

STEEL culverts provide low-cost efficient drainage

U·S·S Corrugated Metal Pipe combines high drainage capacity with ease and speed of installation that makes it superior for the drainage of roads and highways, for railroad right-of-way, for airports and factory wherever groundwater must be run off in a hurry.

Light, strong and easily handled it withstands vibration and impact without any ill effects. Accidental dropping won't break it, neither will the pounding of the heaviest traffic. No time consuming foundations or forms are necessary. Even the heaviest plates for large culverts can be easily handled by ordinary labor and without special tools.



STEEL provides a sturdy backbone for concrete

Add strength and long life to concrete bridge piers, abutments, retaining walls, etc., with U·S·S Concrete Reinforcing Bars. Engineers and contractors have found them the most economical and practical means of obtaining thoroughly reliable reinforcement for all types of concrete construction.

U·S·S Concrete Reinforcing Bars, cleanly rolled from *new* billet steel to standard specifications bear the symbol of the Concrete Reinforcing Steel Institute—assurance that they are made to meet the highest standards of the industry. Our distributors located in all principal cities carry ample stocks of standard sizes to insure prompt delivery.

COLUMBIA STEEL COMPANY
San Francisco, Los Angeles, Portland, Seattle, Salt Lake City

CARNEGIE-ILLINOIS STEEL CORPORATION
Cleveland, Chicago and New York

United States Steel Export Company, New York

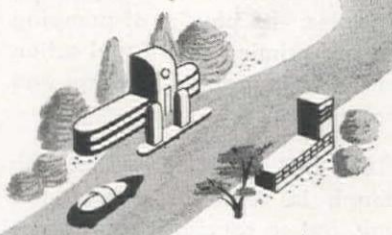
UNITED STATES STEEL


LOOK TO YOUR SUCCESSFUL
POSTWAR FUTURE WITH
MARION
SHOVELS • CRANES • DRAGLINES • PULL-SHOVELS • CLAMSHELLS
Let us help you
with your plans
THE MARION STEAM
SHOVEL COMPANY
MARION, OHIO, U. S. A.
MARION
MARION
AFTER THE WAR IT WILL PAY TO
MODERNIZE WITH MARIONS
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 Building, Portland 5, Oregon; Star Machinery Co., 1741 First Avenue South, Seattle 4, Washington.

Ready for the Nation's Highways..

Standard Steel's complete line of stationary, unit built and portable batching plants are ready now for production. New and improved features will make this equipment more than ever a leader in its field.

Standard built the first fully automatic electric batching unit. It was the first to have a predetermined accumulative cycle which was interlocked with an auto electric timer. Prospective purchasers of this type of equipment can look for more "firsts" when production is resumed. Right now, our steel fabricating facilities are turning out materials of war. However, we will be glad to give you further information and discuss any specific problems which you may have in preparation for "that time when." Send for bulletins.



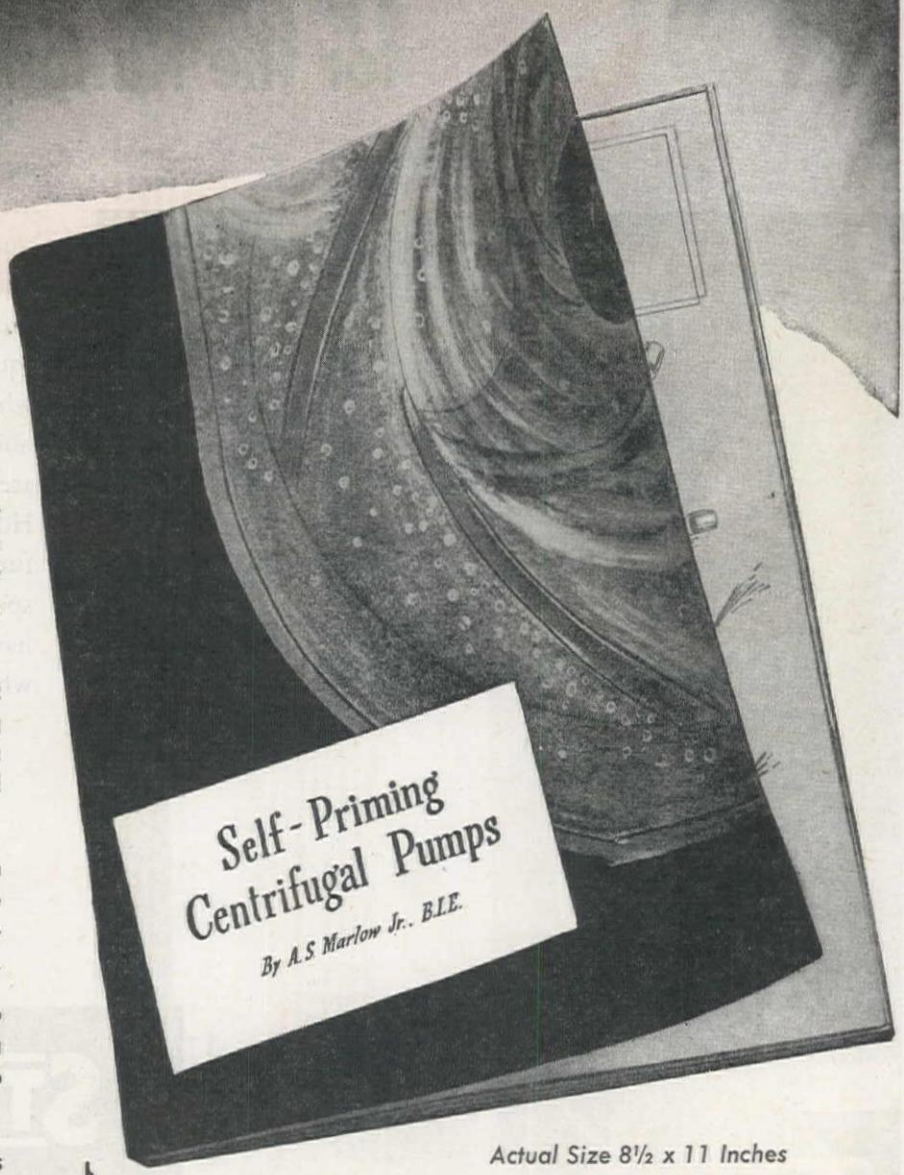
STANDARD STEEL CORPORATION

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

Other Standard Road Construction Equipment: Rollers, Paving Plants, Dryers, Subgraders, Finishers, Brooms, Materials Handling Equipment.

FREE! The FIRST AUTHORITATIVE WORK on SELF-PRIMING CENTRIFUGALS!

FOR YOUR LIBRARY. Knowledge of this "new kind of pump" is essential today in dozens of fields. This long-needed textbook (the first work of its kind) covers the subject thoroughly, gives the important facts you should have.



Actual Size 8½ x 11 Inches

BRILLIANTLY WRITTEN—Technical but simple. Facts are presented in a clear, direct order that the engineer will admire . . . and even the schoolboy can understand.

PROFUSELY ILLUSTRATED — Hydraulic principles, the physics of pumping and self-priming centrifugal action are shown in graphic drawings and photographs.

COMPLETE BUT CONCISE — Thorough enough to serve as a reference work, but so concise it can be absorbed in half-an-hour's reading.

GIVES INSTRUCTIONS — Tells how to install and operate self-priming centrifugals . . , where and how to use them.

PRAISED BY AUTHORITIES—Engineers and professors who have reviewed this new textbook recommend it enthusiastically. If you find progress interesting, you will want a copy . . . and are cordially invited to send for it.

MARLOW PUMPS

Manufacturers of Pumping Equipment

RIDGEWOOD, NEW JERSEY

FILL IT IN
TEAR IT OUT
MAIL IT TO US

MARLOW PUMPS,
RIDGEWOOD, NEW JERSEY

Please send me a copy of the new textbook "Self-Priming Centrifugal Pumps."

NAME.....

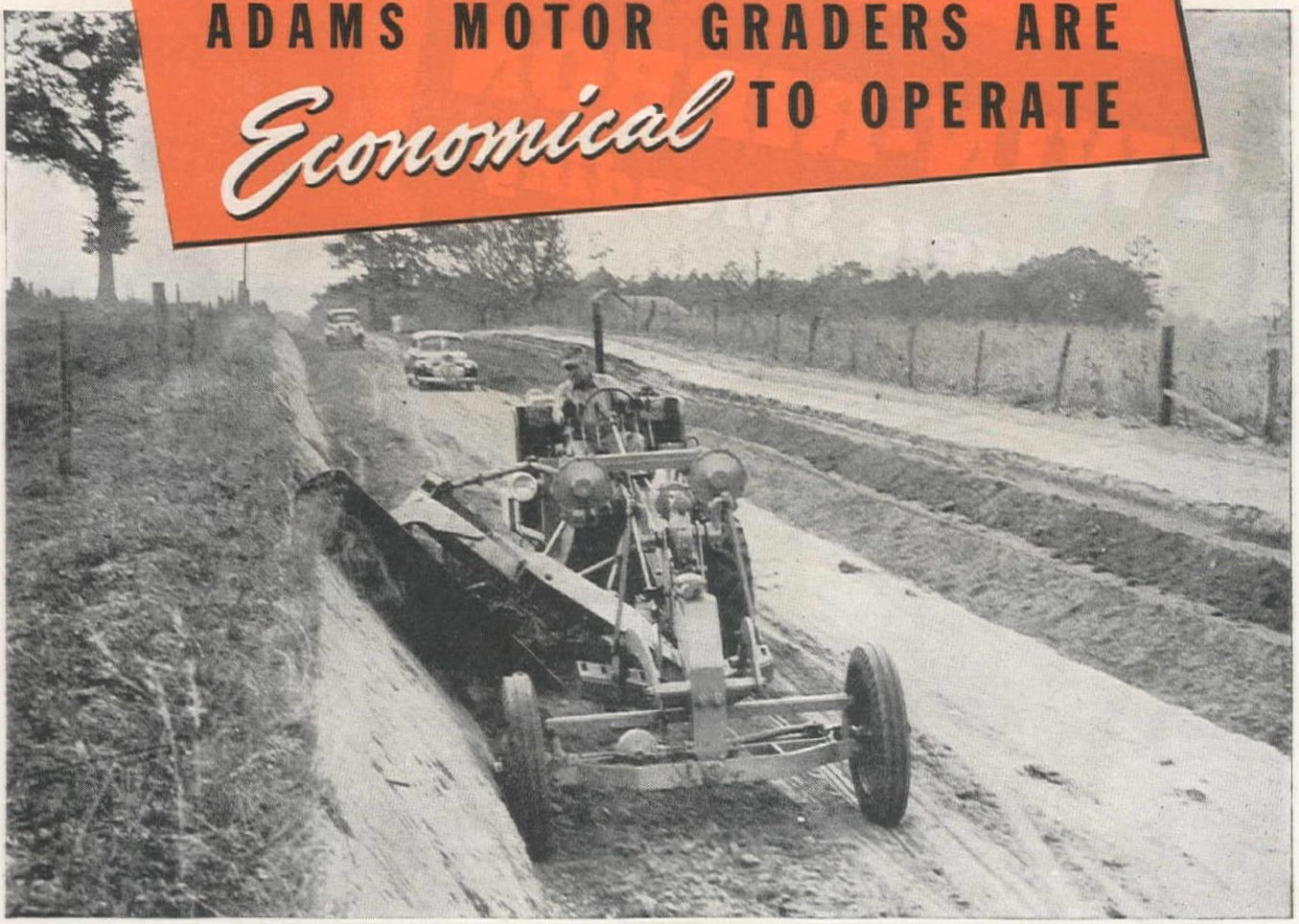
POSITION.....

STREET.....

CITY.....STATE.....

WCN

ADAMS MOTOR GRADERS ARE *Economical* TO OPERATE



One of a series of ads on Adams motor grader features

ECONOMICAL motor grader operation involves two considerations—(1) daily operating cost and (2) the machine's ability to stand up under hard usage without excessive repairs. On both considerations Adams are tops.

As to fuel consumption, there are plenty of Adams heavy-duty motor graders doing hard work today on two gallons or less of low-priced Diesel fuel per hour . . . As to maintenance, Adams machines, with their strong, all-welded and machine-finished construction, seldom need repairs; use the adjustments for wear and they will run for many months without repair parts. The International Diesel engines used have enviable records for economy and when repairs are needed, parts and service are readily obtainable anywhere at fair prices.

Add to this economy of operation their ability to adapt themselves to a wide variety of work, their abundance of power and their ease of operation and you have in Adams motor graders all of the qualities you are looking for. Plan now to standardize on Adams and ask your local Adams distributor for further details.

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 ☆

TWIN-RIBBON Concrete Spreading

• Koehring Paver stability permits practically right angle pouring. Bucket can travel to end of boom for maximum spreading area.

CUT BATCH CYCLE TIME...

Koehring Pavers, Twinbatch and Unibatch, have the special fast spreading Twin-Door boom bucket. Twin doors, both opening same direction, provide Double-Quick Dumping and Spreading. Twin ribbons of concrete are spread on the grade. Action is instantaneous . . . large Twin-door opening is approximately 13 square feet. Full width of bottom is used for door opening. No choking at bucket doors with dry or harsh concrete. Bucket shaking is not necessary. Seconds saved when dumping and spreading cut batch cycle time.

DEPEND ON YOUR KOEHRING DISTRIBUTOR to help you keep your equipment operating. Care for your Koehring equipment *NOW*, so it will serve you tomorrow. Koehring distributors have genuine Koehring parts. Koehring parts warehouses are at your service.

KOEHRING HEAVY DUTY

ARMY E NAVY

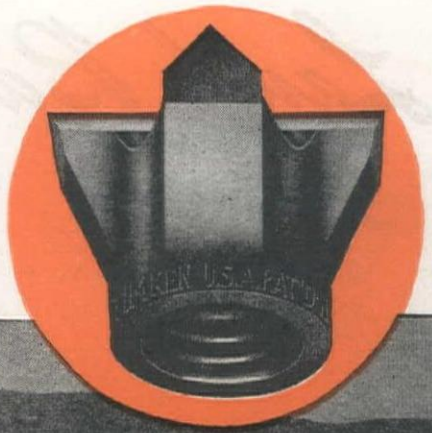
MEMBER MIXER BUREAU
AFFILIATED WITH A. G. C.

KOEHRING COMPANY
Milwaukee 10, Wisconsin

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

TIMKEN ROCK BITS

used for all drilling on the Sweetwater Falls Dam Project



The Sweetwater Falls Dam project, located near San Diego, California, presents an unusually difficult rock drilling operation. The dam is being constructed in a narrow deep canyon and the working face is nearly 300 feet high.

In this connection, the prime contractor, Macco Construction Company, writes: "We could enumerate other reasons for using Timken Rock Bits, but the elimination of steel transportation is of major importance on this project."

From Mr. Huso Festich, excavation superintendent, comes this statement: "I have found the Timken Bit to be entirely satisfactory from every standpoint." As stated above, all rock drilling on this job is being done with Timken Bits, both wagon drills and sinkers being used.

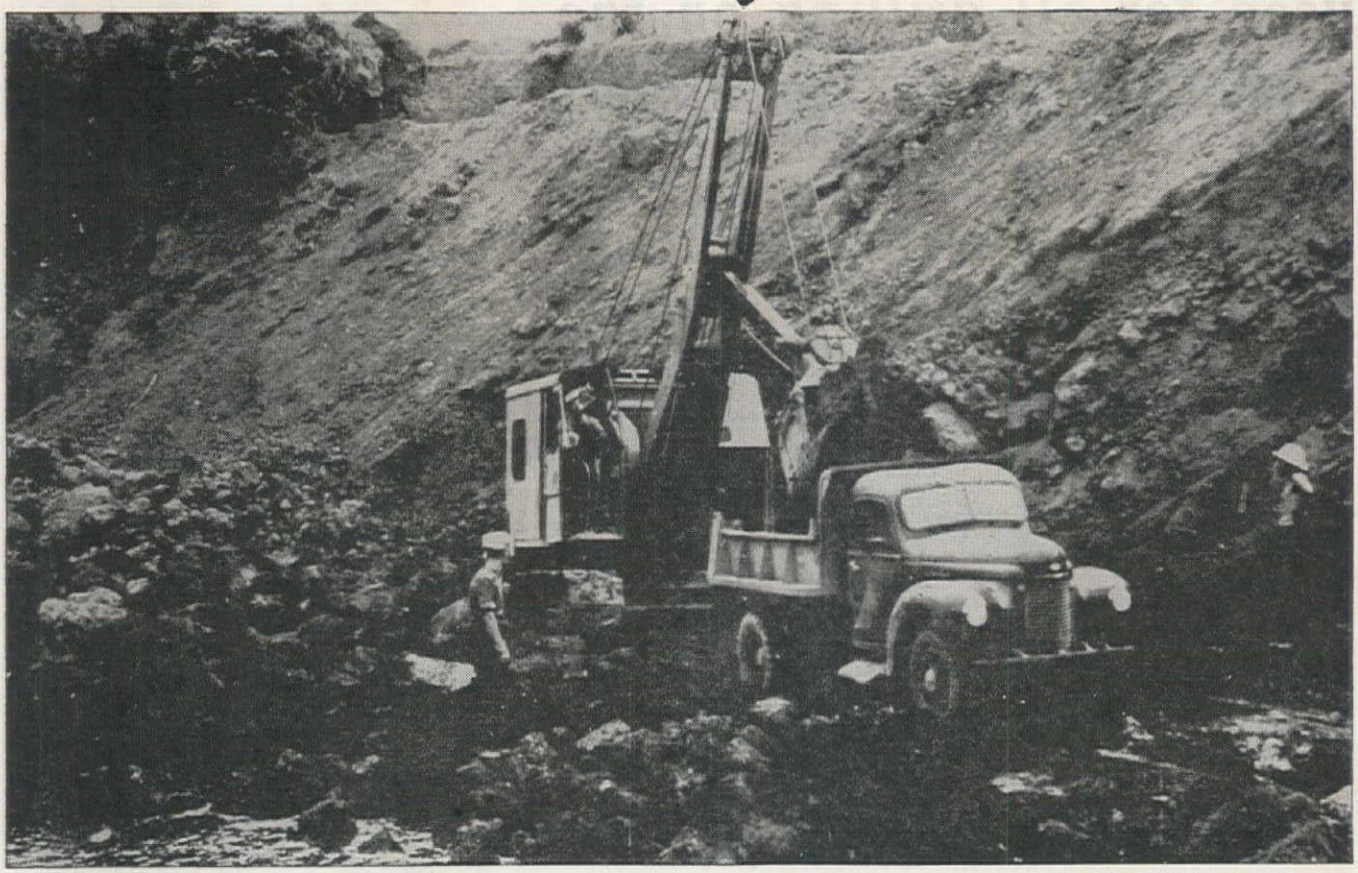
You, too, can save with Timken Removable Rock Bits — no matter what your conditions may be; for Timken Bits drill faster; last longer per use; can be resharpened a number of times, depending upon the rock being drilled; eliminate steel transportation; and avoid delay at the working face. Write for name of nearest Authorized Distributor. The Timken Roller Bearing Company, Canton 6, Ohio.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

ROCK BITS

Land Battle Wagon....



OFFICIAL U. S. NAVY PHOTO

Seabees and their International on a Tough Waterfront Job

THE SEABEES know International Trucks. They know that when the chips are down an International earns the call as a Land Battle Wagon. Here's a tough waterfront job . . . the 63rd Construction Battalion of the Seabees and an International at work.

International Trucks with the Seabees, like Internationals everywhere, are all-truck trucks. Every part and fitting is made for one purpose—stalwart truck performance. These trucks are brothers under the hood of the International Half-Tracks that are fighting on foreign fronts, powered with the same famous International Red Diamond Engines.

International Trucks are rugged. Their stamina and dependability at war and at home explain why—in the 10 years before the war—more heavy-duty International Trucks were sold than any other make.

INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue Chicago 1, Illinois

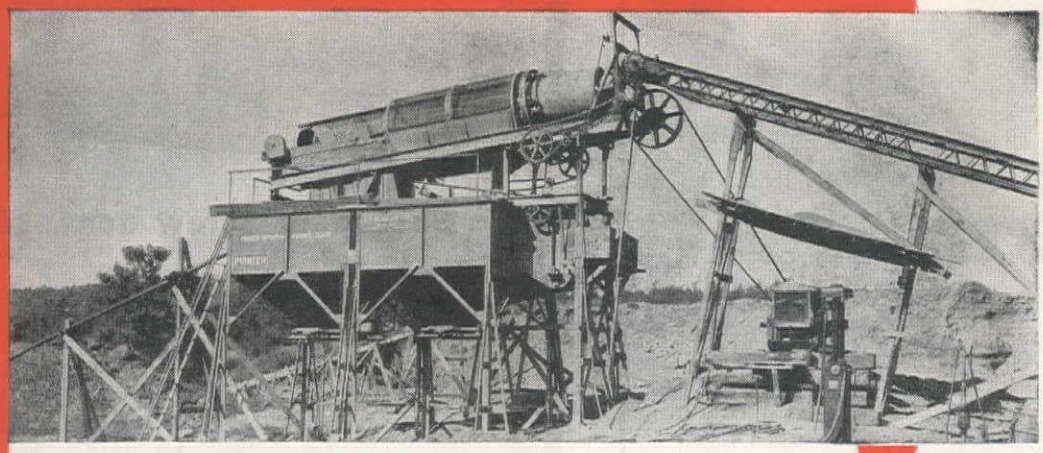
International Truck Branches located at San Diego, Los Angeles, West Los Angeles, Glendale, Fresno, Sacramento, Oakland, San Francisco, Portland, Tacoma, Seattle, Spokane and Salt Lake City.

INTERNATIONAL *Trucks*

HARVESTER

New Trucks—Now! The government has authorized the manufacture of a limited quantity of trucks for essential civilian hauling. International is building them in medium-duty and heavy-duty sizes. See your International Dealer or Branch now and get valuable help in making out your application. Don't delay!

THE BODINS ADD A PIONEER WASHER *now produce concrete aggregate*



A. A. BODIN & SONS figured that there was a profitable market in the Duluth area for washed sand and gravel that could be produced locally. They owned a 15-35 Pioneer portable Duplex Crushing Plant, which had served them well on highway work. They located a gravel pit in the city of Duluth, but the material was exceptionally dirty.

To Pioneer they came with their problem—and on Pioneer's recommendation they used their 15-35 Duplex Crushing Plant and purchased a 305-W Washing Plant to wash and separate the required sizes.

The plant consists of a belt conveyor, a combination revolving scrubber and screen, two 21 cubic yard storage bins and a paddle type dehydrator. The scrubber was designed extra long to assure complete cleaning of the unusually dirty material.

Average production is 60 tons an hour—40% is sand, the balance of 60% is divided into 3 sizes, pea gravel, ¾" to 1", and 1" to 1½". This one plant serves all the requirements of the Duluth area.

Because of the wide flexibility of Pioneer units, the Bodins, at small additional equipment investment, were able to use their 15-35 plant for crushing ahead of the washing plant, and at the same time have it available for distant locations on highway work. The Bodins are now equipped to meet the requirements of any job and any market.

● Pioneer's files contain interesting records of Pioneer owners who have made existing equipment serve new needs. In today's planning for tomorrow's production, many operators are counting on the flexibility of Pioneer equipment to meet a wide range of requirements—many of them are now taking advantage of Pioneer's long experience and helpful engineering counsel. Planning with Pioneer involves no obligation. Every opportunity to be of service to the industry is welcomed. Detailed literature on Pioneer products furnished promptly.

Pioneer
ENGINEERING WORKS
Jaw Crushers • Roll Crushers • Screens • Conveyors • Feeders • Washers
MINNEAPOLIS 13, MINNESOTA

ENGINEERS and MANUFACTURERS of QUARRY-GRAVEL AND MINING MACHINERY

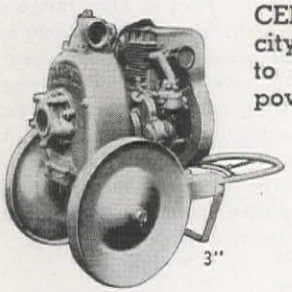
LOOK AHEAD WHEN YOU BUY

Guaranteed performance is *minimum* performance for JAEGER "Sure Prime" PUMPS

3000 Gallon "Bantam"

Contractors who watch their costs know there's a *big* difference between a Jaeger "Sure Prime" and an ordinary pump of the same size and rating. Jaeger Pumps are built to exceed their promises — deliver their rated capacity under tougher conditions, prime unfailingly and up to 5 times faster, assure you of thousands of *extra* hours of dependable cost-cutting service during the post-war building years ahead.

INDIVIDUALLY TESTED AND CERTIFIED for vacuum, capacity and pressure. Sizes 1½" to 10"; gas, electric or diesel power.



3"

10"

JAEGER DISTRIBUTORS in over 100 cities sell, rent and service "Sure Prime" Pumps.

LOOK AHEAD WHEN YOU PLAN

Jaeger's method of RE-MIXING ON THE SUBGRADE will meet tomorrow's specifications . . .

— the Spreading Screw does it!

Comparative tests by highway engineers have proved conclusively that the Jaeger Screw Concrete Spreader produces a more uniform and denser pavement slab.

By its thoro, positive re-mixing and inter-mixing of piles dumped on the subgrade, both segregation in the batch and the variations between batches are eliminated; badly placed batches are re-distributed to leave a uniform spread ahead of the Finisher; material is placed so solidly against road base and side forms as to eliminate the honeycomb problem and the entire mass compacted to a weight and density approaching that of vibrated concrete.

It is logical to expect that re-mixing on the subgrade will be specified to insure higher strength, longer life pavements.

JAEGER *Engineered* EQUIPMENT

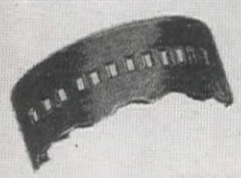
is sold and serviced by

- **EDWARD R. BACON CO.** San Francisco 10, Calif.
- **A. H. COX & CO.** Seattle 4, Wash.
- **C. H. JONES EQUIPMENT CO.** Salt Lake City 1, Utah
- **H. W. MOORE EQUIPMENT CO.** Denver 1, Colo.
- **WORTHAM MACHINERY CO.** Cheyenne, Wyo.
- **SMITH BOOTH USHER CO.** Los Angeles 54, Calif. and Phoenix, Ariz.
- **NELSON EQUIPMENT CO.** Portland 14, Ore., Spokane, Wash., Twin Falls, Ida.
- **CONNELLY MACHINERY CO.** Billings, Great Falls, Mont.
- **R. L. HARRISON CO.** Albuquerque, N. M.
- **TRACTOR & EQUIPMENT CO.** Sidney, Mont.

"MORE THAN 10% INCREASE IN GASOLINE MILEAGE!"*

Ring-Free removes carbon. Keeps pistons clean, rings free. Reduces power loss.

Ring-Free's high film strength and long cling make bearings last longer, even under overloads.



Ring-Free holds foreign particles in suspension... stops sludge formation, reduces port clogging.

You'll move more tons of material per gallon of fuel consumed if you use Macmillan Ring-Free Motor Oil. That is a simple statement of fact, and the reasons are very easy to explain.

It takes *power* to move material. It also takes power to *overcome internal engine friction.* The more internal friction is reduced, the more power you'll have for hauling material, or other productive work.

Ring-Free Motor Oil cuts friction-power-loss materially, because it *reduces friction fast.* It lubricates better because it removes carbon, has high film strength, long cling and thorough penetration.

*TESTED AND PROVED ON THE JOB

Operators everywhere find their engines run better and last longer when lubricated with Ring-Free. Power is increased, shut-downs and repairs are decreased. Operating and maintenance costs go down, production and profits go up.

You, too, will notice *immediate improvement* when you change to Ring-Free. Give it the hardest tests you can, on your toughest jobs. It will effectively answer many of your difficulties.

**"For the past seven years I have been using Ring-Free Motor Oil in my fleet. I get from seventy to eighty thousand miles before changing motors or being forced to make any major repairs. I never have any sticky valves and but slight traces of carbon, and my gasoline mileage has increased more than ten per cent."*

Henry J. Schafer, Jr., Pres.
Schafer Brothers Trucking Corp.

MACMILLAN PETROLEUM CORPORATION

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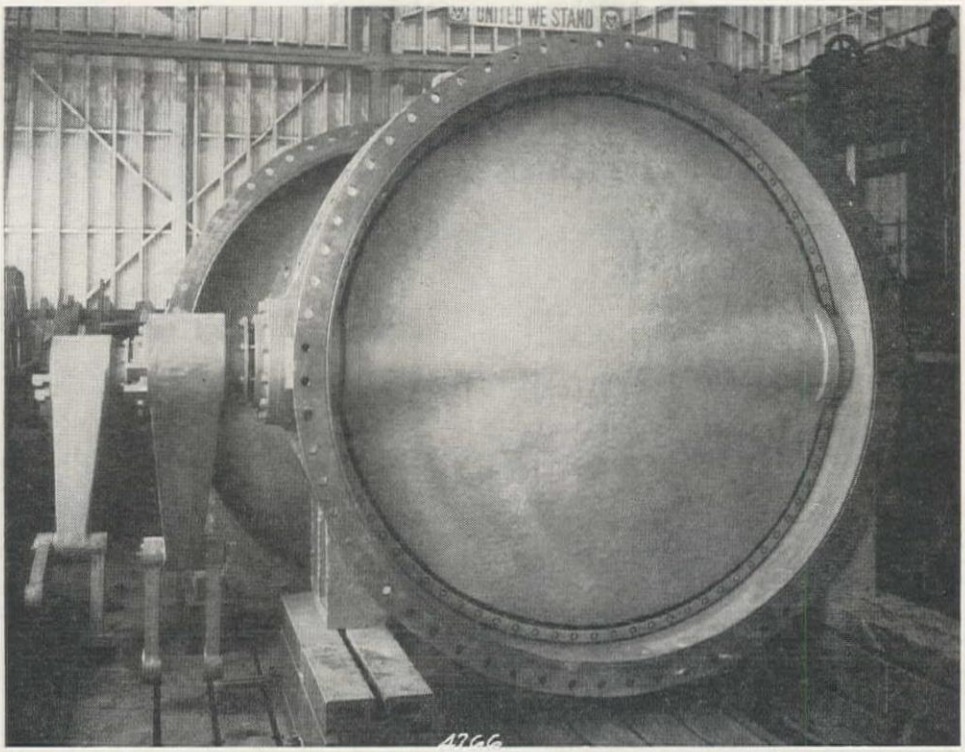

10-Foot Butterfly Valves built by PELTON for Pit No. 5

A BUTTERFLY VALVE 10 feet in diameter controls the flow of water to each of the four penstocks leading to the turbines at Pit No. 5—the 214,477-horsepower hydroelectric plant recently completed by the Pacific Gas and Electric Company.

Built by Pelton, these valves have improved contour of the discs which permit the water to flow with the least turbulence while improvements in the seal ring and seat construction end leakage.

The hydraulic operating mechanisms, not pictured here, have been developed for maximum safety and reliability under all operating conditions.

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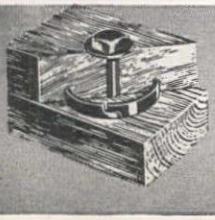

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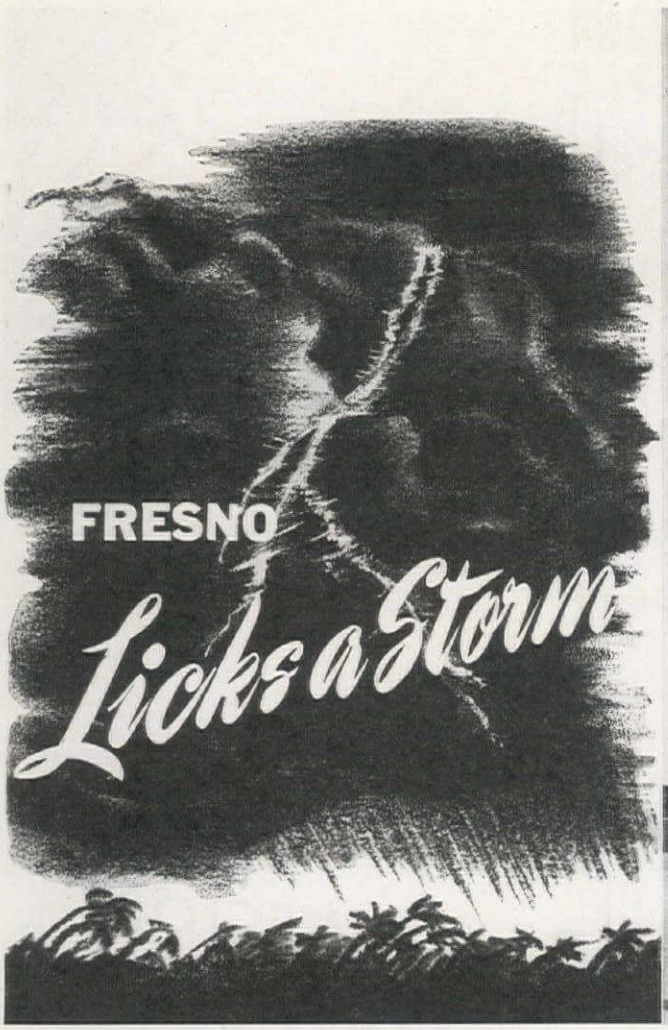

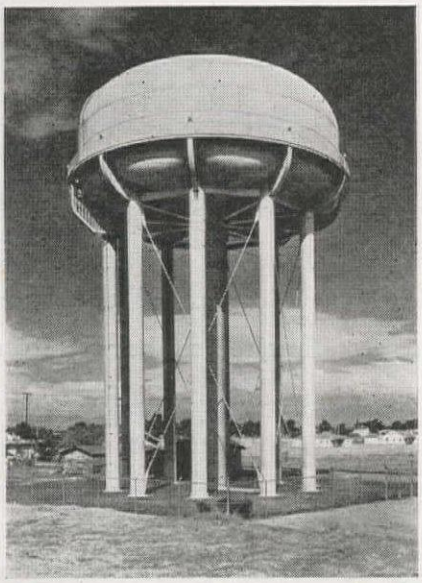

The structure directly above is the 500,000-gal. tank and the tank at the top of the page is the 1,000,000-gal. unit. Both are of Horton radial-cone bottom design.

. . . with the aid of Horton Elevated Storage

Storms hold no terror for the residents of Fresno, California, at least as far as their water supply is concerned. Once, during a nineteen-minute interval of power failure due to a storm, when the city's pumping stations were not operating, adequate pressure was maintained, with the aid of Horton elevated storage, for domestic use and for fire protection.

Since 1887, when Fresno installed a 200,000-gal. flat-bottom tank on an ornamental tower, elevated storage has been an integral part of this city's water supply system. Today there are several elevated tanks throughout the city — a 1,000,000-gal. Horton radial-cone bottom tank, a 500,000-gal. Horton radial-cone bottom structure and an ellipsoidal-bottom unit of 150,000-gal. capacity.

By providing for pumping during off-peak periods, elevated storage makes for greater economy in pump operations. And, by locating elevated storage tanks in different locations, as Fresno did, a city is able to provide more uniform distribution pressure in all sections of the system.

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WESTERN CONSTRUCTION NEWS
WITH WHICH IS CONSOLIDATED WESTERN HIGHWAYS BUILDER
September, 1944 Vol. 19, No. 9

Missouri, Yes; Central Valley, No

IN THE JULY ISSUE of *Western Construction News*, a firm editorial position was taken in support of the Bureau of Reclamation viewpoint in the Missouri Valley controversy over water development and use.

At least one of our readers interpreted that as meaning that we gave unqualified support to every Bureau proposal. Such was not our intention, it referred to the Missouri Valley only.

Just now a great to-do has been started over the limitation of acreage to be irrigated by waters from Shasta dam and other works of California's Central Valley project. Under the Reclamation Law, no one may have project water for more than 160 ac. Because possibly over half of the land in the valley is already owned in blocks of more than 160 ac., the Department of Interior has declared these lands must be broken up, or be denied the supplemental water for which the project was conceived and built.

Such limitation may be well and good where new farm land is being opened up, although even in such cases, experience has shown that one acreage limit will be owned by a farmer, another by his wife, another by each of his children, and even Aunt Sue and Cousin Bob may take out papers on some land, all of which is operated by Farmer No. 1. As a matter of fact, it scarcely seems to us to be a part of the American system of free enterprise to tell a young man, "Here is 160 ac. of choice farm land. No matter how efficient a farmer you are, or how your neighbor mismanages his land, you can never buy it or any other land, or do any bigger business. This land will give you subsistence all your life, but you can never expand."

The only reason that the War Production Board recognizes for allowing construction of Reclamation projects right now is the early production of food. The Interior Department is going contrary to this policy by forcing the limitation issue, because some vital foods, now produced in quantity in the Central Valley, simply cannot be grown and harvested efficiently on small farms. Wheat and rice are two such important Central Valley crops. Grapes, cotton, fruit, can be grown at a profit on smaller parcels. To destroy the large acreages now producing wheat and rice, for instance, will cause a decline in the production of those needed items, rather than an increase.

We're for irrigation—no regular reader can possibly doubt that. We believe the engineering staff of the Bureau of Reclamation is one of the finest in the Nation, and the technical work in the Central Valley is splendid. We object, however, to the intrusion of planning for social regimentation into these great and needed developments. We had understood we were fighting a war for the freedom of the individual all over the world, including the U. S. A.

Dear OPA: (An Open Letter)

THE WAR HAS inevitably brought shortages in almost every commodity, the two perhaps most distressingly felt in the West being gasoline and tires. You have been assigned the task, as we understand it, of determining what calls for these products are of vital importance in winning the war, seeing that those calls are fully met, and proportioning the remainder of the limited available quantity to the less essential elements.

All in all, you've done a pretty fair job, too. But unfortunately, most of the people who make your decisions have no idea of the size or importance of the West. To them it's still a colony, with Indians walking the streets (they do, too, in some of our towns!).

You know what a harrowing trip it is all the way from New York to Boston, don't you? But that long trip is less than half the way from San Francisco to Los Angeles (both of which "villages," incidentally, have populations far in excess of Boston and are producing vastly more war material). And remember what a severe journey it is if your trip be extended all the way up to Portland, Me. Well, it still is only about two-thirds the distance from "Frisco" to "L. A." And from San Francisco to Seattle is practically the same distance as from New York to Milwaukee. Most of your executives have never even gotten as far "West" as Milwaukee, have they?

The reason for these comparisons is to point out the faulty thinking behind equal gas and tire quotas for the cozy East and the stretched-out West.

Construction contractors here are actually being handicapped for lack of heavy equipment tires. The Army and Navy bases **must** be built. You know that and now more than ever, they are needed for the Pacific area.

Unless you allow this area more heavy tires, and unless you advance the standing of the construction industry on the priority consideration list, these installations will simply not be built, or the construction period will be seriously lengthened.

(1) The area has a too-meagre tire allotment;
(2) The construction industry is too low in the preference lists.

Unless this is corrected, you will be responsible for delay in Victory, and even jeopardy to success in the Pacific war.

Fire, Fire, Fire!!!

THE WEEK OF October 8-14 will once again be observed as National Fire Prevention Week. With all eyes straining overseas, the subject of fire defense may seem trivial and prosaic. But is it?

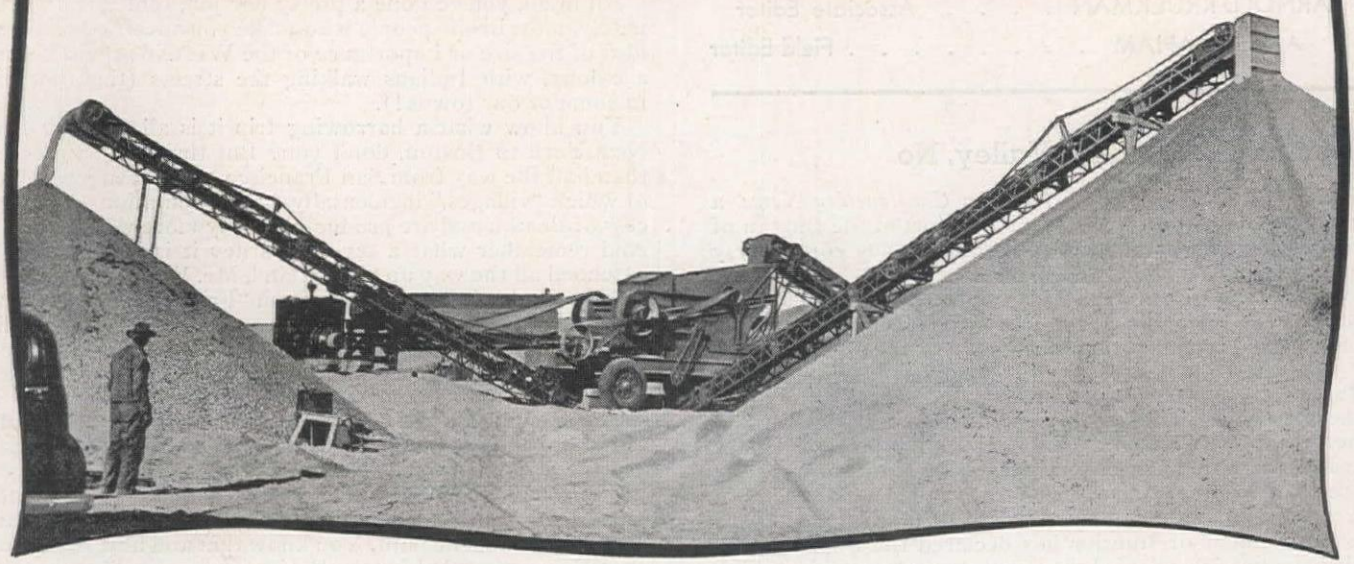
Particularly to everyone concerned with war production, fire should be a subject of major importance. Every man or woman killed or injured by fire represents a loss of badly needed manpower as well as needless grief and tragedy for loved ones. Every loss of scarce materials or interruption to production caused by fire means just that much loss to our armed forces.

Many war plants have excellent fire records, in spite of new types of hazards, green personnel, and operation under tremendous pressure. Their managements have recognized the importance of proper safeguards against fire and of a personnel trained in both fire prevention and control.

Nevertheless, we are in a period of sharply increasing fire losses, piling up at the rate of more than a million dollars a day at last report. This can mean only that too many people are still "taking a chance." The tragedy of these fires is underscored by the fact that most of them could have been prevented, or at least need not have become disastrous, if known fire defense measures had been in force.

There is nothing particularly mysterious about fire. The basic ways of preventing and controlling it are known, though methods are constantly being improved. Information is available for the asking from fire protection authorities throughout the country. In many cities, the local fire department is glad to help in the training and organization of plant or job fire brigades.

"PEAK PERFORMANCE"



Handling approximately 300 tons of material per hour in an Ordnance Plant, this Primary Unit of an Austin-Western Twin-Unit Plant, with its 1036 Jaw Crusher, produced (in the pile at the right) pit fines to be used for secondary roads; and (in the pile at the left) minus 2″ crusher-run rock for base course. At the same time, the Secondary Unit, with its 4022 Roll Crusher, was 100 miles away, producing surfacing material for black-top roads. The two were demonstrating one of several reasons why the Twin-Unit type of Plant is the logical selection for many operators.

Each Unit of the Austin-Western Twin-Unit Plant is capable of producing material that meets the requirements of many jobs—and producing it more efficiently than would be possible with a two-crusher Plant. The complete Twin-Unit Plant, on the other hand, has a capacity and a variety of output far greater than that of any two-crusher Plant. Thus, for maximum output and variety of specification on the one hand, and maximum economy of operation on the other, the owner of a Twin-Unit Plant has the flexibility of operation that spells maximum profits

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

All photos by Richard Finnie.

Canol Project—
Controversial Fuel Line Completed

Construction of the Canol project represents a remarkable achievement in overcoming weather and wilderness which combined to test the courage, initiative and capacity of construction men —The project is one of the largest self-contained petroleum systems ever built as a unit from field to refinery to consumer

THE CANOL PROJECT is now operating, transporting crude oil from remote and extensive fields in the shadow of the Arctic Circle, across the vast wilderness of northwestern Canada to be refined at Whitehorse, Yukon Territory, and from there distributed as gasoline east along the Alaska Highway, south to the seacoast, and north to central Alaska.

The crude oil travels 581 mi. from the field at Norman Wells to Whitehorse. From that point the gasoline lines extend 596 mi. northwesterly to Fairbanks, 300 mi. southeasterly to Watson Lake, and 110 mi. southerly to Skagway. The project is gigantic in conception, magnificent in operation, and "impossible" of construction.

With typical American ingenuity, talent and drive, however, the "impossible" has been accomplished and in 20 months the snow-swept Canadian mountains were conquered, and gasoline from the oil pool on the Mackenzie River was powering highway and war equipment in the critical Alaska defense area. Forbidding mountains, utter inaccessibility, and month after month of below-zero weather were but challenges to be met and overcome in this great battle of supply for the American war machine. The Army Engineers, Bechtel-Price-Callahan, the contractors, and an army of civilian field workers, combined to enact one of the greatest construction stories ever unfolded.

Canol is one of the largest and one of the very few self-contained petroleum systems ever built as a unit, from field to refinery to user. Any consideration of the Canol achievement inevitably will be an evaluation of Western construction courage and capacity, for not only was the contractor a Western firm, but most of the key people engaged in the work were from the Pacific Coast and a large percentage of the workers hailed from the same area.

History

The basis for the Canol project is, of course, the oil field at Norman Wells, on the east shore of the Mackenzie River. Oil was first discovered at this point in 1789 by Alexander Mackenzie, during exploration of the river. He found seepages of crude oil in the district. No attempt was made to develop an oil field there until 1919-20, when Imperial Oil Co. (the Canadian subsidiary of Standard Oil Co. of New Jersey) drilled the first well.

Because of the lack of a market, there being few users of petroleum within a

radius of many miles, the field was closed down in 1925. However, a radium mine was opened on the shore of Great Bear Lake in 1932, which gave the field a customer, and the wells were reopened and new drilling was commenced. Production has been continuous since that time.

In 1939 a small but modern and efficient 840-barrel per day refinery was built at the Norman Wells field. Part-time summer operation supplied the demand for petroleum products. In 1941 the output of the plant was slightly under 24,000 barrels of gasoline and oil.

On May 20, 1942, the War Department executed contracts for the additional development of the field, and for the construction of the pipeline to Whitehorse. Participants in the petroleum production portion of the oil field project were Imperial Oil Co., as producers, and Standard Oil Co. of California, as consultants and operators of the pipelines and refinery, on a non-profit basis.

At the start of the expanded field operations, three wells were operating, and about 30 new wells are now either producing or are being developed. While conditions at the outset were considered favorable for increased production, geologists declined to guarantee the Army's original quota of 3,000 bbl. per day. Actual results, however, are far better than the most optimistic forecasts. Already a daily production of 20,000 bbl. is predicted, and the area on the west side of the Mackenzie River (reported to be the most favorable potential field by Canadian government geologists) has yet to be tapped.

The crude oil at Norman Wells flows freely from the wells, no pumping being required. Drilling is not difficult, the wells being shallow, ranging from 1,200 to 2,000 feet in depth. The oil is a high grade paraffin base substance, but is low in content of actual paraffin wax. The crude oil has been used as diesel fuel without refining, needing only slight adjustment in fuel pumps. The fluid will flow at 70 deg. F. below zero, according to actual tests. This is extremely important, in view of the sub-zero temperatures obtaining along the pipeline during the winter months.

There are two distinct features to the Canol project. The first, and the one which had to be licked before construction could commence, was the transportation problem. This was so difficult, and the methods employed to overcome it so diversified and interesting that a special article will be devoted to Canol transportation in the October issue of *Western Construction News*.

The second feature was the actual construction work, which went forward as rapidly as material supply would permit, and without regard to weather.

The pipeline

Canol is essentially a pipeline job. The first section, from the Norman field to Johnson's Crossing of the Teslin River by the Alaska Highway, thence along that newly constructed thoroughfare to Whitehorse, is 581 mi. long, constructed of 4-in. steel pipe, except for the last 120 mi., which for reasons of hydraulic gradient, are of 6-in. steel pipe.

The Whitehorse-Skagway gasoline line, which was the first section actually completed, because it was possible to bring in the necessary pipe by water to Skagway, located at the head of navigation on the so-called Inside Passage, is also a 4-in. steel line. The pipe for this section was all strung and welded early in 1943, and gasoline delivered to Skagway by tanker from the United States was being pumped, in reverse of the ultimate plan, to truck filling stations along the Alaskan Highway.

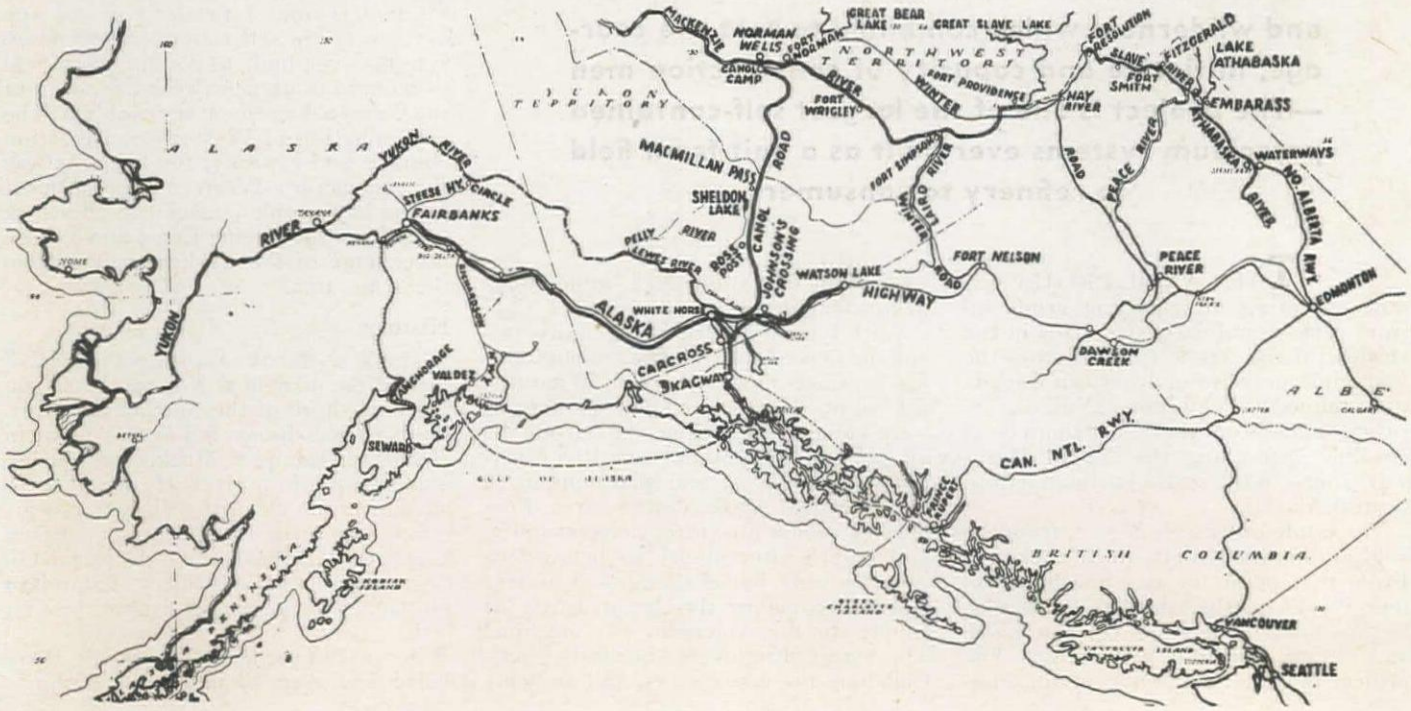
The second unit completed was the Whitehorse-Carcross-Watson Lake gasoline line. This is constructed of 2-in. screw pipe. The 596-mi. Whitehorse-Fairbanks gasoline line is made from 3-in. steel pipe, welded.

On all the pipeline routes the extremes of weather, rough terrain and mosquitoes fully lived up to the contractor's warning to prospective employees, "This is no picnic." At no place was the going easy. But the gasoline lines to Watson Lake and north to Fairbanks had the advantage of being built in proximity to the Alaska Highway, providing ready access for men and materials. Work proceeded on normal, or nearly normal, schedules, with the result that these lines were completed in advance of the main trunk line from field to refinery.

Pipe laying along the route of the crude oil line began in 1943. Crews from Whitehorse and Canol Camp (across the Mackenzie River from Norman Wells) worked from both terminals toward a common meeting point. The initial part of the line was a submerged crossing of the Mackenzie River nearly four miles in length.

Creek and river crossings were made underwater in most cases, though occasionally by trestles and suspension structures. Pipe laid under the larger streams was anchored, and buried underground at the banks to avert river ice pressure during break-ups.

While in most instances of underwater stream crossings, the required length of pipe was welded together on shore and then pulled across the stream by cables attached to tractors on the opposite bank, this system was not suitable for the Mackenzie crossing, even though the total length of 4 mi. was split by bringing the line to the surface on an island approximately half-way across. In the case of this crossing, long sections were welded on a wharf. The head end of one of these was then carried out on a barge, the pipe trailing behind. As the tail end of each fabricated section neared the end of the wharf, progress ceased



LOCATION of the Canol project—Crude oil flowing from the Norman Wells is pumped through a pipeline, adjacent to the Canol Road, to the refinery at Whitehorse. From Whitehorse pipelines carry gasoline to Skagway, Fairbanks and Watson Lake for distribution to consumers.

long enough to weld on another section. Motive power for pulling this pipe into the riverbed was furnished by a tugboat lashed to the barge, and assisted by a hoist mounted on the island.

Submarine examination of the line after being pulled into position showed several bad kinks, caused by the current. To correct these conditions, the damaged sections were raised onto barges, where workers cut out the deformed portions and replaced them with new pipe. No damage was reported in the other stream crossings.

Methods and techniques employed in pipe laying were the same throughout the project. The line was laid on top of the ground, the experiments previously referred to indicating that no interruption to flow would occur because of the temperature. No support was given to the pipe, it following the contour of the country in all its major variations. Joints were welded throughout, thus producing a single continuous line. There was no need for flexible joints, it being anticipated that variations in length due to temperature changes would be compensated for by the horizontal bends in the line and the vertical curves as it followed the ground.

The pipe was delivered to the job in 22-ft. length, sometimes double-ended at the pipe yard before stringing along the access roads. All section ends were bevelled before delivery to the job.

Common practice called for the utilization of the edge of the cleared road area as the pipeline right-of-way. Occasionally, it proved more economical to construct a shorter right-of-way at some distance from the road. Pipe, usually, was stockpiled at frequent intervals along the route, and strung as welded. This was done to prevent loss of single lengths under snowdrifts.

The field sections were tack-welded after lining up with a detachable clamp. A tractor equipped with a side boom hoist held up the pipe while the tack welds were made, and then lowered it onto blocks which held it about 2 ft. off the ground. The final welding crew completed the joint in two passes, it being necessary for the operator to lie on his back to make the under weld, because it was impossible to roll the pipe. All joints were peened by hand after welding to relieve welding stresses. Later, the completed line was lowered from the welding blocks by another crane-equipped tractor.

Completed sections of the pipe were blocked off and tested for leaks by compressed air.

Welding current was furnished by portable electric generators, gas-driven, and mounted either on small trucks, or sleds fabricated from scrap pieces of the pipe, dragged to position by tractor. Extra long welding leads permitted freedom of movement by the welders without frequent re-positioning of the welding sets.

Pumping stations

The crude oil line from Norman Wells to Whitehorse was nominally designed to transport 3,750 bbl. per day of Norman crude with an oil temperature of minus 30 deg. F. The line's capacity will vary according to temperature and the characteristics of the oil being pumped up to a daily volume of 4,000 bbl. or slightly more. The crude oil line has been built for 1,600 lb. maximum operating pressure.

Between Norman Wells and Whitehorse ten pumping stations have been built at varying distances apart according to requirements, but with an average spacing of about 50 mi. Oil traveling this route is lifted to an elevation of nearly 6,000 ft. above sea-level at a point approximately 100 mi. from the initial pumping station, and again at Macmillan Pass on the Mackenzie-Yukon Divide to an elevation exceeding 5,000 ft.

The Skagway to Whitehorse gasoline line is served by two pumping stations, located at Carcross and Skagway. Fuel unloaded from tankers at Skagway during the construction period was pumped northeast over White Pass Summit from tidewater to an elevation of almost 3,000 ft. by the Skagway station. Fuel is pumped through the Carcross station, which also serves the Carcross to Watson Lake section. The Watson Lake line is activated by four additional pumping plants.

Fifteen booster stations were constructed on the Whitehorse-Fairbanks line. They are spaced at approximate 50-mi. intervals.

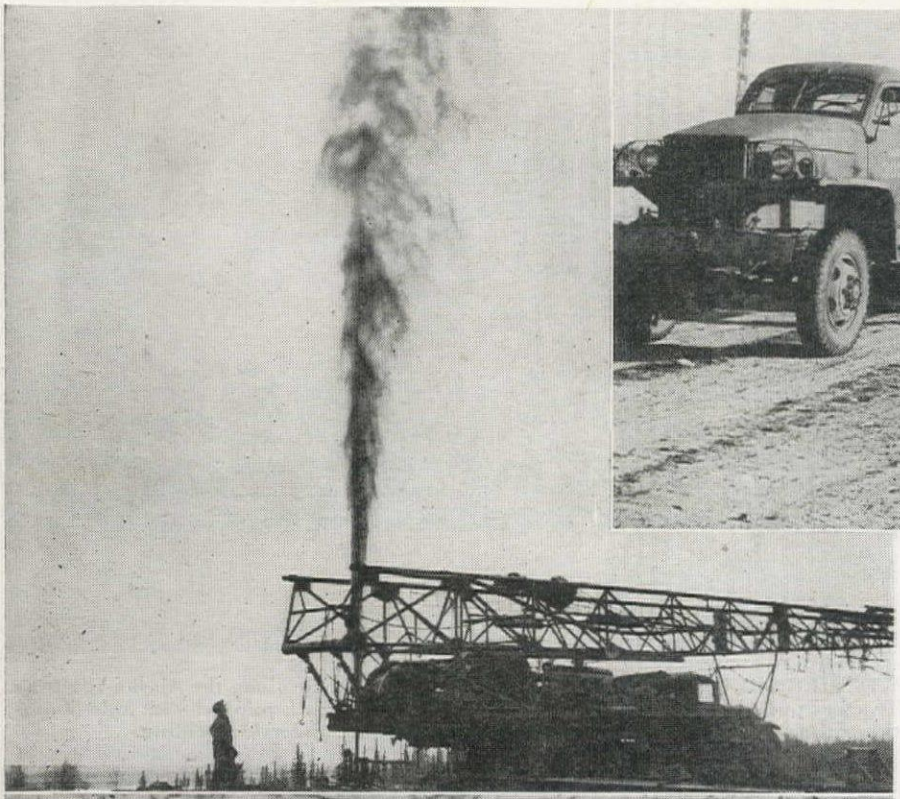
In general, the pumping stations are similar in design and equipment. Power is furnished at each station by three diesel engines along the crude oil line and the Skagway-Whitehorse line, and by gasoline engines along the other sections. Fuel for engine operation is generally drawn from the lines. Flow differentials are equalized at the stations by means of equalizer tanks. Outlets on the finished-products lines have been provided at airports and other service points along the routes.

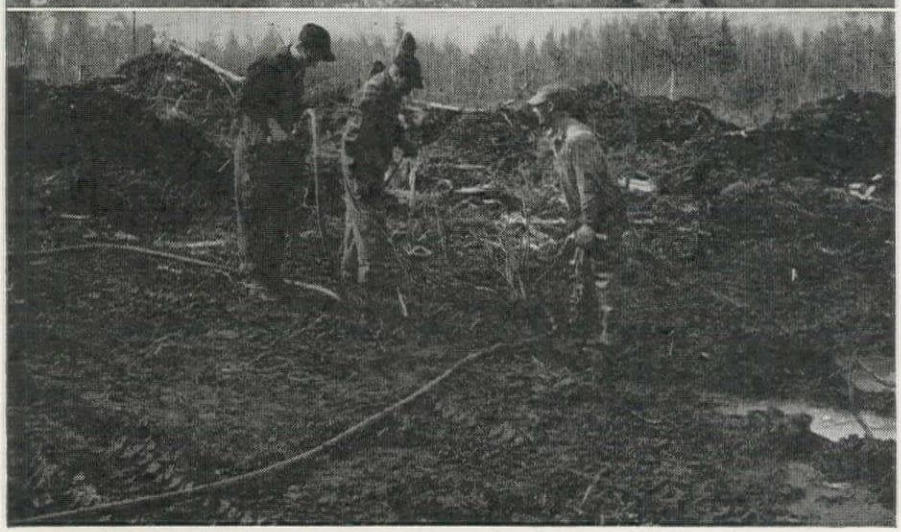
WELDING CREW working on 6 in. line from Whitehorse along the Alaska Highway. Tractors pull sleds carrying portable welding machines. Equipped with side booms, they raise and lower the line from blocks to facilitate underside welding.

Storage tanks for crude oil have been established at Norman Wells and Whitehorse, and for gasoline at Whitehorse, Watson Lake, Fairbanks, Skagway and several airports. Both welded and bolted tanks were used and a number of the bolted tanks provided with welded bottoms were erected in gasoline service.

Refinery tankage at Whitehorse comprises nearly 450,000 bbl., stored in tanks ranging downward from 80,000-bbl. capacity per tank. Included in the tank farm are several Hortonspheres used for storage of light fractions processed in the alkylation and isomerization process.

BECAUSE OF THE WINTER sub-zero weather, steam-lines required heavy insulation. This three-man crew is insulating a steam-line at the new Whitehorse refinery.





The refinery

The project also involved construction of a complete refinery, including a power plant for steam and electric power generation, a cooling water system, sewer system, oil recovery equipment and other utilities. In addition, provision was made for the necessary auxiliary services by the construction of offices, a laboratory, warehouse, machine shop, garage, living quarters, and other auxiliaries.

The refinery was nominally designed to process an average volume of 3,000 bbl. per day of Norman crude, which in the actual design was interpreted as 3,750 bbl. per operating day, giving an actual daily capacity of about 4,000 bbl.

Several processes are employed, viz., crude distillation, three coil thermal cracking and reforming (The Dubbs Process), gas concentration, HF alkylation, and isomerization; plus treating, blending and Ethylizing.

Materials and equipment for construction of the refinery began to arrive at Whitehorse early in 1943. The refinery vessels were moved from points of origin to Seattle by rail, by ship to Skagway, and over the White Pass & Yukon Railway to Whitehorse. Certain vessels obtained by dismantling an existing refinery were cut into two or three sections for shipment, and new vessels were furnished in sections for final assembly in the field, because clearances in tunnels, snow sheds and on sharp curves were scant.

Construction started in the spring of 1943, and the crude distillation unit first went on stream in April, 1944. At the peak of construction operations a force varying between seven and eight hundred men were employed on this work at Whitehorse.

A substantial portion of the refinery equipment was housed with the columns

A TRUCK CONVOY (top right) poses to be photographed on the Mackenzie Winter Road. A new well (top left) comes in at Norman Field. Two men (middle) bolt down a tank floor during the construction of Whitehorse refinery. A crew uses a pneumatic drill (bottom) to make holes for dynamite to be used in breaking up frozen ground on the Canol Road to facilitate the placing of culverts.

extending through the roof. This permitted protection of the pumps, heat exchangers, and instruments, eliminating operating problems which would result from exposure to low temperatures in an outdoor location.

Canol complete

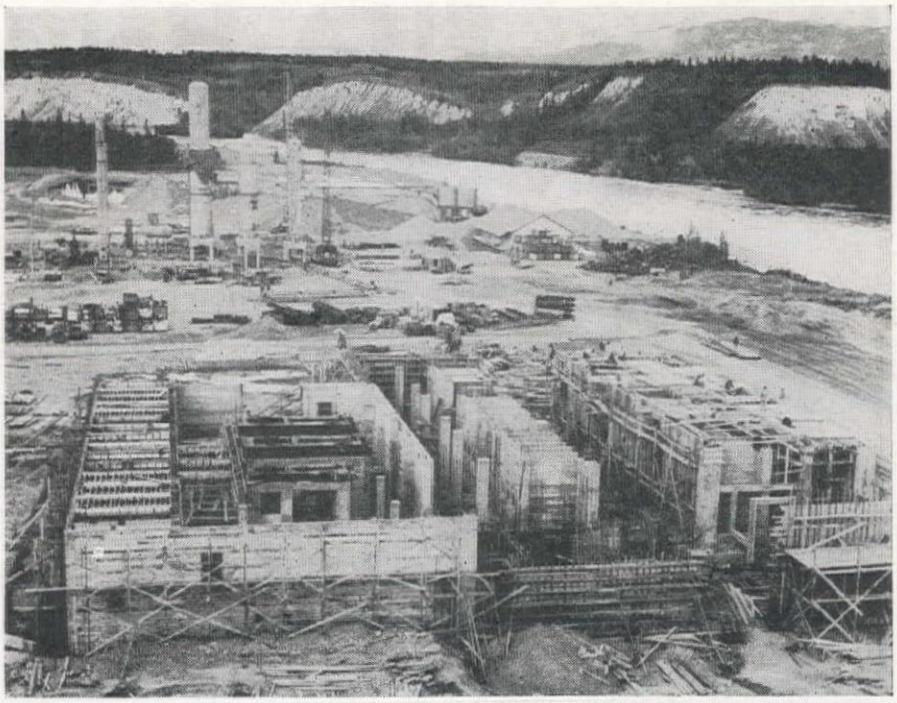
The final weld was made on the crude oil line on February 16, 1944, and the refinery first went on stream in April, as the first Norman crude flowed into Whitehorse. Today the finished products of the refinery fuel the trucks plying the Alaska Highway and soon the planes calling at northern airports from Watson Lake to Fairbanks will be using Canol products. Ships and tankers can load the products refined at Whitehorse and transported by pipeline to Skagway.

In a short time, war planes traveling to Alaska and Siberia will be serviced with Canol fuel, just as Army trucks and combat vehicles are now being fed with its products.

After victory the Canol project will serve the requirements of northern peacetime commerce in this last rich frontier of the continent, the frontier which Canol has done much to open to development.

The prime contract between the War Department and the constructor was awarded to Bechtel-Price-Callahan, a joint venture comprising the W. A. Bechtel Co., San Francisco; H. C. Price Co., Bartlesville, Okla.; W. E. Callahan Construction Co., Dallas and Los Angeles. Additional participants in the project's construction, by agreement, were Bechtel Company, San Francisco; B-M-P Company, Los Angeles, a Bechtel-McCone-Parsons affiliate; Gunther & Shirley Company, Los Angeles; Paul Grafe, Los Angeles; R. A. Conyes, San Pablo, Calif.; and J. H. Pomeroy & Co., Inc., San Francisco. J. Gordon Turnbull of Cleveland, Ohio, and Sverdrup & Parcel, St. Louis, Mo., served as the architect-engineer contractors on the project. Planning and supervision were by the Corps of Engineers, which established headquarters at Edmonton, Alta. Col. Theodore Wyman, Jr. was in charge for the first part of the work, and was succeeded in April, 1943, by Brig. Gen. L. D. Worsham. Early in 1944 General Worsham was called to Washington, D. C., as Assistant Chief of Engineers. Colonel F. S. Strong, Jr., is now in charge as commanding officer, Northwest Service Command and Division Engineer, U. S. E. D.

During the early stages of the project Everett Seabury was in charge for Bechtel-Price-Callahan. Later, with the tremendous expansion of the project, Van W. Rosendahl was senior officer for Bechtel-Price-Callahan, and as such directed the project from Edmonton, Alberta.



AN EARLY STAGE in the construction of the refinery at Whitehorse. The larger vessels were shipped to the site in several sections and welded together on the job.

EVERETT SEABURY, construction manager for the eastern division, managed to keep warm while he directed the activities of hundreds of construction men.

British Columbia Plans Extensive Expansion of Hospital Facilities

PLANS FOR $3,500,000 new construction in the biggest hospital building movement in British Columbia's history have been drawn for completion within the next 18 months. In addition, financing and other plans are under consideration for at least two millions more when materials and priorities are available.

This will add to more than $1,500,000 in hospitals already completed during the war.

The end of 1945 or middle of 1946, therefore, is expected to see approximately seven millions in new hospital accommodation added since start of the war.

Newest announcement on hospital construction concerns a $742,000 military hospital of 250 beds to be built near the Royal Jubilee Hospital, Victoria. Plans drawn for Shaughnessy Military Hospital at Vancouver by Messrs. Mercer & Mercer will be duplicated, it is understood.

Plans have also been announced for a maternity unit to cost $200,000 at Royal Jubilee Hospital.

In Vancouver two military units are planned. A new wing at Shaughnessy will cost $455,000, with an additional story on a completed building. A chest unit there also will cost in the vicinity of $400,000.

A $1,350,000 program for mental hospitals in B. C. is also contemplated. Included will be a new unit for veterans and further construction on hospital buildings at Essondale, while at New Westminster a $294,000 addition is now planned for the mental institution.

In Vancouver, Mount St. Joseph's Hospital will cost $265,000. While Vancouver General Hospital contemplates a $1,200,000 nurses' home, this has not been included in immediate construction plans. Crippled Children's Hospital plans a $70,000 structure.

During the war, St. Paul's Hospital in Vancouver completed a $400,000 wing, Vancouver General a $550,000 wing, St. Vincent $28,000, following a $250,000 main building in July, 1939. Hycroft was equipped and other hospitals extended.

Largest FHA Housing Project

Contractors Bohannon and Chamberlain are building in San Lorenzo, California, permanent homes for war workers living in the East Bay area—Construction progress has been expedited by the use of power equipment and assembly-line procedures

HARRY ARNOLD, as general superintendent has organized, directed and supervised the field and construction work.

SAN LORENZO VILLAGE, considered the largest private housing project in the world, is being built at San Lorenzo, Calif., by the contracting firm of Bohannon & Chamberlain of San Mateo, in order to alleviate a critical housing shortage situation that has developed in the East Bay area. The $7,000,000 project, begun about May 1 of this year, is scheduled to be completed by November 15. The village has been designed as a community, complete in itself, and being F. H. A. financed, the building specifications are typical of government financed homes. Wherever possible, mass production methods have been employed to expedite construction.

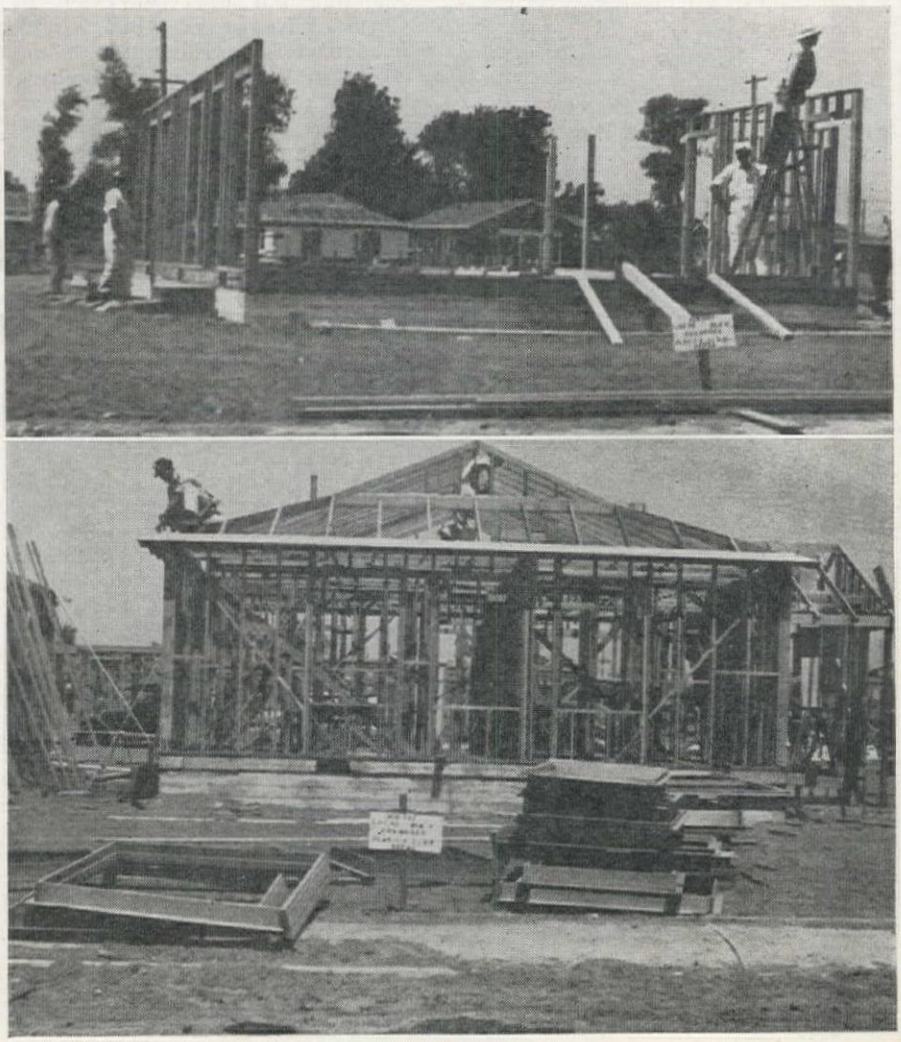
The site of the village was settled early in the middle of the last century because of its fertile, productive soil, flat, more or less level land, and good climate. Within a radius of 15 mi. are the vast Oakland and Alameda air development areas, a number of great shipyards, several naval drydocks and repair bases, and many rapidly expanding industrial sections that will share in a broad postwar development.

Design details

The project will consist of 1,329 five-room houses and a complete community and business center. These homes will contain kitchen and bathroom cabinets, a built-in breakfast set, a dual wall furnace, and a fireplace. Under present regulations, occupancy is restricted to war workers. At present the houses are selling for $5,975, with a small down payment and low monthly payments that extend over a period of 25 years. The smallest lots are 50 by 100 ft. The houses are one-story frame buildings with a floor area of 1,000 sq. ft. and since this is the largest area permitted by the government, there is no garage. However, a driveway and garage floor slab are poured so that the owner may build a garage as soon as restrictions are relaxed. A single floor plan and its opposite, as well as six different roof designs and exterior elevations are used in order to give the dwellings distinct appearances. Another factor adding to individuality is the setting of the houses at varying distances from the sidewalk.

The building specifications are typical of those for all F. H. A. financed homes: 4 x 4 foundation posts, 4 x 6 foundation girders, 2 x 6 mud sills, 2 x 6 floor joists (span under 8 ft.), 2 x 6 solid floor blocking, 1 x 8 subfloor, ½-in. T. & G. hardwood finish floor, 2 x 4 exterior wall studs, 2 x 4 bearing partition studs, and 2 x 3 interior partition studs. These specifications call for single lower plates, double upper plates, one row of wall and partition blocking, 2 x 4 diagonal bracing cut in between the studs in the outside walls, 2 x 4 ceiling joists, and 2 x 4 rafters with cedar shingles on a 5 on 12 pitched ridged roof. A 4-in. sewer pipe and a ¾-in. water pipe (⅝-in. meter) connect to the larger street lines. The lots rise 6 in. to the back, permitting street drainage.

Five sacks of cement are used per cu. yd. of concrete in foundations, sidewalks, driveways and other structures. The ag-



EACH CREW has a definite part of the construction work to accomplish. One crew (upper) frames the walls, partitions and ceilings. Another crew (lower) frames the roof. Other crews will follow until the house is completed and ready for occupancy.

gregate is graded from 1¼ in. down. Concrete top surfaces are sprayed with a paraffin seal cure as soon as the concrete finishers have completed their work. The foundation walls are stripped and sprayed after 48 hours.

Exterior finishes consist of different arrangements of stucco and redwood rustic, while the interior finishes are plaster on rock lath. Tile floor and base is laid in the bathroom and linoleum cemented over felt is laid in the kitchen and breakfast nook. In order to take care of postwar appliances, a 3-circuit wiring system has been installed.

The village is located in established sanitary and utility districts. The site is in the Ora Loma sanitary district. One hundred and sixty-nine thousand cubic yards of dirt were moved in order to grade the entire area so that both storm and sanitary sewers flow by gravity. Water will be furnished by the East Bay Municipal Utility District which obtains its supply from the Mokelumne River above Stockton. Electricity and gas will be supplied by the Pacific Gas & Electric Co.

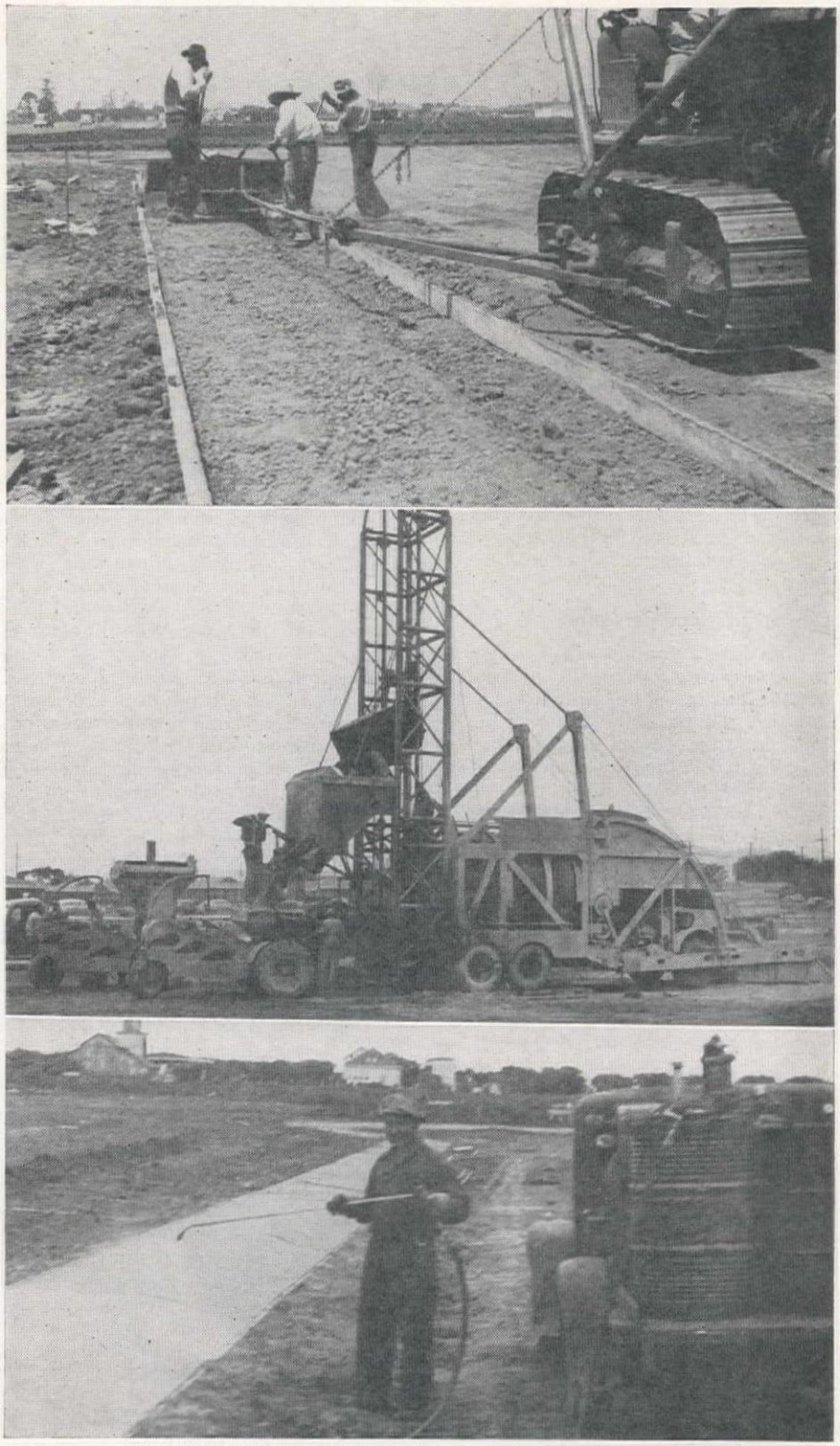
Construction details

The actual construction is organized in steps so that each crew has a definite job to do on each building. Four thousand feet of metal curb and sidewalk forms are used, permitting the pouring of 1000 lin. ft. of curb and sidewalk each day. Folding steel templates are used in laying out foundation walls and piers from four corner points set by surveyors. The foundation wall forms are made of heavy 2-in. lumber and the circular pier forms of sheet iron so that they can be used over and over again. Fifty sets of these forms permit the pouring of 25 foundations a day. Rapid and economical methods of grading and digging are made possible by the use of power equipment. One man can dig 225 circular pier foundation holes in 4 hours by using a boring attachment on a Ford Ferguson system tractor. As a further example, concrete is mixed at two central points and transported to the point of placement in fast 3-wheeled motorized buggies.

All of the concrete work, which includes curbs and sidewalks, foundation footings, walls and piers, driveways and garage and porch slabs, is completed before the framers begin their work. Each framing crew, consisting of from 20 to 30 men, has a definite part of the framing to do, and the crews follow one another in order. Portable 1-cylinder gasoline engine driven 3,000-watt generators are used around the project to furnish power for sawing, sanding and boring work.

Since a large part of the lumber that can now be obtained is in large sizes such as 2 x 10 and 2 x 12, more than half of the 9½ million bd. ft. required for the job is being ripped and classified as to length, size and grade by the contractor. The process is accomplished on an assembly line. All sawing other than that for sheathing and flooring is done in the stock yard so that each length of each piece of lumber used in framing is precut and placed in a definite pile. This lumber includes blocking, stud cripples, headers, bracing and all other pieces required. The loads are assembled in the stock yard so that when they are delivered to a particular house, the material will be available in the order in which it is needed from the top down. In one of the precutting processes, a piece of 2 x 4 passes down a line of 4 saws and a planer before it comes out as a rafter ready for the job. A crew of 7 men can cut 700 rafters an hour.

The streets are 30 ft. between curbs. The paving will consist of a 4-in. base course of rock covered by a 2-in. layer of plant-mix. The asphalt will be supplied by a plant that has been built on the job.



A TRACTOR (upper) pulls a machine, built on the job, to grade and roll the ground in preparation for pouring concrete sidewalks and rounded curbs. Concrete is mixed (middle) in Mixermobile machine and transported to each job in three-wheeled buggies. In order to prevent the evaporation of moisture from the freshly poured concrete, a paraffin seal-coat is sprayed (lower) on concrete surfaces as soon as they are finished.

HOUSES in various sections are seen to be in the same stage of construction. Crews have certain types of work to do, follow each other up and down the rows of houses. The village is to consist of 1329 homes and a complete business and civic center.

Rounded concrete curbs are used along all sidewalks, being poured monolithically with them, except at street intersections at the ends of blocks where the standard shaped curb is constructed. The sidewalk is 4 in. thick, increased to 6 in. for driveways.

Contractors and personnel

There are a number of subcontractors that are taking part in the construction of this project. The millwork is being done by the Diamond Match Company of Chico. Cabinets are made by the Peerless Built-In Fixture Company of Oakland. Rhodes and Jamieson deliver the materials and concrete. Mt. Diablo cement and Niles Pacific Coast aggregate are used. The electrical work is done by the Crockett Electrical Company of Crockett. The plumbing is being laid by W. L. Hickey of Lomita Park. The tile work is subcontracted to Mills and Hinz of San Francisco, the brick work to George Reed of San Francisco, plastering to Walter Gould of the San Carlos Construction Company, sheetmetal work to the San Carlos Sheetmetal Works, and the linoleum and window shade work to the Mission Carpet House of Redwood City.

Among the key men participating in the design and construction of this village are planning consultant Ronald Campbell of San Mateo, architect Samuel Chartock of San Carlos and job superintendent Harry Arnold of San Carlos, California. Fay Morser is the superintendent in charge of foundations. Earl Evans is superintending the framing, Richard De Luchi is superintendent of the finishers, Tony Skubi is street and sidewalk superintendent, and Robert Smiley is the superintendent in charge of the lumber and precutting. Edwin Smith is the resident engineer and Irving Randall, Jr. is the office manager.

WOODEN TEMPLATES are used to place and hold the round sheet iron forms for the interior concrete foundation piers.

Work Resumed on Canal Project in New Mexico

CONTRACTS TOTALING over a million dollars have been awarded to low bidders J. A. Terteling and Sons, Inc., of Boise, and Clyde W. Wood, Inc., of Los Angeles, for continuation of the construction of the Conchas Canal to bring water to the Tucumcari Reclamation project in northwestern New Mexico.

Work on the Tucumcari project, halted in 1942, is being resumed under the war food program to supply irrigation service to 17,000 ac. of productive land. Wartime work on the project has been cleared by the War Production Board on recommendation of the War Food Administration. Ultimately, 45,000 ac. of land in Quay Co., N. Mex., will be served by the project.

J. A. Terteling and Sons, Inc., was awarded the contract, amounting to $563,441, to construct three sections of the Conchas Canal, and Clyde W. Wood, Inc., a contract for $686,248 to construct five other sections of the earthwork and canal structures.

The main canal will have an initial capacity of 700 cu. ft. per sec. for a length of 50 mi. below the reservoir and then be reduced to 96 cu. ft. per sec. in the remaining 17 mi., because of canal and lateral diversions. The Hudson, a branch canal, will be constructed to serve the northeastern areas, and smaller laterals will distribute water to the farm units of the Tucumcari project.

The water supply through the canal will come from the Conchas Reservoir, which controls 7,310 sq. mi. of the South Canadian drainage area extending northwesterly into the high Sangre de Cristo Mountains. Conchas Dam is located in San Miguel County, approximately 35 mi. northwest from Tucumcari, and approximately a quarter mile below the confluence of Conchas River with the South Canadian River.

The dam and reservoir, authorized by the Flood Control Act of 1936, were built by the Corps of Engineers of the United States Army with Emergency Relief Appropriation funds for immediate flood control benefits to the states of New Mexico, Texas, and Oklahoma, and for future irrigation.

The reservoir capacity of 600,000 ac. ft. is apportioned between flood control and irrigation. One hundred thousand ac. ft. are reserved for dead storage necessitated by the required elevation of reservoir outlets and to provide silt storage. An agreement has been made between the Army Engineers and the Bureau of Reclamation for the operation of the reservoir, for the multiple-purpose uses of flood control, and irrigation.

Railway Roadbed Proposed as Base for Montana Highway

THE MONTANA State Highway Commission is contemplating the use of 12 mi. of railway roadbed as the base for a modern highway. The section of roadbed under consideration was a part of the Northern Pacific's branch line running between St. Regis and Henderson. Sections of it were washed out by the flood of 1933, and since that time the Northern Pacific has routed its trains over the Chicago, Milwaukee and St. Paul tracks which approximately parallel the inundated stretch. The 12 mi. of railway roadbed would become a part of the Yellowstone Trail. A 32-ft. highway would be built on it. Although the plan is now under consideration in the engineering offices of the Highway Department, actual construction will be deferred until after the war.

New Materials Conservation Guide Book Issued by WPB

A REVISED edition of the "Critical Construction Materials Design Guide" has been prepared to assist persons contemplating construction during wartime, the Conservation Division of the War Production Board has announced.

This guide is an unofficial supplement to Schedule A, Controlled Materials Plan Regulation 6 (Construction Limitations), and stresses the necessity of restricting construction designs to those utilizing materials that are most plentiful.

Intended for consultation by all persons applying for permission to begin construction on Form WPB-617, this supplement is neither a directive nor an order of the WPB. Copies are available at all WPB regional and district offices.

Timber Piling Gunite-Encased

Teredo-infested piling at U. S. Naval Drydocks, Hunters Point, incased with concrete by a newly-developed method of constructing a continuous shell of gunite which is lowered below the bottom of the bay, after which the space between shell and pile is filled with grout—The method permitted continuous use of the piers during construction and resulted in complete monolithic encasement—Copper-arsenic treatment had failed to stop marine borers

THE PROBLEM—

By L. J. SULLIVAN
Project Manager
Case Construction Company
San Pedro, Calif.

A NOVEL PROCESS of encasing submerged timber piling with gunite has been developed by the Case Construction Company of San Pedro, Calif., in connection with a contract awarded to them in January, 1944, by the U. S. Navy Bureau of Yards and Docks for the encasement with concrete of the timber bearing piles underneath three piers and a connecting quaywall at U. S. Naval Drydocks, Hunters Point, Calif.

The piling had been in place a little less than a year and had been treated before driving with a process based upon the use of copper applied electrolytically. This method of treatment was used because of the difficulty encountered at the time in obtaining creosoted piling. Investigation a short time after the piers were completed indicated that the piling were being attacked and were in danger of being entirely destroyed by teredos. The piers were vitally needed for the repair of naval vessels and the loss of use while making repairs to the piling would seriously hamper such repair facilities.

Alternate methods

The Navy requested that bids be submitted for encasement of the piling with concrete. Bids were received from several contractors, with the result that four different methods of encasement were submitted, as follows:

(1) The conventional form and tremie method;

(2) The replacement of affected piling with new creosoted piling involving the removal of the superstructure and the complete decommissioning of at least one of the piers at a time with resulting loss of use and time;

(3) The cutting away of a portion of the existing piles underneath the caps and the insertion of precast concrete or prefabricated shells over the remaining piles and the insertion of precast concrete or prefabricated grout-filled shells over the remaining portion of piling; then splicing in new pieces of piling;

(4) The process of the successful bidder, Case Construction Co., which was based on the encasement of the piles with gunite. This method not only met all of the requirements desired by the Navy in protecting the piling against marine borers, but also provided for maximum use of the piers during construction. This method allowed for the encasement of the piles without cutting the existing piles or removing the superstructure and resulted in the complete salvaging of the pier structurally.

The low bid was $140,000 lower than the next highest bidder, and $506,000 lower than the highest bidder.

—THE ANSWER

The method consisted essentially of building a seamless gunite cylinder around the piling above water and the lowering of the cylinder below the water and penetrating into the mud for a minimum distance of 5 ft. The annular space between the cylinder and the piling was then filled with grout to form a complete monolithic encasement of the pile.

This method consisted mainly of the following different steps:

(1) Removal of all timber bracing from the piling;

(2) Placing of forms and reinforcing mesh;

(3) Application of a gunite shell;

(4) Lowering of the shells and the successive application of additional gunite shells so as to form a monolithic tube around the pile;

(5) Filling the annular space between the gunite shell and the timber pile with a 4:1 sand-cement grout.

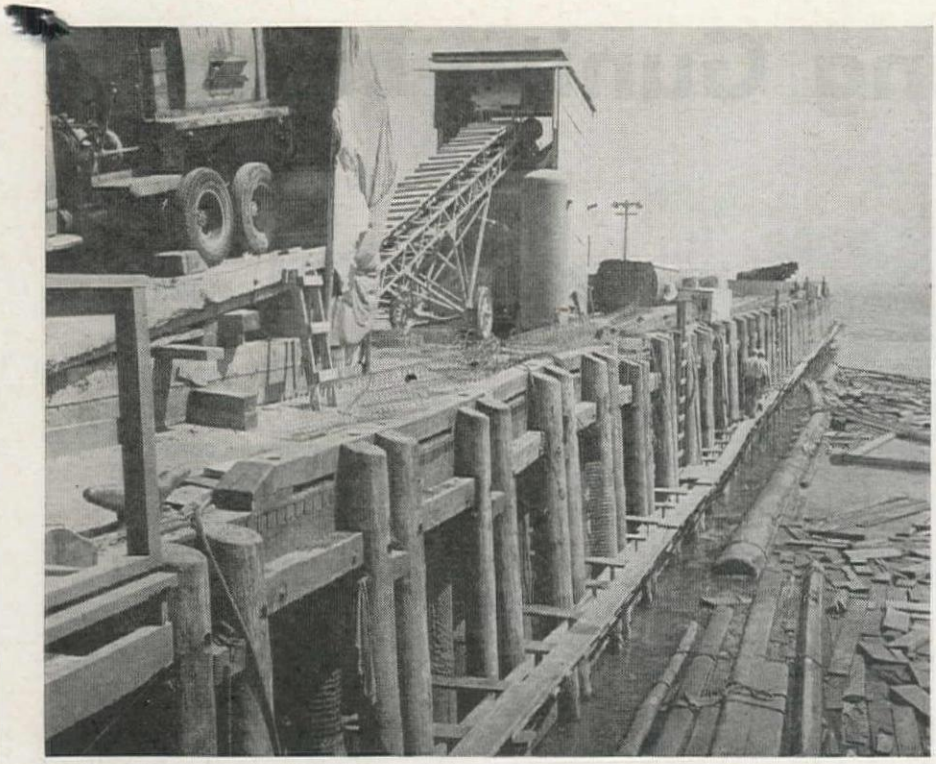
All piles were encased from a point 6 ft. above low water to a point at least 5 ft. below the mud line.

Specific procedure

The means actually employed in carrying out the above procedure follow:

The timber bracing was removed from each pier, rafted in the water alongside and later towed away for cleaning and sorting. As all operations were completed underneath the pier, the bracing was replaced at a higher elevation above the top of the concrete encasement. All bolts were cleaned and rethreaded and all hardware was painted before replacing.

Scaffolding consisted of 2 x 12-in. planks spanning 4 x 4-in. ledgers, which in turn fastened to 1-in. square steel hangers suspended from the timber caps. As operations proceeded on the job, it was found necessary to place enough scaffolding to cover the entire area underneath each pier.



SIDE VIEW of the piling encasement work on one of the piers. On the deck, a transit-mix truck delivers concrete for the gunite machine; a timber scaffold was built at 6 ft. above low water. Timber bracing was rafted alongside pier during the guniting.

The scaffolding planks were placed at an elevation 6 ft. above mean low, low water and were secured to prevent flotation during high tides. A large portion of the area underneath the piers was occupied by various utility lines, necessitating the installation of scaffolding at an elevation of 2 ft. above mean lower, low water and the consequent conducting of all operations during favorable tide hours.

The contractor developed several types of forms for the encasement process, but it was decided that the use of a wood form would be more suitable for this particular job because of the variation in size of piling and the difficulties of handling material in such confined working spaces underneath the piers.

Forms consisted of sets of vertical furring strips. The strips were assembled in units of 25 strips per pile. A ½-in. 6-thread cotton rope was threaded through a hole at the top of each form strip to maintain the strips in sets and to facilitate handling. Each form strip was 4 ft. 6 in. in length, 2 in. wide, 1 in. thick on the front side, and ⅜ in. thick on the back side, which was fastened to the timber pile.

The length of the form strip was fixed by the necessity of casting the gunite shell around the pile between the bottom of the pile cap and the high water level. This resulted in approximately 5 ft. of working headroom between the scaffolding and the underside of the deck.

A piece of ⅜-in. sash cord was wrapped around the head of the pile just underneath the timber cap, and the form strips were then placed around the pile with the top of the strip bearing against the sash cord and the bottom of the strip bearing directly against the wood pile, thereby producing sufficient taper to allow the gunite shell to be lowered from the forms by its own weight.

Each form strip was fastened to the timber pile with one nail at the top of the strip.

The form strips were then covered with a 15-lb. asphalt felt, 4 ft. wide, which was fastened to the strips by means of staples applied with a small stapling machine.

Reinforcing, which consisted of 2 x 2-in. 14-gauge galvanized wire mesh, was placed around the asphalt felt form and a uniform space of ½ in. between the felt and the members of the mesh was maintained by crimping the wire at intervals at the time of manufacture.

The lower section of each pile encasement was equipped with two suspension anchors manufactured from ½-in. round reinforcing bars which were tied securely to the wire mesh and gunited in place.

A minimum clearance of 2 in. between the gunite casing and the timber pile was maintained by the frequent insertion of steel hairpins or spacers through the felt and secured to the wire mesh.

Suspension and lowering of the casing was accomplished by means of ½-in. wire rope which was deadended to the cap on each side of the pile, passed through the eye of the suspension bar, returned to the cap and one complete wrap taken around the timber cap. The loose end was then fastened to the leading part of the line with No. 16 tie wire.

Application of gunite

Gunite was applied to the form in the usual manner in sections 4 ft. in height and for a thickness of 2 in. After each 4 ft. section of encasement had been placed, it was lowered to within 6 in. of the bottom of the form. The asphalt felt adhered to the gunite and was lowered along with the casing each time. The wood strip form remained always in place; and after lowering of a section of encasement, a new felt skin was placed around the form, wire mesh was again fastened around the felt and lapped 4 in. over the mesh projecting from the preceding section of encasement. Gunite was then applied to the succeeding section in the same manner as previously mentioned so as to form a continuous tube.

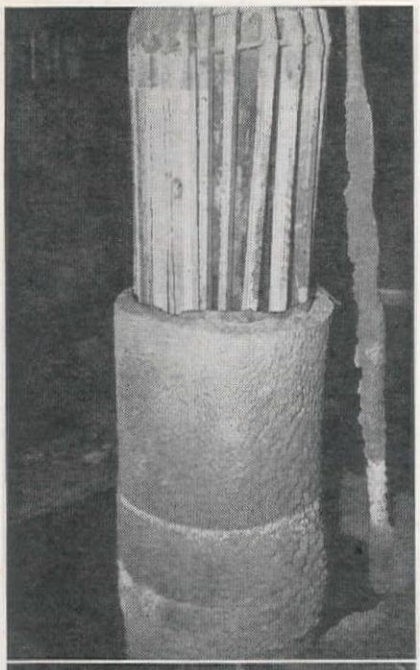
During the winter months much difficulty was experienced in guniting due to the wave action caused by rough water. A method was devised to satisfactorily secure the encasement in place so as to prevent damage from the battering wave action.

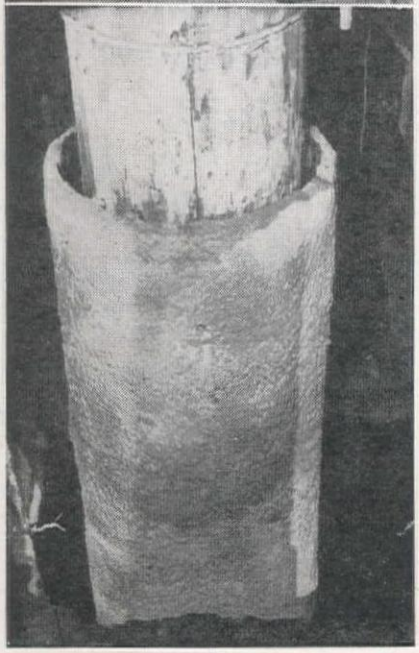
The top of each section of encasement was tapered so as to provide for a complete bond between sections of the tube.

All of the above operations were repeated successively until the encasement had attained sufficient length to penetrate a minimum distance of 5 ft. into the mud beneath the piers.

Due to the contour of the ocean bottom and the depth required, it was sometimes necessary to obtain not only a minimum penetration of 5 ft. into the mud but to force the encasement through the mud sometimes as much as 20 ft. in order that the piling would be protected in the event of dredging adjacent slips. This was satisfactorily accomplished by the use of track jacks placed between the timber cap and the top edge of the encasement shell. Inasmuch as the gunite attained a strength of approximately 5,000 lb. per sq. in. in seven days the shell was sufficiently strong to with-

UNDER THE QUAYWALL the encasements were secured by grout to the underlying rock fill. The water varied in depth here between 1 and 25 feet to the rock.





AT THE LEFT: Steps in the encasement procedure. Top, interior form sticks in place; center, gunite application; bottom, completed segment ready for grout filling.

stand the pressure exerted by the jacks.

A simple and effective seal was developed at the bottom of the lower section of gunite encasement to prevent the mud from entering between the shell and the pile and to prevent the loss of grout.

Grout filling

When encasement had attained the desired length and penetration into the mud, the form strips were removed from the head of the pile for reuse and the annular space between the shell and the timber pile was then filled with sand-cement grout. For this purpose it was found most satisfactory to use a 2-cu. yd. capacity pneumatic grout-placing machine developed by the Case Construction Co. The grout machine was charged from transit-mix trucks, and the grout transported from the grout machine to the pile encasement through a 2-in. rubber material hose under pressures varying from 60 to 100 lb. per sq. in., depending upon the length of hose fastened to the grout machine. At the pile, a 50-ft. section of wire-wrapped, rubber-covered hose was fastened to the end of the material hose and was flattened to an oval shape to allow for insertion into the space between the timber pile and the gunite shell and down to the mud.

Inasmuch as each encasement contained approximately 1½ cu. yd. of grout material, it was possible to completely fill each casing with grout before recharging the machine. The hose was withdrawn from the casing as the grout rose in the column displacing the sea water.

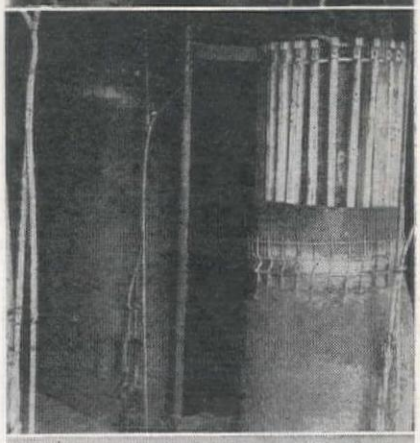
After the annular space was filled, the grout usually settled from 8 to 12 in. in the shell, and this space was later filled with gunite in the topping-off process which consisted of applying gunite to the top of the grout-filled encasement in order to attain a uniform elevation for the top of all encasements.

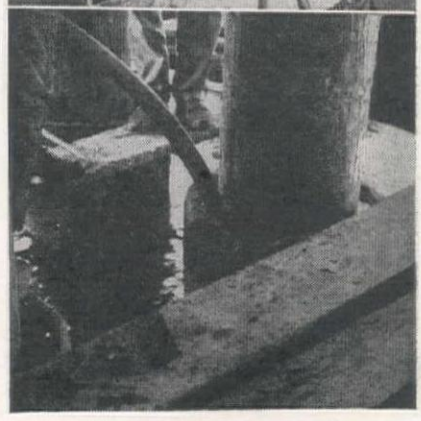
Equipment

The grout machine was placed on a platform suspended over the side of the pier by steel angles fastened to the timber guard rail. Two batteries of two cement guns each were used for placing the gunite, and a fifth cement gun was used for the topping-off process. Wire mesh was cut into proper lengths on a foot-operated shearing device.

The gunite mix consisted of a sand-cement mixture in a proportion of 4½:1 by volume. Calcium chloride was added to the gunite water in sufficient quantities to protect the fresh concrete from

AT THE RIGHT: Top, clipping asphalt felt to the form sticks; second, crimps in wire netting to hold it away from felt; third, 2-cu. yd. grout machine; bottom, grout tube leading into annular opening between pile and encasement segment. This is final step.





BEARING PILING under one of the piers after encasement work was completed, and timber bracing had been replaced. The fender piles in the foreground were not encased and will be replaced when necessary. Deterioration at water surface is evident.

damage due to wave action and to impart sufficient early strength as to allow for lowering of each section within four hours. Test cylinders indicated that the gunite attained an average comprehensive strength of 5,500 lbs. per sq. in. in seven days and 6,300 lbs. per sq. in. in 28 days.

The encasement was applied to 4,000 piles for a total of approximately 134,000 lin. ft. of encasement and required the placing and forming of 800,000 sq. ft. of gunite, 850,000 ft. of electric welded fabric, 5,200 cu. yds. of grout, and the removal and replacing of approximately 500,000 board ft. of timber.

As a result of the satisfactory application of the encasement by this novel method, the piers were never entirely out of commission, and protection against marine borers was provided with a minimum of delay.

Personnel

The work was planned and directed for the Navy by Capt. George F. Nicholson, Resident Officer in Charge of Construction. Lt. Comdr. W. L. Dickey was project manager for the Navy.

The work was prosecuted for the Case Construction Co. under the general supervision of F. W. Freeman, Manager of the Gunite Department of that company. The contractor's job organization was as follows: L. J. Sullivan, project manager; Everett Cannan, superintendent; F. F. Prendergast, assistant superintendent and engineer; J. D. Kise, office manager; H. E. McKnight, general foreman.

Idaho Engineers Seek to Take Public Works Out of Politics

THE NEXT IDAHO legislature will be asked for a law taking the state Department of Public Works out of politics and placing its administration under a bipartisan commission, according to resolutions adopted by the Idaho Society of Engineers executive committee at their annual summer meeting in Boise in August.

The proposed law would provide for a merit system of choosing employees of the department.

Raymond J. Briggs of Boise is chairman of the committee and president of the society, Clyde P. Humphrey of Morrison-Knudsen, former head of the state highway bureau, is vice-president and chairman of the legislative committee. Other members of the executive committee are William P. Hughes, city engineer of Lewiston; L. W. Johnson, city engineer of Weiser; W. P. Havenour, Pocatello, Bannock county engineer; L. W. Lesher, city engineer of Burley, and Lloyd Stalker, of Idaho Falls.

In explaining the resolution, Humphrey said that the society wanted to make a definite contribution to the postwar program, when the department will be called upon to handle the greatest road program in Idaho history.

The text of the resolution follows:

"Whereas, it is apparent that the activities and selection of personnel in the Department of Public Works can be dominated by political expediency in the interest of any administration that happens to be in power, to such an extent that any employee, even a common laborer, regardless of fitness, can be compelled to have the approval of his precinct committeeman and county chairman before he or she can presume to apply for a job, thus affecting the efficiency and economy of work done with public funds by and under the supervision of professional engineers, and

"Whereas, the present political system is definitely unfair to our boys who desire to work on their return from the war;

"Therefore, our first consideration should be to rectify the present practice so these men can be rehabilitated in their chosen work, and

"Be it resolved, that we favor the enactment of a law taking the administration of the Department of Public Works out of politics by the creation of a bipartisan commission to administer its affairs, said law to provide for a merit rating system of employment for all employees, that will recognize military service, ability, education, experience, industry, personality and integrity, regardless of political affiliation."

A similar system is in force in the state Game Department, and the merit rating system is also in use in the State Department of Public Welfare.

A bipartisan commission originally was the ruling force of the old highway department, when it was created in 1913. When, in 1919, the entire state government was remodeled to centralize both power and responsibility, an appointive commissioner took over the duties of the former group of three.

El Paso Secures Right To Purchase Water Land

THE CITY OF EL PASO, Tex., has been granted the right to purchase 2,000 ac. of land in Dona Ana County, New Mexico, with first class water rights in the Elephant Butte Water District. This right has been affirmed in a contract entered into by the city of El Paso, the Reclamation Bureau and the El Paso County Water Improvement District. The contract is similar to another already in effect, permitting the city to purchase 2,000 ac. When the full 4,000 ac. are acquired, the city will have a supplemental municipal supply from the Rio Grande which will amount to over 12,000,000 gal. per day. The city has also recently acquired 1,200 ac. of land with water rights in El Paso County.

Seattle City Engineer Will Plan Trunk Sewer Extensions

THE CITY COUNCIL of Seattle, Wash., has requested the city engineer, Charles L. Wartelle, to prepare plans immediately for extension of the city's trunk sewer outfalls further into Puget Sound. This is made necessary because recent surveys at the city's two saltwater beaches, Golden Gardens and Alki, disclosed sewage pollution in the water.

Transport Housing Units 116 Miles

Temporary family dwellings moved by truck, trailer and dolly from Gabbs Valley, Nevada, FHA project to an army air base at Tonopah—Original concrete floors are replaced by wood before buildings are moved from original sites—Little damage results from trip

By BETTY MEARS
Gabbs, Nevada

TWENTY cement-floored buildings, a total of 82 temporary family dwelling units, are being moved from the Gabbs, Nevada, Federal Housing Project No. 26061 to Tonopah, Nevada, a distance of 116 mi., to provide housing for civilian personnel of the nearby army air base. The contract included the erection of a new community building, reflooring and moving dwellings, installation of utilities, drying yards, incinerators, sidewalks, paved roads and a water tank.

The job has been considered a "guinea pig" of the U. S. by Federal Public Housing officials and the general contractor, E. C. Nickel, of Arcadia, Calif. If successful, it may well develop into a major housing program.

Two time-saving innovations in house moving have been developed on the job: first, in the installation of the floors, and, second, in the loading and hauling of the houses.

Preparation of houses for moving

The houses are of the flimsiest construction and were not built to be moved. Walls are of 2 x 3 in. studs covered on the exterior with fiber board and interior with gypsum board, insulated with rock wool. Ceilings are of fiber board. Overall lengths of the buildings were 74 ft. 4 in., 94 ft. 4 in., 104 ft. 4 in., and 156 ft. 4 in., all 21 ft. wide. Only the longest was cut in two, the rest being moved intact.

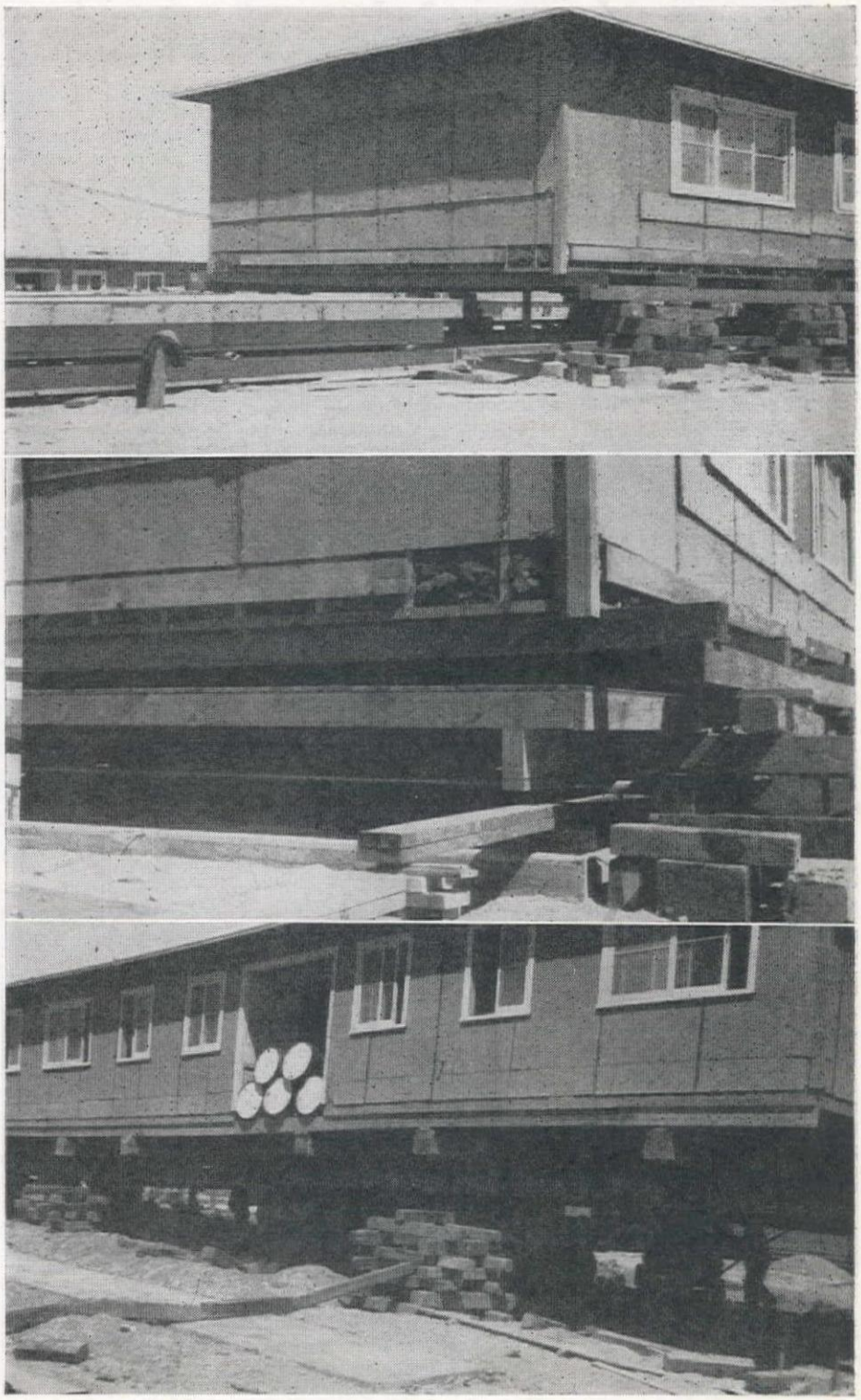
The buildings were on typical concrete floor slabs, which had to be replaced with wood floors before moving to Tonopah. Furnishings, stoves and plumbing were first taken out and the doors removed; then approximately 12 in. of fiber board on the exterior at the bottom plate line was removed to facilitate unscrewing the nuts from the bolts embedded in the concrete floor.

The buildings were then loosened with steel wedges and raised approximately 2 in. A 2 x 6-in. ribbon was then nailed on the exterior all around the building; step jacks were placed under these and the building raised to allow 6 x 6-in. timbers to be placed under all cross partitions. Then a continuous 6 x 6-in. ribbon was run under the ends of these along the full length of the building. It was then jacked high enough to give clearance for the floor to be rolled under, and cribbed clear of the floor space.

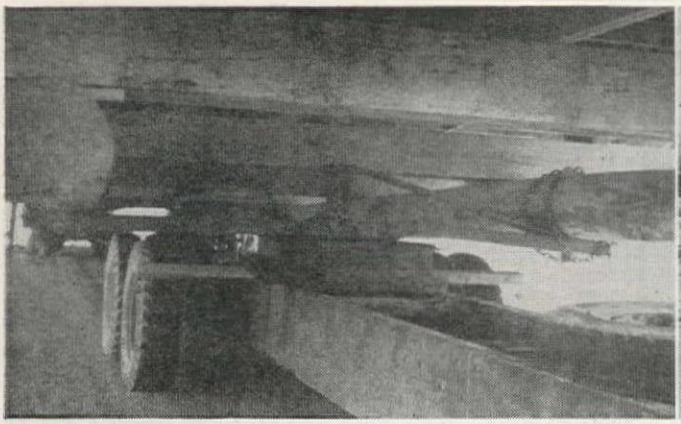
New floors installed

The first important innovation in house moving was in the method used for replacing the cement slabs with wood floors. The floor for each building was built complete at the end of the building and in alignment with it, on three 4 x 8-in. tracks placed to come directly under the girders and blocked to conform to the height of the concrete slab. The floors rested on 2-in. pipe, laid across the tracks at 6-ft. intervals.

The floors were sanded with coarse paper, then rolled under the buildings by means of a small hand winch mounted on a truck and attached to a cable. The



BUILDING is jacked up above original concrete floor and cribbed, and wooden floor rests on pipe rollers ready for placement (upper). New floor is rolled under (middle) and securely nailed to building. Dollies are rolled under and supporting timbers placed in position (lower).



HEAVY UNDERCARRIAGE built on trailer and dollies (left). Truck ready to move one of the houses (right). Skirting on building at new site in Tonopah (lower).

building was then lowered onto the floor, lined up and nailed with 20-d. finish nails, interior walls toe-nailed through the base and exterior spiked through the plate. Rough plumbing was then reinstalled, and the buildings were ready to be jacked up and loaded onto the truck and dollies.

It should be noted here that not only was the initial installation of the floors advantageous in supporting these weak buildings for moving, but also saved many trips of hauling by replacing all the furnishings and equipment—heating stoves, cook stoves, water tanks, plumbing fixtures and furniture—so that each building was completely equipped on its arrival in Tonopah. Also, had the buildings been moved without floors the damage to the interior gypsum board would have been much greater.

Moving of houses

The second innovation came when it was found that the 7-ton, 95-hp. Diesel truck and other equipment were inadequate for hauling the structures, as the buildings weigh up to approximately 75 tons, including the timbers used for longitudinal support and to equalize weight.

A special low-boy trailer was built to support the front end of the buildings and a pair of double dollies, steel reinforced, were used near the rear, a total of 26 wheels thus being employed to support the weight. A 15-ton, 150-hp. Kenworth Diesel with Cummins motor was substituted for the smaller truck and has performed satisfactorily. Pneumatic tires were used entirely in all operations, as the use of steel dollies was impractical in such a long move.

J. P. STEELE, superintendent for general contractor E. C. Nickel, is directing the work of moving the temporary housing units.

A permanent carrying base was assembled for all sizes of buildings; this procedure saved a great deal of time in both loading and unloading the buildings.

The carrying base consisted of the pair of double dollies at the rear, built up to the level of the trailer bolster with two 12-in. timbers, 26 ft. long, which served as bolsters on the rear dollies and as support, and three 12-in. cross timbers, the width of the houses. On these cross timbers and the front bolster rested two 12-in. round timbers running the full length of the house to be moved, and two shorter timbers extending from bolster center to dolly center, all securely cabled to bolster and dollies. This rig was backed under the cribbed-up building to be moved, cross timbers placed every 6 ft., and the building lowered onto it. When loaded, the floors were 7 ft. above the ground, and approximately 16 ft. was needed for overhead clearance.

Road traffic was only a minor problem, since the rig could move over to the shoulder to meet trucks and cars. No attempt was made to drive after dark. Flag cars bearing "House Moving Ahead" signs were driven at a reasonable distance in front and behind the loaded truck.

Only two small communities are along the road and little difficulty was encountered with overhead wires until the rig reached Tonopah, where wires had to be raised for clearance. The main street of Tonopah was usually traversed during the light traffic period of early morning.

The 32-mi. roadway from Gabbs to Luning has a 30-ft. roadbed with suitable gravel base and plantmix surface 24 ft. wide, with 4-ft. shoulders. On it there are 21 curves with a minimum radius of 1000 ft., grade running from level to 7 per cent. The remaining 85 mi. of highway from Luning to Tonopah is relatively level except for the last 15 mi. into Tonopah, which is slightly upgrade. The road is of approximately the same specifications.

The first eight buildings moved onto the new area at an average time of five days per building. All indications point to a better record by the time the project is completed.

Completing buildings in Tonopah

Before the houses could be moved the Tonopah area had to be prepared for them. Concrete piers with 6-in. wood caps were poured, sewer and water pipe laid. To save time, much of the work proceeded simultaneously. The first house was moved onto the project just 30 days after work started.

After arrival on the area the buildings were lined up with the piers and cribbed up so as to release the rig to return for the next house. The building was then gradually lowered to the underpinnings, set in place at that time. Necessary repairs were then made, skirting put on from the ground up to the floor joists, new porches and steps built in place, exterior walls covered with 90-lb. mineral surface roofing paper, and the interior and exterior trim repainted. Then the floors were given their final sanding with fine paper. Lastly, plumbing connections were made and the buildings were ready for occupancy.

Repairs

Damage to the buildings has been slight, consisting mainly of replacing a few sheets of interior wall board under and over the windows near the center, where there is a tendency of the buildings to sag, and renailing a few pieces of moulding loosened when the houses were jacked up. The maximum damage done to any one building has amounted to six sheets of wall board cracked and broken.

Damage has been greatly lessened by the installation of the floors before moving, thus giving buildings greater rigidity, and by using pneumatic tires

throughout the moving, thus lessening breakage from road shock.

The contract terms include the removal of cement sidewalks and floor slabs at the old site to a distance of no more than one mile. However, the Board of Directors of the remaining Gabbs housing area is in favor of retaining at least a portion of both for playground purposes. The board feels that the slabs could be used advantageously by the children of the community for roller skating, tennis, etc. At present, no definite action has been taken.

The contract for the complete job of moving and rehabilitating the 82 units was let by the Federal Public Housing Agency of San Francisco to E. C. Nickel, general contractor, Arcadia, California, at $141,000.00. J. P. Steele, superintendent for Nickel, is at Tonopah, and W. F. Horsewood, assistant superintendent, is at Gabbs. M. A. Crabtree is project engineer, with offices in Tonopah.

Hall Bros., house movers of Ely, Nevada, subcontracted the actual moving of the buildings, with Jasper Hall supervising the operations.

Congress Group Investigates Western Irrigation Problems

A SPECIAL Senatorial Sub-committee on Irrigation and Reclamation held meetings at numerous cities throughout the West during July and August with Bureau of Reclamation officials and representatives of local irrigation interests. Although numerous projects were considered, the two of widest importance were the Central Valley Project of California and the development of Arizona through the use of Colorado river water.

The Central Valley discussion principally centered around the 160-ac. land use limitation sponsored by the Bureau under the 42-yr.-old Reclamation Law. Opposition to this limitation was so intense that the State of California is now considering taking over operation of the entire Central Valley Project, reimbursing the Bureau of Reclamation for its services in constructing Shasta Dam, Friant Dam and the other features, by means of a bond issue authorized by the voters of California in 1933.

The sub-committee, made up of Senators Sheridan Downey of California, Ernest W. McFarland of Arizona, Carl A. Hatch of New Mexico, Guy Cordon of Oregon and Chan Gurney of South Dakota, heard statements by Commissioner of Reclamation Harry W. Bashore, Regional Director Charles E. Carey and other Bureau officials, strongly supporting the 160-ac. limitation and disclaiming any intention to disregard state water laws or private water rights.

In Arizona, the sub-committee heard testimony concerning the three principal proposals for transporting Colorado river water to the central agricultural area of the state.

O. C. Williams, State Land and Water Commissioner for the state of Arizona, presented the needs of the state as a whole for additional irrigation water, stating that more than 1,000,000 ac. ft. are needed to supplement the supply for more than 750,000 ac. now either irrigated, or partially irrigated in the state. Representatives from various irrigation districts presented in details the specific need in their districts.

Among those appearing before the Senate Committee were Lin B. Orme, president of the Salt River Valley Water Users' Association; James B. Girand, representing the Gillespie Water Company; Warren Peterson, secretary and treasurer of the Arlington Canal and Water Company; C. C. Tillotson, representing the Colorado-Verde Association; Charles A. Carson, attorney for the Arizona-Colorado River Commission, as well as a score of others representing irrigation districts and blocs of farmers in various portions of the state.

The highlight of the meeting was the unified effort of each and every irrigation district and community toward bringing Colorado river water to Arizona for irrigation purposes, regardless of the benefit to the individual project. Mr. Orme's statement at a luncheon given by the Salt River Valley Water Users' Association in honor of the members of the sub-committee, reflects the attitude of the whole state toward the proposed project. He said, "The Association is willing to help in every way it can, short of taking sides as to what land should or should not be irrigated. We do urge, however, that those areas that are given water be given an ample supply of water. Whatever projects we build, let us build them on a strong foundation."

The Bureau has been working on the Arizona diversion plans for three years, compiling data to determine the most feasible route to bring Colorado river water into central Arizona. The Bureau started its surveys by setting out to study every proposed route for the diversion of water to the central part of the state, finally selecting three for detailed studies and cost estimates.

The three are:

Marble Gorge: Calling for a high dam in Marble Gorge, with a 139-mi. tunnel to a point on the Verde river near Camp Verde and a series of dams along the Verde for stream regulation and power development. This project would cost $487,000,000, not counting the cost of the Marble Gorge dam.

Bridge Canyon: Calling for a high dam at Bridge Canyon at the headwaters of Lake Mead, a 72-mi. tunnel to Sacramento Wash, an 82-mi. canal from Sacramento Wash to the 400,000-ac. ft. reservoir site on Cunningham Wash near Parker, and an 180-mi. canal from there to Granite Reef dam. The estimated cost is $385,000,000, exclusive of the cost of the Bridge Canyon dam.

Parker Pump Plan: Calling for a pumping plant on Lake Havasu to lift the water 1040 ft. into a canal that would carry it to the Cunningham reservoir site, thence through a 180-mi. canal to Granite Reef. This plan would cost $134,000,000.

Indications are that the Bureau will be ready by the end of 1944 to make its final choice of routes and will at that time be ready to seek initial appropriations from Congress for the gigantic program estimated to cost $640,000,000. The multiple projects under the plan chosen could be ready for actual construction within six months after the war ends. It is anticipated that the construction will take from three to twenty years for completion, depending upon the route finally chosen.

The Bureau estimates that water could be delivered for $8.00 per ac. per yr. under any one of the plans, and bases its cost figures on amortization in 40 years.

Meetings were also held by the subcommittee and the Reclamation officials in Boulder City, Nev.; Salt Lake City, Utah; Boise, Idaho; Billings, Mont., and Amarillo, Texas. In each case, local irrigation problems were investigated with a view to recommending them in the postwar construction inventory of the Bureau.

ATTENDING THE Arizona reclamation luncheon were, l. to r.: H. F. McPHAIL, director of power utilization, Bur. of Recl.; REP. JOHN R. MURDOCK, Ariz.; H. W. BASHORE, Commissioner of Reclamation; SEN. CARL HATCH, N. Mex.; LIN B. ORME, President, Salt River Valley Water Users' Assoc.; SEN. E. W. McFARLAND, Ariz.; SEN. CARL HAYDEN, Ariz.; E. B. DEBLER, chief of project planning, Bur. of Recl.; O. C. WILLIAMS, Arizona water commissioner.

Arizona Tunnel Rehabilitated

THE TUNNEL after being cleaned and lined. Original alignment was good and walls had suffered little disintegration.

A 50-year-old tunnel at Horseshoe Bend, Arizona, was rehabilitated and lined with concrete—It will serve as a diversion tunnel for the new earth and rock filled Horseshoe dam which will be 140 ft. high and will impound 25,000 ac. ft. of water annually

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

FINDING IT necessary to secure additional water for operation of the mammoth copper mines and reduction works at Morenci, Ariz., the Phelps Dodge Corporation has entered into an agreement with the Salt River Valley Water Users Association to remove a portion of the flow of the Black river and replace the water by construction of an earth and rock fill dam on the Verde river about sixty miles north of Phoenix.

The first step in construction of the 67,000-ac. ft. reservoir at Horseshoe Bend was the rehabilitation and concrete lining of a diversion tunnel driven through the tongue of rock inside Horseshoe Bend over fifty years ago.

Borrowing water

The diversion from the Black river is limited by agreement to not more than 40 ac. ft. per day and not more than 14,000 ac. ft. per year. In return for this borrowed water, the new reservoir on the Verde river will impound an average of 25,000 ac. ft. annually, which will reimburse the farmers of the irrigation district.

In addition it will conserve flood waters which in the past have been wasted because they have been in excess of the capacity of Bartlett reservoir. This excess now spills over Granite Reef diversion dam and its usefulness for irrigation purposes is lost to the Salt River project.

The storage dam is to be of earth and rock fill 140 ft. in height and will be so constructed that it may be enlarged at a later date to create a reservoir of 300,000-ac. ft. capacity. The contract for this structure was recently awarded to the Arundel Corporation of Baltimore, Md., and L. E. Dixon Co. of Los Angeles, Calif., in the amount of $1,659,000. At the present time the contractors have established a camp a short distance downstream from the damsite and started preliminary excavation and construction of a temporary diversion. The present field headquarters of the contractors is at the San Carlos Hotel, Phoenix.

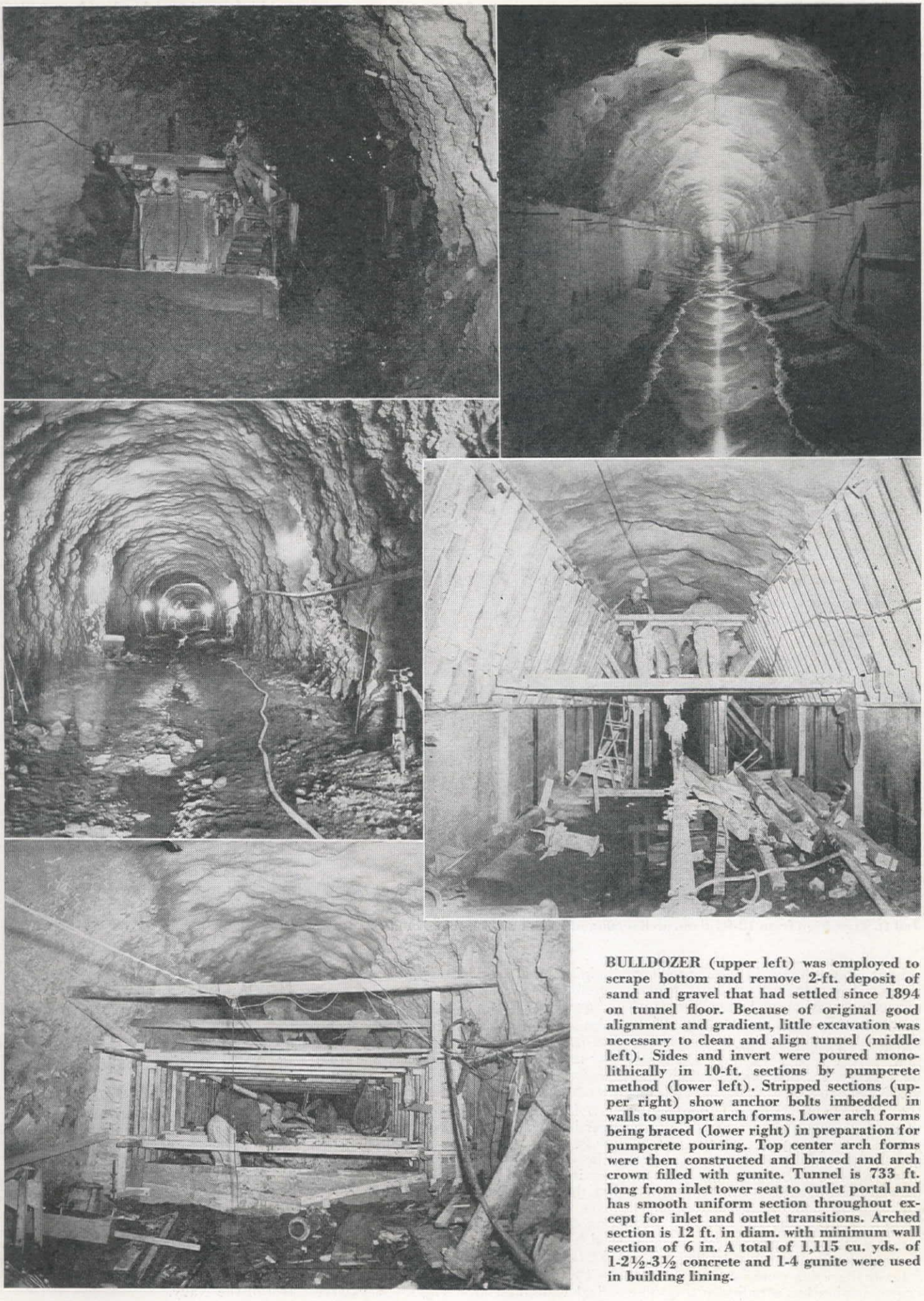
The first work at the Horseshoe damsite took place near the end of the nineteenth century. Twelve years prior to construction of Roosevelt dam, the Verde Canal Co. sold stock, drilled a diversion tunnel about 15 ft. in diameter past the damsite and constructed a few miles of canal in what is now known as Paradise Valley. Through lack of funds, however, this plan was abandoned and all work ceased in 1894. Nothing further was done at this location for fifty years.

Tunnel rehabilitation

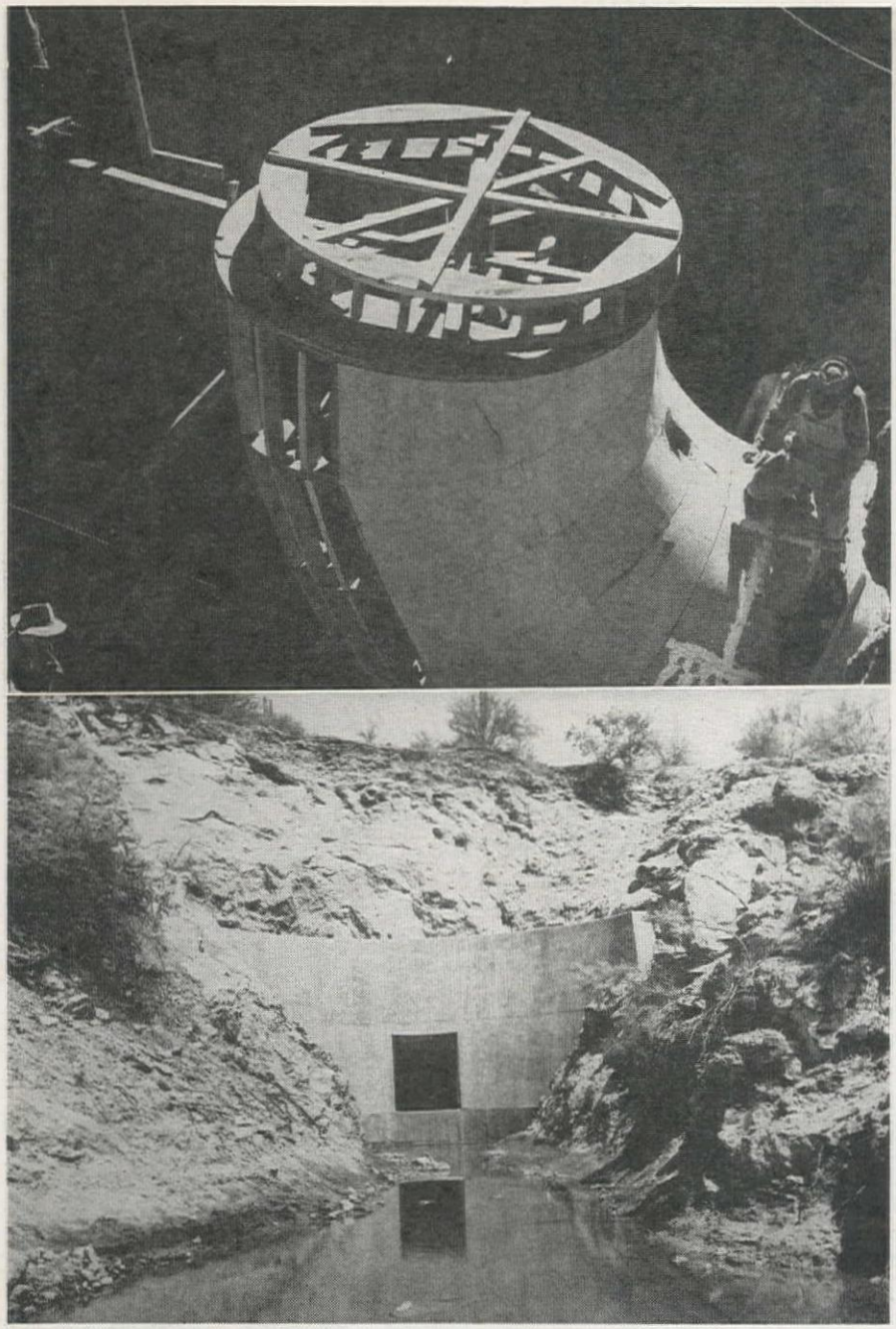
The rehabilitation and lining of this tunnel was the first step in the present project and contract for the work was awarded to Vinson & Pringle of Phoenix. This company started its work about December 1, 1943, and completed the contract on May 25, 1944. Also included in their work was the erection of a construction camp, complete with roads, lighting, domestic water supply and sewage disposal. The total contract cost was approximately $164,000.

It was found that the original tunnel had suffered little damage or disintegration during the 50-year period of disuse. It was necessary for the contractor to excavate approximately 2 ft. of sand and gravel which had been deposited on the floor of the tunnel by flood waters which had passed through the tunnel at intervals over the 50-year period. When this excavation was completed it was found that surprisingly good alignment and gradient had been maintained during the

SITE OF PROPOSED DAM. Recently renovated diversion tunnel cuts through the high ground in the center of the river curve. The dam will be built in approximately the same position as the foot bridge.



BULLDOZER (upper left) was employed to scrape bottom and remove 2-ft. deposit of sand and gravel that had settled since 1894 on tunnel floor. Because of original good alignment and gradient, little excavation was necessary to clean and align tunnel (middle left). Sides and invert were poured monolithically in 10-ft. sections by pumpcrete method (lower left). Stripped sections (upper right) show anchor bolts imbedded in walls to support arch forms. Lower arch forms being braced (lower right) in preparation for pumpcrete pouring. Top center arch forms were then constructed and braced and arch crown filled with gunite. Tunnel is 733 ft. long from inlet tower seat to outlet portal and has smooth uniform section throughout except for inlet and outlet transitions. Arched section is 12 ft. in diam. with minimum wall section of 6 in. A total of 1,115 cu. yds. of 1-2½-3½ concrete and 1-4 gunite were used in building lining.



PLYWOOD FORMS (upper) being built for curved intake section. Intake gate tower, 108 ft. high will surmount this opening. Outlet rectangular section (lower) is 7x8 ft. Transition from 12-ft. diam. arch section of main tunnel is made in last 23 ft.

original construction, in spite of the fact that drilling machinery and the science of rock excavation were then in their infancy.

The removal of the 2-ft. deposit on the floor of the tunnel was first attempted by sluicing, but this was found unsatisfactory due to lack of gradient. The contractor then proceeded to remove the deposit by means of a bulldozer.

When the deposited material had been cleaned out and loose rocks in the walls and crown of the tunnel removed, the bore was lined with reinforced concrete to a finished arch shape having a width of 12 ft. and a total height of 12 ft. The invert was poured on a circular outline having a radius of 18 ft. 6 in. The lower 5 ft. of the walls were vertical and the crown section has a radius of 6 ft. The minimum allowable thickness of concrete in the walls was 6 in.

The invert and vertical sides of the tunnel were poured simultaneously in 10-ft. sections, the concrete being placed by means of a pumpcrete machine from a central plant established at the upstream portal.

After removal of the forms from a vertical wall section, arch ring forms were placed for the lower segments of the arch. These lower segments were again poured by the concrete pump method. Finally the center of the arch was filled with gunite. The result was a smooth uniform section throughout, with the exception of the inlet and outlet transitions.

Plywood forms were used for the vertical walls and arch rings. They were held in place by anchor bolts grouted in the walls. A portable arc welding machine was used inside the tunnel for cutting and welding the bolts to ¾ in. reinforcing steel for a proper length to furnish alignment of the forms.

Structures

A depressed intake, curving so that the water will enter through a vertical intake tower, was constructed at the upstream end of the tunnel. This depressed intake will have a diameter of 12 ft.

Also included in the contract was a concrete seat for the gate tower which will be 108 ft. high, and a 23-ft. transition section at the outlet end of the tunnel, which changes the cross section of the bore to a 7 x 8-ft. rectangular opening, with the invert curving upward.

The concrete mix (by weight) used in the various sections of the contract is as follows: Tunnel lining, 1-2.5-3.5; intake tower base, 1-2-5; gunite for the arch crown, 1-4. Quantity of concrete in the tunnel lining, including gunite, was 1,115 cu. yd., and an additional 666 cu. yd. were used in the structures at the two portals.

The plans for the project were prepared by Leeds, Hill, Barnard and Jewett, consulting engineers of Los Angeles and Phoenix, with Raymond A. Hill being in direct charge.

Steel Ship Sunk Near Portland To Be Removed

A CONTRACT will be awarded soon for the removal of a Russian steel steamship which sank beside the port of Portland, Ore., drydocks on June 24. The vessel is 390 ft. long and 45 ft. in beam and is reported to have been the private yacht of Czar Nicholas II. It was a 4,000 ton vessel. Col. Ralph A. Tudor, U. S. Army district engineer, has announced that the contractor may keep the hulk and all its appurtenances; or if he does not wish to keep it, he must dispose of it at some place where it will not be a menace to navigation. One hundred and fifty days are given to the contractor for removal. No explosives will be permitted because of the proximity of important wharfage installations.

Navy Leases Santa Barbara Municipal Airport at Goleta

THE MUNICIPAL airport of the city of Santa Barbara, Calif., located at Goleta, has been leased to the U. S. Navy for the duration of the war and 6 additional months thereafter. About 580 ac. of land are involved in the deal. The Navy agrees to pay an annual rental of $2,600. Inasmuch as the airport has been occupied by the Navy since June 30, 1942, subject to the present negotiations, an accrued rental of $5,200 is now payable. The Navy is required to repair and maintain the airport during its tenancy. Commercial airlines may continue to use the facilities subject to the military control of the Navy.

Assemble Homes in Half Hour

Sixteen complete two-bedroom houses are built each eight-hour day by "Prenco," Toledo, Ore.—Complete outer walls, interior partitions, roofs and floors are built in the four-story 1000-ft. assembly-line building—"Stressed-skin" principle of using two sheets of plywood, separated by strong light frame was employed in design

By CLYDE J. GORMAN
Seattle, Washington

POWER EQUIPMENT solves heavy lifting problem. "Cherry picker" mobile derrick lifts two-bedroom house to be loaded on truck in background and taken to building site. Prefabricated sections in this storage yard will be assembled into housing units.

A COMPARATIVELY few years ago, a building enterprise, by name the Prefabricated Engineering Company, "Prenco" for short, set up shop with a few leaves taken from the history of the automotive industry. Now this Toledo, Oregon, company seems to have taken the whole book.

These apt students of mass production are turning out houses, complete from flower box to shower, sink, and easy chair, in 30 minutes. If you want three bedrooms, instead of two, add 10 minutes.

We are, of course, talking about assembly time, as the component parts, just like fenders and wheels, are ready to snap in place. But since a new house rolls out of the plant every 30 or 40 minutes, the parts had to come from somewhere, and it's still 30 or 40 minutes, no matter how you figure it.

The schedule of 16 complete two-bedroom houses, or its equivalent, per eight-hour day, takes a lot of planning, plant, and equipment. Robert Johnson, managing partner of the company, and the men who work with him, didn't figure it out in a day. Yet, having cut their eyeteeth on prefabricated housing before the war, and on Army hutments, thousand-bed hospitals, and knock-down barges since the war, it was a natural for Prenco to step up for a substantial whirl in prefab housing when the War Department let out contracts several months ago. Other awards went to firms in Elkhart and Albany, Indiana, and Alma, Michigan, but as of now, the Oregon organization leads in production.

Assembly line building

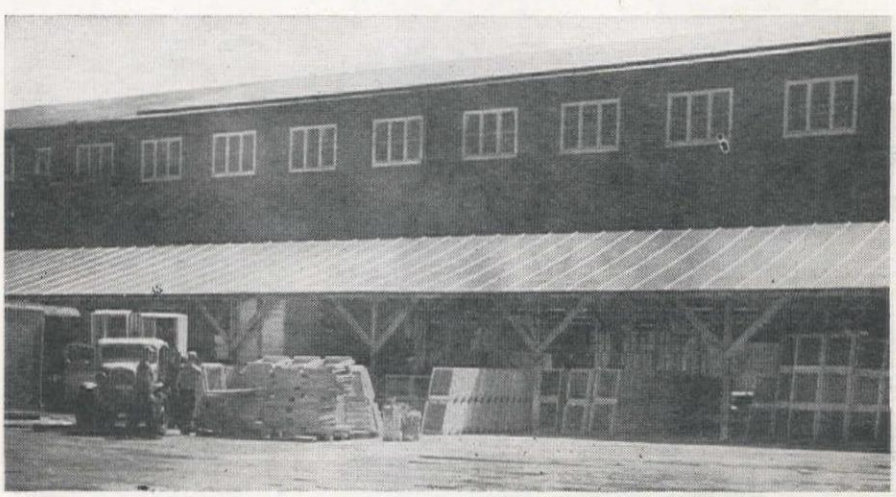
In a 1,000-ft. shed, four stories high, rented from the C. D. Johnson Lumber Company, who used to use it for loading lumber on trains, Prenco has set up four 600-ft. assembly lines. From the adjoining fabrication or cut-up department, occupying some 50,000 sq. ft., filled with trim saws, gang drills, morticing machines, and the like, the makings of a little home are conveyed to the second floor of the big shed, where they are fitted in subassembly sections. From their overhead position it's an easy drop to the assembly line at the right time and in the right place.

Some six hundred workmen, all representing one or another of the allied skills that usually assemble at the building contractor's jobsite, are required for the daily stint. Here, the building, or part of it, comes to them much more smoothly than the mountain came to Mohammed, and nails are driven, holes are bored, wires strung, or pipes fitted. It appears that some of the lessons and practices learned in plywood aircraft construction have been applied with good results in these structures that also fly—on the assembly line. A "stressed-skin" principle, that of using two light-weight sheets of plywood, separated by a strong light frame, has given good results. The method succeeds in developing girder strength without reliance on usual structural members. As graphic evidence, of the kind very difficult to produce in a testing lab, a 60-mi. wind recently took two truck trailers and their house cargo down a canyon over a route not previously contemplated. The upshot of this vigorous bouncing and rolling was that certain minor repairs were required, largely as a result of the furniture rattling around inside. The windows were undamaged.

A few subassembly pieces that are not greatly disturbed by subsequent installation, or that later become hard to reach, such as ceilings, are painted by spray guns beforehand. Other functions of subassembly find complete outer walls, interior partitions, door frames, roofs, and floors made ready for the final operation.

Below, on the wide-gauge track of the 600-ft. runs, the house takes shape in a hurry. Plumbers install ready-built showers and kindred facilities. Twin kitchen sinks, electric water heaters, and necessary piping are already jointed to fit in place. Electricians move in with meters and switch boxes, tie on to pre-

PREFABRICATED window assemblies are stored in warehouse before being sent to the sub-assembly division. Construction processes are organized in this two-story plant so as to save every minute possible in the building operations.



CARPENTERS BUILD wall panels on benches in sub-assembly building. Outside wall panels are insulated and wired before application of final plywood finish surface.

viously wired panels. Thence into the paint room, and out again in a matter of minutes for drying, and the linoleum layers take over. Obviously, no time is needed to juggle, trim, and try in this operation. Electric stoves and refrigerators add their refinement.

Furniture and delivery

And that does it, all but the furniture. This is installed almost on the fly, when trucks pause at a furniture plant in Portland. Here rushing out of the B. P. John factory all the day from 8:00 a.m. to midnight, are regular employees, and soldiers and sailors keeping in trim on leave, each carrying an endless stream of three living room cabinets, two bookcases, one chest of drawers, a highboy cabinet, a storage cabinet, tables, chairs, three low chests for under the windows, a dressing table, a mattress and box spring, a day-bed sofa, and a mirror for every house. To top it all off, a flower box is slung in to hook on the porch when the house finally settles down. It can hold ten flower pots or one victory garden.

From here, the houses are off to the home front war, where, on arrival, they are set up intact on tailor-made foundations. Pipes, drains, and lead-in wires are already in place. They match the house to a whisker.

Currently, the prefab dwellings are going to Pasco, Washington. They could go anywhere. Maybe after the war they will.

Present problem in any postwar speculation (and the potential of these houses has caused plenty of said speculation), is the matter of duplicating such favorable conditions for jobsite installation. It is one thing to set 'em up like peas in a pod, and quite another to tote them up every scattered swale and hogback where the private owner has a piece of ground with 40 ft. of frontage on Lake Whooshimigosh. These separate sales would likely lead to delivery of knockdown sections and jobsite erection on a prepared foundation. Prewar experiments were made in trying to deliver more nearly completed units by having a crane trundle along in the wake of the main column.

However, costs are apt to confine such activity to limited areas. Present costs seem to run around $1,200 to $1,600, depending on the number of bedrooms. There has been some discussion on this point, perhaps because one thinks of a house in terms of built-in-place structures of varied design and more immovable appearance. Considering that these houses resemble a cross between a house trailer and a week-end cabin, and that either of the foregoing costs equally as much or more when finally outfitted, the cost seems to be in line. Certainly, the prefab business will not lack the know-how to approach its postwar competition.

Some think that the whole future of prefab housing will be one of localized applications. Others envision a terrific future, with markets reaching around the world. Area assembly plants would be spotted as they are in the automotive industry. Export firms have been giving this angle some thought. Obviously, the business could become well geared for jobsite housing on postwar construction jobs, and for certain types of industrial or mining communities. Somewhere along the line prefab housing will find its niche.

ELECTRICIANS in final assembly, connect panel wires and install pre-assembled switch and meter units. Wiring for modern electric appliances is installed in sub-assembly building while panels are being fabricated.

INTERIOR VIEW of typical kitchen showing compact arrangement of cabinets and equipment—electric stove, linoleum drainboard and floor and modern plumbing.

New Glues Improve Laminated Timber

Stimulated by war demands, research has developed glues that withstand rain, frost, heat and cold — Glued laminated timbers meet heavy construction and tough engineering requirements. Beams can be fabricated into various shapes and sizes from readily available lumber of standard dimensions

By R. T. TITUS
Director
West Coast Lumbermen's Association
Seattle, Wash.

BIGGER, BETTER AND longer wood beams than ever have been sawed from a log are now available for use in hundreds of structural shapes, because of the spectacular development in new glues being used in fabrication of laminated timbers.

Research, stimulated by war's demands, has developed all sorts of glues. Quick-setting cold glue; a phenolic resin glue now suitable for beams exposed to rain, frost, heat and cold; a casein glue that won't mold; and glues so strong that a glued-up, laminated member will not break on the glue line—these are some of the very new offerings of science and laboratory technicians designed to extend ultra-modern wood use into the difficult game of heavy construction and tough engineering requirements.

The lumber industry today is making heavy plans for the future, with the great war uses for lumber as a wonderful proving ground, enabling wood to take its rightful place among the chosen few universally accepted "semi-precious" materials. With the aid of new technologies, such as the perfection of high-grade glues, lumbermen hope to keep out of the economic doghouse of the future, by reversing the old adage to one of their own—"making big ones out of little ones."

With the transition in the Pacific Northwest of forest lands from decadent old-growth stands to wood producing young forests determining the marching orders of the industry, many problems must be solved. Lumber manufacturers and private forest land owners must begin to think in terms of products and markets instead of trees. Their keynote for the future is, "Year by year, cut fewer trees and employ more men."

Because complete utilization of the tree crop from the millions of acres of top quality timberland is a basic element of forestry, it stands to reason that any new method of utilization will have a profound effect on future forestry policies.

For instance, if by developing glued-up lamination to the point where future requirements of industry for heavy timbers can be completely met from the combination of small boards and gluepot, then the entire forestry picture changes. Gone will be the need for large trees from which to cut large "sticks." If smaller trees can be profitably harvested and the lumber therefrom converted into every requirement of the building industry, the growth cycle of a forest can be greatly reduced. That means that private capital can better afford to retain control of forest-growing land with much shorter and more frequent periods of harvest.

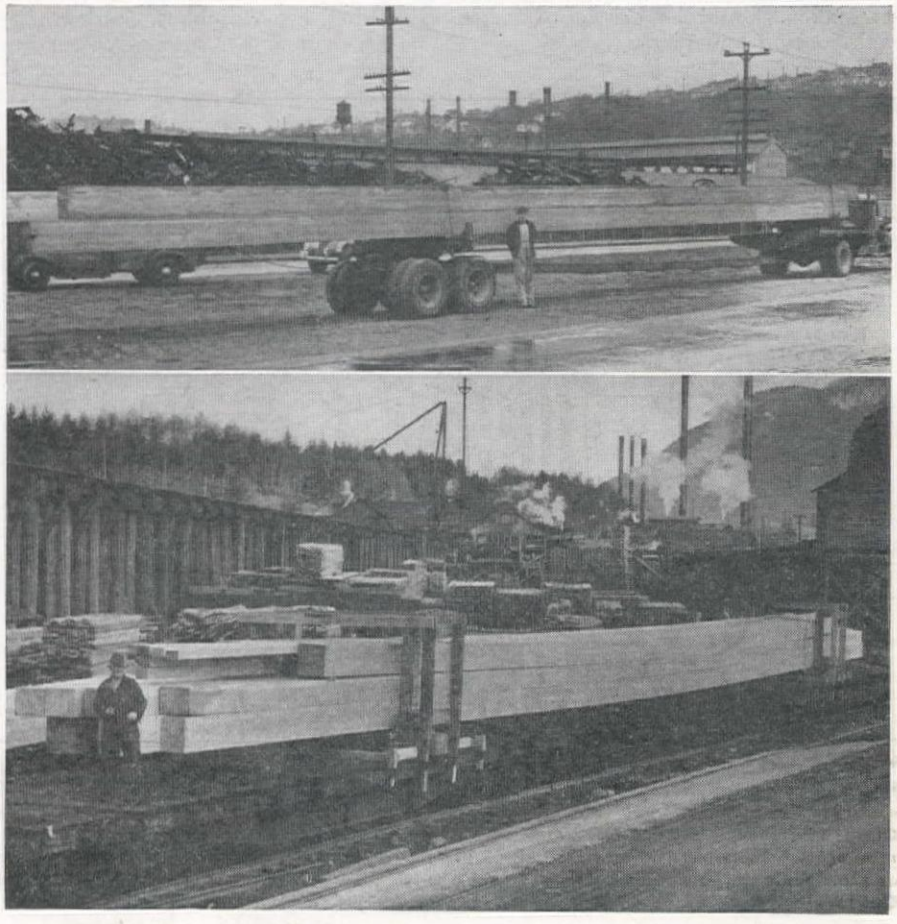
Glued lamination construction has many advantages. It can be fabricated to any desired shape, size or length from lumber of sizes and lengths readily available. Laminations can be selected for uniformity in grade and quality. They must be seasoned for gluing, therefore the resulting structure will not shrink nor check. A camber can be built in to offset deflection. Additional laminations can be added at any point to give additional strength, or to provide greater area for timber connectors. Laminations on top of a roof beam may be stepped up to give slope to a roof and the laminated member can be bent to any curvature.

The beam, column, arch or truss chord resulting from glued lamination is claimed to be stronger than if sawn from a log in one piece. Knots will not be in the same locations in adjacent laminations. Also, slope of grain in many laminations will be straighter than the maximum slope permitted by the grade. Bending and compression members will be stronger because seasoned before loading. Economy can be served in members in bending by sorting pieces for grade, to use the highline pieces where the stresses are greatest and the lowline pieces where stresses are low, or even by using laminations of different grades for different portions of the member.

The available practical variations are limitless in the field of glued laminations. Wood has always been recognized as our most flexible material, and with the full development of proven glues the flexibility and use extend into almost every range of construction and use.

Modern glue fabricating plants are now equipped to use the new phenolic resin glue which is efficient for exposed beams, and experimenting through use and research is almost certain to provide more improved glues.

SOLID TIMBERS of Douglas fir up to 136 ft. long (upper) are for Navy boat keels. Modern glue fabricating plants are now equipped to build laminated beams of many shapes and lengths. Truss chords (lower), 10x18¼ in. and 86 ft. in length, for naval construction work are fabricated by gluing together small pieces of Douglas fir. Timbers of tomorrow will not be sawed "big sticks" but boards glued and built up into giant beams.



HOW IT WAS DONE

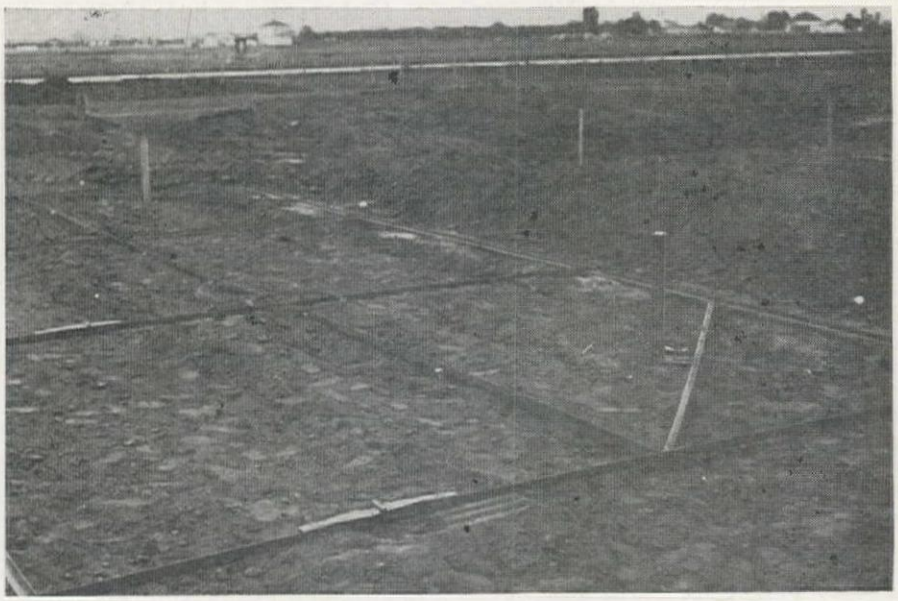
JOB AND SHOP TIPS FROM THE FIELD EDITOR'S NOTEBOOK

Folding Template Expedites Layout

A FOLDING ANGLE IRON template has been designed during the construction of San Lorenzo Village (see page 72, this issue), for use in laying out the foundations for 1,329 homes. Power equipment and assembly-line procedures have expedited the construction of this project so that it will be completed in record time.

Crews of workmen are organized to follow one another as each does its particular phase of the construction work. In the process of laying out the house foundations, a survey party establishes grade stakes at each corner of each lot. This party is followed by a man operating a bulldozer, which is used to grade the dirt so that the ground slopes from 6 in. above the curb at the front of the lot to 12 in. above the curb at the back of the lot.

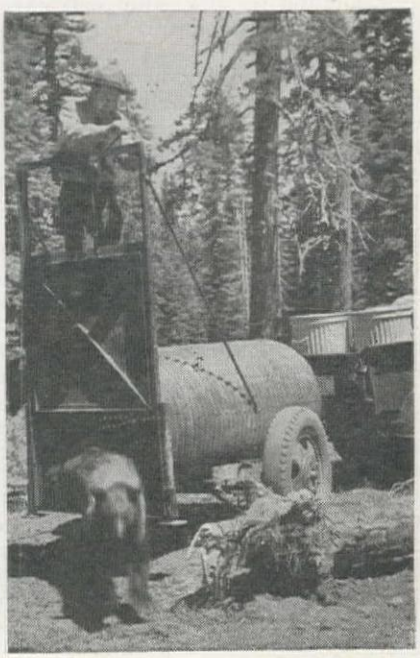
The next crew lays out stakes for the footing forms. This crew employs the hinged template shown at the right. It is rigidly braced at each corner by a piece of angle iron so that it will not be distorted while being moved from lot to lot. It is marked to indicate where offset stakes should be driven to locate each footing and pier.

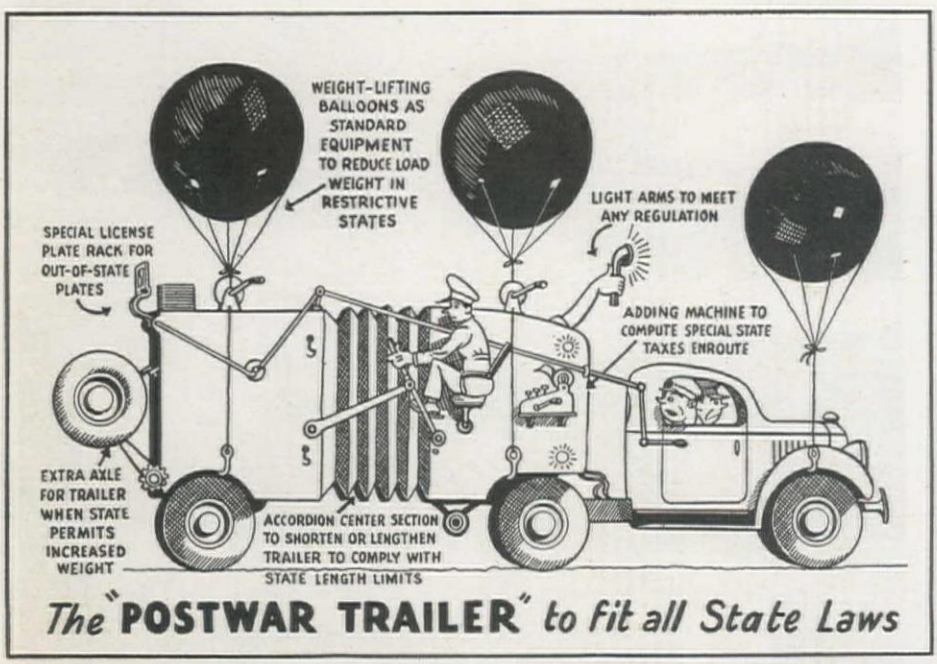


Bear Trap Made From Culvert Pipe

BEARS IN YOSEMITE NATIONAL Park are so friendly and sociable that, while looking for a midnight lunch, they sometimes make themselves nuisances by breaking into kitchens. Park rangers have designed a trap to catch the bears so that they can be hauled away to isolated sections of the park.

The trap is made from a section of corrugated culvert pipe, closed at one end and having a trap door at the other. When the bear reaches for honey on the inside of the pipe, the door closes. The pipe is mounted on wheels and can be attached to a ranger's patrol car. Although this relief may be only temporary, it seems to have solved the bear problem.





• Ike Doodlesmalz, M.E., D.D.S., independent industrial engineer de luxe, has submitted this design to Fruehauf Trailer Co. Here is what we have out West: Maximum gross weights: California, 76,000 lbs.; Oregon, 54,000 lbs.; Washington, 68,000 lbs. Lengths: Calif., 60 ft. truck and trailer, single unit 35 ft.; Oregon, truck and trailer 50 ft., tractor semi-trailer 35 ft.; Washington, 60 ft. Height: Oregon: 11 ft. Other Western states same as California for preceding. Oregon, only bottleneck on the Pacific Coast, now grants California weight up to 68,000 and 13 ft. 6 in. height for the duration.

NEWS OF WESTERN CONSTRUCTION

SEPTEMBER, 1944

Study Snake River Dam Sites On Dangerous Canyon Trip

A 260-MILE TWELVE-DAY TRIP down the wild Salmon and Snake rivers in Idaho and part of Washington was recently made by a party of eight army engineers from Col. Ralph A. Tudor's Portland district office, who made a study of possible dam sites, stream flow and geological features for the comprehensive plan for postwar Columbia Basin development.

The party drifted through thunderous river canyons and swift flowing rapids in a flat-bottomed boat, 30 ft. long and 8 ft. wide, drawing only eight inches when oaded. Two experienced rivermen, Clyde Smith and his son, Don, manned the 22-ft. sweeps at either end of the boat to guide it through rapids and around menacing rocks.

The engineer's group was headed by O. L. Hoffman, engineer in the Portland district office, and included L. E. Rydell, K. M. MacDuffee, F. O. McGrew, C. W. Waggoner, C. O. Greenwood, Jr., S. E. Sporseen, other engineers; and L. L. Ruff, geologist.

As a result of finding several likely appearing dam sites, more detailed studies are contemplated by other parties of engineers, and aerial photographic studies will also be added to the data.

The original party left from Indianola ranger station, 32 mi. above Salmon, Idaho, and dropped 2,500 ft. in elevation in 12 days during the 260-mi. drift.

Colorado Planning Six-Lane Freeway

A SIX-LANE FREEWAY from Fort Collins, Colo., 65 mi. to Denver, will be the first major postwar project undertaken by the Colorado Highway Department, according to a resolution adopted by the Department's Advisory Board and approved by Gov. John C. Vivian.

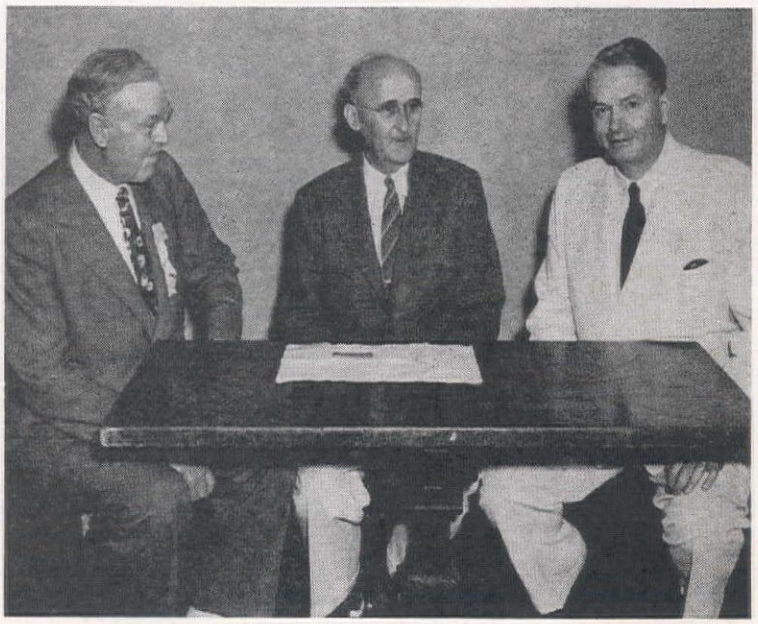
It will lie between the two major north and south highways of Colorado, U. S. 85 and U. S. 87, and will follow the present Highway 185, which was improved just before the war as a by-pass highway particularly for truck traffic. At Denver it will connect with the proposed Platte River Drive—a superhighway following the banks of the Platte River through the city, also planned for immediate postwar construction—thence will drop south to a connection with the present Highway 85.

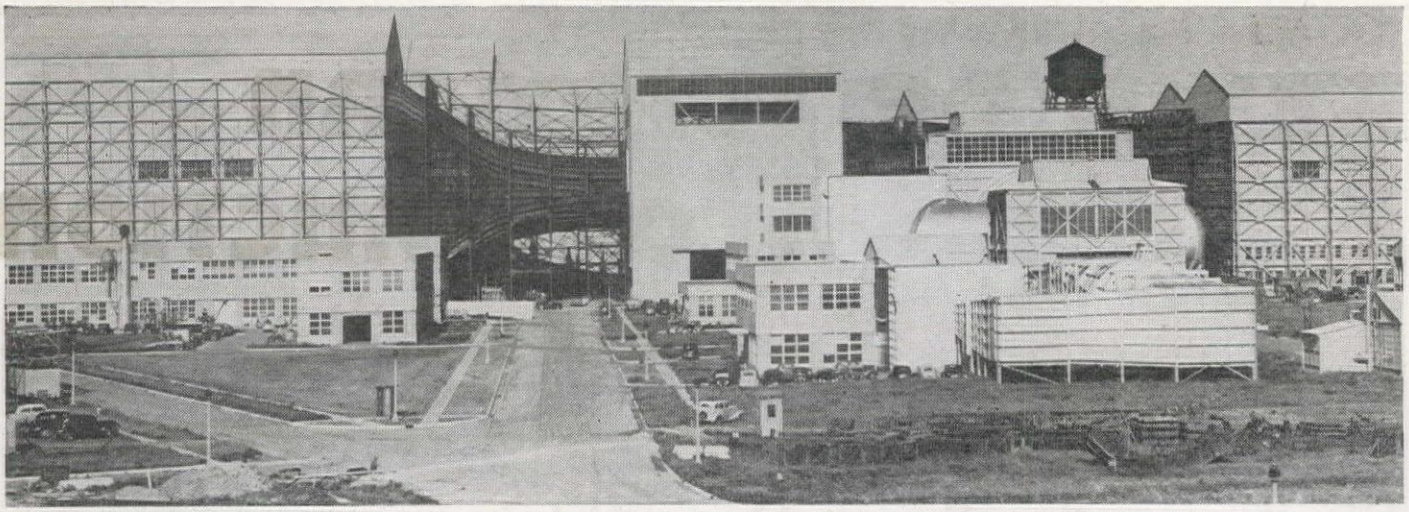
In connection with general postwar highway improvement, the Department has given notice that, if Colorado is to be able to meet the federal grants proposed in HR 4915 for postwar construction, the state will have to find $12,500,000 in new highway funds somewhere. The present departmental surplus of approximately $3,800,000 will be virtually "soaked up" to meet already existing federal allocations totaling $5,512,000, which have been unexpended on account of the war. Surplus derived from state revenues now available, will amount to only about $3,000,000 by 1948—when federal postwar allocations must be matched under present plans—and the state must find $15,892,000 in all to match the $23,271,000 in federal funds available to the state under HR 4915.

The Department's tentative suggestion is that $4,000,000 be made available from the present state general fund surplus of $8,000,000 held for postwar purposes, that motor vehicle license fees be raised to provide $1,600,000, that the gasoline tax be increased one cent—to

MORRIS HEADS LOS ANGELES WATER SYSTEM

SAMUEL B. MORRIS, right, has been appointed to the position of chief engineer and general manager of the Los Angeles Department of Water and Power, succeeding H. A. VAN NORMAN, left, who resigned the position on August 29. His salary will be $25,000 per year. Van Norman is retained in an advisory capacity until January 1 at a fee of $1,000 monthly. He has been with the department almost continuously since 1907, the exception being a year as Los Angeles City Engineer, supervising construction of the city's North Outfall Sewer. Morris is dean of engineering at Stanford University, a post which he has occupied since 1935. Prior to that he was general manager of the Pasadena, Calif., water department, and while there supervised construction of the 328-ft. Morris dam in San Gabriel Canyon, which now forms one of the principal distributing features of the Metropolitan Water District system. He is a past president of the American Water Works Association, and of the San Francisco section of American Society of Civil Engineers. Also shown in the photograph is JULIAN HINDS, chief engineer and general manager of the Metropolitan Water District of Southern California.





THE WORLD'S LARGEST wind tunnel, to be used in testing full-scale airplanes, has been completed at Moffett Field, Calif., by Pittsburgh-Des Moines Steel Co. It is 868 ft. long and has a ceiling height of 180 ft. The width at one end is 399 ft. and at the other 353 ft. The unit is box-shaped, with exterior bracing, and is constructed of steel throughout. The cost of the tunnel was approximately $7,000,000.

Six 37-ton, 6,000 h.p. electric motors each driving a 6-bladed fan 40 ft. in diameter, send 24 million cu. ft. of air through the 2,150-ft. closed circuit at more than 200 mi. per hr. At the corners 3,888 curved vanes turn the air at right angles without turbulence. The structure is large enough to test planes with wing spreads up to 72 ft., which includes all present pursuit and fighter types, even medium bombers, and is particularly designed to test for "lift" or "drag." This wind tunnel is a part of the Ames Aeronautical Laboratory at Moffett Field, and is the largest of 21 similar structures built by Pittsburgh-Des Moines at various points over the country. Also in operation at the Ames Laboratory are a 12-ft., a 16-ft., and two 7x10-ft. wind tunnels. In the 16-ft. structure, a maximum wind velocity of 600 mi. per hr. is attained.

five cents—to provide $4,575,000, and that the state postpone the payment of principal on $2,332,000 of state highway warrants—of a total of $25,000,000 issued in 1936 to pay for a highway program. This would total $12,507,000.

Aviation Gas Refinery To Be Built at Torrance

ANTICIPATED unemployment problems in the partial demobilization period following the close of the European war will be alleviated to some degree by a construction program to be undertaken by General Petroleum Corp. in the near future. To provide additional 100-octane aviation gasoline manufacturing production, and to further conserve future oil resources, the company is to build an addition to its refinery in Torrance, Calif., which will cost well in excess of $4,000,000.

The new unit will be built for General Petroleum Corp. by the M. W. Kellogg Co., who will employ up to 700 to 800 men during the ensuing year. The additional facilities will have a capacity of from 13,000 to 15,000 bbls. of components each day.

This new unit is designed to get "the last squeal out of the pig" before final reduction of crude oil to the coke stage. By producing additional high octane and other components out of the crude, it will play a part in conserving oil resources, the future of which has caused so much concern during the last few years.

The plant will also provide the latest scientific methods for quick adaptation to the manufacture of products that may be required, ranging from the highest octane aviation gasoline down to diesel and fuel oils, and make possible a controlled production of the highest quality of these products.

Arizona Water District Payments 5 Years Ahead

THE SALT RIVER VALLEY Water Users' Association of Phoenix, Ariz., has just sent in a check for over $170,000 to the Bureau of Reclamation for prepayment of the installment due Dec. 1, 1949, on the original construction charge of the project.

One year after the passage of the Federal Reclamation Act in 1902, the Salt River project was authorized for construction. Not only was Salt River one of the first irrigation projects to be started under the Reclamation Act, but the Bureau's first power plant was constructed there and started operation in 1906 at Roosevelt Dam, which was finally completed in 1911.

The Salt River project, which serves almost 300,000 ac., has proved its worth many times. Last year, the crop value on irrigated land under its ditches was $157 per ac. It has been said that the growth of Phoenix has been made possible in large measure by the irrigation development on the Salt River project, which is noted for high-quality vegetables, cantaloupes, grapefruit, and other specialty crops.

Beach Dredging Project Once More Advertised For Bidding

A NEW EFFORT is being made to secure bids on the improvement of the beaches at Santa Monica and Venice, Calif. The normal littoral drift of the sand along the beaches has been prevented by the construction of the Santa Monica breakwater, thus rendering the frontage unserviceable. The cost of restoring the strand is estimated at $235,000. The project envisions dredging of the huge deposits of sand accumulated behind the breakwater and the distribution of the sand along the strand to the southeast. Bids were called on March 15, but no bids were received by the State Department of Public Works. The project will be paid for jointly by the state, the county of Los Angeles and the cities of Los Angeles and Santa Monica.

Marin Workers Idea Leaders

WORKERS IN Marinship yard, Sausalito, Calif., have proved themselves the "idea leaders" of the country, by winning 10 out of 20 individual awards made by the War Production Board to workers in 5,000 plants from coast to coast. It is estimated their suggestions have saved 1,410,000 manhours and $2,456,000. A total of 152 awards have now been made to Marinship workers. Packard Motor Co. is second with 138.

Pleasure Craft May Now Operate On Shasta Lake

PERMITS TO OPERATE privately-owned craft on Shasta Lake may now be obtained, the Bureau of Reclamation has announced. Rules and regulations provide that boats so licensed may not approach within 200 ft. of Shasta dam nor may they enter zones marked as rest areas for wild life.

Permits cost from $2.00 to $10.00, depending on the size of the craft, are issued on a calendar year basis, and may be obtained from the Bureau of Reclamation at Redding. Ralph Lowry, Construction Engineer, has been designated to supervise the recreational activities.

Holders of permits may apply to the Bureau for permission also to build temporary landing floats or piers. Landing facilities of a more permanent type may

be built at places designated by the Bureau official at no extra charge to persons holding a boating permit.

The rules and regulations are termed "interim." They are in effect until the permanent program for development of the Shasta recreational area is ready. That program plan, as recommended by a group of representatives of local, state, and federal agencies, is now in Washington. Its provisions are such, however, that some time will be required to put it into effect.

The lake, now 25 mi. long, already offers sailing and fishing opportunities, and under the federal licensing plan the government, for wartime security reasons, must supervise the use of the lake for recreation. The land surrounding the lake shore is government-owned, and under the proposed program, if and when adopted, individuals may obtain leases for various purposes such as home, hotel, or club sites.

Federal Wages in Hawaii Stabilized by New Order

THE NATIONAL War Labor Board has announced adoption of General Order 37, which delegates to the Secretary of War authority to establish wage or salary schedules for civilian employees of the War Department in government owned and operated installations in the Territory of Hawaii.

The general order specified that the level of wage and salary rates prevailing on June 6, 1944—the date on which the Board extended wage stabilization to Hawaii—is to be maintained. The order also specified that, exclusive of the Hawaiian Air Depot, the approval of any wage or salary schedule resulting from job reclassifications is not to cause an overall increase in excess of 5 per cent.

Rates established for the air depot must be in conformity with rates for other War Department installations in the Territory, according to the order, which also specified that rates for any new classifications must bear a proper relationship to rates for immediately interrelated classifications.

Actions taken under the delegation of authority are subject to final review by the National War Labor Board.

Nevada Construction Co. Enters Iron Mining Business

DODGE CONSTRUCTION CO., Inc., a well known Fallon, Nev., construction contractor, has entered a new field of activity. The firm produces a crushed and screened magnetite iron ore from a property in the Humboldt range. They have completed one contract for producing 10,000 tons of the 65 per cent ore and have been awarded an additional contract for as much more. The material comes from an open pit mine, is crushed in a crushing plant constructed by the company, and hauled in a fleet of trucks to Woolsey for shipment to the Pacific Coast, where it is used as ballast in both navy and marine vessels.

Hetch Hetchy Time Limit Extended by Six Months

IN A DECISION of the Federal Court handed down on Aug. 28, expiration date of the delay allowed the city of San Francisco to secure a customer for its Hetch Hetchy power, a further stay of six months was granted.

An agreement had been worked out with the Pacific Gas and Electric Co. whereby power generated at Moccasin power plant of the city, located in Yosemite National Park, would be turned over to the private utility at Newark and they would deliver power to the municipal street car system and other municipal functions. This exchange of power was on a basis of 2½ kw. hr. delivered to the company at Newark for each 1 kw. hr. used in the city's work. No exchange of money was involved. This arrangement would have used the entire output of the Moccasin plant and would not result in any revenue loss to the city. However, the U. S. Department of Justice ruled that this agreement was still a violation of the Raker Act, which forbids the transfer of any power generated in a public park to a private utility company.

During the new six months' time extension a new agreement must be worked out by the city. The Department of the Interior has suggested that the city lease or even condemn certain lines of the utility corporation to conduct the Hetch Hetchy power to the municipal street car system and to certain other large users such as the Navy yards at Hunters Point and Mare Island.

Line and Grade of 13.1-mi. Continental Divide Tunnel Found Nearly Perfect

SURVEYS BY engineers of the Bureau of Reclamation for the 13-mi. Alva B. Adams tunnel under the Continental Divide were so accurate that the two-way bores were holed through within a fraction of an inch of each other.

This was disclosed recently after the final survey of this longest tunnel ever to be driven from two points of access. The tunnel was constructed to carry Colorado river water to the eastern slope of the Divide in Colorado.

The checkup shows that the alignment of the two sections of the tunnel coincided within 7/16 of an in., and the tunnel grades met within ¾ of an in.

To achieve these precise results, Reclamation engineers, working under all weather conditions, carried their surveys over the main range of the Rockies. They located their control (triangulation) stations on some of the highest peaks—Mt. Craig, Hagues Peak, and others, some towering more than 13,000 ft. above sea level.

The surveyor's monument set on the Continental Divide above Andrews Glacier was the only one engineers could reach by horseback travel. Although the point did not require laborious packing by manpower, it was the most difficult for instrument work. Whistling gales in this high pass between Otis and Taylor Peaks often delayed the survey work because the precise instruments employed could not be used except during infrequent periods of calm air and clear weather.

As soon as the tunnel has been lined with concrete, it will be ready to bring water from the western or Pacific slope of the Rockies to the eastern side, furnishing supplemental irrigation water for 615,000 ac. of fertile farm land in northeastern Colorado.

Several miles of wood-stave pipe will be laid on top of the ground as a temporary means of bringing water from the east end of the tunnel into the Big Thompson River, so that it will flow to storage reservoirs for the supply of various irrigation canal distribution systems now in service. This makeshift device will be used until after the war, when a permanent conduit and tunnel system will be constructed.

OBITUARIES . . .

Ralph J. O'Rourke, a former president of the Colorado Society of Engineers, died in Denver on Aug. 5 at the age of 57. His last construction project was the War Relocation Authority camp at Amache, Colo. He had also been regional engineer for the National Youth Administration, with headquarters at San Francisco, Calif.

* * *

Dr. Horace Russel, Jr., one of the most able chemical engineers in the country, died in Pasadena, Calif., on Aug. 5 as a result of injuries sustained while horseback riding. He was 27 years of age, and had been working on war investigations at Caltech for some time past.

* * *

John W. Howe, editor of California Highways and Public Works, official publication of the California Division of Highways, died Aug. 29 in Sacramento, Calif. He had been with the division since 1931, at one time being secretary of the Highway Commission.

* * *

Heber C. Maughan, 74, died July 30 in Logan, Utah. For the past 40 years he has been superintendent of the Logan municipal power plant, and was an authority on municipal power development.

* * *

Frank R. O'Leary, County Surveyor of Humboldt Co., Nev., since 1922, died on Aug. 18 in Winnemucca, at the age of 59. He was also City Engineer of Winnemucca.

* * *

John E. Long, 58, a veteran employee of the Seattle city engineering department, died in that city on Aug. 4.

WASHINGTON NEWS

. . . for the Construction West

By ARNOLD KRUCKMAN

WASHINGTON, D. C.—WPB is now setting up a committee of 40 representative members of the construction industry to work upon plans for reconversion, and to help guide the actual peacetime construction steps. The first meeting of a nucleus group was held early in August by Donald Nelson. Those present were F. Stuart Fitzpatrick, manager, Construction and Civic Development Department, U. S. Chamber of Commerce; William Muirhead, president, and H. E. Foreman, managing director, AGC; Robert P. Gerholz, president, and Frank W. Cortright, vice-president, National Association of Home Builders; Allen J. Saville and E. Lawrence Chandler, American Society of Civil Engineers; Douglas Whitlock and J. W. Follin, Producers' Council; D. K. Este Fisher, Jr., American Institute of Architects; Norman P. Mason, National Association of Retail Lumber Dealers; R. G. Kimball, National Lumber Manufacturers Association.

The Nelson program enunciated at this initial meeting has largely faded into uncertainty by reason of the fact that Nelson has been sent to China, where he is expected to remain until early next year. Charles E. Wilson, who was expected to take over and give a more incisive character to the Nelson program, has quit in order to give sharp emphasis to his opinion of the Nelson shortcomings.

WPB to left

This brought back into the picture J. A. Krug, long groomed by the New Dealers as the white hope, from their point of view, when time for reconversion came. Krug, who left some months ago to become a lieutenant-commander in the Navy, was yanked out of the service and brought back to Washington with extraordinary abruptness. No one knew he was here until his appointment was announced to succeed Wilson and to take Nelson's place.

It is generally assumed Nelson is through. His methods were Machiavellian, and gained for him an extensive following in Congress and throughout the country. This made it difficult for the Administration to get rid of him. He built up a highly integrated organization in WPB which was very loyal to him. It is anticipated it will be Krug's first job to immunize the many parts that make up this following.

It also appears to be Krug's job to put the lid on the whole mess stirred up by the fight over reconversion. Reconversion is a ticklish political subject. Dewey stresses reconversion; but the Democrats have attempted to deflect attention from everything except the war in order that there might be no embarrassing debates which would force the Commander-in-Chief to step into the role of candidate for the Presidency. Apparently Krug has been brought in to do this Herculean job.

He came into the government by way of the TVA, where he was Chief Power Engineer and Manager of Power, under David Lilienthal. Like Lilienthal, Krug is a product of the University of Wisconsin, and through Lilienthal apparently won the confidence of the White House. From TVA he was translated to the post of chief power official of WPB, and then quickly rose to third highest man of WPB. He is 36 years old, and is one of the most acute and deft young politicians in the government organization. He is known for his implicit faith in the Roosevelt policies, and for his leadership in the attenuated New Deal group. His appointment to the overlordship of WPB, **the prospective reconversion agency,** is regarded as confirmation of the expectation that the postwar swing of the Administration will be very far toward the the left, again.

The water use debate

Whether or not we will have preferential use of the waters in Western streams for irrigation, power, and other non-navigational purposes, will be determined in the Battle of Capitol Hill which is scheduled to begin when Congress resumes business after the election in November. By agreement between Sen. Overton and other interested legislators, the time for the start of the debate was left to Sen. Barkley, of Kentucky. It was general consensus that it will take five to six weeks to dispose of the Rivers and Harbors and Flood Control Bills. There seemed agreement that the bills either should be considered together, or one immediately after the other. It seems likely also that the bills introduced recently by Sen. Murray, of Montana, and by Sen. Gillette, of Iowa, for the creation of a Missouri River Authority, will come into this discussion.

The National Reclamation Association meets in Denver in November immediately after the election. There is strong demand from the members of Congress from states west of the Mississippi, and from some states in the East, that the Rivers and Harbors and Flood Control consideration be left until the Denver meeting is out of the way. This would bring the subject before the Senate after Nov. 20. The sentiment is unanimous that the whole business shall be cleaned up before this session ends. The likelihood is that, therefore, the debate will run almost to the end of December, when this Congress adjourns and goes out of business. Apparently to get final results will be a tight fit.

The drift of developments is indicated by the conference which took place in Chicago on Sept. 7 and 8. It was called a Water Conservation Conference. Delegates represented 29 states. Each Governor either was present in person or represented by five delegates. The states represented were each of the states of the Pacific Slope, most of the plains states, the states of the Southwest and Northeast, and some of the states of the East. The call for the conference was sent out jointly by elements from all sections in order to avoid conflicts. It was signed by Elwood J. Turner, chairman, Interstate Commission on the Delaware River Basin; L. Mims, chairman, Texas Delegation at the New Orleans Meeting of the National Rivers and Harbors Congress; Clifford H. Stone, chairman, on behalf of the National Reclamation Association; and Arthur W. Coolidge, chairman, Northeastern States Conservation Conference. The purpose of the conference: 1. To assure local and state participation in plans for water resources development; 2. To preserve the integrity of state water laws; 3. To perfect the amendments to the Omnibus Rivers and Harbors Bill (HR 3961), and the Omnibus Flood Control Bill (HR 4485), now pending before the Senate; 4. To insure adoption of the amendments; 5. To consider such other matters as may come before the conference. Broadly, the consideration was focussed on State and Federal responsibilities in river use and control, and stream basin development in the humid areas of West and Midwest, in the arid and semi-arid West, and the conflicts in the use of water.

There seems small doubt that out of this conference will come a united front from the majority of states of the nation in the demand to amend the bills. The President already has made his favorable stand clear in the letter quoted in these columns addressed to Sen. Overton. At least 26 Governors have pledged themselves specifically to support the amendments.

War Department stand

Apparently the War Department has modified its stand on the preference in use of water in the West for irrigation and similar needs. At the recent meeting of the Nine States at Omaha, Brig. Gen. Miles Reber in effect agreed that the principle of preferential use in the West should be established. His only reservation was that an exception should be made to cover the projects of the Missouri River program. Gen. Reber, whom the West has known favorably as a friend for a long time, is particularly well known to the readers of *Western Construction News* as Maj. Miles Reber, of the Corps of Engineers. Maj. Reber had much to do with the Rivers, Harbors, and Flood Control problems of the Pacific slope before this war.

Gen. Reber is probably one of the youngest generals of the Army. He is the grandson of Gen. Nelson A. Miles, and of Maj. Samuel Reber, both of whom were Indian fighters in the days when the best military talents of the nation gained fame in the West. Gen. Reber has a genius for friendship as well as for engineering and military skill, and is abundantly endowed by nature with the genial ability to compose conflicts and to deal fairly with diverse elements. He

apparently has been chosen by the heads of the Army to improve the public relations of the War Department. Without much fanfare of publicity he has lately appeared before congressional committees in connection with knotty Army problems. Apparently his job is to deal with postwar problems. Actually he seems to be smoothing out many of the difficulties which have inevitably beset the Army in its relations with Congress and the public. That is the reason for Gen. Reber. And that is why his appearance on the scene undoubtedly spells better relations in water, as well as other problems.

Congressman Fred Norman, of southwest Washington, member of the House Rivers and Harbors Committee, was nominated a director of the Rivers and Harbors Congress at New Orleans in July. The nomination was made by Secretary Floyd Hagie of the National Reclamation Association, and he was elected unanimously. At the New Orleans meeting the Congress formally adopted resolutions opposing any legislation which would subordinate navigation of the Missouri River to any other use. The Government was asked to reorganize the Interstate Commerce Commission with five members representing railways, inland waterway transport, air transport, highway transport, and ocean transport. Government also was asked to prepare plans for a nation-wide inter-connected inland waterway system.

Streamflow in the West is reported as deteriorating, due to subnormal rainfall. Conditions are reported below the lowest runoff in 66 years in the Columbia River Basin. In Arizona, July was one of the driest months in 30 years. Similar conditions are reported in Utah, Nevada, and New Mexico, by the Geological Survey. In contrast, streamflow averaged four times normal runoff in July from Kansas to North Dakota.

Foreign construction

The Department of Commerce has word from Syria that the Palestinians plan an irrigation project of 500,000 ac., with hydroelectric stations for cheap power, to cost $175,000,000. It is reported the program was formulated by Jews formerly resident in the West of the United States.

From China word has seeped into Washington that vast postwar plans have been outlined for a series of highways, the chief importance of which at present to the United States is that the Chinese will be in the market for a very large quantity of road-making machinery, especially grading equipment. We are told the military uses of road machinery has been a liberal education to the Chinese and other Asiatics in the potentialities of the equipment made in the United States.

Another prospective market is Brazil, which has laid out—on paper—a national highway system of approximately 25,000 mi. A report was originally ordered by the Minister of Railways and Public Works in 1942. Recently the National Director of Public Highways was directed by Executive Order to proceed with further studies. Brazil has been a buyer of American road machinery for a number of years since the first World War. It is expected after this war it will particularly demand tractors and graders.

Prime Minister Mackenzie King of Canada recently informed his Parliament about the reimbursements which would be made to the United States for permanent improvements on air fields on the northwest staging route and in the northwest generally; also for the telephone line from Edmonton to the boundary of Alaska. "Canada will reimburse the United States to the extent of $72,800,000 (U. S. funds) for construction costs on works of permanent value on the northwest staging route, the flight strips along the Alaska Highway, flight strips along the Mackenzie River . . . and the telephone line from Edmonton to the Alaska border. An additional $13,800,000 is not repaid because it represents wartime expenditure and provides nothing of permanent value; for example, temporary barracks and other housing facilities. However, all these works, permanent or non-permanent, are relinquished to the Canadian Government."

Prof. Fred O. MacMillan, head of the Department of Electrical Engineering, Oregon State College, at Corvallis, returned recently to Washington after spending a year in China as specialist for the State Department. He was detailed to work with the Chinese Ministries of Education, Economic Affairs, and Communications. He lectured before the leading Chinese engineering colleges and collaborated in revising their electrical engineering curricula. He helped in the inductive coordination of the electric power and communication systems of China, and inspected a total of 55 industrial plants, and 15 electric power plants. His office was established in the Department of the National Resources Commission at Chungking. He now returns to his post at Corvallis.

The road bills

Late in August the Senate Post Office and Post Roads Committee authorized Sen. Hayden, Arizona, to introduce and report S. 2105, a bill providing for an appropriation of $1,950,000,000 to be spent after the war for urban, rural, and intercity highways. This is the companion bill to HR 4915 pending in the House, which would provide $1,500,000,000. Apparently the Senate bill is the result of the discontent of the northeastern states which insist the funds be allocated upon the basis of population rather than upon area. With both reports before the Senate the differences would be fought out on the floor. Any prolonged debate, at this time, is apt to act as a deterrent to action, and might cause the question to be postponed until after election. The feeling here is that if the postwar highway measure is not settled before October there is little chance that anything will be done during this session.

Of frozen Federal Aid highway funds covered by the over-all programs submitted by the various states, but not yet claimed by the states, there is the sum of $144,000,000 for program projects. If the funds are not claimed by the states the appropriation does not lapse, but apparently remains to the credit of Federal Aid highway projects which may be proposed in the future. The principal sufferers seem to be the states which fail to make their claims.

Airports, etc.

During the next month Congress is expected to receive from CAA a report covering a postwar program of $1,000,000,000 airport construction. The report is expected to recommend 100 large commercial airports to cost $630,000,000, and 2,900 small airports which would cost $370,000,000. The large fields would have runways either 3,500-4,500 ft. long, or 4,500 to 5,500 ft. long, or over 5,500 ft. long. All large runways would be paved, 100 to 200 ft. wide. The unpaved portion would total from 300 to 400 ft. The smaller fields would be unpaved in the 2,500 to 3,500-ft. group, and paved if they are from 2,500 to 3,000 ft. long. Unpaved runways would be 300 ft. wide. The plan would bring the total of airports to approximately 7,000 for the United States. This would enable the CAA to provide 1,827 airports for airline stops instead of the present 286. Several bills already pend in Congress. The usual proposal would extend the program over 10 years, and require the states to pay half.

Congressman Rolph, San Francisco, introduced HR 5208, which will provide funds to defray the expenses of civilian internees repatriated from enemy countries. The bill would take over any expenditures the internees have incurred, and would wipe out any pledges they have made to the U. S. Government in connection with the cost of their repatriation. Apparently some internees have been obliged to pay for transportation in the process of repatriation. Congressman Carter, Calif., introduced HR 5142 which will provide a method by which the Secretary of the Navy may compensate those who have lost property, or who have been injured, or who have lost members of their family, as the result of the catastrophe at Port Chicago, Calif., on July 17. The law would take care of those situations which are not covered by existing laws.

Oregon Highway Commission Finds Roads in Good Shape

MEMBERS OF THE Oregon State Highway Commission, accompanied by R. H. Baldock, state highway engineer, recently completed a tour of the entire state highway system to determine the condition of the roads subjected to unprecedentedly heavy war emergency traffic. As in other states maintenance operations have been held at a minimum because of equipment and manpower shortages. However, the Commission members, upon completion of their tour, issued a report stating that the highways were in splendid condition and were serving the war needs admirably. Only in isolated instances—particularly those cases where heavy logging trucks made frequent use of the highways—were evidences of deterioration noted.

National AGC Officers Consult With Local Chapters Throughout the West

SPECIAL MEETINGS of Associated General Contractor Chapters were held throughout the West during the month of August to meet, and hear messages from the national president, William Muirhead, and managing director, H. E. (Doc) Foreman.

Meetings were held at Denver, Salt Lake City, Boise, Spokane, Seattle, Portland, San Francisco, Los Angeles and Phoenix. In each case the two visitors outlined the postwar planning and public relations activities of the national association. President Muirhead stated that he expected the construction industry to be operating at an annual rate of 12 billion dollars by the end of the first year after the close of the war. He anticipates that this rate of activity will employ 3 million men and women at the site of construction and an additional 6 million off the site, in mining, logging, transportation and processing of materials. Because of the extensive backlog of needed construction, he feels that by the end of five years, construction could and should be operating at the rate of 20 billion dollars annually.

In several of the meetings Muirhead proposed a change in the federal and local tax structures so as to permit a more rapid depreciation allowance on buildings. At the present time a building is not assumed to be obsolete in less than 40 or 50 years, with the rate of depreciation a steady one. He proposed that depreciation up to 10 per cent annually be allowed in the early life of the building, with the rate lowering progressively. This will allow removal and rebuilding at a much earlier time.

Foreman spoke of the public relations program instituted by the association, which includes the employment of a capable advertising agency, the publication of a manual and advertising in leading journals. This expanded program will necessitate a budget increase in 1945.

At each of the meetings opportunities were given to ask questions and indicate local problems which the national officers might assist in solving. Low priorities assigned to construction contractors for heavy tires and employee housing were two of the problems mentioned. Foreman indicated that if specific information was forwarded to his office concerning these handicaps, the national headquarters could take action and probably could secure some relief.

Harry A. Dick of Portland, Ore., national vice-president of AGC, and Ford J. Twaits of Los Angeles, national director, accompanied the visitors on most of their trip through the West.

Gasoline Taxes in Idaho Greater Than Last Year

WHILE IDAHO gasoline taxes collected during the first six months of 1944 were 4.48 per cent greater than those collected for the same period of 1943, they were 17.78 per cent less than for the same six months of 1941, which was the heaviest in Idaho history, according to a report of the state planning board.

During the period the state taxed 36,807,045 gal. of gasoline, as compared with 35,229,313 in the corresponding period last year, and 44,768,766 during the first six months of 1941.

From the tax collected for the benefit of the highway fund, the highway bureau received $1,840,351, as compared with $1,761,468 for the same period in 1943, and $2,238,361 for the first half of 1941.

Registrations of motor vehicles, however, showed a falling off of nearly 40 per cent compared with 1941, and 1.8 per cent as compared with 1943. As of July 1 the state had 148,487 vehicles of all types registered, as against 151,208 on the same date a year ago, and 170,357 for the first half of 1941.

NATIONAL AGC OFFICERS at the banquet honoring them in Los Angeles. L. to r.: F. J. CONNOLLY, manager, Los Angeles Chapter; H. A. DICK, Gilpin Construction Co., Portland, Ore., national AGC vice-president; H. E. FOREMAN, managing director, AGC, Washington, D. C.; WILLIAM MUIRHEAD, Durham, N. C., national president; E. S. McKITTRICK, president, Los Angeles Chapter; FORD J. TWAITS, Los Angeles, national director of AGC.

Standardize Metal Lath In New Simplification

METAL LATH and metal plastering accessories are greatly simplified and standardized in the revision of the Simplified Practice Recommendation of the products, promulgated by the Division of Simplified Practice, National Bureau of Standards, Department of Commerce, Washington, D. C.

This latest development is a further revision of the draft originally issued on July 1, 1924, as a result of a general conference of representatives of manufacturers, distributors, users and others interested.

The latest revision is identified as Simplified Practice Recommendation R3-44 and is titled "Metal Lath (Expanded and Sheet) and Metal Plastering Accessories."

A perusal of the recently released Simplification Recommendation indicates that under Diamond Expanded and Self Furring Metal Lath (Table 1) there are 18 eliminations; under Flat Rib Expanded Metal Lath (Table 2) there are 8 eliminations; under 3/8-in. Rib Lath and Sheet Lath (Table 3) there are 11 eliminations; under 3/4-in. Rib Expanded Metal Lath (Table 4) there are 5 eliminations; under Cold Rolled Channels (Table 5) there are 28; Small Nose Galvanized Corner Bead (Table 6) shows 8; Corner Lath (Table 7) shows 4; Strip Lath (Table 8) shows 3; Bull Nose Corner Bead (Table 9) shows 9; Galvanized Base Screeds (Table 10) shows 2; Galvanized Metal Casing (Table 11) shows a total of 108 eliminations; Tie Wire and Hanger Wire show 9; while Metal Studs for Hollow Partitions indicates 3.

Copies of Simplified Practice Recommendation R3-44 may be purchased from the Superintendent of Documents, Washington 25, D. C., at a price of 5¢ each.

Contract Awarded for Branch Oil Line in Rocky Mountains

CONTRACT has been awarded to the Eastern Construction Co., Dallas, Tex., for a feeder pipeline 110 mi. long from Craig, Colo., to the main Wyoming pipeline of the Utah Oil Refining Co. The existing line over the Rocky Mountains is 600 mi. long and cost $4,500,000. The new line will be of 6-in. welded pipe and will joint the main line at Wamsutter, Wyo.

NEW BOOKS...

DRIVER'S MANUAL — Published by The White Motor Company, Cleveland 1, Ohio. 158 pages, 8 x 5½. Price 40 cents.

The manual is a compilation of authoritative data concerning truck drivers' problems and possible solutions to these problems. The findings are based on the experience of thousands of successful drivers, on the teachings of authorities in the motor transport industry, and on nationwide studies. The manual is written for all drivers regardless of the make of vehicle that they are driving. The pilots of air transport planes, railroad trains, and ships have crews and various guiding assistance, but once the driver of a motor vehicle pulls away from the loading docks he is completely responsible for the vehicle and cargo.

The manual covers correct practices in all brackets of motor vehicle operation, with subjects arranged in natural sequence. Chapter I covers correct preparation, suggesting the factors that insure a good trip and showing how quick preliminary inspections are made. Chapter II discusses correct starting, showing what to expect from the starting and power system and how the instrument panel should be checked. Chapter III has to do with correct taking-off, picturing the engine's reserve power and how it should be handled, and offering instructions on clutch testing, gear shifting and allied operations. Chapter IV covers correct road practices, discussing better steering methods, shifting, cruising, braking, and off-the-road driving. Chapter V offers pointers on correct parking, including the parking procedure under various conditions, and the use of brakes. Chapter VI takes up the all-important subject of correct care, offering information of value to drivers on lubrication, air cleaners, battery, tires, fuel, air tanks, and similar parts which need attention.

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THE LIQUIDATION OF WAR PRODUCTION—by A. D. H. Kaplan. Published by the McGraw-Hill Book Company, Inc., New York. 134 pages, 9 x 6. Price $1.50.

Both government and business circles now recognize that the manner in which war contracts are terminated and surplus supplies, war plants, and equipment are disposed, will have far-reaching effects on the level of peacetime production. Dr. Kaplan's study analyzes economic problems that will face government and business during the liquidation of war production. He has attempted to determine policies and methods that would result in high levels of production and employment as soon as possible after the war. The author's findings emphasize the dangers inherent in defensive measures that might be enacted to protect the special interests of particular groups and localities. They point to the need for policy and action which will serve the best interests of the country as a whole. They emphasize that careful preparation, clearly defined policies and proper administration are essential to the successful accomplishment of this task.

PERSONALLY SPEAKING

Newly registered as civil engineers in California, as a result of recently given examinations, are: **Philip Charles Harris,** Albany; **Elmer O. Bergman,** Alhambra; **Albert L. Brinckman, F. E. Bryan** and **Stanley E. Teixeira,** Berkeley; **R. B. Ward,** Escondido; **L. Sherrill Van Voorhis, R. B. Welty** and **Robert H. Wilken,** Fresno; **Eugene D. Birnbaum, Wayne H. Clark, L. LeRoy Crandall, Gerald W. James, William C. Mason, Archer R. Norcross, Neil P. Richards,** and **Loring E. Tabor,** Los Angeles; **W. D. Treadway,** Mill Valley; **Pierce B. McIntosh,** North Sacramento; **Charles O. Boynton, Wesley A. Buehl** and **Ernest A. Tarr,** Oakland; **H. L. Thackwell,** Pasadena; **O. B. Christensen,** Permanente; **Justus A. Olsson** and **Charles E. Randlett,** Redwood City; **Orland E. Buckius, Fred P. Hart** and **Gerard C. Weeshoff,** Sacramento; **Leslie W. Graham, Carl Hendrickson, Edwin C. Kelton** and **Leonard F. Robinson,** San Francisco; **Oscar C. Blumberg,** San Jose; **D. H. Stewart,** San Leandro; **Joseph R. Jarvis,** Stockton; **Loren M. Barnett,** Yucaipa. From out-of-state, the following were registered: **William Eipel,** New York City; **Edward F. Eldridge,** Fort Douglas, Utah; **Frank L. Flood,** Boston, Mass.; **W. E. King,** St. Paul, Minn.; **Ernest H. Lee, Jr.,** Oak Ridge, Tenn.; **Karl V. Steinbrugge,** Portland, Ore.

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Recent changes in the staff of the Denver, Colo., District engineer office of U. S. E. D. include **Maj. H. D. Thomas,** transferred from Pueblo to the Denver Ordnance Depot, as operations officer; he replaces **Capt. Harton D. Burton,** who is now at Lowry Field; **Capt. Raymond T. West,** formerly assistant to Maj. Thomas at Pueblo, has been named operations officer at that city; **Maj. D. A. McKinnon** has returned to the Denver district and has also been assigned to the Ordnance Depot.

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Elmer J. Freethy and **Stanley Kimball** have associated and formed the firm of Freethy-Kimball Co. to engage in the general contracting and industrial engineering business. Kimball was formerly chief engineer of the Kaiser Co., and Freethy has contracted such large projects as Camp Adair at Corvallis, Ore., and the Canal housing project at Richmond, Calif. Headquarters will be at 406 Montgomery St., San Francisco, and 1432 Kearney St., El Cerrito, Calif.

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L. W. Nims, personnel director of Utah Power & Light Co., has been elected president of the Utah post of the Society of American Military Engineers. Other new officers are: **Col. N. H. Truax,** first vice-president; **Lt. Col. Fred H. Richardson,** second vice-president; **Capt. M. F. McConnell,** secretary-treasurer; **A. Lawrie Kurtz,** assistant secretary-treasurer; **Col. George W. Morris, Maj. M. A. Higgins,** and **Duane O. Wright,** directors.

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Frank T. Waldeck, formerly with the Navy Public Works Department and the Bureau of Reclamation, and for the past 18 months with the Maritime Commission, has been transferred by that agency to San Francisco, where he is employed on design, control and inspection of armor plating for various Maritime vessels.

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George Mannschreck, for seven years secretary of the building trades, plasterer's and laborer's union in Pasadena, Calif., has been appointed secretary of the Contracting Plasterer's Association in Los Angeles. He is succeeded in Pasadena by **Hugh L. Losbee.**

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Carrol Gresham, employee of J. E. Haddock, Pasadena, Calif., contractors, has been awarded the second Oak Leaf Cluster to his air medal. He is serving with the air force in England as pilot of a Flying Fortress.

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Members of the new San Diego County Water Authority, authorization for which was announced in *Western Construction News* for July, are: From San Diego, **Fred A. Heilbron, Arthur H. Marston, Fred W.**

Simpson and **Walter B. Whitcomb**; from Fallbrook, **Emil J. Schmitz**; from Lakeside, **A. J. Mitchell**; from Ramona, **A. C. Bisher**; from National City, **George V. Johnson**; from Oceanside, **Harold M. Beck**; from Chula Vista, **Arthur Lyons**; from Coronado, **Rear Adm. George F. Neal**; and from La Mesa, **W. H. Jennings.**

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Gilbert C. Lamb, formerly manager of the war housing centers in San Bernardino and Riverside, Calif., has been appointed senior representative for the National Housing Authority in Los Angeles. He replaces **Kelvin C. Vanderlip,** recently resigned.

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Charles O. Porter, engineering aide with the Bureau of Reclamation, has been transferred from Shasta Dam, where he has been working on the extensive railroad relocation and the Shasta-Oroville transmission line, to the Sacramento, Calif., office, plans and estimates division.

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Charles S. King, formerly connected with the Washington state highway department, will serve as district airport engineer for the Civil Aeronautics Administration, with headquarters in Helena, Mont. He will be in charge of a newly-established Montana-Idaho district. He will be assisted by **Ralph Wendland,** also from the Washington highway department.

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Christopher D. McKeon, president of the Associated Home Builders of San Francisco, Calif., has been elected chairman of the Contractor's License Board of the state. **H. Cedric Roberts,** Burbank, is a new appointment to the board.

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Harrison Hawkins has been made county engineer of Okanogan county, Wash., replacing **R. P. Ryker,** recently resigned. He was formerly with the state highway department, and has also served as county engineer of Adams county.

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Arthur D. Hughes, associate professor of mechanical engineering at Oregon State College, has been granted a year's leave of absence from the institution to serve in the steam turbine department of the Allis-Chalmers Manufacturing Co.

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E. R. Durfee has been appointed secretary-treasurer of Monolith Portland Cement Co. and Monolith Portland Midwest Co., to replace **J. J. Calkins,** recently deceased. **P. Carmical** has been named assistant secretary-treasurer.

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Col. Lacey V. Murrow, formerly director of highways in Washington, has received the Legion of Merit for an invention said to have saved the lives of many bulldozer operators in the south Pacific area.

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Clarence L. Seage, structural engineer of San Francisco, Calif., has been appointed as a consultant on postwar industry planning by the Portland, Ore., Chamber of Commerce.

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C. S. Seabrook has been named planning engineer of the Tacoma, Wash., Public Works Commission. He was formerly in the Fort Lewis area office of the U. S. E. D. The Tacoma postwar program is estimated to cost about $13,000,000.

LT. F. J. CONNOLLY, JR., son of the manager of the Los Angeles chapter of AGC, has been awarded the air medal with two oak leaf clusters for "conspicuous gallantry" as a P-38 pilot during the invasion of Normandy, flying 30 missions.

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H. R. Erdman, previously senior engineer for the War Relocation Authority at Heart Mountain, Wyo., is now senior property analyst with the same agency in San Francisco, Calif., an administrative post dealing with the property of evacuated Japanese.

T. N. WHITFORD, design and construction engineer on compressor plants for the Kettleman North Dome Association, Kettleman Hills, Calif., was chief field engineer on construction of the Marin shipyard, Sausalito, Calif. The tanker *Kettleman Hills* was recently launched from the yard. He has done construction work in South America and all over the West.

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H. V. Holt, road inspector with Utah-Morrison-Pomeroy in construction of the Geneva, Utah, steel plant, has entered business for himself at Bloomfield, Iowa. The new firm name is Barton-Holt Coal Co.

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Michael Goodman, associate professor of architecture at the University of California, has been appointed to the Berkeley, Calif., City Planning Commission. He has just completed two years as technical advisor for the Federal Civil Defense Council.

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The area office of the U. S. E. D. at Port Townsend, Washington, has been closed, and all records transferred to the Seattle District office. **William Inhelder** has been engineer in charge of the office.

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M. L. Johnson, formerly in the engineering department of Air Reduction Sales Co., has opened a business of his own at 4724 Santa Fe Ave., Los Angeles, as the Mel Johnson Co., specializing in hard surface welding.

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R. C. Smith, formerly chief civilian engineer at the Auburn, Wash., Holding and Reconsignment Center, is now project engineer for the U. S. E. D. on army installations at Marysville, Wash.

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A. W. Welch has been transferred from the resident engineer's office of the U. S. E. D. in Boise, Idaho, to the District office in Portland, Ore., and assigned to postwar planning work.

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C. H. Johnson, formerly field engineer for General Electric Co. in Honolulu, has been transferred by that company to San Francisco, Calif., where he has been appointed sales engineer.

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A. A. Kearney has resigned as managing engineer for Inland Empire Industrial Research, Inc., Spokane, Wash., to become affiliated with Brown Industries.

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L. Cedric Macabee has been retained by Contra Costa county, Calif., to make preliminary surveys for a trunk sewer to serve the area between Orinda and Concord.

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Roy A. Welsh, city engineer of Centralia, Wash., but for the past year on leave of absence to serve as city engineer of Ephrata, Wash., has returned to his Centralia post.

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Wayne Stone, agricultural power engineer for Pacific Gas and Electric Co., has been transferred from Bakersfield to Fresno, Calif.

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Frank C. Johnson, Seattle business man, has been appointed to head the new Seattle offices of Builders of the West, Inc., opened Aug. 29 at 1309 Vance Bldg.

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Albert L. Brinckman is now in the structural steel design department of the Henry J. Kaiser Co., Oakland, Calif.

SUPERVISING THE JOBS

G. F. Hyatt is general superintendent for Case Construction Co., San Pedro, Calif., on rehabilitating the dredge "Marshall Harris," which was under water for a long period after the Pearl Harbor disaster. The work is being carried out at Coronado Island, Calif. **S. A. (Slim) Kenyon** is office manager on the job, **Lee Grove** is master mechanic, and **M. B. (Red) Kennedy** is labor foreman. **S. H. (Terry) Mansfield** is captain of the barge. **Ed Ryan** is purchasing agent. This rehabilitation project is said to be one of the largest sandblasting jobs ever undertaken. A previous announcement about this job was in error, in that the work was reported in Oakland, Calif.

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Leonard Krull, who has directed construction of numerous airports and other important projects for Casson and Ball, contractors of Berkeley and Hayward, Calif., is now general superintendent on a contract recently awarded for runways at San Diego, Calif. **R. A. (Dutch) Hapgood** is concrete superintendent and **Harlan Williams** is concrete foreman. **Roy R. Jones** is grade superintendent, with **Ed Frost** in charge of dirt moving. **Elmer Sholin** is master mechanic, and **Hoot Gibson** is in charge of the crusher.

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C. C. (Whitey) DeArmond is general superintendent for United Concrete Pipe Co., on that firm's work at the Seal Beach, Calif., naval ammunition depot. Project manager is **Harold Pope.** Other key men are **William Korth,** timekeeper; **E. Allen Smith,** excavating superintendent; **L. W. Cook,** carpenter foreman; **W. W. (Woody) Wood,** excavation foreman; and **Albert Nicholson,** labor foreman.

C. C. DE ARMOND

* * *

Oscar Erickson is general superintendent on a 7-story concrete warehouse being built for the Navy at San Diego, Calif., by the Ford J. Twaits Co., Los Angeles. **Ray O'Connor** is general foreman, **Tex Clark** is concrete foreman, and **Amos Nelson** is labor foreman. The job engineer is **Jack Rodgers,** and **Jack Kay** is field engineer. The timekeeper is **Jack Kelley. F. H. Davis** is superintendent for Raymond Concrete Pile Co. on foundations for the warehouse. **R. A. Erickson** is in charge for Anthony C. Meehles, contractor for steel reinforcing on the same structure.

* * *

Don Daybell, superintendent on the extensive operations of Swinerton-McClure-Vinnell on the Pan-American Highway in Central America, is now general superintendent of all work in the Oceanside, Calif., area for Haddock-Engineers, Ltd. **Jess Weaver** is in charge of roads and paving. **M. C. (Bud) Burns,** formerly superintendent on the Figueroa St. bridge in Los Angeles for Engineers, Ltd., is superintendent of concrete work. **Rufus Dixon** is grading superintendent and building superintendents are **Joe Thomas** and **F. E. Harp.**

* * *

John C. Gist is the general superintendent on a contract awarded to A. Teichert & Sons, Inc., and John C. Gist. The work involves the building of runways at the U. S. Marine Base at Goleta, Calif. **Adolph Bauer** is assistant superintendent, **George Augusta** is superintendent of equipment, **Frank Ahlgren** is paving plant superintendent, **A. J. Toohy** is office manager and **Leslie J. Owens** and **T. A. Smith** are other key men. **Carl E. Larson** is the superintendent for contractor P. J. Walker on the construction of the buildings. **John Russell** is project engineer, **Les Brasher** and **A. J. Roe** are carpenter foremen and **William Charles** is the office manager.

* * *

J. A. Webb is in charge of construction for McLaughlin Construction Co., Livingston, Mont., on their successful bid of $58,880 for highway bridges and other structures on the north main canal of the Deschutes project in Oregon. He is assisted by **Sig Mahlum,** carpenter foreman, and **L. A. Pavey,** in charge of equipment. **Mrs. B. R. McLaughlin** is in charge of the office.

* * *

Martin Zimmerman is superintendent and **William Gandrup** is his assistant on a $335,000 contract held by Earl Heple, San Jose, Calif., to construct two overhead crossings and grade the approaches to same at the Port Chicago ammunition storage area. **Ben Day** is in charge of the field office.

* * *

C. L. Corson, project manager for the Union Paving Co., San Francisco, Calif., on reconstruction of the drainage system at the auxiliary air station in Santa Rosa, Calif., is assisted by **T. O'Connor,** superintendent; **J. D. Allen,** foreman; **C. H. Arthur** and **J. M. Stevenson,** timekeepers. The contract is for $280,500.

AL H. JOHNSON, left, general superintendent, and O. H. TUCKER, project manager, on the Macco-Morrison-Knudsen contract valued at nearly $2,000,000 to place 3,089,000 cu. yd. of fill at the San Francisco, Calif., municipal airport.

* * *

Ben R. Dow is the job manager in charge of the construction of a breakwater at Morro Bay, San Luis Obispo Co., Calif. This $560,000 contract was awarded to the Guy F. Atkinson Co. of San Francisco. **J. A. Cunningham** is the assistant manager, **Leo Stewart** is the master mechanic, **Jack Adair** is quarry superintendent, and **Ray V. Sherrill** is the project engineer.

* * *

Jean W. Beatty is in charge of construction of a gymnasium and classroom building at Tehachapi, Calif., high school. A contract was awarded to Guy E. Hall, Bakersfield, Calif., at $88,000 for the job. Hall himself is general manager of the work, and **Lloyd H. Huffman** is in charge of purchasing and accounting.

* * *

Ivan W. Bruensbach is project manager for Peter Kiewit Sons Co., Seattle, Wash., on a contract now being executed for the Oregon State Highway Department. **Rex McElroy** is grade foreman and **Luke Trimborn** is trucking foreman. **Leland Hathaway** is master mechanic. Resident engineer for the department is **O. B. Johnson.**

* * *

L. H. Calkins, a veteran superintendent for Stolte, Inc., Oakland, Calif., is in charge of that firm's project to build a $645,400 engine overhaul shop at the naval air station in Alameda, Calif. **B. Hedberg** is project manager, and **John Cross** is assistant superintendent.

* * *

E. L. Silver is superintendent in charge of a $319,500 suction dredge job on the Sacramento River above Rio Vista, Calif., for Case Construction Co., San Pedro, Calif., the contractor. **Wm. C. Seidel** is captain on the dredge "Alamitos," which is being used on the job, and **Don Pryor** is chief engineer.

J. W. Brennan is project manager and **Buster Moulton** is general superintendent on a $5,610,000 contract recently awarded to the joint firms of J. A. Terteling & Sons, Boise, Idaho, and Brennan & Cahoon, Pocatello, Idaho, for railroad, roads, buildings, storehouses and services at the navy gun relining plant at Pocatello. **Fred W. Dalton** is office manager on the project and **Paul Varner** is chief engineer. Job superintendent at Pocatello is **T. C. Brennan,** and for a portion of the work at Scoville, **H. D. Durston** is job superintendent.

* * *

George Ritchie is job superintendent for Shipyard Construction Co., Long Beach, Calif., on a project to revise the sewage disposal facilities at the auxiliary air station at Los Alamitos, Calif. The contract is for $75,996. **W. E. Williams** is works manager for the firm.

* * *

Wm. Hoops, Jr. has been named superintendent on a 9.2-mi. surfacing job on U. S. Highway 30 at Twin Falls, Idaho, recently awarded to Hoops Construction Co., of Twin Falls, at $113,838. **Joe Akins** is foreman on the job and **W. Osterloh** is office manager.

* * *

Thomas A. Gibson is superintendent of construction for the Contracting Engineers Co., Los Angeles, Calif., on installation of additional aviation facilities at the naval auxiliary air station at Los Alamitos, Calif. **Mac J. Friedman** is project manager on the $396,838 job.

* * *

Norman Davis will direct work for R. J. Daum and Myers Brothers, joint contractors of Los Angeles, Calif., on erection of barracks, miscellaneous buildings, roads, etc., at the Clearfield, Utah, naval depot. **Earl Payne** is office manager on the $721,996 contract.

* * *

M. R. Gavel, recently in charge of construction work in Long Beach, Calif., for Wm. C. Crowell Co., Pasadena, has been named by the firm to direct erection of a 2-story addition to St. Luke's Hospital in Pasadena. **L. G. South** is project manager and purchasing director.

* * *

W. L. (Pug) McCulloch will supervise construction of pumping units on the Modoc, Calif., unit of the Klamath reclamation project for Clifford A. Dunn, Klamath Falls, Ore., contractor, who won the contract on a $90,688 bid. Other key men have not yet been selected.

* * *

C. L. Patterson is superintendent of construction for George R. Patterson, Stockton, Calif., on 5 mi. of highway grading in Amador county, Calif. **L. C. Kenworthy** is superintendent of equipment on the $95,751 job.

* * *

Lowell C. Thomas is general superintendent for West Construction Co., Seattle, Wash., on extensive construction work in the Aleutian Islands, which has been going on for about a year. **Hugh C. Spellman** is assistant to Thomas.

* * *

Neal Saul, a long-time superintendent for J. E. Haddock, Ltd., Pasadena, Calif., is in charge for that firm on the improvement of streets in the Overland housing project in Los Angeles, a $210,655 job. **Henry Ralston** is foreman and **Pat Murphy** is timekeeper.

L. J. Montgomery will supervise construction of the earthwork and structures on the Conchas canal of the Tucumcari project on a $563,441 contract recently awarded to J. A. Terteling & Sons, Boise, Idaho. The work is being handled from the Kansas City office of the contractor.

* * *

Tom Brennan is superintendent for Brennan & Cahoon, Klamath Falls, Ore., on erection of an officer's quarters building at the Marine barracks in Klamath Falls. **Chas. Todd** is general carpenter foreman on the $67,749 job.

* * *

Bill Smoker is general superintendent for Hodges & Karn, Los Angeles, Calif., on personnel buildings being erected on Coronado Island for the Navy. **Richard C. Speaks** is in charge of excavation and equipment maintenance.

* * *

C. E. Blakley has been appointed superintendent for Clifford A. Dunn, Klamath Falls, Ore., on the paving of access roads and barracks streets at the Marine base at Klamath Falls. The contract is valued at $122,909.

* * *

John D. Myers is project manager and superintendent for E. A. Kaiser, Beverly Hills, Calif., for the prefabrication, transportation and erection of 500 portable dwelling units at Oxnard, Calif., a $560,000 project.

* * *

Alex Law is superintendent for Drake, Wyman & Voss, Portland, Ore., on construction of a $72,000 gunnery building at Pasco, Wash., and **John Reiff** is engineer and in charge of purchasing.

* * *

A. M. Carpenter is serving as project manager and job superintendent on the $169,950 contract awarded to O. L. Carpenter, San Diego, Calif., for erection of a temporary frame storehouse at the naval aviation station in San Diego.

L. V. MULHERRON, formerly a superintendent for Tavares Construction Co., is now general superintendent for Shannahan Brothers, at their San Diego headquarters.

L. Bodeen is job superintendent and **A. Watten** is carpenter foreman on a contract valued at $57,623 held by Bergesen, Wick & Dahlgren, Seattle, Wash., to construct net sheds and other buildings at the Salmon Bay terminal, Seattle.

* * *

J. M. DeLuca is supervising construction for T. E. Connolly, San Francisco, Calif., who was awarded a $113,700 contract to replace the Bald Hill outlet shaft and adits on the San Francisco water system.

* * *

L. E. Skinner is superintendent for Ramey & Mathis, Amarillo, Texas, on a contract to erect 80 temporary family dwellings at Belen, N. M. **Justin Heck** is timekeeper on the $142,000 job.

* * *

Howard Porter is the new general superintendent on the housing contract held by Wm. P. Neil Co., at the Seal Beach, Calif., naval magazine. He succeeds **G. P. Smallwood,** previously announced as the superintendent.

* * *

Arthur Sharpe is directing work of the Sound Construction & Engineering Co., Seattle, Wash., on that firm's $119,988 contract for extensions to a warehouse at the naval station in Seattle.

* * *

Samuel Upton is job superintendent at Muroc, Calif., for C. B. Stratton, contractor of San Gabriel, Calif., on a $118,655 contract for additional officers' quarters. **Geo. Ellis** is assisting him.

* * *

R. E. Hazen is superintendent for Carl E. Nelson Construction Co., Logan, Utah, on an important project at Elko, Nev. **L. P. Adams** and **Carl N. Ratliff** are grading foremen, and **George Mickle** is crusher foreman.

* * *

Norman Batty is general superintendent for the Julius Electric Co. on work being installed at Camp Pendleton, Calif. He was formerly with Samson Electric Co., San Diego, in a similar capacity.

* * *

Richard Price is job superintendent at Port Chicago, Calif., on site preparation, installation of utilities and miscellaneous work for 250 prefabricated houses. De Luca & Son, San Francisco, hold this $125,300 contract.

* * *

Paul Cross is in charge of resurfacing 43 mi. of state highway between Spring and Clayton, N. M., for Henry Thygesen & Co., Albuquerque, who received the contract at $55,727.

* * *

Seth Hudgins, formerly a supervisor for James I. Barnes Construction Co., is now a foreman for Wm. P. Neil Construction Co. on the Seal Beach, Calif., Navy project.

* * *

Cecil Hagne has recently transferred to Marin Shipyard, Sausalito, Calif., where he is employed as an oiler on a truck crane.

* * *

Hans C. Jensen is directing construction of 45 temporary dormitory units at Clear Creek, Utah, for Jensen Bros., Salt Lake City, on a $59,622 contract.

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UNIT BID SUMMARY

Irrigation . . .

New Mexico—Quay County—Bureau of Reclamation—Canal

J. A. Terteling and Sons, Inc., of Boise, Idaho, submitted the low bid at $563,441 on Schedules (1) to (3) and Clyde W. Wood, Inc., of Los Angeles, Calif., bid low at $686,248 on Schedules (4) to (8) to the U. S. Bureau of Reclamation for canal excavations and structures of the Tucumcari Project. The bidders and their stipulations were as follows:

		Company will accept award of—
(A)	Morrison-Knudsen Company, Inc.	Sched. 1 to 8 or 1 to 3 incl.
(B)	Allison-Armstrong & Thygesen	Sched. 1 to 3 incl.
(C)	Winston Bros. Company	
(D)	Clyde W. Wood, Inc.	Sched. 1 to 3, 4 to 8, or 1 to 8 incl.
(E)	Lowdermilk Brothers	Sched. 1, 2, 3, 1 and 5, 2 and 4, 2 and 6, or 3 and 7.
(F)	L. J. Miles Const. Co. and Ernest Loyd	Sched. 1 to 8 incl.
(G)	Mittry Brothers Construction Co.	Sched. 1 to 3, 1 to 4, or 1 to 8 incl.
(H)	Martin and Denison	
(I)	Bressi-Bevanda Constructors	Sched. 1 to 3, 4 to 8, 4, or 1 to 8 incl.
(J)	Farrel Contracting Co.	Sched. 1, 2, 3, 1 and 2, or 2 and 3.
(K)	Brown Brothers	
(L)	D. D. Skousen	
(M)	A. O. Peabody	
(N)	J. H. Ryan	
(O)	J. T. McDowell & Sons	
(P)	Gaastra & Gilbert	
(Q)	J. A. Terteling & Sons, Inc.	

	Sched. 1	Sched. 2	Sched. 3	Sched. 4	Sched. 5	Sched. 6	Sched. 7	Sched.8
(A)	$220,901.00	$148,902.50	$251,439.00	$171,742.00	$178,550.00	$165,215.00	$176,865.00	$63,680.00
(B)	225,191.00	160,145.00	279,269.00	—	—	—	—	—
(C)	240,908.00	208,763.00	283,410.00	—	—	—	—	—
(D)	246,314.50	157,613.50	266,413.50	177,832.00	153,135.00	143,010.00	154,602.00	57,669.00
(E)	305,149.00	215,541.00	357,284.00	284,754.00	242,610.00	225,620.00	230,570.00	—
(F)	347,923.00	256,306.50	460,224.50	169,548.00	145,787.50	137,462.50	143,765.50	53,092.00
(G)	357,345.00	243,445.00	573,805.00	277,614.00	244,660.00	226,405.00	245,724.00	89,032.00
(H)	395,873.00	—	—	—	—	—	—	—
(I)	404,358.00	275,690.00	540,879.00	231,165.00	198,335.00	185,090.00	200,223.00	91,104.00
(J)	444,976.00	271,903.00	416,921.00	—	—	—	—	—
(K)	—	145,761.00	—	—	—	161,800.00	—	—
(L)	—	232,834.50	—	138,317.50	—	—	—	—
(M)	—	—	—	158,406.00	—	—	—	—
(N)	—	—	—	157,313.00	—	—	—	—
(O)	—	—	—	248,183.50	283,345.00	316,515.00	—	—
(P)	—	—	—	—	—	—	—	53,216.00
(Q)	206,361.00	144,236.00	212,844.00	—	—	—	—	—

(1) 390,900 cu. yd. excav., common, for canal.
(2) 138,700 cu. yd. excav., rock, for canal.
(3) 16,100 cu. yd. excav. for core banks.
(4) 1,000 cu. yd. remove loose rock, canal.
(5) 120,000 sta. cu. yd. overhaul.
(6) 60,600 cu. yd. compacting embank.
(7) 10,700 cu. yd. excav., com., chans. & dikes.
(8) 4,600 cu. yd. excav., rock, chans. & dikes.
(9) 6,500 cu. yd. excav., common, structs.
(10) 2,800 cu. yd. excav., rock, structs.
(11) 7,200 cu. yd. backfill.
(12) 2,500 cu. yd. compact. backfill.
(13) 900 cu. yd. concrete in structures.
(14) 80,100 lbs. place reinf. bars.
(15) 700 sq. yd. dry-rock pave.
(16) 2,200 lbs. install misc. metalwork.
(17) 291,300 cu. yd. excav., common, canal.
(18) 100,000 cu. yd. excav., rock, canal.
(19) 4,800 cu. yd. excav. for core banks.
(20) 4,100 cu. yd. remove loose rk. above canal.
(21) 77,000 sta. cu. yd. overhaul.
(22) 44,600 cu. yd. compacting embank.
(23) 2,200 cu. yd. excav., com., chans. & dikes.
(24) 1,000 cu. yd. excav., rock, chans. & dikes.
(25) 2,900 cu. yd. excav., common, structs.
(26) 1,300 cu. yd. excav., rock, structs.
(27) 10,200 cu. yd. compact earth l'n'g for canal.
(28) 3,500 cu. yd. backfill.
(29) 1,000 cu. yd. compact. backfill.
(30) 345 cu. yd. concrete in structs.
(31) 28,300 lbs. place reinf. bars.
(32) 300 sq. yd. dry-rock pave.
(33) 500 lbs. install misc. metalwork.
(34) 573,100 cu. yd. excav., common, canal.
(35) 243,200 cu. yd. excav., rock, canal.
(36) 3,600 cu. yd. excav. for core banks.
(37) 900 cu. yd. remove loose rk. above canal.
(38) 16,000 sta. cu. yd. overhaul.
(39) 5,200 cu. yd. compacting embank.
(40) 3,600 cu. yd. excav., com., chans. & dikes.
(41) 1,600 cu. yd. excav., rock, chans. & dikes.
(42) 4,100 cu. yd. excav., common, structs.
(43) 1,800 cu. yd. excav., rock, structs.
(44) 5,200 cu. yd. backfill.
(45) 1,200 cu. yd. compact. backfill.
(46) 345 cu. yd. concrete in structs.
(47) 27,900 lbs. place reinf. bars.
(48) 600 sq. yd. dry-rock pave.
(49) 1,000 lbs. install. misc. metalwork.
(50) 3,300 cu. yd. excav., common, canal.
(51) 1,000 cu. yd. excav., rock, canal.
(52) 500 cu. yd. remove loose rk. above canal.
(53) 1,000 cu. yd. compact. embank.
(54) 62,700 cu. yd. excav., common, structs.
(55) 26,900 cu. yd. excav., rock, structs.
(56) 8,100 cu. yd. backfill.
(57) 1,200 cu. yd. compact. backfill.
(58) 3,700 cu. yd. concrete in structs.
(59) 640,600 lbs. place reinf. bars.
(60) 300 sq. yd. dry-rock pave.
(61) 296 sq. ft. place elas. joint filler.
(62) 84 lin. ft. place rubber water stops.
(63) 2,600 lin. ft. construct. 6-in. diam. underdrains.
(64) 900 lin. ft. lay 6-in. diam. sewer pipe.
(65) 4,500 lbs. install. radial gates and hoists.
(66) 1,200 lbs. install. misc. metalwork.
(67) 6,400 cu. yd. excav., common, canal.
(68) 2,800 cu. yd. excav., rock, canal.
(69) 100 cu. yd. excav. for core banks.
(70) 500 cu. yd. remove loose rk. above canal.
(71) 35,400 cu. yd. excav., common, structs.
(72) 15,200 cu. yd. excav., rock, structs.
(73) 37,500 cu. yd. backfill.
(74) 1,900 cu. yd. compact. backfill.
(75) 3,420 cu. yd. concrete in structs.
(76) 641,000 lbs. place reinf. bars.
(77) 300 sq. yd. dry-rock pave.
(78) 13,800 lbs. place metal water stops.
(79) 3,100 lbs. install blow-off valves & con'ct.
(80) 11,100 cu. yd. excav., common, canal.
(81) 4,800 cu. yd. excav., rock, canal.
(82) 100 cu. yd. excav. for core banks.
(83) 500 cu. yd. remove rock above canal.
(84) 34,500 cu. yd. excav., common, structs.
(85) 14,800 cu. yd. excav., rock, structs.
(86) 39,000 cu. yd. backfill.
(87) 1,600 cu. yd. compact. backfill.
(88) 3,000 cu. yd. concrete in struets.
(89) 571,000 lbs. place reinf. bars.
(90) 300 sq. yd. dry-rock pave.
(91) 11,400 lbs. place metal water stops.
(92) 3,100 lbs. install blow-off valves and connections.
(93) 4,500 cu. yd. excav., common, canal.
(94) 1,900 cu. yd. excav., rock, canal.
(95) 100 cu. yd. excav. for core banks.
(96) 500 cu. yd. remove rock above canal.
(97) 33,500 cu. yd. excav., common, structs.
(98) 14,400 cu. yd. excav., rock, structs.
(99) 35,800 cu. yd. backfill.
(100) 2,300 cu. yd. compact. backfill.
(101) 3,700 cu. yd. concrete in structs.
(102) 493,600 lbs. place reinf. bars.
(103) 300 sq. yd. dry-rock pave.
(104) 14,200 lbs. place metal water stops.
(105) 3,100 lbs. install blow-off valves and connections.
(106) 7,800 cu. yd. excav., common, canal.
(107) 3,300 cu. yd. excav., rock, canal.
(108) 200 cu. yd. excav. for core banks.
(109) 100 cu. yd. remove rock above canal.
(110) 9,000 cu. yd. excav., common, structs.
(111) 3,800 cu. yd. excav., rock, structs.
(112) 8,500 cu. yd. backfill.
(113) 800 cu. yd. compact. backfill.

(Continued on next page)

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(114) 1,332 cu. yd. concrete in structs.
(115) 190,800 lbs. place reinf. bars.
(116) 200 sq. yd. dry-rock pave.
(117) 5,600 lbs. place metal water stops.
(118) 5,200 lbs. install blow-off valves and connections.

		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(I)	(J)	(Q)
(1)	.....	.17	.21	.30	.28	.36	.475	.45	.52	.35	.13
(2)	.....	.50	.55	.30	.28	.50	.675	.45	.52	1.30	.45
(3)	.....	.20	.16	.30	.28	.30	.475	.30	.50	.60	.20
(4)	.....	1.00	.50	2.50	1.00	2.00	2.25	.75	1.50	1.50	1.00
(5)	.....	.025	.03	.03	.02	.03	.03	.04	.02	.05	.02
(6)	.....	.25	.25	.30	.20	.15	.20	.30	.60	.50	.50
(7)	.....	.30	.21	.45	.50	.30	.475	.40	.32	1.00	.30
(8)	.....	1.00	.55	.45	.50	.50	.675	1.50	.98	2.00	1.00
(9)	.....	.75	1.00	1.00	1.25	.60	.575	1.20	1.00	1.00	.30
(10)	.....	1.50	1.50	1.00	1.25	3.00	.875	1.20	1.50	2.00	1.00
(11)	.....	.25	.50	.25	.25	.25	.275	.20	.30	.60	.30
(12)	.....	2.00	.50	1.10	1.00	3.00	.275	2.00	3.00	1.00	1.75
(13)	.....	37.50	20.00	30.00	54.00	45.00	21.50	60.00	50.00	35.00	35.00
(14)	.....	.03	.04	.03	.035	.05	.03	.05	.04	.07	.04
(15)	.....	3.50	4.00	3.50	4.00	5.00	3.00	4.00	5.00	6.00	2.50
(16)	.....	.20	.30	.15	.10	.20	.05	.40	.30	.12	.30
(17)	.....	.17	.21	.38	.28	.37	.475	.45	.48	.30	.13
(18)	.....	.50	.55	.38	.28	.50	.675	.45	.48	1.10	.45
(19)	.....	.20	.16	.30	.28	.35	.475	.30	.50	.60	.20
(20)	.....	1.00	.50	2.50	1.00	2.00	2.25	.75	1.50	1.25	1.00
(21)	.....	.025	.03	.03	.02	.03	.03	.04	.02	.05	.02
(22)	.....	.25	.25	.30	.20	.15	.20	.30	.60	.50	.50
(23)	.....	.30	.21	.45	.50	.40	.475	.40	.32	1.00	.30
(24)	.....	1.00	.55	.45	.50	.60	.675	1.50	.98	2.00	1.00
(25)	.....	.75	1.00	1.00	1.25	1.00	.575	1.20	1.00	1.00	.30
(26)	.....	1.50	1.50	1.00	1.25	3.00	.875	1.20	1.50	2.00	1.00
(27)	.....	.75	1.00	1.25	.25	.80	1.25	1.25	2.00	1.00	1.15
(28)	.....	.25	.50	.25	.25	.25	.275	.20	.30	.60	.30
(29)	.....	2.00	.50	1.10	1.00	3.00	.275	2.00	3.00	1.00	1.75
(30)	.....	37.50	20.00	30.00	54.00	45.00	21.50	60.00	50.00	40.00	35.00
(31)	.....	.03	.04	.03	.035	.05	.03	.05	.04	.06	.04
(32)	.....	3.50	4.00	3.50	4.00	5.00	3.00	4.00	5.00	6.00	2.50
(33)	.....	.20	.30	.15	.10	.25	.05	.40	.30	.12	.30
(34)	.....	.17	.21	.31	.28	.34	.475	.65	.61	.26	.13
(35)	.....	.50	.55	.31	.28	.50	.675	.65	.61	.95	.45
(36)	.....	.20	.16	.30	.28	.30	.475	.30	.50	.50	.20
(37)	.....	1.00	.50	2.50	1.00	2.00	2.25	.75	1.50	1.00	1.00
(38)	.....	.025	.03	.03	.02	.03	.03	.04	.02	.05	.02
(39)	.....	.25	.25	.30	.20	.20	.20	.30	.60	.30	.50
(40)	.....	.30	.21	.45	.50	.25	.475	.40	.32	.60	.30
(41)	.....	1.00	.55	.45	.50	.60	.675	1.50	.98	1.50	1.00
(42)	.....	.75	1.00	1.00	1.25	1.00	.575	1.20	1.00	.60	.30
(43)	.....	1.50	1.50	1.00	1.25	3.00	.875	1.20	1.50	1.50	1.00
(44)	.....	.25	.50	.25	.25	.25	.275	.20	.30	.50	.30
(45)	.....	2.00	.50	1.10	1.00	3.00	.275	2.00	3.00	1.00	1.75
(46)	.....	40.00	20.00	32.00	54.00	45.00	21.50	60.00	50.00	40.00	35.00
(47)	.....	.03	.04	.03	.035	.05	.03	.05	.04	.05	.04
(48)	.....	3.50	4.00	3.50	4.00	5.00	3.00	4.00	5.00	5.00	2.50
(49)	.....	.20	.30	.15	.10	.25	.05	.40	.30	.10	.30
(50)	.....	.30	....	....	.50	.50	.475	.55	.73	....	....
(51)	.....	.75	....	....	.50	1.00	.675	.55	.73	....	....
(52)	.....	1.00	....	....	1.00	2.00	2.25	.75	1.50	....	....
(53)	.....	.25	....	....	1.00	.25	.20	.30	1.10	....	....
(54)	.....	.40	....	....	.60	.85	.575	1.20	.73	....	....
(55)	.....	1.00	....	....	.60	2.25	.875	1.20	.73	....	....
(56)	.....	.35	....	....	.25	.25	.275	.30	.30	....	....
(57)	.....	2.00	....	....	1.00	3.00	.275	2.00	3.00	....	....
(58)	.....	24.00	....	....	26.50	32.50	21.50	35.00	32.50	....	....
(59)	.....	.025	....	....	.02	.05	.03	.04	.03	....	....
(60)	.....	3.50	....	....	3.00	5.00	3.00	4.00	5.00	....	....
(61)	.....	.50	....	....	1.50	1.00	1.00	1.50	2.00	....	....
(62)	.....	1.00	....	....	1.50	2.00	1.00	1.50	2.00	....	....
(63)	.....	1.50	....	....	1.00	2.00	1.00	1.00	4.00	....	....
(64)	.....	1.50	....	....	1.25	.60	1.00	1.50	1.00	....	....
(65)	.....	.10	....	....	.20	.25	.05	.20	.30	....	....
(66)	.....	.20	....	....	.20	.25	.05	.40	.30	....	....
(67)	.....	.30	....	....	.50	.40	.475	.55	.50	....	....
(68)	.....	.75	....	....	.50	1.00	.675	.55	1.25	....	....
(69)	.....	.30	....	....	.50	1.00	.475	.30	1.00	....	....
(70)	.....	1.00	....	....	1.00	2.00	2.25	.75	1.50	....	....
(71)	.....	.50	....	....	.60	.85	.575	1.20	.50	....	....
(72)	.....	1.25	....	....	.60	2.25	.875	1.20	1.25	....	....
(73)	.....	.25	....	....	.25	.25	.275	.20	.25	....	....
(74)	.....	2.00	....	....	1.00	3.00	.275	2.00	3.00	....	....
(75)	.....	30.00	....	....	26.50	35.00	21.50	40.00	34.00	....	....
(76)	.....	.025	....	....	.02	.05	.03	.04	.03	....	....
(77)	.....	3.50	....	....	3.00	5.00	3.00	4.00	5.00	....	....
(78)	.....	.30	....	....	.10	.20	.10	.20	.10	....	....
(79)	.....	.10	....	....	.20	.25	.05	.25	.20	....	....
(80)	.....	.30	....	....	.50	.40	.475	.55	.50	....	....
(81)	.....	.75	....	....	.50	1.00	.675	.55	1.25	....	....
(82)	.....	.30	....	....	.50	1.00	.475	.30	1.00	....	....
(83)	.....	1.00	....	....	1.00	2.00	2.25	.75	1.50	....	....
(84)	.....	.50	....	....	.60	.85	.575	1.20	.50	....	....
(85)	.....	1.25	....	....	.60	2.25	.875	1.20	1.25	....	....
(86)	.....	.25	....	....	.25	.25	.275	.20	.25	....	....
(87)	.....	2.00	....	....	1.00	3.00	.275	2.00	3.00	....	....
(88)	.....	30.00	....	....	26.50	35.00	21.50	40.00	34.00	....	....
(89)	.....	.025	....	....	.02	.05	.03	.04	.03	....	....
(90)	.....	3.50	....	....	3.00	5.00	3.00	4.00	5.00	....	....
(91)	.....	.30	....	....	.10	.20	.10	.20	.10	....	....
(92)	.....	.10	....	....	.20	.25	.05	.25	.20	....	....
(93)	.....	.30	....	....	.50	.40	.475	.55	.50	....	....
(94)	.....	.75	....	....	.50	1.00	.675	.55	1.25	....	....
(95)	.....	.30	....	....	.50	1.00	.475	.30	1.00	....	....
(96)	.....	1.00	....	....	1.00	2.00	2.25	.75	1.50	....	....
(97)	.....	.50	....	....	.60	1.25	.575	1.20	.50	....	....
(98)	.....	1.25	....	....	.60	1.25	.875	1.20	1.25	....	....
(99)	.....	.25	....	....	.25	.25	.275	.20	.25	....	....
(100)	.....	2.00	....	....	1.00	3.00	.275	2.00	3.00	....	....
(101)	.....	29.00	....	....	26.50	32.50	21.50	40.00	34.00	....	....
(102)	.....	.025	....	....	.02	.05	.03	.04	.03	....	....
(103)	.....	3.50	....	....	3.00	5.00	3.00	4.00	5.00	....	....
(104)	.....	.30	....	....	.10	.20	.10	.20	.10	....	....
(105)	.....	.10	....	....	.20	.25	.05	.25	.20	....	....
(106)	.....	.30	....	....	.50	....	.475	.55	.50	....	....
(107)	.....	.75	....	....	.50	....	.675	.55	1.25	....	....
(108)	.....	.30	....	....	.50	....	.475	.30	1.00	....	....
(109)	.....	1.00	....	....	1.00	....	2.25	.75	1.50	....	....

(Continued on next page)

More Snow...Less Man-Power...

Won't "Stump" FWD "Truck-Power"

Husky FWDs like this make a clean sweep of the snow removal problem for Douglas County, Nebraska.

SNOW, this year, will be a more serious problem than ever before on highways . . . because less manpower is available. FWDs will not be "stumped" by this handicap! They are no amateurs at snow removal . . . nor at many other heavy-duty jobs they perform reliably and economically in road maintenance and construction.

The same FWDs that served through spring, summer and fall can be snow-plow equipped and quickly converted to snow removal duty. Equipped with underbody type scrapers, the same trucks will strip ice sheets or ruts from roads.

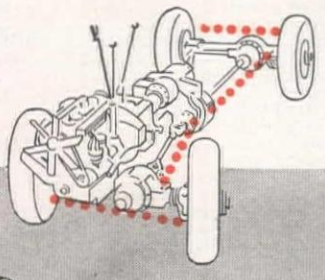
With power and traction on all four wheels, plus ruggedness that withstands toughest service, FWDs continue to deliver more "truck-power" as the effective answer to less manpower for highway service.

THE FOUR WHEEL DRIVE AUTO CO., Clintonville, Wisconsin

Canadian Factory: KITCHENER, ONTARIO

FWD TRUCKS

Trade-Mark of the Original and Exclusive Builders of Four-Wheel-Drive Trucks.



Four-Wheel-Drive . . . THE BACKBONE OF RUGGED, DEPENDABLE TRUCK HAULING POWER

The true application of four-wheel-drive with center differential provides ability to get through under difficult conditions — increased surety and safety on the road — lower operating cost per ton-mile — long service life.

COMMERCIAL

CONSTRUCTION

UTILITIES

OIL FIELDS

MILITARY

(110)	.50	....	....	.60	....	.575	1.20	1.00	....	....
(111)	.75	....	....	.60	....	.875	1.20	2.00	....	....
(112)	.25	....	....	.25	....	.275	.20	.25	....	....
(113)	2.00	....	....	1.00	....	.275	2.00	3.00	....	....
(114)	30.00	....	....	26.50	....	21.50	40.00	40.00	....	....
(115)	.025	....	....	.02	....	.03	.04	.03	....	....
(116)	3.50	....	....	3.00	....	3.00	4.00	5.00	....	....
(117)	.30	....	....	.10	....	.10	.20	.10	....	....
(118)	.10	....	....	.20	....	.05	.25	.20	....	....

Bridge and Grade Separation . . .

California—Ventura County—State—Timber

J. & B. Rocca of Stockton, Calif., was low bidder at $64,425 on the repairing of the north trestle and truss spans of the existing bridge at Saticoy across the Santa Clara River. The work has received an AA-2 priority rating. The state will furnish the bar reinforcing steel and sheet metal. Bids were submitted to the Calif. Division of Highways, Sacramento, and were as follows:

(A) J. & B. Rocca $64,425
(B) C. B. Tuttle 67,498
(C) Norman I. Fadel 74,916
(D) Oberg Bros. 75,371
(E) Dan Caputo 75,941
(F) J. E. Haddock, Ltd. $78,170
(G) Byerts & Dunn 85,654
(H) Ralph A. Bell 89,101
(I) Modern Builders Constr. Co. 92,935

(1) Lump sum, remove bridge deck.
(2) 6,500 cu. yd. road. exc.
(3) 1,250 T. mineral aggre.
(4) 62 T. liq. asph. MC-3.
(5) 8 T. liq. asph. MC-3.
(6) 176 M.F.B.M. Douglas fir timber.
(7) 52 M.F.B.M. salvaged timber stringers.
(8) 17 M.F.B.M. detour bridge timber.
(9) 114 lin. ft. salv. timber bridge rail.
(10) 480 cu. yd. Class "A" P.C.C.
(11) 44,000 lbs. misc. iron and steel.
(12) 31 ea. guide posts.
(13) 20,000 lbs. bar reinf. steel.
(14) 87,000 lbs. place bar reinf. steel.
(15) 32,000 sq. ft. place sheet metal.
(16) Lump sum, misc. items.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
(1)	$4,925	$10,812	$11,719	$4,200	$9,000	$3,800	$9,500	$11,000	$10,000
(2)	.50	.375	.50	.75	.60	.50	.75	.75	.53
(3)	4.00	4.06	4.00	4.00	4.25	3.60	4.00	4.50	4.00
(4)	12.00	13.20	13.35	15.00	15.00	16.50	15.00	25.00	13.00
(5)	15.00	16.50	16.65	25.00	20.00	38.50	20.00	30.00	16.00
(6)	125.00	121.00	145.00	140.00	125.00	192.00	150.00	150.00	219.44
(7)	48.00	21.50	65.00	60.00	35.00	92.00	50.00	55.00	132.35
(8)	130.00	106.00	150.00	150.00	125.00	152.00	125.00	150.00	200.00
(9)	.75	1.50	1.00	2.00	2.00	2.10	3.00	2.00	1.50
(10)	15.00	21.60	21.00	25.00	25.00	19.65	27.00	25.00	12.00
(11)	.20	.19	.14	.25	.20	.15	.18	.30	.23
(12)	4.00	3.00	2.00	3.00	5.00	4.50	2.00	3.00	6.00
(13)	.07	.05	.05	.07	.06	.052	.06	.07	.05
(14)	.03	.025	.04	.025	.03	.034	.04	.04	.025
(15)	.03	.025	.03	.03	.10	.06	.05	.05	.07
(16)	$2,500	$1,040	680.00	$2,000	$2,500	$1,800	$6,500	$2,000	$3,000

Utah—Box Elder County—State—Overpass

S. E. Faddis Construction Co. of Salt Lake City, submitted low bid at $57,690 to the Utah State Road Commission for the construction of a 273.6 ft. span concrete T-beam overpass structure on the Box Elder County line. The state engineer's estimate was $79,481. The bids were as follows:

(1) S. E. Faddis Construction Co. $57,690
(2) Merrill & Lauch Construction Co. 65,570
(3) Young & Smith 72,761
(4) Olof Nelson Construction Co. $76,352
(5) L. A. Young Construction Co. 77,736
(6) Ora Bundy & Co. 83,735

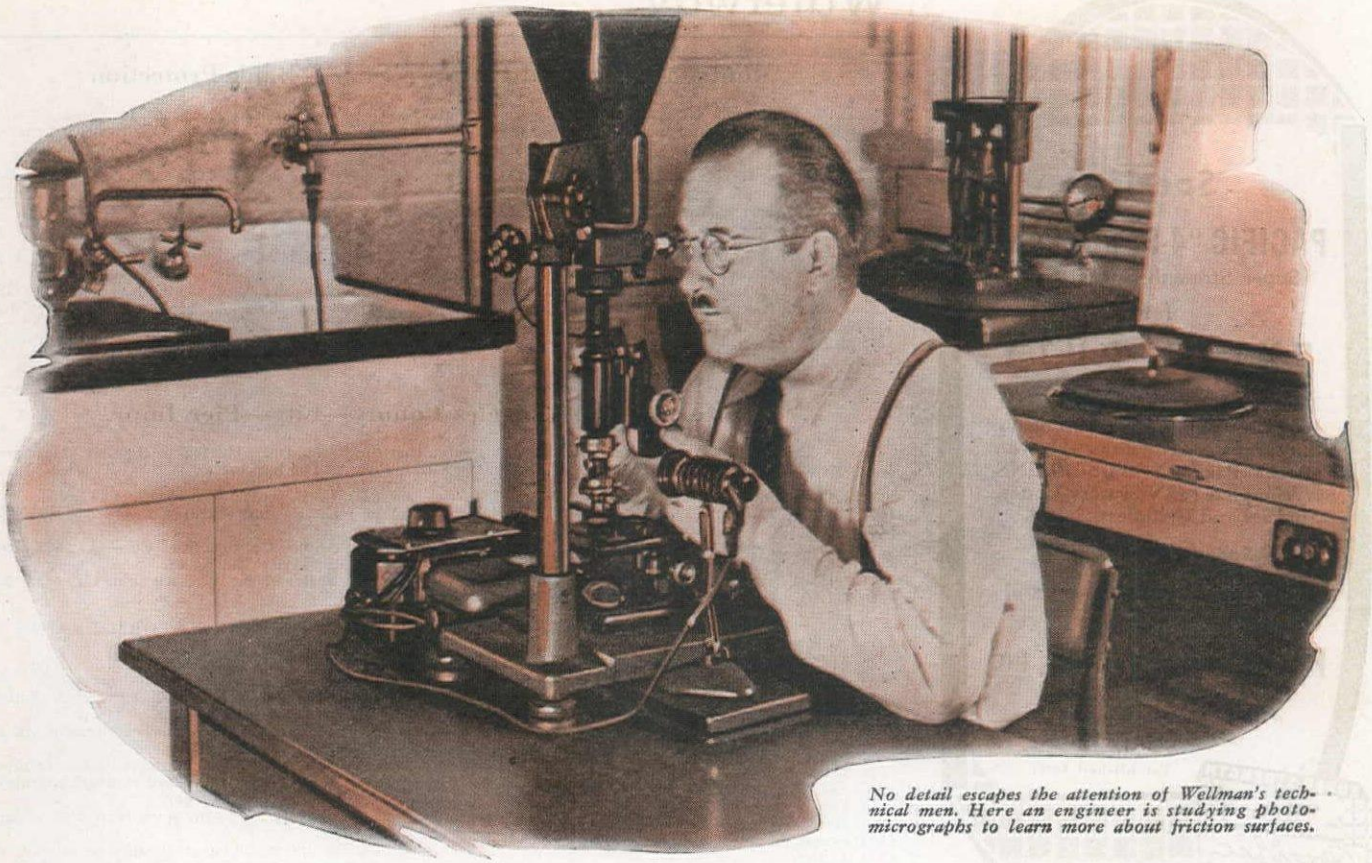
	(1)	(2)	(3)	(4)	(5)	(6)
450 cu. yd. excavation for structures	2.30	4.00	4.00	3.00	4.00	4.00
1,210 cu. yd. concrete, Class "A"	28.00	30.00	34.00	38.00	35.00	39.80
596 lin. ft. concrete handrail	4.00	7.50	6.00	7.00	6.00	9.00
3,500 lbs. structural steel	.26	.20	.25	.30	.30	.20
235,000 lbs. reinforcing steel	.055	.055	.07	.06	.08	.0775
4,200 lin. ft. piles, treated	1.43	2.00	1.80	2.10	2.00	2.10
92 lin. ft. 6-in. perforated CGM pipe underdrains	.73	1.25	2.00	1.00	2.00	1.00
288 lin. ft. 6-in. C.G.M. pipe	.72	1.25	2.00	1.00	2.00	1.00
1 ea. furnishing pile driving equipment	275.00	500.00	600.00	500.00	$1,000	300.00

Montana—Gallatin County—State—Conc. Overpass

Dudley-Anderson Co., Great Falls, submitted the low bid at $66,229 to the State Highway Commission for the construction of a 154-ft. overpass and the grading, surfacing, and oiling of 0.3 mi. of highway on the Yellowstone Trail. The commission estimated a cost of $63,276. The bids were:

(1) Dudley-Anderson Co. $66,229
(2) Cahill-Mooney Const. Co. 68,020
(3) McLaughlin Const. Co. 68,556
(4) W. P. Roscoe Co. $74,023
(5) J. C. Boespflug 75,110
(6) Standard Const. Co. 79,955

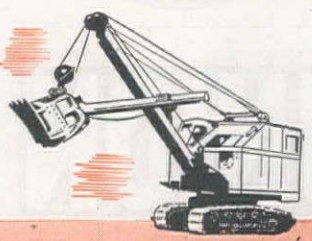
	(1)	(2)	(3)	(4)	(5)	(6)
133,000 lb. structure steel	.09	.085	.105	.10	.08	.10
51,000 lb. reinforcing steel	.07	.075	.09	.07	.06	.09
224 cu. yd. Class "A" conc.	38.00	35.00	35.00	33.00	35.00	35.00
140.3 cu. yd. Class "D" conc.	38.00	40.00	42.00	38.00	40.00	37.00
309.3 lin. ft. conc. handrail	3.25	4.00	5.00	4.00	10.00	6.00
510 cu. yd. structure excavation	3.00	5.00	3.00	6.00	5.00	5.00
752 lin. ft. tr. timb. fdtn. piling	1.65	1.25	3.00	1.83	1.30	2.00
Lump sum, remove exist. str. maint. tr.	.....	.....	.....	.....	.....	.....
38,805 cu. yd. unclass. exc. and borr.	.25	.35	.30	.37	.27	.35
98 cu. yd. culv. exc.	1.20	5.00	1.25	1.00	3.00	1.50
4,609 T. base crse. cr. gravel	1.65	1.00	1.30	1.80	1.70	1.70
1,502 T. Grade "A" top crse. cr. gr.	1.90	2.00	1.60	2.20	1.90	2.20
80 T. stone chips	5.00	3.00	7.00	4.00	8.00	5.00
250 cu. yd. binder	1.00	.50	.10	.25	.30	1.00
500 yd. mi. o-haul and binder	.20	.25	.05	.15	.10	.15
710 M. gal. watering	1.25	3.00	2.00	2.00	3.00	2.00
9,511 gal. applic. MC-3 keros. C. B. asph.	.14	.14	.13	.12	.15	.15
2,240 gal. seal ct. oilg. with 150-200	.14	.25	.14	.15	.16	.17
0.306 mi. processing	$1,000	$1,800	$1,000	$2,000	$1,000	$2,000
246 sq. yd. process rd. apps.	.50	.20	.20	.25	.25	1.00
136 lin. ft. 15-in. R.C.P. culverts	2.50	2.50	2.50	3.50	2.50	3.00
38 lin. ft. relay pipe culverts	1.50	2.00	1.50	2.00	1.50	2.00
0.36 M.F.B.M. lumber in hdgates	150.00	150.00	150.00	200.00	120.00	100.00
2,790 lin. ft. comb. wd. g. posts and header	1.75	2.00	1.50	2.20	3.50	4.00
44 lin. ft. tr. timb. ditch lining	1.50	2.00	1.25	3.00	4.00	5.00
192 lin. ft. construct oil gr. ft. path	.50	1.00	.50	1.00	1.50	5.00
15 ea. conc. r/w monuments	5.00	5.00	3.00	5.00	10.00	5.00
2 ea. conc. sta. markers	5.00	5.00	5.00	5.00	5.00	5.00



No detail escapes the attention of Wellman's technical men. Here an engineer is studying photomicrographs to learn more about friction surfaces.

YOUR FRICTION PROBLEMS

are mighty important to us



Simple though it may seem, the friction in your clutches and brakes is extremely complex . . . influenced by pressure, temperature, velocity and many other factors. That's why The S. K. Wellman Company maintains a large and well equipped laboratory to study *your* friction problems.

From such research and experimentation have come many developments that result in smoother performing, longer lasting Velvetouch all-metal friction materials. Specify Velvetouch replacement clutch facings and brake linings for your tractors, graders, scrapers, shovels and other earthmoving equipment.

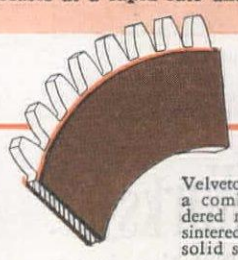
THE S. K. WELLMAN CO.
1374 EAST 51st STREET • CLEVELAND 3, OHIO

Interesting Facts About FRICTION

Friction, both in its total amount and its coefficient, is practically independent of the surface areas in contact, so long as the total pressure remains the same.

Thus, in the illustration, the 10 lb. block has the same coefficient of friction (*f*) in a horizontal position as it does in a vertical position. The amount of surface areas in contact has little or no effect on the friction coefficients. When the pressure becomes abnormally high, however, friction increases at a rapid rate until seizing occurs.

For Brake and Clutch . . . Use. **Velvetouch**



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

Waterway ...

Montana—Richland County—State—Bank Protection

L. V. Lockwood, Glasgow, was the low bidder at $52,980 to the State Hwy. Comm. for the construction of timber bank protection along the Sidney branch, near the N. Dakota Line. The highway commission's estimated cost was $56,980. The following bids were submitted:

(1) L. V. Lockwood $52,980
(2) Walter Mockin 54,447
(3) Otis Williams & Co. 54,635
(4) W. P. Roscoe Co. $64,577
(5) Inland Const. Co. 65,454

	(1)	(2)	(3)	(4)	(5)
132 M.F.B.M. untreated lumber	90.00	110.00	100.00	142.30	132.00
5,500 cu. yd. select backfill	.60	.75	.50	.60	.52
168 ea. 15-ft. tr. timber piles	30.00	27.00	30.00	28.00	28.50
501 ea. 30-ft. timber piles	45.00	46.00	45.00	55.00	62.00
11,000 lin. ft. ½-in. round steel cable	.20	.20	.30	.12	.18
18,000 lb. structural steel	.13	.14	.10	.10	.13
Lump sum, bundled brush and logs	....	....	....	....	....

California—Los Angeles County—City—Pier Impr.

Owl Truck and Construction Co., Compton, submitted the low bid of $105,148 to the Port Manager of Long Beach for the improvement of the East Long Beach Pier A. The bids were:

(A) Owl Truck & Constr. Co.—(a) $28,830.60, (b) $11,370.75, (c) $13,920, (d) $53,919.06 (e) $105,148.50.
(B) Modern Builders Construction Co. — (e) $109,776.92.
(C) H. F. Kretlow Co.—(b) $10,466.60, (e) $114,701.80.
(D) C. B. Tuttle—(e) $119,946.41.
(E) C. R. Butterfield Co.—(c) $12,960, (d) $60,667.60.
(F) Ansco Construction Co.—(a) $28,259.60, (c) $11,520, (d) $54,754.45.
(G) Sully Miller Construction Co.—(a) $28,761.25.

"A"—PAVEMENT
(1) 1940 tons asphalt concrete base course.
(2) 4187 tons asphalt concrete leveling course.
(3) 1387 tons asphalt concrete surface course.

"B"—TRACK WORK
(4) 2350 track ft. of 128-lb. rails installed.
(5) 108 track ft. of 90-lb. rails removed.
(6) relay 108 track ft. of 90-lb. rails.
(7) remove 37 cross ties and replace with switch ties.
(8) 1800 sq. ft. of asphalt concrete removed.
(9) 560 sq. ft. of concrete pavement removed.
(10) excess labor installing two 128-lb. turn-outs.
(11) 42 tie rods installed.
(12) 195 cu. yds. excavating for track.
(13) 650 tons No. 1 crushed rock ballast furnished and placed.
(14) 1050 tons Nos. 3 and 4 crushed rock ballast furnished and placed.

"C"—ROCK ROADWAY
(15) 4800 tons pit run disintegrated rock in roadway, furnished, spread, grading and rolling.
(16) 2400 tons crushed disintegrated rock in roadway.

"D"—GRADING, STORM DRAINS AND CURBS
(17) 35,700 cu. yds. grading.
(18) 30 palm trees removed and replanted.
(19) 5200 cu. yds. top soil excavated, hauling, dumping and spreading.
(20) 1411 lin. ft. 12-in. standard strength vit. clay or cement concrete pipe.
(21) 60 lin. ft. of 12-in. reinforced concrete pipe.
(22) 475 lin. ft. 8-in. standard strength vit. clay or cement concrete pipe.
(23) 12 lin. ft. of 24-in. spun reinforced concrete pipe.
(24) 530 lin. ft. 24-in. standard strength vit. clay or cement concrete pipe.
(25) 22,000 sq. ft. of oil caked roadway removed.
(26) 243,830 sq. ft. 6-in. cushion course for pavement subgrade.
(27) one reinforced storm drain manhole, complete.
(28) 10 manhole-catch basin combinations, complete.
(29) concrete wall removal and repair, new ramp retaining wall, curb and other incidental work.

(1)	3.75	3.75	3.95	4.00	.....	3.65	3.80
(2)	3.75	3.75	3.95	4.00	.....	3.70	3.80
(3)	3.95	3.96	4.15	4.20	.....	4.10	3.95
(4)	2.30	2.72	2.50	3.00	.....	.....	.....
(5)	1.00	.84	1.00	1.00	.....	.....	.....
(6)	2.20	2.72	2.50	3.50	.....	.....	.....
(7)	.75	.78	2.50	.65	.....	.....	.....
(8)	.10	.08	.15	.17	.....	.....	.....
(9)	.12	.08	.25	.30	.....	.....	.....
(10)	150.00	156.75	275.00	580.00	.....	.....	.....
(11)	.60	.63	.50	1.00	.....	.....	.....
(12)	1.00	.68	2.00	3.00	.....	.....	.....
(13)	2.50	2.09	2.00	2.40	.....	.....	.....
(14)	2.50	1.73	2.00	2.40	.....	.....	.....
(15)	1.80	1.78	1.80	1.90	1.80	1.60	.....
(16)	1.90	1.78	1.80	1.90	1.80	1.60	.....
(17)	.39	.34	.45	.35	.45	.37	.....
(18)	60.00	78.38	75.00	85.00	75.00	35.00	.....
(19)	.90	.78	1.25	.85	1.25	.80	.....
(20)	1.90	4.39	2.50	3.60	2.50	3.50	.....
(21)	12.50	8.36	7.50	17.00	7.50	4.50	.....
(22)	3.00	7.16	4.00	6.60	4.00	4.00	.....
(23)	15.00	12.00	11.00	22.40	11.00	10.00	.....
(24)	5.00	8.00	7.50	9.65	7.50	6.50	.....
(25)	.03	.026	.025	.028	.025	.046	.....
(26)	.065	.058	.07	.062	.07	.065	.....
(27)	250.00	282.87	400.00	168.00	400.00	300.00	.....
(28)	135.00	317.00	175.00	280.00	175.00	215.00	.....
(29)	$6,500	$6,677	$6,100	$9,182	$6,100	$6,000	.....

Highway and Street ...

Idaho—Twin Falls County—State—Hwy.

Hoops Construction Co. of Twin Falls, Idaho, was awarded the contract at a low bid of $113,838 to the Idaho Department of Public Works for the construction of a bituminous surface on 9.2 mi. of U. S. No. 30 east and west of Twin Falls. The following bids were submitted:

(1) Hoops Constr. Co. $113,838
(2) Triangle Constr. Co. 117,045
(3) Duffy Reed Construction Co. $119,267
(4) Western Constr. Co. 133,661

	(1)	(2)	(3)	(4)
360 sq. yd. remove concrete pave.	2.00	1.00	3.00	3.00
5,190 cu. yd. unclass. excav.	.60	.50	.75	1.00
5 sta yd. overhaul	.10	.10	.10	.10
7,750 M. Yd. haul	.20	.25	.25	.20
850 T. cr. gr. surf. for shldrs, 1-in. max.	1.50	2.00	1.75	2.00

(Continued on next page)

Something You Should Know About Virginia, Minnesota

Who would want to part with electricity, running water, gas or the telephone? The prevalence of these low cost, convenient and dependable utilities has made the American living standard the envy of the world. Virginia, Minnesota has added a utility to these widely accepted public services—*steam heat* piped through the streets to practically every home, store and office building in the city, and hot water for domestic purposes, too.

The average cost per home owner is one-half to two-thirds the cost of operating a private heating plant. Obviously a power plant can be operated more efficiently than many small heating plants. Additionally, fire losses have been drastically reduced, the atmosphere is less polluted with smoke and gases, and there is no ash disposal problem.

Originally privately owned, the power plant, built for a saw mill, was purchased by the citizens who floated a bond issue for one-half million dollars to purchase the plant and install steam lines through the streets to the homes. The venture is a complete success for this thriving iron mining community of 12,500 population.

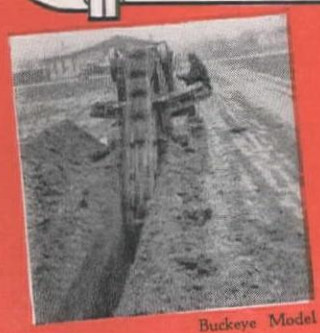
The factor of public ownership is secondary—the convenience and economy of this home heating service is the prime factor. Oak Park, Illinois (Chicago suburb), among other cities, has long been served by a privately owned dispenser of home heating. Many of our military establishments built for the present war are utilizing central heating.

When well-deserved peace comes, public funds will be spent to cushion demobilization. Postwar planners, particularly city planners, will do well to look into the Virginia, Minnesota central heating plan. Millions of home owners would welcome abolition of "furnace slavery." Trenching contractors in every community stand ready to provide fast, low cost digging of trench for installation of steam mains and service pipe with Buckeye Trenchers.

The idea is as practical as electric lighting was at the turn of the century.

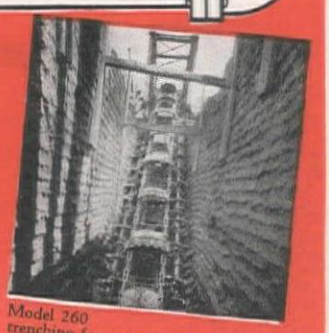
Buckeye Traction Ditcher Co.

Findlay, Ohio



Buckeye Model 410 trenching for water main.

Sewer extension with a Model 160.



Model 260 trenching for storm sewer.

Built by **Buckeye**

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

680 cu. yd. cr. gr. surf. for shldrs., L-H-P	1.50	1.00	1.75	2.00
970 cu. yd. selected borrow subbase	1.50	1.25	1.75	2.00
15 days rolling, power roller	40.00	48.00	40.00	40.00
5 days rolling, tamping roller	40.00	64.00	50.00	30.00
245 M. gal. water base and surf. courses	1.50	3.00	2.00	2.00
2,310 T. cr. gr. surf. course, 1-in. max.	1.50	2.00	1.75	2.00
12,715 T. cr. gr. in windrows, 1-in. max.	1.75	1.75	1.75	2.00
5,025 cu. yd. cr. gr. surf., L-H-W	1.60	1.00	1.75	2.00
1,210 cu. yd. cr. gr. surf., L-H-P	1.60	1.00	1.75	2.00
310 bbl. MC-1 liquid asph. prime coat	5.00	6.00	5.00	5.00
8.455 mi. mixing, finishing and rolling	$1,500	$1,000	$1,500	$2,000
6,400 bbl. MS-3 liq. asph. for roadmix	4.75	6.00	5.00	5.00
1,070 bbl. MC-5 liq. asph. seal coat	5.00	6.00	5.00	5.00
2,240 T. cover coat material, type "B"	5.00	4.00	5.00	6.00
7.915 Mi. prepare shoulders	250.00	200.00	200.00	200.00
15 days roll truck roller	25.00	56.00	20.00	35.00
575 cu. yd. bitum. level. course	5.00	10.00	6.00	7.50
Lump sum, mix, finish and roll, Sec. 1	$1,000	$1,000	800.00	750.00
Lump sum, mix, finish and roll, Sec. 3	500.00	500.00	600.00	750.00

Utah—Box Elder County—State—Surf.

Olof Nelson Construction Co., Logan, Utah, bid low at $66,968 to the Utah Road Commission for the construction of a 0.6 mi. roadmix bituminous surfaced road on the Box Elder County line. The unit bids were:

(1) Olof Nelson Construction Co. $66,968
(2) R. M. Jensen Construction Co. 69,245
(3) H. W. Glenn 72,624
(4) W. W. Clyde and Co. $72,854
(5) Reynolds Construction Co. 79,217
(6) L. A. Young Construction Co. 79,424

	(1)	(2)	(3)	(4)	(5)	(6)
17,500 gal. bitum. material, MC-2	.09	.10	.15	.10	.10	.12
2,900 gal. bitum. material, RC-5	.09	.10	.16	.14	.12	.15
140 T. cover material	3.00	3.00	4.00	3.50	3.00	5.00
0.592 mi. scarify and mix	750.00	800.00	$1,800	$1,200	$1,000	$1,200
0.311 mi. scarify and mix paved gutter	750.00	$1,200	$1,800	$1,500	$1,000	800.00
5,150 ton cr. rock or cr. grav. surf.	.85	.85	1.00	1.00	.90	1.00
4,700 ton grav. or crush rock base	.85	.85	1.00	1.00	.85	.90
116,300 cu. yd. unclass. excav.	.22	.23	.20	.30	.25	.22
705,000 sta. yd. overhaul, Class "A"	.015	.015	.02	.01	.02	.02
57,000 yd. mi. overhaul, Class "B"	.15	.15	.15	.12	.15	.20
.75 cu. yd. channel excav.	1.00	1.25	.50	1.00	1.00	1.00
1,830 1,000 gal. water	1.50	1.50	1.50	1.50	2.00	2.00
1,565 hrs. roll	3.50	4.00	4.00	3.50	6.00	5.00
87 lin. ft. 18-in. conc. pipe	3.00	2.50	4.00	2.50	3.00	3.00
50 cu. yd. excav. for structures	1.00	1.50	1.50	2.00	2.00	2.00
54 ea. guide posts	5.00	6.00	4.00	4.00	5.00	5.00
2,100 lin. ft. fence, Type "A"	.20	.16	.13	.18	.25	.20
250 lin. ft. move fence	.15	.10	.08	.12	.20	.15
2,000 sq. yd. remove exist. pave.	.75	.75	.75	.50	.50	1.00
3 ea. 16-ft. gates	25.00	25.00	25.00	25.00	30.00	25.00
2 ea. F.A.P. markers	20.00	20.00	20.00	20.00	10.00	20.00

Miscellaneous . . .

California—Alameda Co.—U.S.E.D.—Various

Stolte, Inc., Oakland, Calif., and Duncanson Harrelson Co., San Francisco, Calif., operating jointly, submitted the low bid and received the contract at $2,450,284. Buildings, utilities, roads, railroad fencing and other items are included in the project. In the unit bids exact quantities were not indicated for the utility items. The following total and unit bids were submitted:

(1) Stolte, Inc. and Duncan Harrelson Co. $2,450,284
(2) Ford J. Twaits Co. 2,473,658
(3) A. Farnell Blair 2,597,536
(4) Barrett & Hilp $2,630,320
(5) MacDonald & Kahn 2,632,066
(6) Haas Construction Co. and associates 2,637,357

	(1)	(2)	(3)	(4)	(5)	(6)
Lump sum, transit warehouse	$306,847	$325,530	$326,572	$317,000	$358,000	$354,896
Lump sum, classification warehouse	306,787	319,300	326,572	317,000	354,000	356,176
Lump sum, storage warehouse	171,500	182,800	184,290	179,000	200,000	190,617
Lump sum, storage warehouse	171,500	182,800	184,290	179,000	200,000	190,617
Lump sum, storage warehouse	171,500	182,800	184,290	179,000	200,000	190,617
Lump sum, salvage warehouse	255,484	227,500	315,770	256,000	205,000	252,974
Lump sum, salvage warehouse	229,273	211,400	266,205	242,000	187,000	247,486
Lump sum, utility shop	9,676	7,250	9,170	8,300	8,150	13,253
Lump sum, carpenter and paint shop	10,246	8,590	9,078	10,000	8,700	14,327
Lump sum, office building	4,915	4,880	5,708	5,000	5,100	6,809
Lump sum, warehouse	7,176	5,450	6,853	6,600	5,500	8,895
Lump sum, shed	1,694	2,180	2,336	2,000	1,800	2,724
Lump sum, motor repair shop	14,511	12,880	15,610	15,700	14,000	21,568
Lump sum, wash rack	1,913	1,160	1,848	1,500	2,000	2,879
Lump sum, wash shed	2,057	1,890	2,672	2,300	2,020	3,644
Lump sum, grease rack	1,046	550.00	1,053	1,800	930.00	1,748
Lump sum, mess hall	10,151	8,830	8,976	10,000	10,000	14,799
Lump sum, officers' quarters and lavatory	5,841	4,600	6,440	5,800	5,400	8,811
Lump sum, enlisted men's barracks	2,771	2,330	3,021	3,100	5,200	4,406
Lump sum, enlisted men's barracks	2,771	2,330	3,021	3,100	5,200	4,406
Lump sum, enlisted men's barracks	2,771	2,330	3,021	3,100	5,200	4,406
Lump sum, enlisted men's lavatory	4,900	4,740	5,752	5,200	6,100	6,344
Lump sum, enlisted men's barracks	2,771	2,330	3,021	3,100	5,200	4,406
Lump sum, fire station	6,165	4,710	7,049	5,200	5,800	9,371
Lump sum, cafeteria	29,178	29,660	36,260	36,900	31,500	40,800
Lump sum, administration building	89,252	85,450	106,270	100,000	93,500	123,380
Lump sum, boiler house	6,541	6,930	8,984	8,600	4,200	8,140
Lump sum, exterior elec. distrib. system	63,910	67,300	76,000	67,000	69,500	65,600
Lump sum, water distribution system	109,674	98,100	94,234	99,000	102,000	88,970
Lump sum, gas distribution system	7,382	8,930	8,586	6,200	9,400	8,122
Lump sum, sanitary sewer system	19,006	19,100	16,360	19,400	17,800	17,050
Lump sum, drainage system	147,700	144,800	127,000	145,000	122,500	130,427
18,000 cu. yd. unclass. excavation	.53	.55	.51	.95	.50	.78
183,000 T. import. select matl.	.97	.97	.93	1.30	1.00	.88
64,000 T. rock base course	2.36	2.20	2.28	2.65	2.60	2.15
13,800 T. plantmix aggregate	4.09	4.40	3.94	4.70	5.20	3.72
730 T. plantmix asphalt	18.70	13.60	18.00	22.00	17.50	17.00
385 T. prime coat asphalt	24.20	23.80	23.00	23.00	26.00	22.00
106 T. seal coat asphalt	33.00	22.30	31.00	23.00	25.00	30.00
1,320 T. cover aggregates	3.85	3.75	3.70	4.70	4.70	3.50
540 lin. ft. traffic barrier rail	2.48	.90	2.35	2.00	1.60	2.25

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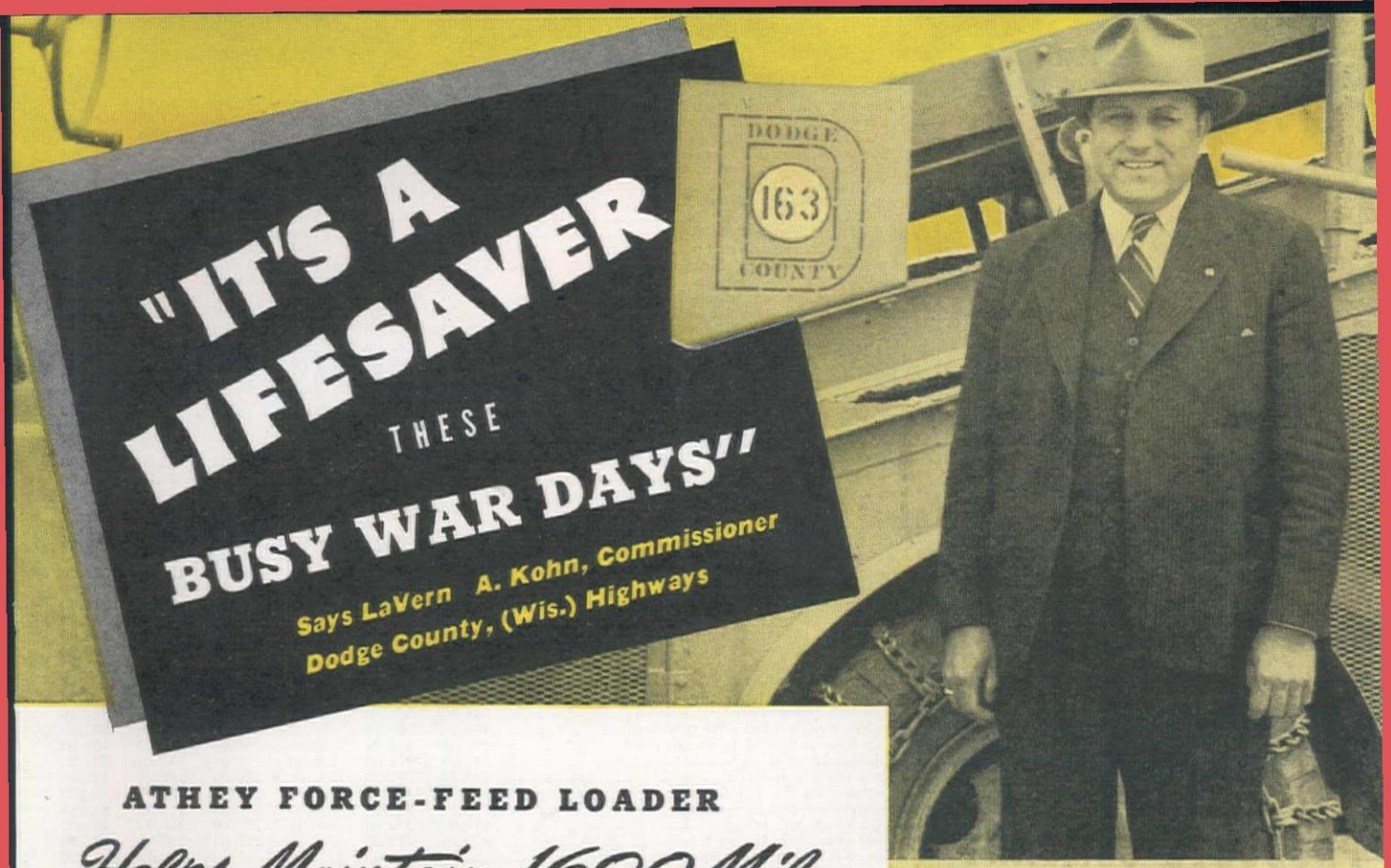
"IT'S A LIFESAVER THESE BUSY WAR DAYS"

Says LaVern A. Kohn, Commissioner
Dodge County, (Wis.) Highways



ATHEY FORCE-FEED LOADER

Helps Maintain 1600 Mile County & State Highway System

LaVern A. Kohn, Dodge County (Wisconsin) Highway Commissioner, has a lot of praise for their Athey Force-Feed Loader because "it has exceeded all of our expectations in its performance," to use his own words.

In maintaining Dodge County's 1600 miles of highway, including State highways in its care, the Force-Feed Loader is playing an important part.

"Caterpillar" Motor Grader cleans out ditches.

Much of its present operation is cleaning up windrows of excess material removed from clogged ditches.

Their "Caterpillar" Motor Graders grade the ditches, throwing out windrows of sand, washed soil, sod and debris which has accumulated and interfered with drainage. The Force-Feed Loader quickly and easily picks up the material from the road surface and loads it into trucks, which carry it to a fill. Time and manpower are saved—material is salvaged.

"No other methods," writes Mr. Kohn, "could do the job as satisfactorily or economically as the Athey Force-Feed Loader."

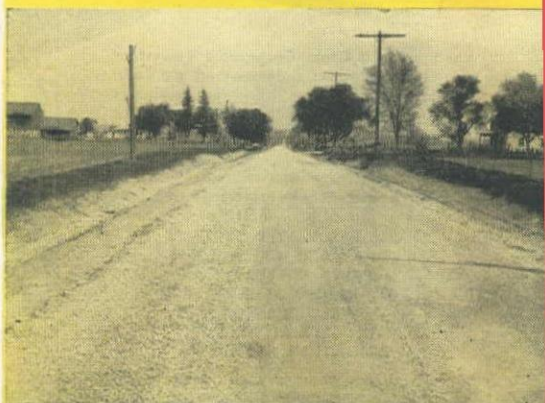
Mr. Kohn also says, "The loader is used for handling loose rock, gravel, oil mix material and snow with completely satisfactory results."

Many other Highway Officials are using Athey Force-Feed Loaders on road maintenance and construction and finding them the lowest cost, most versatile loading tool available.

23 truck-loads in 25 minutes!

Write today to your Athey-"Caterpillar" Dealer or to Athey Truss Wheel Co., 5631 W. 65th St., Chicago 38, Ill., for a new folder describing the Force-Feed Loader.

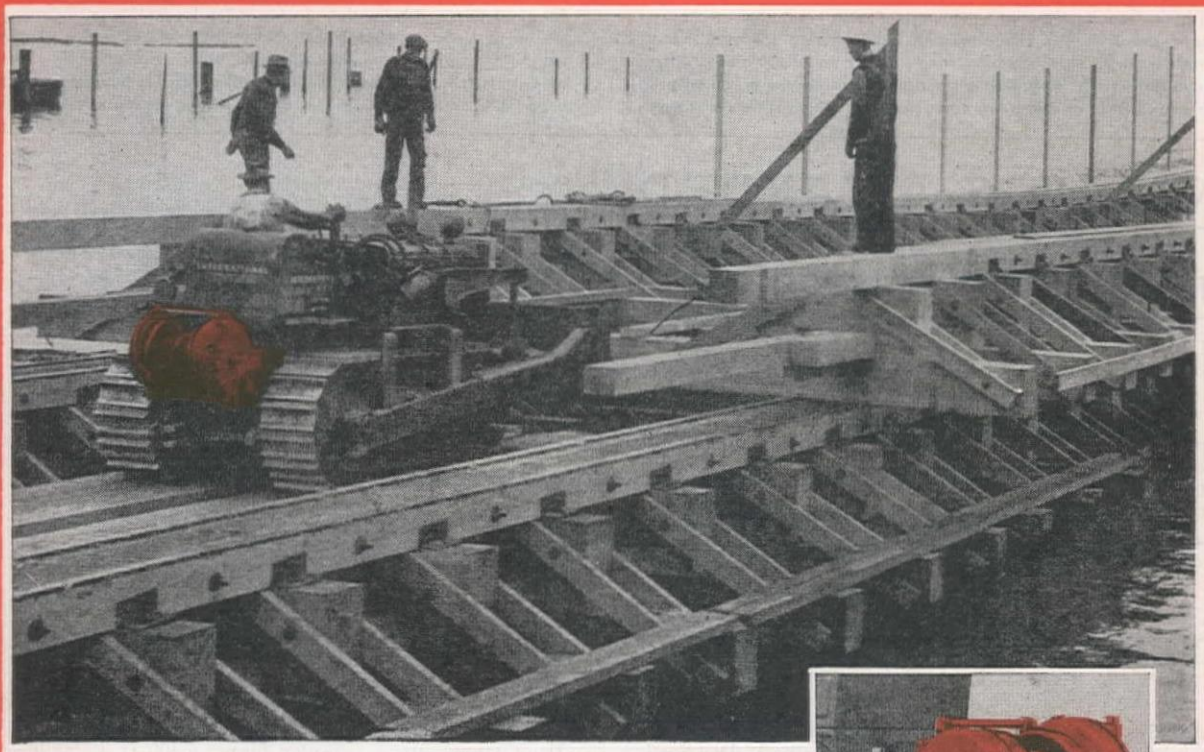
After the Athey Force-Feed Loader and "Caterpillar" Motor Grader have finished the job. Wide, clear drainage ditches and road surfaces mean better highways for Dodge County, Wisconsin.



ATHEY

FAST, DEPENDABLE
★
LOADING EQUIPMENT

1,900 lin. ft. railroad crossing plank	.66	.175	.49	1.20	.45	.55
1,030 lin. ft. curb and post work	.95	.21	.20	1.20	.60	.95
200 tr. ft. 128-lb. 7-in. girder rail	2.75	2.75	2.65	2.80	2.90	2.50
18,530 tr. ft. T rail	1.86	1.85	1.80	1.90	1.95	1.69
19 ea. inst. No. 8 turnout	291.50	292.00	280.00	300.00	300.00	265.00
1 ea. inst. Hayes derail	38.50	39.00	37.00	40.00	40.00	35.00
7 pr. inst. wheel stops	27.50	28.00	26.00	28.00	29.00	25.00
15,000 T. furn. and place ballast	1.70	1.70	1.65	1.70	1.75	1.55
65 lin. ft. remove curbing	1.10	1.10	1.06	1.00	1.10	1.00
35 lin. ft. replace curbing	2.20	2.20	2.12	3.00	2.30	2.00
Lump sum, remove end unloading ramp	110.00	110.00	106.00	115.00	115.00	100.00
170 sq. yd. rem. and repl. Atlantic Ave. pave.	2.97	3.00	2.86	3.00	3.10	2.70
1,630 tr. ft. railroad track	1.86	1.90	1.79	1.90	1.95	1.69
8,000 T. furn. and place ballast	1.70	1.70	1.64	1.75	1.75	1.55
3,875 tr. ft. remove railroad track	.97	1.00	.93	1.00	1.00	.875
6 ea. remove No. 9 turnouts	181.50	182.00	175.00	185.00	200.00	165.00
6 ea. reinstall No. 9 turnouts	291.50	292.00	280.00	300.00	300.00	265.00
680 trk. ft. move railroad track, 75-80-lb. rail	1.65	1.70	1.59	1.70	1.70	1.50
4,000 trk. ft. raise track on ballast	.97	.96	.93	1.00	1.00	.875
8 ea. remove concrete bases	33.00	33.00	32.00	34.00	40.00	30.00
ELECTRICAL DISTRIBUTION SYSTEM						
Ea., 50-ft. king pole	194.00	229.00	103.00	98.00	205.00	119.00
Ea., 45-ft. line pole	185.00	86.00	97.00	92.00	78.00	93.00
Lb., No. 8 HDBC wire, installed	.45	.50	1.26	1.20	.45	.87
Lb., No. 4 HDBC wire, installed	.50	.40	.67	.64	.36	.50
Lb., No. 8 NHDWP wire, installed	.50	.57	1.16	1.10	.52	.93
Lb., No. 6 NHDWP wire, installed	.44	.50	.95	.90	.45	.66
Lb., No. 4 NHDWP wire, installed	.39	.46	.79	.75	.42	.53
Ea., 37½ kva. pole type transformer	333.00	354.00	299.00	285.00	322.00	324.00
Ea., 25 kva. pole type transformer	265.00	280.00	236.00	225.00	254.00	253.00
Ea., 15 kva. pole type transformer	201.00	215.00	221.00	210.00	195.00	211.00
Ea., 10 kva. pole type transformer	161.00	172.00	137.00	130.00	156.00	154.00
Ea., 7½ kva. pole type transformer	136.00	153.00	110.00	105.00	139.00	148.00
Ea., Type C manholes	595.00	726.00	824.00	785.00	660.00	660.00
Ea., Type D manholes	289.00	206.00	299.00	285.00	187.00	293.43
Lin. ft., 2-3-in. ducts	1.38	.86	1.31	1.25	.78	.88
Lin. ft., 4-3-in. ducts	2.17	1.52	2.10	2.00	1.38	1.53
Ea., 50 kva. submersible transformer	565.00	581.00	446.00	425.00	528.00	528.00
Ea., 37½ kva. submersible transformer	466.00	500.00	389.00	370.00	454.00	463.00
Ea., 25 kva. submersible transformer	387.00	312.00	326.00	310.00	284.00	409.00
Ea., floodlight pole "A"	341.00	376.00	289.00	275.00	342.00	293.00
Ea., floodlight pole "B"	353.00	382.00	302.00	288.00	347.00	344.00
Ea., substation No. 1, installed	$15,840	$15,092	$7,875	$9,000	$13,720	$15,150
Ea., substation No. 2, installed	$1,650	$2,059	788.00	$1,000	$1,872	$1,084
Ea., G&W second. box	249.00	293.00	236.00	225.00	266.00	263.00
Ea., 400 amp., bole top switch	430.00	319.00	247.00	235.00	290.00	233.00
Lin. ft., No. 1/0 stranded bare copper wire	.17	.13	.19	.18	.12	.30
Lin. ft., No. 6 5000-V VCL cable, installed	.29	.71	.47	.45	.64	.48
Lin. ft., No. 4 5000-V VCL cable, installed	.33	.88	.68	.65	.80	.55
Lin. ft., No. 2 5000-V VCL cable, installed	.36	.126	.76	.72	1.14	.29
Lin. ft., No. 2/0 600-V VCL cable, installed	.44	.40	.84	.80	.36	.38
Lin. ft., No. 4/0 600-V VCL cable, installed	.52	.47	.55	.52	.43	.42
Lin. ft. No. 350 600-V VCL cable, installed	1.91	.84	.88	.84	.76	.97
Ea., street light with cable	69.00	36.20	40.00	38.00	33.00	24.75
Ea., street light, transformer pole	858.00	800.00	761.00	725.00	726.00	768.00
WATER DISTRIBUTION SYSTEM						
Lin. ft., 4-in. cem. asbestos pipe	1.53	2.09	1.89	1.90	2.00	1.90
Lin. ft., 6-in. cem. asbestos pipe	1.95	2.76	2.63	2.50	2.50	2.51
Lin. ft., 10-in. cem. asbestos pipe	3.10	4.35	3.84	3.75	4.00	3.95
Lin. ft., 12-in. cem. asbestos pipe	3.84	5.28	4.57	4.50	5.00	4.80
Lin. ft., 1¼-in. galv. steel pipe	.84	1.71	1.43	1.50	1.60	1.55
Lin. ft., 1½-in. galv. steel pipe	.88	1.76	1.48	1.55	1.65	1.60
Lin. ft., 2-in. galv. steel pipe	.95	1.93	1.76	1.70	1.75	1.75
Lin. ft., 3-in. galv. steel pipe	1.28	2.48	2.02	2.10	2.25	2.25
Ea., 2-in. gate valves	12.10	28.60	12.60	20.00	28.00	26.00
Ea., 3-in. gate valves	20.24	46.20	27.30	30.00	43.00	42.00
Ea., 4-in. gate valves	35.54	52.00	31.50	45.00	48.00	47.30
Ea., 6-in. gate valves	51.62	70.20	53.55	60.00	64.00	63.80
Ea., 10-in. gate valves	105.88	167.00	116.55	135.00	155.00	152.25
Ea., 12-in. gate valves	128.17	206.00	144.38	160.00	187.00	187.00
Ea., fire hydrants	135.00	280.00	205.80	225.00	260.00	255.00
Cu. yd., rock backfill in trenches	3.85	3.85	3.15	3.25	4.00	3.50
GAS DISTRIBUTION SYSTEM						
Lin. ft., 1¼-in. C.I. pipe, threaded and coated	1.05	1.10	1.43	1.36	1.00	1.00
Lin. ft., 3-in. C.I. pipe, threaded and coated	1.51	2.09	2.02	1.92	2.00	1.90
Lin. ft., 4-in. C.I. pipe, threaded and coated	1.91	2.20	2.49	2.37	2.25	2.00
Lin. ft., 5-in. C.I. pipe, threaded and coated	2.46	3.08	2.96	2.82	2.80	2.80
Ea., 4-in. lubricated valve	22.00	49.50	42.00	40.00	48.00	45.00
Ea., 5-in. lubricated valve	83.00	77.00	121.80	116.00	75.00	70.00
Lin. ft., ¾-in. black iron pipe, thread. and wrap	.81	.66	1.52	1.45	.65	.60
Lin. ft., 1-in. black iron pipe, thread. and wrap	.85	.77	1.79	1.70	.75	.70
Lin. ft., 1¼-in. black iron pipe, thread. and wrap	.97	.99	1.94	1.85	.95	.90
Lin. ft., 1½-in. black iron pipe, thread. and wrap	1.05	1.21	2.05	1.95	1.15	1.10
Lin. ft., 2-in. black iron pipe, thread. and wrap	1.10	1.54	2.21	2.10	1.40	1.40
SANITARY SEWER SYSTEM						
Lin. ft., 6-in. vitr. pipe	1.02	1.32	1.50	1.20	1.25	2.00
Lin. ft., 8-in. vitr. pipe	1.28	1.70	2.00	1.54	1.50	2.25
Lin. ft., 10-in. vitr. pipe	1.76	1.98	2.25	1.80	2.00	3.00
Lin. ft., 12-in. vitr. pipe	2.25	2.36	3.00	2.14	2.25	3.50
Lin. ft., 15-in. vitr. pipe	3.43	3.15	4.25	2.83	3.00	4.50
DRAINAGE SYSTEM						
Lin. ft., 10-in. reinf. concrete pipe	2.83	2.75	2.30	2.50	2.00	2.00
Lin. ft., 12-in. reinf. concrete pipe	3.36	3.15	2.65	2.90	2.30	2.50
Lin. ft., 15-in. reinf. concrete pipe	4.29	3.44	3.70	3.12	2.50	3.00
Lin. ft., 18-in. reinf. concrete pipe	5.28	3.92	5.00	3.56	2.60	3.50
Lin. ft., 21-in. reinf. concrete pipe	6.25	4.29	5.60	3.90	3.30	5.00
Lin. ft., 24-in., reinf. concrete pipe	7.48	6.45	7.00	5.86	4.20	6.00
Lin. ft., 30-in. reinf. concrete pipe	9.60	8.25	10.00	7.50	5.50	9.00
Lin. ft., 10-in. corr. metal pipe	2.54	2.40	2.35	2.18	1.90	6.00
Lin. ft., 12-in. corr. metal pipe	2.86	3.30	2.50	3.00	2.50	5.00
Lin. ft., 15-in. corr. metal pipe	3.71	3.68	4.00	3.35	3.40	8.00
Lin. ft., 24-in. corr. metal pipe	7.66	5.50	6.50	5.00	4.70	12.00
Lin. ft., 30-in. corr. metal pipe	8.00	6.24	8.75	5.67	6.00	14.00
Ea., catchbasin Type A and grating	110.00	165.00	115.00	150.00	110.00	125.00
Ea., catchbasin Type B and grating	123.00	165.00	130.00	150.00	115.00	150.00
Ea., catchbasin Type C and grating	130.00	165.00	160.00	150.00	120.00	200.00
Ea., square conc. manhole and cover	220.00	165.00	160.00	150.00	140.00	250.00
Ea., corrugated metal MH	182.00	143.00	125.00	130.00	160.00	125.00
Lin. ft., Type FEN-D-M fence	.41	.41	.39	.50	.37	.37
Ea., 18-ft. double gates and hardware	80.38	81.00	77.05	100.00	74.00	73.38



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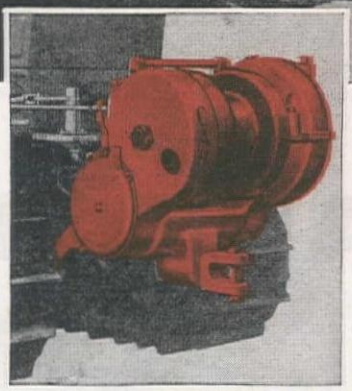

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CONSTRUCTION SUMMARY

The following pages contain the most complete available tabulation of construction contracts awarded in the eleven western states during the past month. Except for certain instances, contracts amounting to less than $10,000 are not listed. Space is not available to list more than a small proportion of the proposed projects. For your convenience, all items are prepared in an identical manner to provide the following information: County of job location (capital letters); name and address of contractor (bold face); bid price; brief description of work; awarding agency; and approximate date of award. More detailed information on many of these projects is often available, and will gladly be furnished upon your request to the Editor, WESTERN CONSTRUCTION NEWS, 503 Market Street, San Francisco.

CONTRACTS AWARDED

Large Western Projects...

A. Farnell Blair, San Francisco, Calif., was awarded a $602,877 contract to construct a trussed-arch landplane hangar at Litchfield Park, Phoenix, Ariz., by Bureau of Yards and Docks, Washington, D. C.

A. Teichert and Co., Sacramento, Calif., received a $1,384,887 contract to extend runway, taxiway and aprons and to install night lighting at Mather Field, Calif., from the U. S. Engineer Office, Sacramento, Calif.

Macco Construction Co., Clearwater, Calif., has been awarded a $3,420,840 contract to pave, drain landing mat and build additional taxiways at the Naval Air Station at San Diego, Calif., by the Bureau of Yards and Docks, Washington, D. C.

J. A. Casson Co., Hayward, Calif., was awarded a contract at $948,943 to stabilize shoulders for runways and taxiways, and miscellaneous work at the Fairfield-Suisun Airfield near Fairfield, Calif., by the U. S. Engineer Office, Sacramento, Calif.

McGuire and Hester, Oakland, Calif., have received a contract at $221,577 to complete the sewer system in the Castro Valley Sanitary District near Hayward, Calif., from the Castro Valley Sanitary District.

Ben C. Gerwick, Inc., Morrison-Knudsen Co., Inc., and **Ford J. Twaits Co.,** of San Francisco, Calif., have contracted at $1,690,000 to dredge and fill certain areas at the Naval Dry Docks at Hunters Point, San Francisco, for the Bureau of Yards and Docks, Washington, D. C.

Pacific Bridge Co., San Francisco, Calif., was awarded a $2,100,000 contract to construct a pier at the Bethlehem Steel Co., San Francisco, by the Bureau of Yards and Docks, Washington, D. C.

Coast Construction Co., Vancouver, B. C., received a $514,648 contract to construct fish ladders and excavate the channel at Hell's Gate Canyon, Fraser River, B. C., from the International Pacific Salmon Fisheries Commission, New Westminster, B. C.

Clyde W. Wood, Inc., Los Angeles, Calif., was awarded a $686,248 contract to construct earthwork and structures on the Conchas Canal of the Tucumcari Project (Schedules 4 to 8), by the Bureau of Reclamation, Tucumcari, N. Mex.

Barrett and Hilp, San Francisco, Calif., have received a $5,296,848 contract to construct a magazine storage building at Inland Storage Area, Port Chicago, Calif., from the Bureau of Yards and Docks, Washington, D. C.

J. A. Terteling and Sons of Boise, and **Brennan and Cahoon** of Pocatello, Idaho, were awarded a contract at $5,610,000 to construct storehouses, a boiler plant, 6,300 ft. of railroad, Waves quarters, roads and services at the gun relining plant at Pocatello by the Bureau of Yards and Docks, Washington, D. C.

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BOILING BOWL TERRA CLIPPER PRINCIPLE

SCRAPERS

J. H. Pomeroy and Co. and the **Utah Construction Co.**, San Francisco, Calif., received a $3,038,701 contract to construct eight storehouses, one shipping building and one receiving building, including roads, railroads and utilities, at Clearfield, Utah, from the Bureau of Yards and Docks, Washington, D. C.

Lease and Leigland, and **Kuney-Johnson,** Seattle, Wash., were awarded a $2,681,122 contract to construct industrial and personnel buildings and services at the Naval Magazine at Bangor, Wash., by the Bureau of Yards and Docks, Washington, D. C.

Henrik Valle Construction Co., Seattle, Wash., has received a contract for $1,996,000 to construct 9 warehouses, an administration building, a cafeteria, depot, trackage, roads and miscellaneous work at the Advanced Naval Base Depot, Longview, Wash., from the Bureau of Yards and Docks, Washington, D. C.

Dinwiddie Construction Co., San Francisco, Calif., was awarded a contract at $1,157,000 to construct a dispensary, drill hall, powerhouse addition, and miscellaneous work at the Naval Air Station at Alameda, Calif., by the Bureau of Yards and Docks, Washington, D. C.

United Concrete Pipe Corp., Los Angeles, Calif., received a $1,546,000 contract to construct an ammunition classification and segregation yard at the Naval Magazine Depot, Seal Beach, Calif., from the Bureau of Yards and Docks, Washington, D. C.

Eastern Construction Co., Dallas, Texas, has been awarded a contract to construct 111 miles of 6-in. oil pipe line from Craig, Colo., to Wamsutter, Wyo., by the Utah Oil Refining Co. of Salt Lake City, Utah.

Highway and Street . . .

Arizona

YAVAPAI CO.—**W. E. Orr,** 302 West Monte Vista Ave., Phoenix — $95,013 to grade and drain 5¾ mi. of road on Hillside-Bagdad Hwy. — by State Hwy. Comm., Phoenix. 8-17

California

ALAMEDA CO.—**Lee J. Immell,** 3030 San Pablo Ave., San Pablo—$75,042 to grade and pave with asph. conc. pave. on a crusher-run base, 0.5 mi. of hwy. near Gilman Street, Alameda Co.—by Div. of Hwys., Sacramento. 8-28

AMADOR CO. — **George R. Patterson,** Box 2004, Stockton—$95,751 for grading 5 mi.—by Pub. Roads Admin., San Francisco. 8-3

CONTRA COSTA CO.—**A. J. Raisch,** 900 West San Carlos St., San Jose—$24,938 to resurface with asph. conc. 0.9 mi. of hwy. between the Alameda-Contra Costa Co. line and San Pablo Ave.—by Div. of Hwys., Sacramento. 8-28

DEL NORTE CO.—**John Burman & Sons,** 2750 Harrison Ave., Eureka — $34,847 to grade, furnish and place imported base material, and apply a double prime coat on 0.5 mi. of hwy. near Little Mill Creek—by Div. of Hwys., Sacramento. 8-16

KERN CO.—**Griffith Co.,** 502 Los Angeles Railway Bldg., Los Angeles—$35,595 to repair with plant-mix surf. and seal coat about 3.8 mi. of hwy. east from Wasco—by Div of Hwys., Sacramento. 8-28

a HIT

WITH EXPERIENCED OPERATORS

"Today it is still the favorite unit on the job", is the way one operator expresses his individual enthusiasm for his Isaacson Kable-Power Unit. Acquired before Pearl Harbor, it is giving continuous service on gruelling construction work in the Pacific Northwest. "It's the best, yet", says another who operates a fleet of cable units. These are people who know equipment, value dependability, smooth operation and long service. The heart of cable operation to them is in the Cable Power Unit. A unit that holds its adjustments longer, eliminates tedious tuning-up periods, is simple in design and sturdily constructed is a big hit in these days of war time stress and crushing demands on tractor equipment. They can depend on their Isaacson Kable Power Unit. It won't let them down.

16 AWARDS IN WAR PRODUCTION

Front mounted Isaacson Kable-Dozers give constant power although tractor master-clutch is disengaged and they allow rear end to be free for rear power-take-off equipment.

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ENGINEERED TRACTOR EQUIPMENT

KERN & LOS ANGELES COS.—**Phoenix Construction Co.,** P. O. Box 906, Bakersfield—$13,258 to repair with road-mix surf. and asph. seal, 16 mi. of hwy. between Antelope School and State Hwy. 58—by Calif. Div. of Hwys., Sacramento. 8-14

LASSEN CO.—**Baker Brothers,** Box 971, Chico — $46,977 for clearing, excavating, etc., of 6.5 mi. on access road project—by Pub. Roads Admin., San Francisco. 8-3

LOS ANGELES CO. — **J. E. Haddock, Ltd.,** 3578 E. Foothill Blvd., Pasadena—$210,655 to improve streets in the Overland Housing Project, Pico Blvd. and Overland Ave., Los Angeles—by F.P.H.A., San Francisco. 8-14

LOS ANGELES CO.—**Claude L. Murphy,** 1046 S. Olive St., Los Angeles—$12,375 to improve portions of Colorado St. and Fair Oaks Ave., Pasadena—by City Clerk, Pasadena. 8-16

LOS ANGELES CO.—**Vido Kovacevich,** 5400 Imperial Hwy., South Gate—$19,076 for 0.4 mi. of grading and widening with Portland cement conc. and plantmix surf. at Atlantic and Bandini Blvd., Los Angeles —by Div. of Hwys., Sacramento. 8-10

SACRAMENTO CO.—**A Teichert & Co.,** 1846-37th St., Sacramento—$42,072 to grade and surface with coarse run base and armor coat 2 mi. of hwy. on E St., between 16th and 32nd Sts., Sacramento Co.—by Div. of Hwys., Sacramento. 8-29

SAN BERNARDINO CO.—**M. S. Mecham Construction Co.,** 1210 W. 48th St., Los Angeles—$26,909 to construct roads and parking areas at the Shell Plant, Fortuna—by the U. S. Engr. Ofc. 8-29

SAN MATEO CO.—**Union Paving Co.,** 310 California St., San Francisco—$16,581 to resurf. with asph. conc. and a seal coat portions of Brewster Ave., Hamilton St., Middlefield Rd., and Marshall St. and to construct 14 inverted syphon storm drains —by City Clerk, Redwood City. 8-24

SOLANO CO.—**Parish Brothers,** 619 "H" St., Sacramento — $213,461 for 5.5 mi. of pave., curb. and gutters in Benicia—by City Clerk, Benicia. 8-10

SOLANO CO. — **C. M. Syar,** P. O. Box 1431, Vallejo—$22,263 to grade, excavate and pave and construct curbs and sidewalks on portions of Marin and Capital Sts., Vallejo—by City Clerk, Vallejo. 8-22

YOLO & COLUSA COS.—**W. C. Railing,** 27 Lowell St., Redwood City—$47,357 to repair with imported borrow material 10 mi. of hwy. between Knights Landing and Grimes—by Div. of Hwys., Sacramento. 8-22

Idaho

BONNEVILLE CO. — **H. A. Gardner,** Blackfoot—$40,308 for 7.3 mi. roadmix surf. on Reno Park-Taylor Road—by Bur. of Hwys., Boise. 8-7

BOUNDARY & BONNER COS.—**McAtee & Heath,** 3527 Trent Ave., Spokane, Wash.—$17,484 for sealcoat. 5.5 mi. on U. S. Hwy. No. 2 betw. U. S. Hwy. No. 95 and Moyie Springs; 15.6 mi. on U. S. Hwy. No. 95 betw. Copeland Junc. and Eastport; and 6.4 mi. on U. S. No. 10-Alt. betw. Pack River and Hope—by Bur. of Hwys., Boise. 8-7

CLEARWATER CO.—**H. S. and H. F. Green,** Chronicle Bldg., Spokane—$19,988 to construct roadmix surf. and seal coat on 4 mi. of State Hwy. 11, near Wieppe—by Bur. of Hwys., Boise. 8-15

CUSTER CO. — **Morrison-Knudsen Co., Inc.,** Box 1518, Boise — $16,444 to place bitum. surf. on 7.8 mi. of U. S. Hwy. 93 be-

Let's get

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The rising tide of the war effort is creating extraordinary demands for heavy construction equipment — especially track-type tractors. The War Production Board is asking for every piece of used equipment that can be gathered to supplement what the factories are able to build.

Most any machine, regardless of make, age or condition, can probably be used somewhere. Your Government will help find a place for it. Write or telephone the nearest War Production Board office. If you don't know its location or any of its personnel, your "Caterpillar" dealer will gladly help you make the proper contacts.

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TRACTORS • ENGINES AND ELECTRIC SETS • EARTHMOVING MACHINERY

tween Willow Creek Summit and Grandview Canyon — by Pub. Works Comm., Boise. 8-18

CUSTER CO. — **Morrison-Knudsen Co., Inc.,** Box 1518, Boise—$24,560 to treat 11.2 mi. with bitum. surf. on U. S. Hwy. 93 from Challis to the Watt Bridge — by Bur. of Hwys., Boise. 8-7

FREMONT & TETON COS.—**Nick Burggraf,** Box 397, Idaho Falls—$49,239 for 15 mi. crush. gravel surf. on State Hwy. 32 betw. Drummond and Tetonia—by Bur. of Hwys., Boise. 8-7

IDAHO CO.—**Standard Asphalt Paving Co.,** 603 Chronicle Bldg., Spokane, Wash.—$37,753 for 5.3 mi. roadmix bitum. surf. and 9.3 mi. seal coat on U. S. Hwy. 95 from Grangeville south — by Bur. of Hwys., Boise. 8-7

KOOTENAI CO.—**Roy L. Blair,** 1220 Ide Ave., Spokane, Wash.—$35,926 for 4 mi. roadmix bitum. surf. on U. S. Hwy. 95 betw. Coeur d'Alene and Hayden School—by Bur. of Hwys., Boise. 8-7

KOOTENAI CO.—**E. A. Sullivan,** Parkwater, Wash.—$48,198 for 5.1 mi. roadbed, drainage structs. and crush. gravel surf. on Bayview Closure Road from Naval Training Sta. entrance to Bayview—by Bur. of Hwys., Boise. 8-7

LEWIS & NEZ PERCE COS.—**McAtee & Heath,** 3527 Trent Ave., Spokane, Wash.—$15,922 to sealcoat 22.7 mi.—by Bur. of Hwys., Boise. 8-7

MADISON, FREMONT & BONNEVILLE COS.—**Nick Burggraf,** Box 397, Idaho Falls—$40,727 for stockpiling crush. gravel surf. and sealcoat. 11.7 mi. on U. S. Hwy. 20-Alt. from Teton to Canyon Creek; 11 mi. of State Hwy. No. 29 betw. Beeches Corner and Ririe; and 3 mi. on Parker-Elgin Road—by Bur. of Hwys., Boise. 8-7

POWER CO. — **Whiting & Haymond,** Springville, Utah—$23,887 for 5 mi. grad., drain. and surf. on State Route 37 betw. Rockland and Roy — By Bur. of Hwys., Boise. 8-7

TWIN FALLS CO.—**Hoops Construction Co.,** Box 431, Twin Falls—$113,838 for 9.2 mi. bitum. surf. on U. S. Hwy. 30, east and west of Twin Falls — by Bur. of Hwys., Boise. 8-3

New Mexico

COLFAX & UNION COS.—**Henry Thygesen & Co.,** Box 876, Albuquerque—$55,727 for resurf., processing and seal. 43.1 mi. on State Hwy. 58 betw. Springer and Clayton—by State Hwy. Dept., Santa Fe. 8-8

GUADALUPE CO.—**Henry Thygesen & Co.,** Box 876, Albuquerque—$16,125 for 24.4 mi. sealing of oil mat on U. S. Hwy. 84 betw. Santa Rosa and Fort Sumner—by State Hwy. Dept., Santa Fe. 8-8

HARDING & COLFAX COS.—**Walter L. Denison,** Albuquerque, N. Mex.—$104,441 to place base, surf. and oil 15.3 mi. of State Hwy. 39 betw. Mills and Abbott—by State Hwy. Dept., Santa Fe. 8-29

OTERO CO.—**Gaastra & Gilbert,** Albuquerque—$15,211 to place base and surf. 20.5 mi. of hwy. and other const. on State Hwy. 24 betw. Weed and Pinon—by State Hwy. Dept., Santa Fe. 8-29

RIO ARRIBA CO.—**Floyd Haake,** Santa Fe—$32,913 for 7.6 mi. grading, surf., minor drain. structs. and misc. const. on U. S. Hwy. 84 and State Hwy. 100 betw. Canjilon and Chama—by State Hwy. Dept., Santa Fe. 8-8

SAN MIGUEL CO.—**A. O. Peabody,** Santa Fe—$22,051 for 6.5 mi. grading, surf., minor drainage structs. and other work on State Hwy. 30 betw. San Jose and Villanueva—by State Hwy. Dept., Santa Fe. 8-8

SAN MIGUEL & MORA COS.—**A. O. Peabody,** Santa Fe—$41,412 for patching, surf., reprossess. and sealing 36.2 mi. on State Hwy. 3 betw. Las Vegas and Holman —by State Hwy. Dept., Santa Fe. 8-3

SANTA FE & SAN MIGUEL COS.—**Brown Bros.,** P. O. Box 1479, Albuquerque —$95,661 to grade, const. drainage structs. and place base course, surf. and black top on 8.7 mi. U. S. Hwy. 85 betw. Santa Fe and Las Vegas—by State Hwy. Dept., Santa Fe. 8-24

Oregon

CLATSOP CO.—**Warren-Northwest, Inc.,** Box 5072, Portland—$36,490 for road paving at the Naval Hosp., Astoria—by Bur. of Yards and Docks, Washington, D. C. 8-1

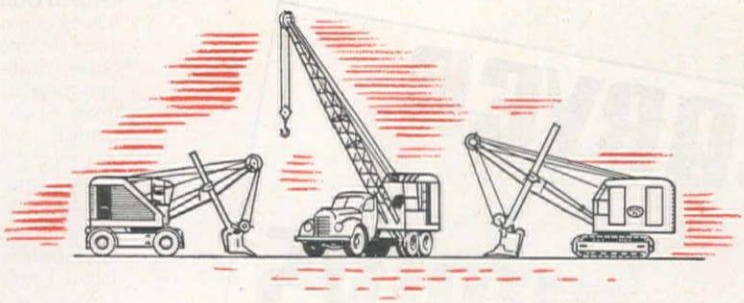
KLAMATH CO.—**Clifford A. Dunn,** Box 431, Klamath Falls—$122,909 to pave access roads, barracks sts., etc. at Marine Barracks, Klamath Falls—by Bur. of Yards and Docks, Washington, D. C. 7-31

YAMHILL CO.—**J. C. Compton Co.,** McMinnville—$19,812 for rock grading and hard surf. pave. in McMinnville—by City Recorder, McMinnville. 8-7

Utah

CARBON & EMERY COS.—**L. A. Young Construction Co.,** Richfield — $11,080 for sealcoat. 18.8 mi. on State Rte. 10 betw. Price and Huntington — by State Road Comm., Salt Lake City. 8-7

CARBON & UTAH COS.—**D. O. Men-**



Announcement of interest to:

CONTRACTORS, ENGINEERS, AND USERS OF MATERIAL HANDLING EQUIPMENT

During the past three years, while new Byers shovels and cranes have not been available to commercial users, our entire company has been devoting its efforts to: (1) meeting enlarged production schedules for machines for our armed forces; (2) maintaining prompt parts service to owners, and (3) following our long established policy of continual improvement of our products.

When shipment of Byers excavators to private owners again becomes possible, our many customers and friends in the construction industry will find that new and revised models of Byers shovels and cranes have been greatly improved in design and construction. This has been accomplished with the aim of providing better values for owners and greater convenience for operators. When this time arrives, the news will be announced to the entire construction industry.

Another policy of prime importance to shovel and crane users is Byers method of distribution through reliable, established construction equipment dealers. This policy will be continued in the firm belief that no other system provides users with equal service, satisfaction, and guarantee of fair dealing during the life of the equipment. You will find these dependable representatives to be of the highest type of construction machinery distributor in your territory.

THE BYERS MACHINE CO.

★ Ravenna, Ohio ★

Distributors throughout the World

---

denhall Construction Co., Springville—$22,020 to const. gravel surf. on 8.25 mi. of hwy. and to provide stockpiles of gravel and cover mat. on U. S. 50 betw. Hiawatha Junction and Wattis Road and stockpiles near Scofield Junction — by State Road Comm., Salt Lake City. 8-23

DAVIS CO.—**Reynolds Construction Co.,** Springville—awarded negotiated contract to sealcoat 6 mi. of road in State Project 929 and resurf. 0.8 mi. of road betw. Clearfield and the Naval Supply Depot—by State Road Comm. 8-24

IRON CO.—**Duque & Frazzini,** Tonopah, Nev.—$41,248 for const. 14 mi. bitum. surf. road on State Rte. 198 betw. Cedar City and Iron Mountain—by State Road Comm., Salt Lake City. 8-7

MILLARD CO.—**W. W. Clyde & Co.,** Bowers Bldg., Springville—$36,800 for 18.6 mi. of gravel surf. road on State Rte. 63 betw. Scipio and Sevier Co. line—by State Road Comm., Salt Lake City. 8-7

Washington

CLARK CO.—**J. C. Compton,** McMinnville, Ore.—$96,528 to surf. and provide drainage facils. on 6 roads in the McLoughlin Heights Housing Project, Vancouver—by Hous. Auth., Vancouver. 8-1

ISLAND CO. — **Northwest Construction Co.,** 3950-6th Ave. N. W., Seattle 7—$104,411 for clearing, grading, draining and light bitum. non-skid sealcoat surf. on section of road betw. warming apron of Clover Valley Land Plane Base and plane apron in Oak Harbor Naval Sta.; and 6.8 mi. ballast, surf. and light bitum. non-skid sealcoat on sections of exist. roads and sts.—Dir. of Hwys., Olympia. 8-2

KING CO.—**Northwest Construction Co.,** 3950-6th Ave. N. W., Seattle 7—$51,575 for grading and surf. 0.12 mi. and const. asph. cem. pave. on State Hwy. 2, Seattle to Renton, Dunlap Canyon Access Road—by Dir. of Hwy., Olympia. 8-2

KING CO.—**Northwest Construction Co.,** 3950-6th Ave. N.W., Seattle 7—$181,818 to grade, drain, and surf. hwy. in King Co.—by Dir. of Hwys., Olympia. 8-14

KING & SNOHOMISH COS. — **Diesel Oil Sales Co.,** 2155 Northlake Ave., Seattle —$19,500 to const. roadmix surf. on State Hwy. betw. Woodinville and Snohomish—by Dir. of Hwys., Olympia. 8-16

KITTITAS & YAKIMA COS.—**Babler & Conley,** 4617 S. E. Milwaukee, Portland, Ore.—$23,079 for 14.5 mi. non-skid sealcoat from American River to Elkridge Lodge; 2.4 mi. Buena to Toppenish; 6.1 mi. Wapato to Toppenish; and 7.8 mi. Alfalfa to Satus—by Dir. of Hwys., Olympia. 8-2

WHITMAN CO.—**Joslin & McAllister,** P. O. Box 1174, Spokane — $47,691 to place ballast, surf. and light bitum. surf. treat. on 6.2 mi. of State Hwy. 11-C betw. Lamont and Imbler Creek — by Dir. of Hwys., Olympia. 8-24

Wyoming

PARK CO. — **The Taggert Construction Co.,** Cody—for 5.6 mi. grading, drainage, base course surf., stone chip sealcoat, etc., and 4 timber bridges on Powell-Elk Basin Oil Field access road — by State Hwy. Dept., Cheyenne. 7-28

Bridge . . .

California

CONTRA COSTA CO.—**Earl Heple,** 494 Delmas Ave., San Jose—$335,000 for two

NO TUBERCULATION TO CHOKE OFF THE HIGH FLOW-RATE of TRANSITE PIPE!

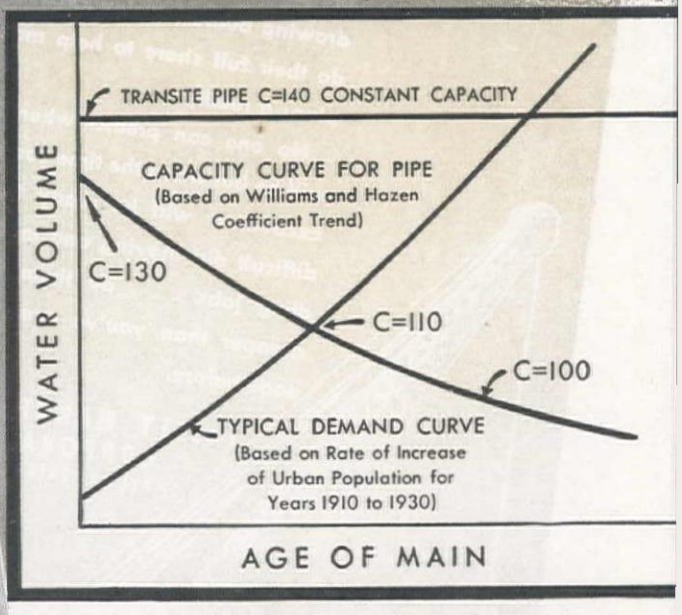


Chart shows how high initial flow rate combined with maintained carrying capacity account for one of the important advantages gained through the use of Transite Pipe.

HERE'S a pipe whose delivery capacity can never be affected by tuberculation. Johns-Manville Transite Pipe has this valuable advantage because it's non-metallic, being made of asbestos and cement.

In addition, Transite Pipe has a smooth, close-grained interior surface that offers less resistance to water-flow, resulting in an unusually high initial flow rate.

Other advantages you get with J-M Transite Pipe are rapid, simple assembly and tight, flexible joints because of the Simplex Couplings; and easy handling due to its light weight.

* * *

For more details, write for Transite Pressure Pipe Brochure TR-11A, Johns-Manville at Los Angeles, San Francisco or Seattle.

JOHNS-MANVILLE JM PRODUCTS

Johns-Manville TRANSITE PIPE

An asbestos product for efficient, economical water and sewer lines

overhead crossing structs., grading and surf. of approaches on State Hwy., Inland Storage Area, at Port Chicago—by Bur. of Yards and Docks, Washington, D. C. 8-2

MENDOCINO CO.—**Fred J. Maurer & Sons,** 369 Pine St., San Francisco—$67,842 for bridge, on south fork of Eel River on access road, to serve Rockport Red Co. and Juan Creek Lumber Co.—by Pub. Roads Admin., San Francisco. 8-3

VENTURA CO.—**J. & B. Rocca,** P. O. Box 1202, Stockton—$64,424 to repair north trestle and truss span of bridge across the Santa Clara River at Saticoy—by Calif. Div. of Hwys., Sacramento. 8-14

Washington

SNOHOMISH CO.—**C. W. Larsen,** 266 Coleman Bldg., Seattle—$27,735 to reconst. timber pier protection for Snohomish River Bridge on State Hwy. 15 at Everett—by Dir. of Hwys., Olympia. 8-18

Airport . . .

Arizona

MARICOPA CO. — **A. Farnell Blair,** 9 Main St., San Francisco—$602,877 to construct trussed-arch landplane hangar at Litchfield Park, Phoenix—by Bureau of Yards and Docks, Washington, D. C. 8-15

California

IMPERIAL CO.—**A. Farnell Blair,** 9 Main St., San Francisco—$734,147 for additional aviation facils. at the Auxiliary Air Sta., Holtville—by Bur. of Yards and Docks, Washington, D. C. 8-9

KERN CO.—**A. H. Koebig, Jr.,** 458 So. Spring St., Los Angeles—$61,000 for additional pave. at Army Air Field, Muroc—by U. S. Engineer Ofc., Los Angeles. 8-1

LOS ANGELES CO.—**David J. Reed,** 401 S. Arden Blvd., Los Angeles—$13,597 to construct control tower and related work at Army Air Field, Palmdale—by U. S. Engr. Ofc., Los Angeles. 8-22

ORANGE CO.—**Basich Bros.,** 600 S. Fremont Ave., Alhambra—$885,000 to const. exterior services and paving at the Marine Corps Air Station, El Toro—by Bur. of Yards and Docks, Washington, D. C. 8-29

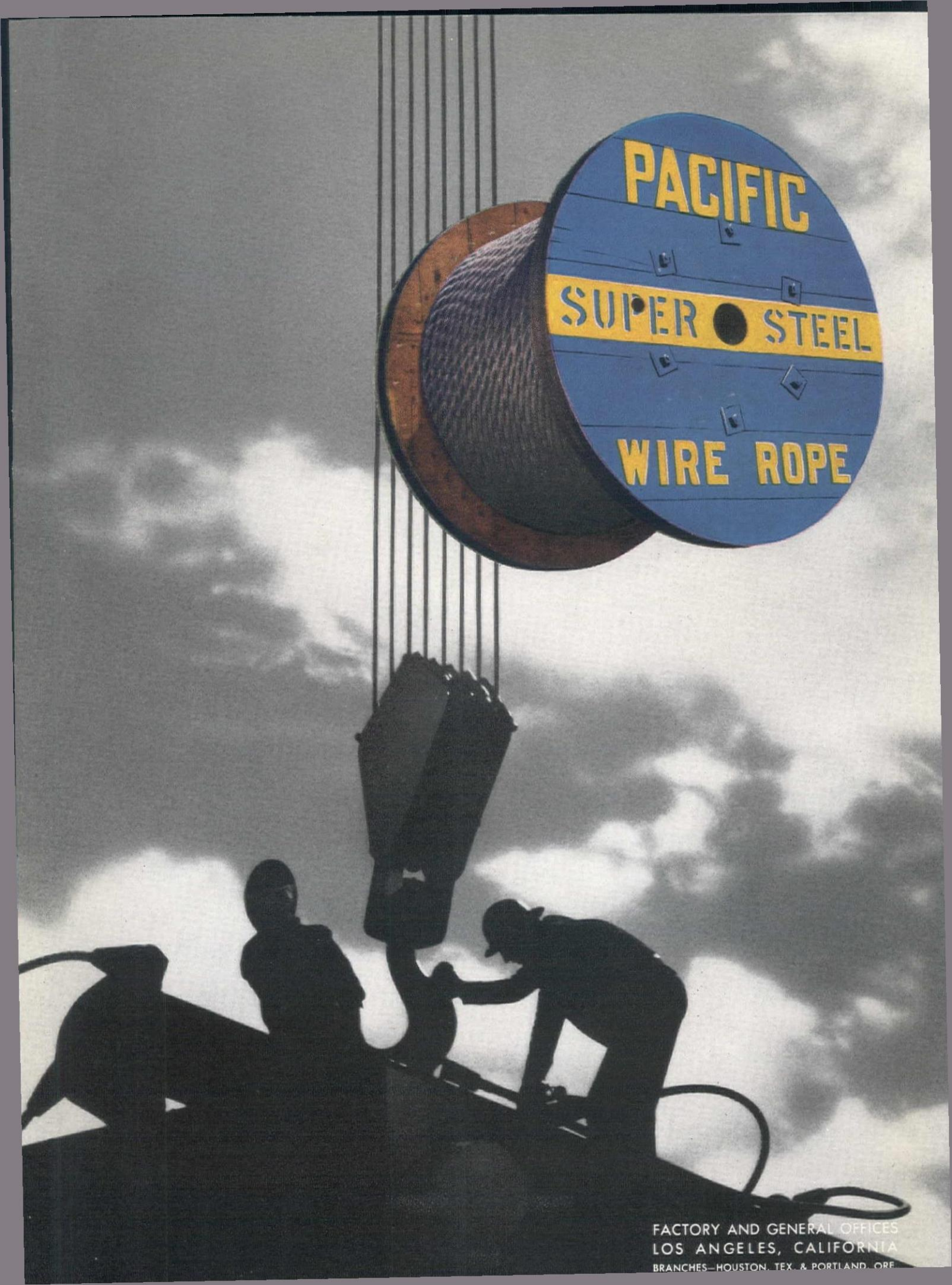
SACRAMENTO CO.—**A Teichert & Co.,** 1846-37th St., Sacramento — $1,384,887 to extend runway, taxiway and aprons and to install night lighting at Mather Field—by U. S. Engr. Ofc., Sacramento. 8-28

SAN DIEGO CO.—**James I. Barnes Construction Co.,** 1119 Montana Ave., Santa Monica—$621,220 to const. additional aviation facilities at Ream Field, San Diego—by Bur. of Yards and Docks, Washington, D. C. 8-11

SAN DIEGO CO. — **Kemp Bros.,** 2900 Hyde Park Blvd., Los Angeles—$230,900 to const. additional aviation facilities at Auxiliary Air Sta., Camp Kearney, San Diego—by Bur. of Yards and Docks, Washington, D. C. 8-29

SAN DIEGO CO.—**Macco Construction Co.,** 815 Paramount Blvd., Clearwater—$3,420,840 to pave, drain landing mat and build additional taxiways at Naval Air Sta., San Diego—by Bur. of Yards and Docks, Washington, D. C. 8-22

SAN DIEGO CO.—**Walter Trepte,** 631 Ninth Ave., San Diego—$339,427 to const. additional aviation facilities at Otay Mesa, San Diego—by Bur. of Yards and Docks, Washington, D. C. 8-11



FACTORY AND GENERAL OFFICES
LOS ANGELES, CALIFORNIA
BRANCHES—HOUSTON, TEX. & PORTLAND, ORE.

SOLANO CO.—**J. A. Casson Co.** and **N. M. Ball Sons,** Hayward—$948,943 to stabilize shoulders for runways and taxiways, and misc. work at Fairfield-Suisun Air Field, near Fairfield—by U. S. Engr. Ofc., Sacramento. 8-24

Texas

EL PASO CO.—**Edgar Martin,** Alpine—$28,500 to const. stabilized caliche runway and taxiway shoulder at El Paso Municipal Airport — by Civil Aero. Admin., Fort Worth. 8-22

MIDLAND CO.—**Thomas & Ratliff,** Rogers—$207,117 to const. runway at the Midland Municipal Airport, Midland—by U. S. Engr. Ofc., San Antonio. 8-23

Washington

MASON CO.—**S. Birch & Sons Construction Co.,** 314 Ford Bldg., Great Falls, Mont. —$71,500 for surf. runways & taxiway shoulders at Aux. Air Sta., Shelton—by Bur. of Yards & Docks, Washington, D. C. 8-1

WHIDBY ISLAND—**Western Construction Co.,** 605 Arctic Bldg., Seattle—$106,500 to construct storehouse, barracks and taxiway at the Naval Air Sta., Whidby Island —by Bur. of Yards & Docks, Washington, D.C. 8-28

Water Supply . . .

California

ALAMEDA CO.—**Martin Murphy,** Rt. 2, Box 894, Walnut Creek—$20,296 to install cast iron water mains in Alameda Co.—by East Bay Municipal Util. Dist., Oakland. 8-24

KERN CO.—**L. E. Tomson,** 10658 Woodbridge St., North Hollywood—$5,859 for drilling water well at Army Airfield, Muroc, Calif.—by U. S. Engr. Ofc., Los Angeles. 8-11

LOS ANGELES CO.—**American Pipe & Construction Co.,** 4635 Firestone Blvd., South Gate—$116,297 for reconditioning and laying 36-in. reclaimed steel pipe in Gaffey St., San Pedro—by Dept. Water & Power, Los Angeles. 7-27

LOS ANGELES CO.—**Norman I. Fadel,** Box 206, N. Hollywood—$19,217 to construct salt storage basin at water softening and filtration plant near La Verne — by Metropolitan Water Dist., Los Angeles. 8-14

SAN BERNARDINO CO. — **Kelly Pipe Co.,** 525 N. Mission Road, Los Angeles—$5,137 to furnish pipe, valves and fittings for temporary water lines at the Fontana Shell Plant.

SAN DIEGO CO. — **Shipyard Construction Co.,** 2609 Cherry Ave., Long Beach—$49,996 for installing cast iron pipe water supply & relocating a 100,000 gal. water tank at Camp Elliott, San Diego—by Bur. of Yards & Docks, Washington, D. C. 8-3

SAN FRANCISCO CO. — **W. J. Tobin,** 5708 Glenbrook Drive, Oakland—$9,970 to lay 12-in. cast iron water mains on Ocean between Junipero Serra and Aptos Ave., San Francisco—by Pub. Util. Comm., San Francisco. 8-23

SHASTA CO. — **Underground Construction Co.,** 75th Ave. at San Leandro Blvd., Oakland—$6,267 to lay cast iron water main in Redding—by City Clerk, Redding. 8-15

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FLAME PRIMING & DESCALING

The Modern Method to Remove Rust Scales and Prepare for Subsequent Painting Is Descaling and Flame Priming

The process of descaling and flame priming is now established. To simplify these operations, we respectfully introduce the new Ribbon Flame Descaling and Flame Priming Torch. The standard models are obtainable in 4″ (No. 361) and in 6″ (No. 362) flame width.

Replaceable Meehanite skid shoes, *Airadiator* cooling section, and built-in *Spiral Mixer* and *Gas Proportioner* assure long service life, freedom from back-firing and best obtainable flame characteristics.

For inaccessible places or rivet heads, Circular Multi-Flame Nozzles are available.

VICTOR welding torch owners require only the attachment.

The new Victor Flame Priming and Descaling Nozzle for faster and better operation.

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Ad No. 82

DISTRIBUTING POINTS FROM COAST TO COAST

Nevada

CLARK CO. — **Neeley-Myers,** 205 East Bridger St., Las Vegas — $10,994 for a water main to Clark County General Hospital, Las Vegas—by Clark Co. General Hospital, Las Vegas. 7-28

Washington

KING CO.—**M. Moschetto,** 5501 13th Ave., Seattle—$24,036 to install water mains on several streets near 33rd Ave., West, Seattle—by Board of Pub. Works, Seattle. 8-22

Sewerage . . .

California

ALAMEDA CO. — **McGuire & Hester,** 796 66th Ave., Oakland—$221,577 to complete the sewer system in the Castro Valley Sanitary District — by Castro Valley Sanitary Dist. 8-25

CONTRA COSTA CO.—**J. L. Kruly Co.,** 1785 N. Eastern Ave., Los Angeles—$213,363 to construct vitrified sewers in El Sobrante—by San Pablo Sanitary Dist. 8-14

KERN CO.—**Edward Green,** 3001 Coolidge Ave., Los Angeles—$60,795 to construct sewer, Mojave—by Mojave Util. Dist., Mojave. 8-16

LOS ANGELES CO.—**Bebek & Brkich,** 238 W. Florence Ave., Los Angeles—$71,589 for a sewer in Quinn St. and other streets in Los Angeles — by Board of Supervisors, Los Angeles. 8-9

LOS ANGELES CO. — **Steve P. Rados,** 1577 Hill Drive, Los Angeles—$69,492 to construct sewer for Overland Housing Project, Pico Blvd. and Overland Ave., Los Angeles—by A. R. Benedict, 1433 E. Colorado St., Pasadena. 8-14

LOS ANGELES CO. — **Sanitary Construction & Engineering Co.,** 439 W. 20th St., Long Beach — $12,977 to construct sewer in Dist. 21-D, Long Beach—by City Manager, Long Beach. 8-21

LOS ANGELES CO. — **Sanitary Construction & Engineering Co.,** 439 W. 20th St., Long Beach—$20,111 to construct sewers—by City Manager, Long Beach, 8-18

LOS ANGELES CO. — **Sanitary Construction & Engineering Co.,** 439 W. 20th St., Long Beach — $19,382 to construct sewer in Dist. 21-C, Long Beach—by City Manager, Long Beach. 8-21

ORANGE CO. — **Shipyard Construction Co.,** 2609 Cherry Ave., Long Beach—$75,996 to revise sewage disposal system at the Aux. Air Sta., Los Alamitos—by Bur. of Yards & Docks, Washington, D. C. 8-9

SONOMA CO.—**Union Paving Co.,** 310 California St., San Francisco—$280,500 for reconstruction work on and making new additions to exist. drainage system at the Aux. Air Sta., Santa Rosa—by Bur. of Yards & Docks, Washington, D. C. 8-8

Utah

SALT LAKE CO. — **Enoch Smith Sons Co.,** 567 "I" St., Salt Lake City 3—$122,288 for a sanitary sewer system & sewer treatment plant project at Magna—by County Clerk, Salt Lake City. 8-1

WEBER CO. — **Stroud-Seabrook,** Union Ave., Bakersfield, Calif.—$80,950 for sewer line involving 27,000 ft. of 6 to 12 in. pipe to be constr. at Roy—by Town of Roy. 8-9

SOMETHING YOU CAN'T CAMOUFLAGE . . .

Our army can paint a Mack or any other truck to hide it from enemy eyes. But nothing about a truck can be camouflaged from its driver. That fact sent thousands of men home from the front after World War I to become Mack boosters. And this time Macks are even better! . . . Returning service men will know what you mean when you use the words "built like a Mack" to describe something tough and dependable.

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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!

Waterway...

California

HUMBOLDT CO.—**Schumann & Johnson,** 1001 Lloyd Bldg., Seattle—$41,100 to construct heavy riprap wire and rock mattress and permeable pile jetties for a distance of 0.1 mi. at Dyerville—by Div. of Hwys., Sacramento. 8-28

LOS ANGELES CO.—**Mittry Bros. Construction Co.,** 4801 San Fernando Road West, Los Angeles—$25,168 to repair concrete lined channel on Ridge Route north of Frenchmens Flat, Los Angeles County—by Calif. Div. of Hwys., Sacramento. 8-14

ORANGE CO.—**Case Construction Co.,** Box 6, San Pedro—$25,763 for altering & making additions to timber fender system on present steel pier, a rock bank & timber bulkhead, earth filling, etc., at the training base on San Clemente Island—by Bur. of Yards & Docks, Washington, D. C. 8-9

SAN FRANCISCO CO.—**Ben C. Gerwick, Inc., Morrison-Knudsen Co., Inc.,** and **Ford J. Twaits Co.,** 112 Market St., San Francisco—$1,690,000 for dredging and filling at Naval Dry Docks, Hunters Point, San Francisco—by Bur. of Yards & Docks, Washington, D. C. 8-9

SAN FRANCISCO CO.—**Healy Tibbitts Construction Co.,** 1100 Evans Ave., San Francisco—$18,800 for rebuilding fender line on north side & end of Pier 54 on San Francisco waterfront—by Board of State Harbor Commissioners, San Francisco. 8-3

SAN FRANCISCO CO.—**Pacific Bridge Co.,** 333 Kearny St., San Francisco—$2,100,000 to construct pier at Bethlehem Steel Co., San Francisco—by Bureau of Yards & Docks, Washington, D. C. 8-14

SAN FRANCISCO CO.—**J. D. Proctor, Inc.,** 451 Monadnock Bldg., San Francisco—$128,000 to construct small ferry boat landing at Treasure Island, San Francisco—by Bur. of Yards & Docks, Washington, D. C. 8-29

SAN FRANCISCO CO.—**J. D. Proctor, Inc.,** 451 Monadnock Bldg., San Francisco $23,933 to reconstruct fender line on south side of Pier 40, San Francisco waterfront—by Board of State Harbor Comm., San Francisco. 8-24

SOLANO CO.—**Case Construction Co.,** Box 6, San Pedro—$319,500 for suction dredging at a junction point above Rio Vista—by U. S. Engr. Ofc., Sacramento. 8-7

SOLANO CO.—**Freethy-Kimball Co.,** 406 Montgomery St., San Francisco—$58,922 to construct bulkhead and place asph. conc. paving from Georgia St. to Virginia St., Vallejo—by City Clerk, Vallejo. 8-29

SOLANO CO.—**San Francisco Bridge Co.,** 503 Market St., San Francisco—$146,000 for maintenance dredging at the Navy Yard, Mare Island—by Bur. of Yards & Docks, Washington, D. C. 8-3

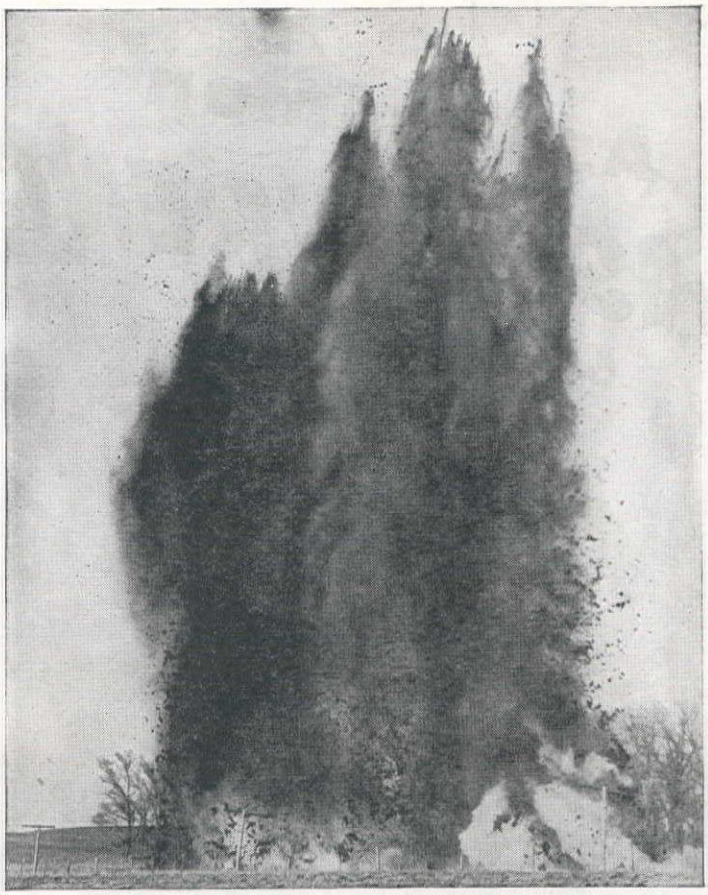
YUBA CO.—**H. Earl Parker,** 310 Eye St., Marysville—$449,669 for 12 mi. of levee north from Marysville along Feather River—by U. S. Engr. Ofc., Sacramento. 8-4

Washington

CLARK CO.—**General Construction Co.,** P. O. Box 3860, Portland, Ore.—$87,000 to remove 100,000 cu. yd. in dredging launching basin and alongside the outfitting dock on the Columbia River, Vancouver—by H. J. Kaiser Co., Vancouver. 8-21

DIG DITCHES WITH DYNAMITE

SAVE TIME... CUT COSTS... CONSERVE EQUIPMENT



TODAY'S SHORTAGES of manpower and equipment are making ditching with dynamite more attractive than ever before.

Digging a ditch with dynamite is easy, quick and inexpensive—whether it is for highway construction, land reclamation, straightening of channels, or for the drainage of areas near dams, airfield runways, railroads or industrial plants.

Du Pont Ditching Dynamite 50% is especially designed for ditch digging. It can be used in soil containing a high percentage of water and detonated by the propagation method, or in drier soils and fired by the use of Electric Blasting Caps. Ditches may vary in depth from 2½ to 12 ft., in width from 4 to 40 ft.

On your next job consider digging the ditches with dynamite. It saves time—reduces costs—conserves heavy equipment. Write for our new 32-page booklet, "Ditching with Dynamite." E. I. du Pont de Nemours & Co. (Inc.), Hoge Bldg., Seattle, Wash.—Old National Bank Bldg., Spokane, Wash.—Midland Savings Bldg., Denver, Colo. and 111 Sutter St., San Francisco, Calif.

INVEST IN VICTORY—BUY WAR BONDS

DU PONT

REG. U.S. PAT. OFF.

Before and after digging a drainage ditch with Du Pont Ditching Dynamite. Note absence of dirt piles at side of ditch.

Get this new Ditching Booklet. Write for your copy of "Ditching with Dynamite." This new 32-page booklet completely describes the methods used in ditch blasting. Tells how to prepare the charge, and illustrates the methods of priming and shooting. Contains useful tables giving amounts of dynamite required for given widths, depths and lengths.

DU PONT
EXPLOSIVES
Blasting Supplies and Accessories

KING CO. — **Puget Sound Bridge & Dredging Co.,** 2929 16th Ave., S. W., Seattle—$68,973 to dredge in the Duwamish Waterway, Seattle—by U. S. Engr. Ofc., Seattle. 8-23

Canada

BRITISH COLUMBIA — **Coast Construction Co.,** Vancouver, B. C.—$514,648 to construct fish ladders and excavate channel at Hell's Gate Canyon, Fraser River, B. C. — by International Pacific Salmon Fisheries Comm., New Westminster, B. C. 8-14

Irrigation . . .

California

MODOC & SISKIYOU COS.—**Clifford A. Dunn,** Box 431, Klamath Falls, Ore.—$90,688 for pumping plants "A," "B" and "C" of the Modoc Unit, Tule Lake Div. of Klamath, Ore., project — by Bur. of Reclamation, Klamath Falls, Ore. 8-10

New Mexico

SAN MIGUEL CO.—**J. A. Terteling & Sons,** Box 1428, Boise, Idaho—$563,441 to construct earthwork and structures on the Conchas Canal of the Tucumcari Project, Sched. 1 to 3—by Bur. of Reclamation, Tucumcari. 8-16

SAN MIGUEL CO.—**Clyde W. Wood, Inc.,** 816 West 5th St., Los Angeles — $686,248 to construct earthwork and structures on the Conchas Canal of the Tucumcari Project, Sched. 4 to 8 — by Bur. of Reclamation, Tucumcari. 8-25

Building . . .

California

ALAMEDA CO. — **Johnson, Drake & Piper, Inc.,** 1736 Franklin St., Oakland—$233,909 to complete contracts awarded previously at Naval Air Sta., Alameda—by Bur. of Yards & Docks, Washington, D. C. 8-3

ALAMEDA CO.—**Stolte, Inc.,** 8451 San Leandro Blvd., Oakland—$645,400 for an engine overhaul shop at the Air Sta., Alameda—by Bur. of Yards & Docks, Washington, D. C. 7-31

CONTRA COSTA CO.—**Barrett & Hilp,** 918 Harrison St., San Francisco—$5,296,848 for a magazine storage bldg. at Inland Storage Area, Port Chicago—by Bur. of Yards & Docks, Washington, D. C. 8-10

CONTRA COSTA CO.—**L. F. Dow Co.,** 8465 Melrose Ave., Los Angeles—$61,864 to construct school bldg. at Stege School, Richmond—by Fed. Works Agency, Berkeley. 8-14

CONTRA COSTA CO. — **Equity Construction Co.,** 411 Webster St., Oakland—$50,224 for 10-classroom school bldg. at San Pablo—by Fed. Works Agency, Berkeley. 8-4

CONTRA COSTA CO.—**D. W. Nicholson Corp.,** 1701 San Leandro Blvd., San Leandro — $64,400 to construct battery charging station, motor vehicle sheds and lunchroom at the Naval Magazine, Port Chicago — by Bur. of Yards & Docks, Washington, D. C. 8-14

CONTRA COSTA CO.—**Raymond Concrete Pile Co.,** 333 Montgomery St., San Francisco—$84,625 to construct pile foun-

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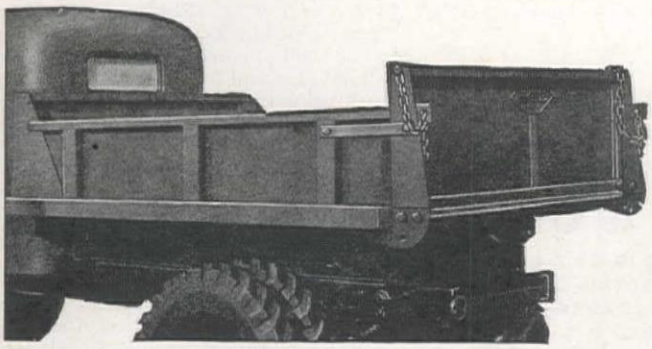
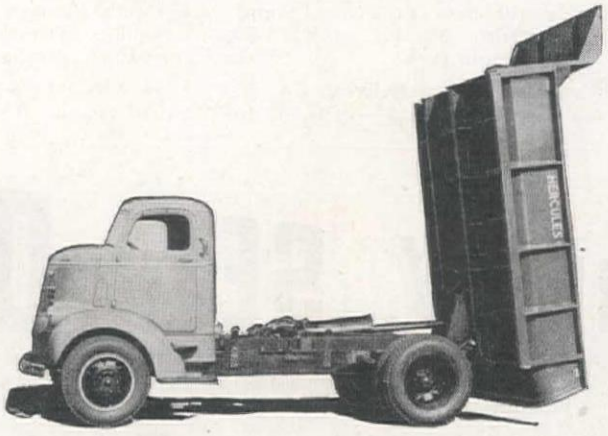
HYDRAULIC HOISTS and DUMP BODIES

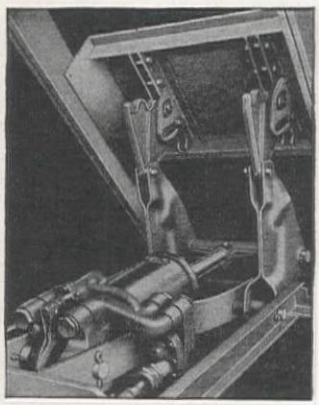
GIVE DEPENDABLE SERVICE ON ALL KINDS OF JOBS



Hercules Removable Side Rub Rail Body with hinged rear corner posts. Available in many sizes.



Hercules High Dumper—Power up, power down with 78° dumping angle. Equipped with 12 ton capacity hoist.



HERCULES HYDRAULIC BOOSTER HOIST

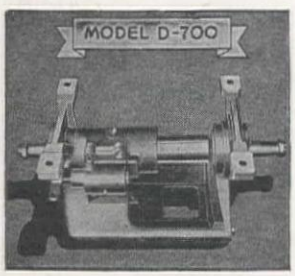
Makes any truck a Dump Truck

Install HERCULES DOUBLE-ARM HYDRAULIC HOISTS under your platform, stake, express or special bodies, which are now idle. Unload the easy way!

This is the Model KXE Hoist, with 6" cylinder, for bodies up to 12 feet long. Body reinforcing plate and steel sills included. Control valve is operated from driver's seat.

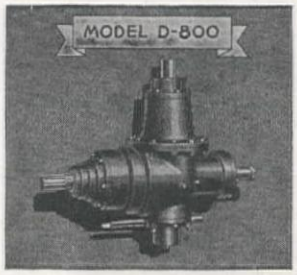
USE THE HERCULES SPLIT-SHAFT POWER TAKE-OFF

To operate any truck-mounted equipment



Direct (D-700 Series), Side (D-800 Series) and Dual Drive (B) models are available for operation of almost every possible type of truck-mounted equipment, either singly or in combination.

Recommendations and complete specifications upon request.



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UTILITY TRAILER SALES, 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.

dations for segregation bldgs. and carpenter shop at the Naval Magazine, Port Chicago — by Bur. of Yards & Docks, Washington, D. C. 8-29

KERN CO.—**Guy E. Hall,** 1326 30th St., Bakersfield—$88,000 for a gymnasium & classroom bldg. at the high school, Tehachapi—by Tehachapi Valley Union High School Dist., Tehachapi. 8-4

KERN CO. — **C. B. Stratton,** 1438 East Broadway, San Gabriel—$118,655 for officers' quarters at Army Airfield, Muroc—by U. S. Engr. Ofc., Los Angeles. 8-1

LOS ANGELES CO.—**James I. Barnes Construction Co.,** 1119 Montana Ave., Santa Monica—$371,200 to construct two temporary storehouses at the Naval Supply Depot, San Pedro—by Bur. of Yards & Docks, Washington, D. C. 8-16

LOS ANGELES CO.—**Beliveau Co.,** 720 So. Palm Ave., Alhambra — $704,000 for 196 frame & stucco 5- and 6-room houses in Watts District, Los Angeles—by self. 8-4

LOS ANGELES CO.—**Buttress & McClellan, Inc.,** 1013 E. 8th St., Los Angeles —$90,000 for reconstruction of fire damaged plant at 2636 Humboldt Ave., Los Angeles—by Reliable Manufacturing Co., Los Angeles. 7-31

LOS ANGELES CO.—**W. J. Disteli,** 3110 W. 43rd Place, Los Angeles—$71,169 to strengthen and reconstruct the main bldg. at the Carson St. School, Torrance—by the Board of Education, Los Angeles. 8-28

LOS ANGELES CO.—**H. M. Keller Co.,** 4604 Hollywood Blvd., Los Angeles—$71,450 for a 2-story combination office & factory bldg. at Burbank—by Lockheed Aircraft Corp., Burbank. 8-4

LOS ANGELES CO.—**Myers Bros.,** 3407 San Fernando Road, Los Angeles—$826,000 for immediate constr. of 207 dwellings in the Van Nuys Dist., Los Angeles—by Biltco Corp., Los Angeles. 8-3

LOS ANGELES CO.—**J. O. Oltmans & Sons,** 810 E. 18th St., Los Angeles—$95,900 for a 2-story office & storeroom bldg., 110 x 116 ft., at Burbank—by Lockheed Aircraft Corp., Burbank. 8-8

LOS ANGELES CO.—**Albert Reingardt,** 405 Redondo Ave., Long Beach—$62,490 for 8-classroom frame & stucco school bldg. at Lakewood Village—by Fed. Works Agency, Los Angeles. 8-10

ORANGE CO.—**Robert E. McKee,** 4700 San Fernando Road, West Los Angeles—$987,000 for admin. bldg., storage & engine overhaul bldgs. test cells and other work at Marine Corps Air Station, El Toro—by Bur. of Yards & Docks, Washington, D. C. 8-1

ORANGE CO.—**Robert E. McKee,** 4700 San Fernando Road, West Los Angeles—$1,221,000 to complete assembly and repair shop bldgs. and flight test and check hangar at Marine Corps Air Station, El Toro—by Bur. of Yards & Docks, Washington, D. C. 8-11

ORANGE CO.—**Albert Reingardt,** 405 Redondo Ave., Long Beach—$114,890 for a nurses' school bldg. at St. Joseph's Hospital in Orange—by St. Joseph's Hospital, Orange. 8-8

RIVERSIDE CO. — **Davies & Keusder,** 118½ No. Larchmont, Los Angeles—$59,550 for a chapel at the Naval Hospital, Corona—by Bur. of Yards & Docks, Washington, D. C. 7-31

RIVERSIDE CO.—**Weymouth Crowell Co.,** 2104 E. 15th St., Los Angeles—$64,279 to construct two additional navigation bldgs., March Field—by U. S. Engr. Ofc., Los Angeles. 8-15

SANTA BARBARA CO.—**Baruch Corp.,** 625 So. Olive St., Los Angeles—$117,218 for a rehabilitation & redistribution center at Santa Barbara—by U. S. Engr. Ofc., Los Angeles. 8-4

SAN BERNARDINO CO.—**Mead and O'Donnell,** 633 S. La Brea Ave., Los Angeles—$52,730 for misc. bldgs. at Kaiser shell plant, Fontana—by U. S. Engr. Ofc., Los Angeles. 8-1

SAN DIEGO CO.—**L. C. Anderson,** 414 Broadway Bldg., San Diego—$137,890 to construct 5 wood frame barracks, a gymnasium and a galley bldg., and to alter 8 existing bldgs. at the Naval (Waves) Barracks at Coronado—by Bur. of Yards & Docks, Washington, D. C. 8-24

SAN DIEGO CO.—**O. L. Carpenter,** 353 Spreckels Bldg., San Diego—$169,950 for temporary wood frame storehouse at the Air Sta., San Diego—by Bur. of Yards & Docks, Washington, D. C. 8-3

SAN DIEGO CO.—**Wm. C. Crowell** 170 E. California St., Pasadena—$322,712 to construct wood frame office bldg. and shop bldg. at Naval Operating Base, San Diego —by Bur. of Yards & Docks, Washington, D. C. 8-21

SAN DIEGO CO.—**Haddock-Engineers,** 605 West Olympic Blvd., Los Angeles—$132,000 to construct high explosive magazines at Camp Pendleton, Oceanside—by Bur. of Yards & Docks, Washington, D. C. 8-25

SAN DIEGO CO.—**Haddock-Engineers,** 605 West Olympic Blvd., Los Angeles—$72,750 to construct service bldg. and incinerator at the Naval Ammunition Depot,

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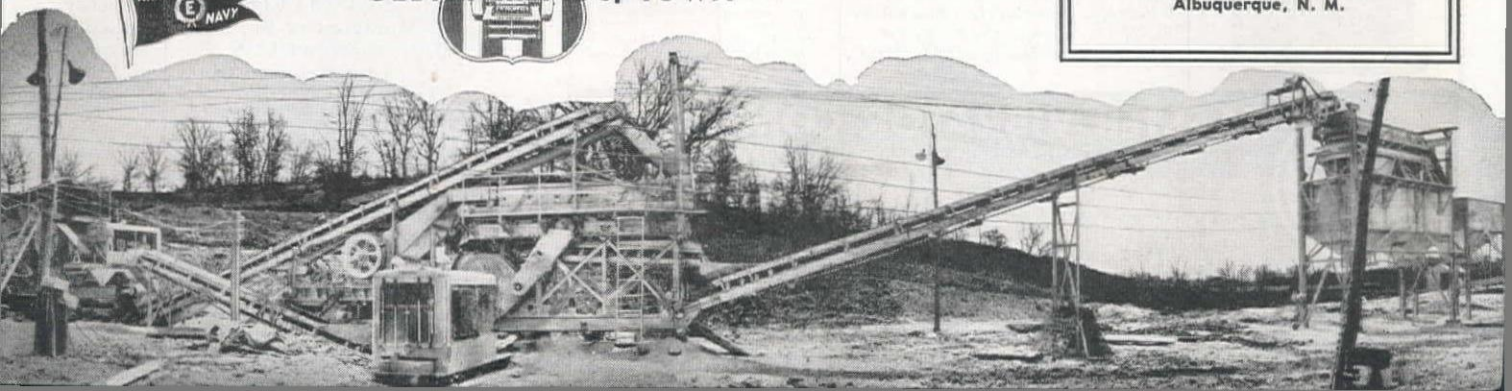


Fallbrook—by Bur. of Yards & Docks, Washington, D. C. 8-25

SAN DIEGO CO.—**Haddock-Engineers,** 605 West Olympic Blvd., Los Angeles—$82,900 for temporary wood frame cafeteria bldg. at Camp Pendleton, Oceanside—by Bur. of Yards & Docks, Washington, D. C. 7-28

SAN DIEGO CO.—**Haddock-Engineers,** 605 West Olympic Blvd., Los Angeles—$71,330 for a dental clinic bldg. at Camp Pendleton, Oceanside—by Bur. of Yards & Docks, Washington, D. C. 8-3

SAN DIEGO CO.—**T. C. Prichard,** 3964 Orange St., Riverside—$136,000 for theatre at Rosecrans & Malaga Sts., San Diego—by Fox West Coast Theatres, Los Angeles.

SAN DIEGO CO.—**Stanton-Reed Co.,** 816 West 5th St., Los Angeles—$174,785 to construct a 1-story addition to the psychopathic ward at Edgemour Farm—by County Board of Supervisors. 8-21

SAN FRANCISCO CO.—**Barrett & Hilp,** 918 Harrison St., San Francisco—$83,260 for a submarine training school at Hunters Point, San Francisco—by Bur. of Yards & Docks, Washington, D. C. 8-7

SAN FRANCISCO CO.—**Barrett & Hilp,** 918 Harrison St., San Francisco—$148,436 to construct additional cafeteria facilities at the U. S. Naval Dry Docks at Hunters Point, San Francisco—by Bur. of Yards & Docks, Washington, D. C. 8-28

SAN FRANCISCO CO.—**Barrett & Hilp,** 918 Harrison St., San Francisco—$291,816 to extend the inside machine shop at Hunters Point, San Francisco—by Bur. of Yards & Docks, Washington, D. C. 8-29

SAN FRANCISCO CO.—**Cahill Bros.,** 206 Sansome St., San Francisco—$71,873 to construct personnel baggage storage bldg. at Treasure Island—by Bur. of Yards & Docks, Washington, D. C. 8-15

SAN FRANCISCO CO.—**L. F. Dow Co.,** 8465 Melrose Ave., Los Angeles—$80,656 to construct six nursery school bldgs. in San Francisco—by Fed. Works Agency, Berkeley. 8-15

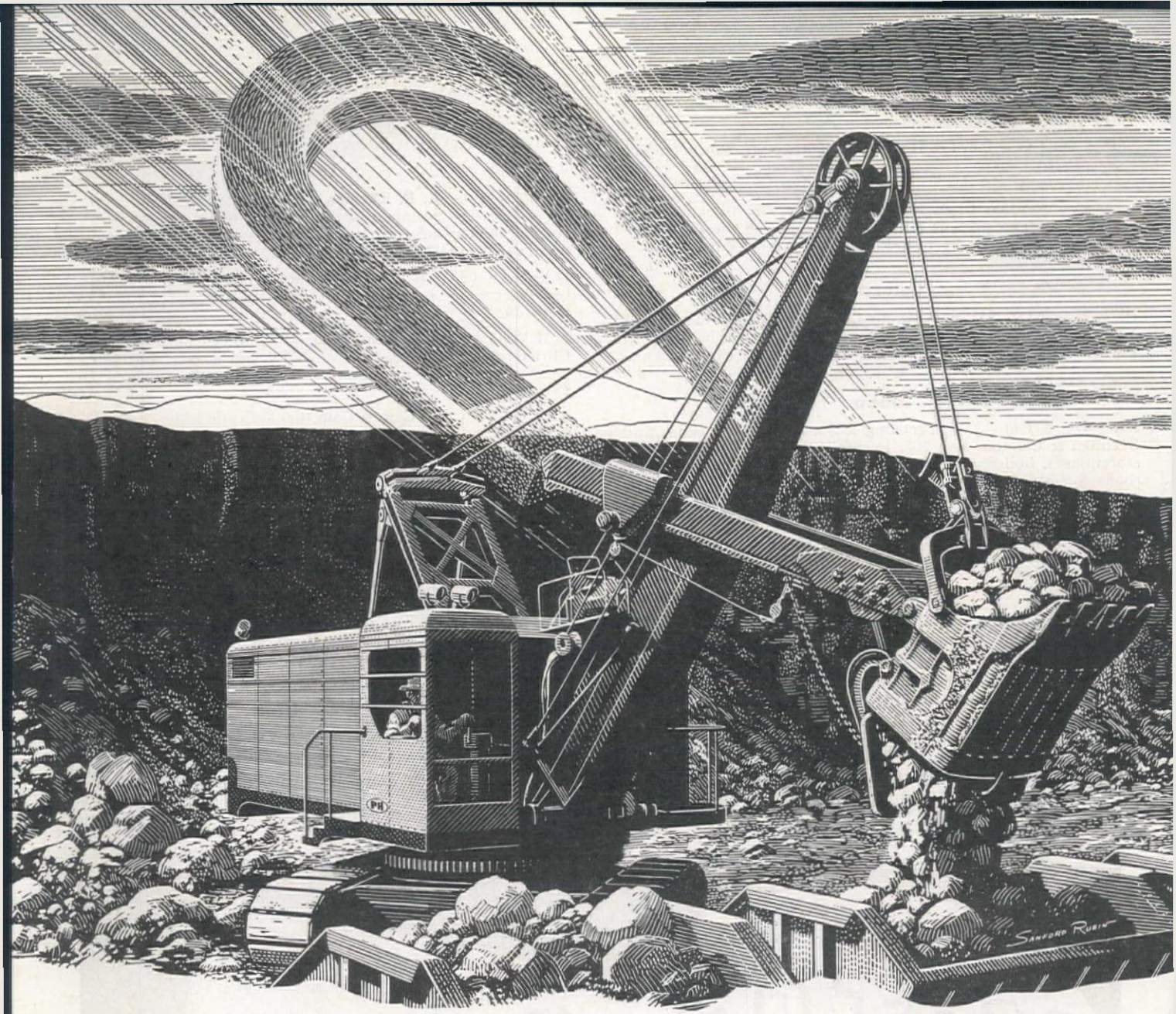
SAN FRANCISCO CO.—**C. L. Harney,** 625 Market St., and **MacDonald & Kahn, Inc.,** Financial Center Bldg., San Francisco—$209,000 to do site development work for 500 portable shelter units at South Basin War Housing, Hunters Point, San Francisco—by Fed. Hous. Auth. of San Francisco. 8-17

SAN FRANCISCO CO.—**Claude T. Lindsay,** 824 Taraval St., San Francisco—$556,004 to furnish 500 prefabricated portable shelter units—by Fed. Hous. Auth., San Francisco. 8-29

SAN FRANCISCO CO.—**Moore & Roberts,** 693 Mission St., San Francisco—$299,746 to construct two additional warehouses for the Marine Corps Dept. of Supply at Islais Creek, San Francisco—by Bur. of Yards & Docks, Washington, D. C. 8-29

SAN FRANCISCO CO.—**J. H. Pomeroy Co.,** 333 Montgomery St., San Francisco—$589,100 to construct U. S. Fleet Hospital on the Amazon Reservoir Site, San Francisco—by Bur. of Yards & Docks, Washington, D. C. 8-29

SISKIYOU CO.—**Karl Gentry,** Tulelake—Estimated $100,000 to construct 124x400 ft. frame building for a cold storage plant on Canby-Hatfield Hwy., Tulelake—by Karl Gentry and R. M. Smith of Tulelake and A. M. Collier and Percy Murray of Klamath Falls, Ore. 8-14



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Washington: F. M. Viles & Co. Sacramento, Calif.: Capitol Tractor Equipment Co.

SISKIYOU CO.—**Lawrence Construction Co.,** 3020 V St., Sacramento—$52,984 to construct six-classroom bldg. at Dorris—by Siskiyou Co. Union High School Dist., Yreka. 8-24

SOLANO CO.—**Jacks & Irvine,** 620 Market St., San Francisco—$56,519 to construct torpedo storage bldgs. at Mare Island Navy Yard—by Bur. of Yards & Docks, Washington, D. C. 8-29

VENTURA CO.—**E. A. Kaiser,** 8825 Olympic Blvd., Beverly Hills—$560,000 to prefabricate, transport, etc. 500 portable dwelling units at Oxnard—by Fed. Pub. Hous. Auth., San Francisco. 7-28

Colorado

PUEBLO CO.—**Mead & Mount Construction Co.,** 422 Denver National Bldg., Denver—$61,604 for a waste reclaiming plant at Pueblo—by Denver & Rio Grande Western Railroad Co., Denver. 8-9

Idaho

BANNOCK CO.—**J. A. Terteling & Sons,** Box 1406, Boise, and **Brennan & Cahoon,** Box 507, Pocatello—approx. $5,610,000 for storehouses, boiler plant, 6,300 ft. of railroad, Waves' quarters, roads & services at the gun relining plant, Pocatello—by Bur. of Yards & Docks, Washington, D. C.

LATAH CO.—**John E. Thomas,** Moscow—$55,000 to construct 3-story brick north wing to Gritman Memorial Hospital, Moscow—by directors of the Moscow Hospital Assoc. 8-14

New Mexico

GUADALUPE CO.—**J. D. Leftwich,** Lubbock ,Tex.—$93,900 for 40 temporary family dwelling units at Vaughn—by Fed. Hous. Auth., Fort Worth, Texas. 8-4

VALENCIA CO.—**Ramey & Mathis,** Amarillo, Tex.—$142,000 for 80 temporary family dwelling units at Belen—by Fed. Hous. Auth., Fort Worth, Tex. 7-31

Oregon

MULTNOMAH CO.—**Halvorson Construction Co.,** 608 First National Bank Bldg., Salem—$69,248 for a 6-classroom addition to School No. 4 in Vanport City (Portland)—by Fed. Works Agency, Washington, D. C. 8-8

MULTNOMAH CO.—**Lewis Construction Co.,** 3447 4th Ave., S., Seattle, Wash.—$220,600 for a 21-classroom bldg. for School No. 6 in Vanport City (Portland)—by Fed. Works Agency, Washington, D. C. 8-8

Texas

BEXAR CO.—**A. P. Rheiner & Son,** Insurance Bldg., San Antonio—for new terminal of reinf. conc., tile & stucco; 4 traffic lanes, tile flooring, etc. on St. Mary's St., San Antonio—by Southwestern Greyhound Lines, Inc., Fort Worth. 7-28

DALLAS CO.—**B & S Construction Co.,** Dallas—$22,610 to construct motor repair shop at Love Field—by U. S. Engr. Ofc., Denison. 8-23

JIM WELLS CO.—**Jack Walsh,** 41 Country Club Place, Corpus Christi—$74,000 for razing old bldg. and constr. 10-room primary school bldg. at Premont—by Independent School Dist., Premont. 8-1

TARRANT CO.—**Cain & Cain,** 406 Majestic Bldg., Fort Worth—$118,500 to alter bldg. at Aircraft Plant No. 4, Benbrook—by U. S. Engr. Ofc., Denison. 8-23

Utah

CARBON CO.—**Jensen Bros.,** 313 Ness Bldg., Salt Lake City—$59,622 to construct a 45-unit dormitory, Clearcreek—by Fed. Hous. Auth., San Francisco. 8-15

DAVIS CO.—**R. J. Daum,** 6803 West Blvd., Inglewood, Calif., and **Myers Brothers,** 3407 San Fernando Road, Los Angeles, Calif.—$721,996 for barracks, officers' quarters, mess hall & brig, misc. bldgs., roads, walks, etc. at Naval Depot, Clearfield—by Bur. of Yards & Docks, Washington, D. C. 8-7

DAVIS CO.—**J. H. Pomeroy & Co.,** 333 Montgomery St., San Francisco, and **Utah Construction Co.,** 1 Montgomery St., San Francisco—$3,038,701 to construct 8 storehouses, 1 shipping bldg. and 1 receiving bldg., including roads, railroads and utilities, at Clearfield—by Bur. of Yards & Docks, Washington, D. C. 8-21

SALT LAKE CO.—**Lembke Construction Co.,** Box 144, Albuquerque, N. M.—$406,600 for 107 brick residences, each to cost $3,800, in southeastern section of Salt Lake City—by American Land Co., Salt Lake City. 8-3

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SALT LAKE CO.—**P. H. Paulsen Co.**, 55½ West First So., Salt Lake City—$73,260 to construct a health center bldg. at the University of Utah, Salt Lake City—by the University of Utah. 8-24

Washington

CLARK CO.—**Goerig & Philip**, Portland, Ore.—$73,270 to construct 1-story addition to Fruit Valley Elementary School, Vancouver, Wash.—by Fed. Works Agency, Washington, D. C. 8-25

CLARK CO.—**Chas. R. Schmeideskamp**, 1421 S. W. Broadway, Portland, Ore.—$135,764 to construct Ogden Meadows School, Vancouver, Wash.—by Fed. Works Agency, Washington, D. C. 8-28

FRANKLIN CO.—**J. C. Boespflug Construction Co.**, 807 Securities Bldg., Seattle—$171,640 for an airplane parts bldg. and a transportation bldg. at Pasco—by Bur. of Yards & Docks, Washington, D. C. 8-7

FRANKLIN CO.—**Drake, Wyman & Voss, Inc.**, 412 Fenton Bldg., Portland, Ore.—$70,000 to construct free gunnery training bldg., Naval Air Sta., Pasco—by Bur. of Yards & Docks, Washington, D. C. 8-29

FRANKLIN CO.—**Drake, Wyman & Voss, Inc.**, 412 Fenton Bldg., Portland, Ore.—$72,000 for a gunnery bldg. at Pasco—by Bur. of Yards & Docks, Washington, D. C. 8-7

KING CO.—**David Brazier**, 12th Ave., N., Seattle—$134,700 to construct nine nurseries—by Fed. Works Agency. 8-18

KING CO.—**Seward Park Development Co.**, 420 4th Ave., Seattle—approx. $125,000 for 25 homes, costing from $4,800 to $5,200 each, comprising housing project on Holly & Brighton Sts., Seattle—by self.

KITSAP CO.—**Lease & Leigland**, 515 Joseph Vance Bldg., Seattle, and **Kuney-Johnson**, 235 9th Ave., N., Seattle—$2,681,122 to construct industrial and personnel bldgs. and services at the Naval Magazine, Bangor—by Bur. of Yards & Docks, Washington, D. C. 8-14

PIERCE CO.—**Henrik Valle Construction Co.**, 407 3rd Ave.,

Seattle—$1,996,000 for 9 warehouses, admin. bldg., cafeteria, depot trackage, roads, etc., at the advanced Naval base depot, Lakeview—by Bur. of Yards & Docks, Washington, D. C. 8-9

Wyoming

LARAMIE CO.—**Francis R. Orshek Co.,** Fremont, Neb.—$576,700 for one bldg., additions to mess bldg., and roads, walks, grading, drainage, excavating, etc., for Veterans Hospital at Sheridan—by Veterans Admin., Washington, D. C. 7-31

Territories

HAWAII—**E. E. Black, Ltd.,** Honolulu—$702,239 for 250 temporary dwelling units on Oahu Island—by Fed. Hous. Auth., Honolulu. 8-10

Miscellaneous . . .

California

ALAMEDA CO.—**Dinwiddie Construction Co.,** Crocker Bldg., San Francisco—$1,157,000 to construct dispensary, drill hall, powerhouse addition, and other misc. work at the Naval Air Sta., Alameda—by Bur. of Yards & Docks, Washington, D. C. 8-14

CONTRA COSTA CO.—**De Luca & Son,** 1745 Filbert St., San Francisco—$125,300 for site work, utils., etc., for 250 prefab. dwelling units at Port Chicago—by Fed. Hous. Auth. of Contra Costa Co., Martinez. 7-28

LOS ANGELES CO.—**Pacific Pipe Line Construction Co.,** 8732 Juniper St. Los Angeles—for installing 8 mi. of 16-in. pipe line along Crenshaw Blvd., Los Angeles—by Southern California Gas Co., Los Angeles. 8-8

MARIN CO.—**Biltwell Construction Co.,** 4745 Geary St., San Francisco—$48,327 to install fire safety devices in the war dormitories, Marin City—by Fed. Hous. Auth., San Francisco. 8-15

ORANGE CO.—**United Concrete Pipe Corp.,** Box 1, Sta. H, Los Angeles—$1,546,000 to construct ammunition classification

and segregation yard at Naval Magazine Depot, Seal Beach—by Bur. of Yards & Docks, Washington, D. C. 8-11

SACRAMENTO CO.—**L. F. Dow Co.,** 8465 Melrose Ave., Los Angeles—$270,599 to construct firewall, railroad crossover and conc. floor in warehouses at Sierra Ordnance Depot—by U. S. Engr. Ofc., Sacramento. 8-18

SAN DIEGO CO.—**Ingersoll-Rand Co.,** 1460 E. 4th St., Los Angeles—$68,409 for installing three 2,700 c. f. m. air compressors at the Naval Air Sta., San Diego—by Bur. of Yards & Docks, Washington, D. C. 8-9

SAN DIEGO CO.—**Oilfield Construction Co.,** 2650 Cherry Ave., Long Beach—$167,730 to install seven 500 h. p. water-tube steam boilers & fittings at Naval Air Sta., San Diego—by Bur. of Yards & Docks, Washington, D. C. 8-4

SAN FRANCISCO CO.—**Charles L. Harney,** 625 Market St., and **MacDonald & Kahn, Inc.,** Financial Center Bldg., San Francisco—$115,000 for 200,000 cu. yd. of fill for 500 portable shelter units in San Francisco—by Fed. Hous. Auth., San Francisco. 7-28

SAN FRANCISCO CO.—**Washington Iron Works,** Seattle, Wash.—$154,980 for two 35-ton cranes to be installed at Hunters Point, San Francisco—by Bureau of Yards & Docks, Washington, D. C. 8-14

SOLANO CO.—**D. W. Nicholson Corp.,** 1701 San Leandro Blvd., San Leandro—$94,500 to construct foundations and structural steel for fleet training facilities bldg. at Mare Island—by Bur. of Yards & Docks, Washington, D. C. 8-14

Colorado and Wyoming

MOFFAT CO., COLO. & CARBON CO., WYO.—**Eastern Construction Co.,** Dallas, Texas—to construct 111 mi. of 6-in. oil pipe line from Craig, Colo., to Wamsutter, Wyo.—by Utah Oil Refining Co., Salt Lake City, Utah. 8-16

Utah

DAVIS CO.—**James J. Burke Co.,** Kerns Bldg., Salt Lake City—$54,614 for furn. & install. a boiler at the Naval Supply Depot, Clearfield—by Bur. of Yards & Docks, Washington, D. C. 8-9

Washington

PIERCE CO.—**General Construction Co.,** 3840 Iowa, Seattle—$260,000 for the first phase of the Tacoma belt line—by Tacoma Board of Contracts & Awards, Tacoma. 8-4

PROPOSED PROJECTS

Airport . . .

California

KERN CO.—The Secretary of the Navy has approved the construction of a $70,000 aircraft maintenance hangar at the Marine Corps Air Sta., Mojave.

LOS ANGELES CO.—The Los Angeles County Board of Supervisors and Planning Commission has approved the construction of a private airport on a 400-ac. site at Newhall for A. L. Novoteny, 1010 Sonora St., Glendale. Plans provide for two hangars, an operations office and two 3,000-ft. runways.

MARIN CO.—The War Department has allotted $1,000,000 for the construction of a hangar, service apron, wash rack, loading mat and an additional bldg. at Hamilton Field. 8-30

Utah

UINTAH & DUCHESNE COS.—Utah State Road Comm. rejected all bids for sealcoating roads on State Highway Project No. 927. Bids were opened August 4. Low bid was $33,000 and the engineer's estimate was $24,240. 8-23

Idaho

CLEARWATER CO.—The state aeronautics engineer has approved the construction of an Elk River municipal airport for the use of forest fire ranger planes and as an emergency landing field. The strip will be 2,200 ft. long and 300 ft. wide. 8-18

Sewerage . . .

California

SACRAMENTO CO. — Sacramento City Councilmen have authorized the extension of the city sewer lines to serve the proposed Industrial Park area that is to be north of the city. Construction of the $80,000 project is scheduled to begin in 90 days. 8-28

Building . . .

California

ALAMEDA CO.—Approval has been given for constr. of a 100-family housing unit for transient Naval personnel at the Naval Air Sta., Alameda—by Bur. of Yards & Docks, Washington, D. C. 7-28

ALAMEDA CO.—Federal Works Agency has approved a grant of $218,000 and a loan of $207,000 to construct 100 bed addition to Berkeley Hospital. Work is expected to start in three months on this three story bldg. 8-31

LOS ANGELES CO.—Architects Walter C. Wurdeman and Welton D. Becker, 6536 Sunset Blvd., Hollywood, are preparing plans and specifications for Bullocks, Inc., for the construction of a $2,000,000 department store bldg. in Pasadena. The 3-story class A structure of modern design will be located on Del Mar St. between Lake and Hudson Aves. 8-31

LOS ANGELES CO.—The Navy has approved a $1,500,000 expansion program to the Naval Hospital at Long Beach—by Bur. of Yards & Docks, Washington, D. C. 8-8

LOS ANGELES CO.—Plans are nearing completion for a $1,796,000 addition to styrene plant at Gardena—by Dow Chemical Co., Gardena. 8-4

LOS ANGELES CO.—The Bur. of Yards & Docks, Washington, D. C., has purchased 150 ac. of industrial land near Crenshaw Blvd. and Lincoln Ave., Torrance, as a site for the construction of a material and redistribution center to be used in salvaging radio and electronic equipment. The total expenditure for this project is estimated at $5,000,000. 8-17

SAN DIEGO CO.—Engineering Department of Consolidated-Vultee Aircraft Corp. have prepared plans for a $500,000 wind tunnel to be built on a 3-ac. site adjoining the Lindbergh Field runway. The main bldg. will be built of reinforced concrete. 9-7

SAN FRANCISCO CO.—Bur. of Yards & Docks, Washington, D. C., has approved prep. of sites, foundations & erection of 155 housing units at Hunters Point, San Francisco, to cost $865,000. 7-28

SAN FRANCISCO CO.—The Navy Dept. has approved an appropriation of $66,000 to be used to remodel California Hall, San Francisco, into living quarters for 500 transient Navy officers.

SAN JOAQUIN CO.—Working drawings are being prepared for a permanent Naval Supply Depot on Rough and Ready Island, near Stockton. Approximate cost, $20,000,000—by Bur. of Yards & Docks, Washington, D. C. 8-9

SHASTA CO.—Deschutes Lumber Co. is planning constr. of a $500,000 lumber mill at Anderson, near Redding. Also, approval has been given for a $200,000 logging road to run from Anderson to Oak Run. 7-31

Nevada

CLARK CO.—Preliminary plans have been completed for a city jail and police station at Las Vegas, estimated to cost $135,000. 7-28

Oregon

MARION CO.—The Dairy Co-operative Association plans construction of a new $100,000 milk processing plant at Salem. 7-20

MULTNOMAH CO.—W. P. B. priorities have been granted the Interstate Associated Creameries, Inc. to construct a $98,998 assembly and storage plant for butter and cheese products in Portland. 8-12

Texas

BELL CO.—Memorial Comm., Temple, plans construction of a memorial museum in downtown Temple, to cost $500,000. 7-31

Utah

SALT LAKE CO.—Arnold Machinery Co., 153 W. 2nd St., Salt Lake City, is preparing plans for a $100,000 office & warehouse on Rio Grande Ave. & 2nd St. So., Salt Lake City. 8-3

Canada

BRITISH COLUMBIA — Architects Mercer & Mercer, 615 West Hastings St., Vancouver, are preparing plans for a new $385,000 four-story, 42 x 335 ft., reinforced concrete, 150-bed hospital unit. 8-28

TRADE WINDS

News of Men Who Sell to the Construction West

CALIFORNIA

Bert B. Fornaciari of Los Angeles has been appointed exclusive parts distributor for California for the BUDA Chore Boy and the BUDA Jacks and the regular lines of BUDA earth drills, jacks, industrial shop trucks and railway equipment, and the BARCO gasoline hammers and flexible ball and swivel joints. Factory-trained personnel are equipped to test and supply parts for servicing the jacks and Chore Boys. The added service has been necessitated by the increased use of this equipment by western industries.

☆ ☆ ☆

RUDE & FULLER BEARING CO., Los Angeles, have been appointed distributors for PRECISION BEARINGS, INC., for southern California, and will handle the full line of industrial and fleet bearing replacements, both ball, roller, and thrust types. **Carl Slocum** is the manager of the Rude & Fuller company. His picture is at the left above. Also pictured is **Richard Gordon**, assistant manager.

☆ ☆ ☆

A. H. Mason has been appointed manager for zones 21 and 22, with headquarters in San Francisco, for the Industrial Power Division of the INTERNATIONAL HARVESTER COMPANY. He started with the company in 1921 and is well known to the industry. **L. W. McCallum** was appointed manager for zone 20, with headquarters in Portland. McCallum has been with the Portland branch for the past ten years.

☆ ☆ ☆

The VICTOR EQUIPMENT COMPANY, with plant and executive offices in San Francisco, has opened an Oakland sales and service store at 312-12th Street. **E. L. Russell**, veteran service engineer, is the branch manager and promises personal attention to the East Bay customers in the selection of gas and electric welding equipment and supplies.

☆ ☆ ☆

The INDUSTRIAL POWER & EQUIPMENT COMPANY of Bakersfield, Central California distributors of BUDA gas and diesel engines, has been appointed as distributors also of the CALCO Portable Rainmakers and the QUINCY Compressors. **E. L. Aldrich** and **A. L. Holman** are operating this equipment company.

☆ ☆ ☆

R. O. Brosemer and **O. A. Gustafson** have been appointed as assistant district engineers of the Pacific district of the GENERAL ELECTRIC COMPANY. Brosemer will administer the federal and marine work of the division, while Gustafson will assist district engineer **Walter C. Smith** in general administrative duties.

☆ ☆ ☆

W. A. (Ted) Cook, standards engineer in charge of incentive bonus for the PACIFIC WIRE ROPE COMPANY, died on August 4 after 22 years of service with the company. His loyal service began with his employment in the spooling, stranding and testing departments.

☆ ☆ ☆

H. D. Haney, who will continue as manager of transportation, has been appointed assistant vice-president of the TIDE WATER ASSOCIATED OIL COMPANY. **Gardiner Blackman** was appointed as manager of the industrial relations of the western division to succeed **C. R. Brown**, who is now assistant to the president.

☆ ☆ ☆

INTERMOUNTAIN

CONTRACTORS' EQUIPMENT & SUPPLY COMPANY of Albuquerque, New Mexico, has been appointed an exclusive sales and service distributor for R. G. LE TOURNEAU, INC., of Peoria, Ill. The supply company will handle sales and servicing rights in its area for Le Tourneau tournapulls, carryall scrapers, power control units, dozers, rooters, cranes, sheep's foot rollers, tournarope and tournaweld. **D. U. Rakestraw** is the owner of the company and **F. O. Skidmore** is general manager. **George Weidner** and Rakestraw will open a second headquarters at El Paso, Texas, in the near future. These men have had years of experience in the sales, servicing and administration fields of the equipment industry. The supply company will continue to handle the noncompetitive construction equipment lines of BARBER-GREENE, CHAIN BELT, LIMA SHOVELS, DIAMOND CRUSHING, and INGERSOLL-RAND.

☆ ☆ ☆

KRAMER-CHURCH TRACTOR COMPANY is now representing the CATERPILLAR TRACTOR COMPANY in the Saskatchewan territory with headquarters in Regina. **C. H. Church** represented "Caterpillar" for a number of years in Canada in the credit and sales departments, and recently has been northern division manager of the UNION TRACTOR & HARVESTER COMPANY at Edmonton, Alberta. **R. A. Kramer** was formerly a member of the contracing firm of MANNIX AND KRAMER.

☆ ☆ ☆

The PITTSBURGH PLATE GLASS COMPANY has acquired a substantial interest in the MURPHY PAINT COMPANY, LIMITED, Canada. The Murphy Paint Company operates factories at Montreal and Windsor and numerous warehouses and offices throughout Canada. This company will now have available all of the research development and technical facilities of the Pittsburgh Plate Glass Company. **Harry W. Thorp** will remain as president of the Canadian company.

☆ ☆ ☆

PACIFIC NORTHWEST

Robert S. Kirksey, past vice-president of the FRUEHAUF TRAILER COMPANY in charge of Pacific Coast operations, has been elected a director of the parent company, with home offices in Detroit. He has been active in the motor transport industry on the Pacific Coast since 1922, and recently has been superintending both its manufacturing and sales activities.

☆ ☆ ☆

George Lundquist Fred A. Koepf

Fred A. Koepf, former assistant manager of the LINK-BELT COMPANY at Los Angeles, is the new district manager for the northwest Pacific division territory with headquarters at Seattle. He has had experience in the purchasing, credit, billing, merchandising and order departments of the company. **George Lundquist**, past assistant to the vice-president and sales manager at San Francisco, succeeds Koepf as assistant manager at Los Angeles. Lundquist started with the company as a stock helper in 1925 and gradually advanced to this managing position.

☆ ☆ ☆

AMONG THE MANUFACTURERS

W. E. Canfield is now vice-president in charge of sales for the S. K. WELLMAN COMPANY of Cleveland. He has been associated with the company for eight years and recently has acted as assistant to the president. **J. R. Nurney** was elected executive vice-president, **R. La France** is the new vice-president in charge of plant operation, **F. F. White** is treasurer, **W. H. Faber** is assistant treasurer, and **C. T. Cox** is the assistant secretary. **J. M. Killpack**, vice-president of the Central National Bank in Cleveland, and R. La France were elected to the Board of Directors. The company manufactures aircraft landing wheel brakes and supercharger clutch discs, tank and landing craft clutch facings, and both clutch facings and brake linings for a variety of construction, earthmoving, marine and industrial equipment.

☆ ☆ ☆

B. F. Lease, past sales manager of ATHEY TRUSS WHEEL COMPANY of Chicago, was elected vice-president in charge of sales, advertising and service. Lease began with Athey in 1931 as a special representative. He then became district representative, manager of service and research, and manager of domestic sales. Lease has had years of experience in field and distributor contacts in the heavy equipment industry. He served from 1917 to 1931 in various capacities with the REPUBLIC TRUCK COMPANY and LYNN MANUFACTURING COMPANY.

☆ ☆ ☆

Ben Alexander, president of MASONITE CORPORATION, died on July 6 in Rochester, Minn., following a short illness. Alexander was a leading authority on timber in the United States. His business career started in 1920, when he became associated with the SILVER FALLS TIMBER COMPANY of Silverton, Ore. He spent his life in the lumber, timber, paper and associated products industries. In 1943, he was Chief of the Lumber Section of the War Production Board in Washington. He graduated from the Biltmore Forestry School, North Carolina, was a student at the University of Wisconsin and graduated in science from the University of California.

☆ ☆ ☆

A. J. Hanlon of New York is the new production manager of the HARVILL CORPORATION. He recently retired as manager of the production department of the INTERNATIONAL NICKEL COMPANY, and has had 25 years' experience in the production of metals and metal products. Though the greater part of production is die castings for airplanes, the limited release of critical materials has permitted the company to begin to manufacture certain electrical and consumer goods for postwar civilian use.

☆ ☆ ☆

THE B. F. GOODRICH COMPANY has announced the appointment of **John B. Beebe** as manager of the new Rubber Suspension Sales department. This new department will have charge of sales of the company's Torsilastic rubber springs, and its line of Vibro-Insulators, made of rubber and metal primarily for the elimination of vibration, rubber parts for street cars and devices for sound dampening. Assisting Beebe in the new department will be **George Wertz** and **Don Schlemmer**.

Charles W. Staacke has resumed his duties as belting sales engineer for the B. F. GOODRICH COMPANY after many months on special war assignments as a civilian specialist on rubber problems, during which he traveled in North Africa, China, Australia, India, New Guinea, New Caledonia, as well as the Solomon and Gilbert Islands.

☆ ☆ ☆

George Selden, new manager of the Flexwood and Flexglass Division of the UNITED STATES PLYWOOD CORPORATION, comes to this company from Johns-Manville Corporation, where he specialized in the acoustical field. Selden's many years of experience in the wood business dates back to his first position as superintendent of a veneer door plant in Florida.

☆ ☆ ☆

MINNEAPOLIS-HONEYWELL REGULATOR CO., Minneapolis, Minn., announces the promotions of **Kentner L. Wilson** to branch manager of the Detroit district and **Charles Locke** to branch manager of the Indianapolis office. Formerly, Wilson was industrial manager at Cleveland and Locke was branch manager at Albany.

Two other promotions were announced simultaneously. **D. J. Peterson**, who has been branch manager at Detroit, is now Zone Original Equipment Supervisor in the Cleveland zone; and **Edward Clucas**, former branch manager at Indianapolis, will be in charge of the company's Modutrol Division activities there.

☆ ☆ ☆

A. M. Guthrie has been advanced from Eastern district manager to field sales manager of the BUCKEYE TRACTION DITCHER CO. He assumes the entire handling of distributor policies and appointments through the company's district managers. His headquarters will be at the plant in Findlay, Ohio.

☆ ☆ ☆

E. E. LeVan has been elected president of the HAYNES STELLITE COMPANY of Kokomo, Indiana, a unit of the UNION CARBIDE AND CARBON CORPORATION. He began his service with the company as a sales engineer in 1922 and gradually advanced until he was elected vice-president in 1939 and general manager and director in

1944. He is a member of several engineering societies and is the author of articles on metallurgical and mechanical engineering subjects.

☆ ☆ ☆

James F. Reid, former Deputy Chief of the Alloy Steel Branch of the War Production Board, has been appointed production manager of THE TIMKEN ROLLER BEARING COMPANY of Canton, Ohio. He had been production manager of the Steel and Tube Division prior to obtaining a leave of absence in May, 1942, to serve with WPB. In his new capacity, his activities and responsibilities extend to all divisions of the company.

☆ ☆ ☆

Herman R. Thies heads the newly created Plastics and Chemical Sales Division of the GOODYEAR TIRE & RUBBER COMPANY. Thies, who holds a master of science degree from the University of Chicago, has been in the company's research department since 1930. Assistant manager of the new department is **Robert D. Vickers,** a graduate of Purdue University. Other members of the department are **J. W. Selden,** Ohio representative; **J. E. Sims,** mid-western representative; **K. M. Fox,** technical coordinator; **R. S. Sanders,** office manager; and **H. P. Protheroe,** technical service manager.

☆ ☆ ☆

George A. Sloan has been elected a member of the Finance Committee of UNITED STATES STEEL CORPORATION to fill the vacancy caused by the recent death of **William J. Filbert.** Sloan has been a member of the Board of Directors of the corporation since 1937. He has held many other posts, among them the presidency of the Cotton Textile Institute which he held from 1929 to 1935. Also he is active in New York civic affairs, being president of the Metropolitan Opera Association.

☆ ☆ ☆

H. N. Mallon, president of the DRESSER MANUFACTURING COMPANY, Bradford, Pa., has announced the election of **J. B. O'Connor** as executive vice-president, and **Arthur R. Weis** and **Lyle C. Harvey,** vice-presidents of the company. **C. P. Clark,** already a vice-president of the Dresser company, will continue to serve in that capacity. He is president of CLARK BROTHERS. O'Connor has been a director of the Dresser company for the past six years, and is also vice-president and general sales manager of CLARK BROTHERS. Chairman of the Board of PACIFIC PUMP WORKS and president of BOVAIRD AND SEYFANG, all subsidiaries of DRESSER MANUFACTURING COMPANY. Weis is president of the PACIFIC PUMP WORKS of Huntington Park, Calif. Harvey is president of BRYANT HEATER COMPANY of Cleveland, also a Dresser subsidiary.

☆ ☆ ☆

After receiving an Army-Navy "E" pennant some time ago, the DAVEY COMPRESSOR COMPANY of Kent, Ohio, announces that it has received an "E" pennant with a star in recognition of continued outstanding war materials production. This company manufactures portable and industrial compressors, air-field lighting units, heavy-duty truck power take-offs and pneumatic saws, and several specialized units.

☆ ☆ ☆

Henry H. Ritchette has been appointed manager of the contractor's tool division of the INDEPENDENT PNEUMATIC TOOL COMPANY of Chicago, Ill. He will be in charge of distributor policies and appointments through district managers and will assist distributors in the sale and service of Thor rock drills, paving breakers, clay diggers, and related air tools. Prior to joining this company, he was a district manager for JOHNS-MANVILLE SALES CORP. and had previously had experience as a design engineer on municipal projects and as a sales manager for H. O. PENN CO., construction equipment distributors of New York.

☆ ☆ ☆

Joseph Duffy will be the new sales manager of the IRVING SUBWAY GRATING CO., in which position he will direct a large sales force of representatives, both from the New York and West Coast divisions of the company. Duffy's experience in salesmanship goes back two decades; he has been with the Irving firm in a sales capacity for the past two years. The Irving company, makers of all types of grating, is now experimenting with a steel grating highway and landing mats for rooftops for postwar helicopters.

☆ ☆ ☆

George Guler is the newly appointed sales manager of the Airconditioning Controls Division of MINNEAPOLIS-HONEYWELL REGULATOR CO. and will be at the company's home office in Minneapolis. **Lou Belford,** field supervisor of the Aero Division, for the past two years, will take over Guler's job as zone supervisor of Airconditioning Controls sales in New York.

☆ ☆ ☆

Joseph T. Meade is the new personnel director of MACK MANUFACTURING CORP. He will be located in the Mack executive offices in the Empire State Building. Formerly, Meade was personnel and industrial relations manager for Sheffield Farms Co., Inc., where he developed a supervisory training program. He is a member of the Public Relations Committee of the National Association of Manufacturers, and at present he is on the Appeal Panel of the War Manpower Commission for the New York area.

☆ ☆ ☆

E. M. Ackerman Carl G. A. Schmidt

Carl G. A. Schmidt has been appointed as sales manager of the W. A. RIDDELL CORPORATION and the HERCULES ROLLER COMPANY, Bucyrus, Ohio. Schmidt is a graduate mechanical engineer and for many years was connected with the sales and engineering work in the construction equipment field. He has been equipment engineer with the Pennsylvania Department of Highways and is now leaving his position as manager of sales for Hercules at Marion, Ohio.

E. M. Ackerman has been appointed as assistant sales manager in the road machinery department of the RIDDELL CORPORATION. He has been associated with the company for the past sixteen years. Through his years of experience in the field and service departments, he has gained a knowledge of all phases of the business and has become well acquainted with men in this field.

☆ ☆ ☆

George French has become associated with UNITED STATES PLYWOOD CORPORATION as production engineer. French has been in charge of the woodworking department of WESTERN ELECTRIC COMPANY. He is a member of the Executive Committee of the Wood Industries Division of the American Society of Mechanical Engineers, has done industrial research for U. S. FOREST PRODUCTS LABORATORIES, and was a consulting engineer for the NATIONAL LUMBER MANUFACTURERS ASSOCIATION.

☆ ☆ ☆

Clinton W. Wood, past vice-president and manager of GAR WOOD INDUSTRIES' Plant 4, has been named vice-president in charge of manufacturing. **Alonzo R. Ketcham,** past production manager of winch war contracts, will be production control manager in charge of personnel management, machine and departmental scheduling of product manufacturing. **Henry Kvindleg** has been made general superintendent of the mechanical division. This reorganization of the company's manufacturing set-up is designed to ease the transition to post-war manufacturing and to improve its output for the Army and Navy. This company manufactures truck bodies, hoists, winches, cranes, road machinery, and home heating equipment.

☆ ☆ ☆

M. C. Horine has been appointed sales promotion manager of the MACK TRUCKS, INC. Horine began his work in the automotive industry as a shop boy in 1907 for a builder of marine engines and the Dorris car agent in Los Angeles. He served as second lieutenant in the first World War and joined the Mack organization as an engineer in 1918.

☆ ☆ ☆

George J. Dimond has been appointed sales manager of the INSLEY MANUFACTURING CORPORATION of Indianapolis. He succeeds **Ray W. Dorward,** who has retired. Dimond recently resigned from the KOEHRING COMPANY of Milwaukee after serving the company for 25 years in the construction equipment department. He has taken an active part in organizations of equipment manufacturers, dealers and contractors, and joins "Insley" with years of experience in the manufacturing field.

☆ ☆ ☆

At colorful ceremonies in the presence of 600 employees of the company, **Charles E. Walsh, Jr.,** director of procurement of the U. S. Maritime Commission, presented the Maritime "M" pennant and Victory Fleet flags to the KENNEDY VALVE

MFG. CO. of Elmira, N. Y. In bestowing the award, Walsh paid tribute to the untiring efforts of management and employees of the plant in their outstanding performance in supplying vitally needed marine valves to meet wartime shipbuilding schedules. **M. E. Kennedy**, company president and treasurer, accepted the awards on behalf of his company.

☆ ☆ ☆

George H. Rose has been appointed assistant to the vice-president of the AMERICAN STEEL & WIRE CO., U. S. Steel subsidiary. **Eugene J. Reardon** will succeed Rose as chief engineer. Rose has been with the company 39 years, starting as a draftsman at the Newburgh Steel Works in Cleveland in 1905. Reardon joined the company in 1922. Since January, 1942, he has been assistant chief engineer.

☆ ☆ ☆

Robert L. Coe, vice-president of CHASE BRASS & COPPER CO., INC., Waterbury, Conn., has been reelected president of the COPPER & BRASS RESEARCH ASSOCIATION. Other officers elected were: Vice-presidents: **Wylie Brown**, president of Phelps Dodge Copper Products Corp.; **William M. Goss**, vice-president of Scovill Manufacturing Company; **Curtis L. Smith**, treasurer of the National Copper & Smelting Company; **Herman W. Steinkraus**, president of the Bridgeport Brass Company; Treasurer, **C. Donald Dallas**, president of Revere Copper and Brass, Inc.; Manager, **T. E. Veltfort**; and Secretary, **B. B. Caddle**.

☆ ☆ ☆

SWAN-FINCH OIL CORP. has announced the following promotions within its organization: **E. O. Lomerson**, promoted to treasurer of the company; **B. C. Price**, to general manager of manufacturing plants; **Carl C. Taleen**, to sales manager of the tractor division; **Edgar J. Cooper**, to manager of the central region of the tractor division; and **S. K. Bodman, Jr.**, to sales manager of the central industrial region.

☆ ☆ ☆

L. J. Fletcher, director of training of CATERPILLAR TRACTOR COMPANY, has been awarded the Cyrus Hall McCormick gold medal by the American Society of Agricultural Engineers "for exceptional and meritorious engineering achievement in agriculture." After being head of the department of agriculture at the University of California for several years, he joined Caterpillar in 1927, and directed agricultural sales. He spent the greater part of the year 1929 in Russia, demonstrating the proper use of tractors and combines and establishing training schools and repair shops. He served as assistant general sales manager until 1941, at which time he became director of training. With a vast experience in engineering and education, Mr. Fletcher developed methods of training which contributed greatly to industry's war production. He served as president of the American Society of Agricultural Engineers in 1931-32.

☆ ☆ ☆

T. B. Hale and **F. W. Jenks** have been elected vice-presidents of the INTERNATIONAL HARVESTER COMPANY. Hale, former domestic sales manager of the company, becomes vice-president of General Line Sales; Jenks, former manager of the company's Credit and Collection Department, becomes vice-president of merchandising services.

At the same time the formation of four new divisions of Harvester was announced, together with the general managers who will direct them. Respectively, new divisions and general managers are: Farm Tractor Division: **R. C. Archer.** Farm Implement Division: **R. P. Messenger.** Industrial Power Division: **H. T. Reishus.** Fibre and Twine Division: **Neil Loynachan.**

Three other executive promotions resulted from the new Harvester divisional organization. They are: **M. J. Graham**, to assistant to the vice-president in charge of manufacturing; **A. J. Peterson**, to manager of the General Line Sales Department; and **F. B. Mattingly**, to manager of the Credit and Collection Department.

☆ ☆ ☆

THE WICKWIRE SPENCER STEEL COMPANY has purchased the business and assets of the SIRIAN WIRE AND CONTACT COMPANY of Newark, N. J., and will immediately assume full control of management and production. Sirian manufactures fine drawn tungsten and molybdenum wire and rods, used in the radio, electronic, electrical instrument and lamp industries. The name of the subsidiary will be changed to the WICKWIRE SPENCER METALLURGICAL CORPORATION with **E. P. Holder** as president, **Lt. Col. Cecil P. Young** (retired) as executive vice-president, **George H. Crevelin**g as treasurer, and **Franklin Berwin** as secretary. Offices of the new corporation will be located at the company's plant, Newark, N. J.

☆ ☆ ☆

The METAL LATH MANUFACTURERS ASSOCIATION, Cleveland, Ohio, has re-established its Technical Division, devoted to developing specifications and methods and to assisting architects, designers, contractors and all who seek help on engineering and design questions connected with metal lath design and use. **Albert MacCullaugh Levy** has been named engineer of the division. Until recently Levy was structural designer and checker with SARGENT AND LUNDY, consulting engineers, Chicago.

☆ ☆ ☆

Alvan Macauley, chairman of the board of Packard Motor Car Company, was chosen for the seventh year to serve as president of the AUTOMOBILE MANUFACTURERS ASSOCIATION and was elected for the third year as president of the AUTOMOTIVE COUNCIL FOR WAR PRODUCTION. Serving with Macauley in these automotive industry groups are **Paul G. Hoffman** of the Studebaker Corporation, **Robert F. Black** of the White Motor Company, **George W. Mason** of the Nash-Kelvinator Corporation, **Albert Bradley** of General Motors Corporation, **B. E. Hutchinson** of Chrysler Corporation, **C. E. Wilson** of General Motors Corporation, **George Romney, Alfred Reeves, Clarence W. Avery** of Murray Corporation, **C. C. Carlton** of Motor Wheel Corporation, **John W. Anderson** of The Anderson Company, **I. B. Babcock** of General Motors Truck & Coach Division, **A. Edward Barit** of Hudson Motor Car Company, **C. W. Davis** of Davis Tool & Engineering Company, **P. V. Moulder** of International Harvester Company, and **A. T. Colwell** of Thompson Products.

☆ ☆ ☆

Andrew J. Dallstream and **William D. Hart** have been elected directors of the CELOTEX CORPORATION of Chicago to fill vacancies existing after the resignations of **John G. Getz, Jr.**, who was commissioned a major in the army, and **Lee B. Ewing**, who has retired from active affairs. Dallstream is a senior partner in the law firm of Pam, Hurd and Reichmann of Chicago which firm has acted as general counsel and has participated in the financial development of Celotex. Hart is president of the National Brass and Copper Co. of Lisbon, Ohio. He was previously associated with the Phoenix Securities Corporation and the Bell Telephone Company of Pennsylvania and at one time operated his own signal device manufacturing company.

☆ ☆ ☆

Fred H. Jusenius is the new export manager of DIAMOND IRON WORKS and the MAHR MANUFACTURING CO. DIVISION, Minneapolis, Minn., manufacturers of crushers, screens, conveyors, heat treating furnaces, etc. For the past five years Jusenius has been export supervisor for Le Tourneau at Peoria; previously he was with Bucyrus-Erie.

☆ ☆ ☆

A. M. Guthrie has been appointed field sales manager of THE BUCKEYE TRACTION DITCHER COMPANY, with headquarters at the home office in Findlay, Ohio. He has been Buckeye's eastern district manager at Philadelphia for the past four years. In his new position he will be in charge of distributor policies and appointments through district managers. Prior to joining the Buckeye company he had been with the PAUL COCHRAN EQUIPMENT COMPANY, Chicago.

☆ ☆ ☆

The UNITED STATES STEEL CORPORATION OF DELAWARE announces the appointment of **C. W. Trust** as assistant vice-president in charge of traffic. Trust is general traffic manager of CARNEGIE-ILLINOIS STEEL CORPORATION, NATIONAL TUBE COMPANY, AMERICAN BRIDGE COMPANY, H. C. FRICK COKE COMPANY and U. S. COAL AND COKE COMPANY, which positions he will continue to hold in addition to his new assignment. He has a record of forty years of service with the United States Steel Corporation.

☆ ☆ ☆

INDEPENDENT PNEUMATIC TOOL COMPANY at Aurora, Ill., was awarded its fourth "E" by the Army and Navy. This company produces Thor pneumatic and electric tools that are used in the production and assembly of fighting machines and weapons.

☆ ☆ ☆

R. T. Dunlap has become vice-president in charge of production at WICKWIRE-SPENCER STEEL COMPANY. Before his promotion Dunlap was vice-president and general superintendent of the Buffalo district and will continue to make his headquarters in Buffalo. He was formerly associated with VULCAN IRON WORKS as general works manager.

Another promotion announced by the company is that of **A. G. Bussman** to assistant to the president from his former position as assistant to the executive vice-president. Before coming to Wickwire Spencer, Bussman was chief chemist of the DENORA STEEL WORKS of the AMERICAN STEEL AND WIRE COMPANY and president of the STANDARD STEEL AND WIRE COMPANY of Greensburg, Pa. His new headquarters will be in New York City.

☆ ☆ ☆

William J. Priestley, succeeding the late **Francis P. Gormely**, has been elected president of ELECTRO METALLURGICAL COMPANY, ELECTRO METALLURGICAL COMPANY of Canada, Ltd., MICHIGAN NORTHERN POWER COMPANY,

and UNION CARBIDE COMPANY of Canada, Ltd. These companies are units of the UNION CARBIDE AND CARBON CORPORATION of New York. Priestley entered the employ of BETHLEHEM STEEL CORPORATION in 1908 and later became division superintendent in charge of ordnance production for that company. He was chief of the alloy steel division of the War Production Board in 1942 and has taken an active part in extending the uses of alloy steels.

☆ ☆ ☆

Carroll E. (Borie) Lewis is now vice-president and manager of the controls divisions of the PERFEX CORPORATION, Milwaukee. Mr. Lewis comes from the Delco Appliance division of the GENERAL MOTORS CORPORATION at Rochester, where he served as general sales manager. He is a past air conditioning sales manager of Delco-Frigidaire conditioning division and is a pioneer in the air conditioning field. He is president of the Oil Heat Institute and is active in the Stoker Manufacturer's association and in the American Society of Heating and Ventilating Engineers.

☆ ☆ ☆

THE INTERNATIONAL NICKEL COMPANY, INC., New York, N. Y., announces the retirement of **Arthur S. Shoffstall** as general manager of their Huntington (W. Va.) Works. Shoffstall had been general manager since 1921, when the plant was planned and constructed. **Herman M. Brown**, assistant general manager, succeeds Shoffstall as general manager. **John A. Marsh**, former general superintendent, becomes assistant general manager of the Huntington plant.

☆ ☆ ☆

Frank P. D'Aquila is now export sales manager of the IOWA MANUFACTURING COMPANY, of Cedar Rapids, Iowa. He is a lecturer-author on Latin American relations and has traveled extensively in South American countries.

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HERCULES STEEL PRODUCTS CO., Division of The Galion Metallic Vault Company, Galion, Ohio, has put into effect a profit sharing plan for its employees. A substantial sum has already been set aside, and yearly additions will be made if operations justify. The sole purpose of the fund is to reward employees for faithful service by making a retirement fund available at the time when it is most needed.

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The TRUCKSTELL MANUFACTURING CO., a stockholder distributor organization of truck equipment, was incorporated May 31 at Cleveland, Ohio, with its founders, **Donald W. Meyer** and **Milton W. Anderson** as president and chairman of the board, respectively. Vice-presidents in charge of various committees are J. D. **Maynard**, Detroit; **C. A. Bieber**, Cleveland; and **Walter Blaul**, Chicago. **F. J. Hessler**, Cleveland, is secretary-treasurer.

Plans were laid at the meeting for manufacture of new equipment and expansion of facilities to handle additional lines of manufacturers. The company already distributes for Eaton, Thornton, Truxmore, Clark, Watson and Champion.

Truckstell's conversion idea for 1.5-ton trucks, conceived by Meyer and Anderson, has helped the company supply the government with numbers of conversions and has thus assisted in overcoming the shortage of heavy-duty trucks.

☆ ☆ ☆

Harold W. Sweatt, president of the MINNEAPOLIS-HONEYWELL REGULATOR COMPANY, has been elected to the Board of Directors of the CHICAGO AND NORTHWESTERN RAILWAY COMPANY. Sweatt has been president of Minneapolis-Honeywell since 1934 and is also a director of GENERAL MILLS, INC., the NORTHWESTERN NATIONAL BANK and NORTHWESTERN BANCORPORATION, all of Minneapolis. Sweatt's term as director will expire in 1946.

☆ ☆ ☆

H. W. Davis has been promoted to Assistant Industrial Sales Manager of THE CLEVELAND TRACTOR COMPANY. He has been connected with Cletrac for over twenty years, and for the past two years has been with the sales division at the home office in Cleveland. In his new position Davis' experience should be of great value to Cletrac dealers throughout the country.

☆ ☆ ☆

The Board of Directors of ALLIS-CHALMERS MANUFACTURING CO. announces the election of **W. A. Roberts, Wm. C. Johnson** and **James M. White** as vice-presidents of the company. For the past three years, Roberts has been Manager of the Tractor Division, a title which he still retains with his promotion to vice-president. Johnson has been a member of the Allis-Chalmers organization for twenty years and for the past two years has been General Sales Manager of the General Machinery Division, and will continue in charge of sales of all products except those of the Tractor Division. White has been in the manufacturing department of the company since 1929. In 1941 he was appointed General Works Manager in charge of manufacturing, and as vice-president, he will direct the manufacturing activities of all Allis-Chalmers plants.

NEW EQUIPMENT

Bulldozer and Trailbuilder

Manufacturer: The Buckeye Traction Ditcher Company, Findlay, Ohio.
Equipment: Side-lift bulldozer.
Features claimed: A new cable controlled side-lift bulldozer and trailbuilder featuring single king pin mounting of the moldboard and double trunnion tilting. The moldboard can be easily angled right or left by removing two pins, swinging the blade, and replacing the pins. A tilt of 12-in. is possible on either end of the blade. The horn and push frame are fabricated from heavy steel welded boxbeams. Welded v-shaped vertical braces and steel plate cross pieces reinforce the blade. The moldboard is fitted with reversible cutting edge and replaceable corner bits.

Concrete Finisher

Manufacturer: Master Vibrator Co.
Equipment: Vibratory concrete finisher screed.
Features claimed: Speeds placing, improves finishing, saves cement in concrete pavements. Available in six different widths varying from 6′ to 25′, it assures uniform vibration throughout the entire span. Accurate strike-off and compaction is secured in a single operation. Is useful either on roads and runways, or in tight spots, floors, etc. The screed comes powered either by 1½ h.p. gasoline engine, or by two ½ h.p. electric motors. Vibrating speed is adjustable from 2,000 to 6,400 R.P.M. in the gasoline engine type, and from 3,400 to 4,500 R.P.M. in the electric operated type.

Boom Raise Stop

Manufacturer: Industrial Equipment Company, Emeryville, Calif.
Equipment: Crane boom stop.
Features claimed: A limit-control valve mounted on the cab frame may be positioned to operate on contact with the boom as the boom approaches maxi-

mum safe elevation. This immediately releases the air in the vacuum operated system causing the spring loaded clutch booster cylinder to disengage the clutch, thus preventing any further rise of the boom. This control stops the boom without shock, thereby causing no dangerous strains.

Conveyor Idler

Manufacturer: Link-Belt Company, Chicago, Ill.

Equipment: Belt conveyor idler.

Features claimed: An anti-friction idler with a positive grease seal; roll shafts locked in frame, yet quickly and easily removed; and interlocking nuts and yokes to keep the roll supporting brackets from spreading. The troughing rolls are accurately aligned in a sturdy streamlined steel frame, and all rolls in each idler are of the same length and therefore interchangeable. Pipe extensions assure safe center-roll lubrication from one end of the troughing idler unit.

Hoists

Manufacturer: The Heil Co., Milwaukee, Wis.

Equipment: Twin-arm hydraulic hoists for trucks.

Features claimed: The hoists have been standardized so that they can be used on all styles of bodies and on all makes of trucks and trailers. They have been simplified, are completely fabricated and welded, require no heavy castings, have eliminated many rollers, cams and gears, and permit operators to carry a large payload on each trip. Twenty-four tons can be lifted to a 50° dumping angle in less than 15 sec. The smooth and noiseless operation can be stopped at any angle and held without undue strain on the hoist mechanism. Production experience gained in supplying thousands of hoists for the armed forces is being reflected in the manufacture of high quality hoists for commercial purposes.

Tape

Manufacturer: Irvington Varnish & Insulator Co., Irvington, N. J.

Equipment: Plastic insulating tape.

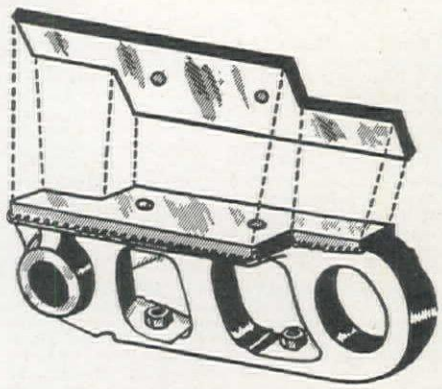
Features claimed: The tape is used for insulating wires, cables and electrical equipment, for splicing cables, and for protecting wiring, piping, and equipment exposed to caustic or corrosive fumes, oil, grease, acids, alkalis or moisture. The tape, manufactured from "Vinylite" resin, is heat-sealing, flame-resistant, and high in dielectric and mechanical strength.

Track-Link Repair Plates

Manufacturer: Pan-American Steel Products Co., Cleveland, Ohio.

Equipment: Alligator track-link repair plates.

Features claimed: Worn-out track links on track-laying tractors can be restored with Alligator track-link repair plates, which are made of a special work-



hardening steel which is highly resistant to abrasive action. The plates fit the top of the worn part of the track-link and are welded to the casting, thus providing a new rolled steel surface for the rail.

New Clamp

Manufacturer: Mechanics Engineering Co., Jackson, Michigan.

Equipment: Cam-O-Lok clamp.

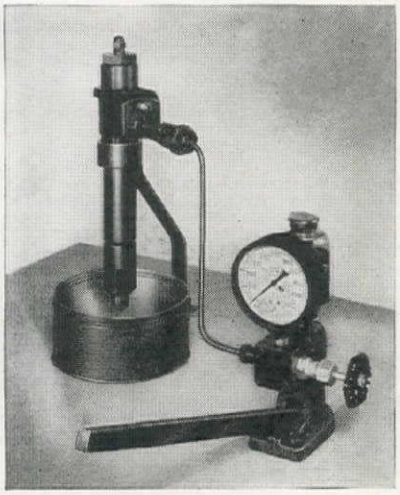
Features claimed: The clamp, made in three types for light, medium and heavy duty, is instantly adjustable over the entire range of its vertical holding capacity. When objects to be held vary in thickness, no adjustment of the hold-down bolt is necessary to obtain the desired clamping pressure. Locking and unlocking are accomplished by means of a threaded element in the positioning handle. Lubrication is provided for the threads. The clamp is compact in design as all dimensions have been held to a minimum. The clamps are sturdily built to withstand hard and long service.

Diesel Nozzle Tester

Manufacturer: Aircraft and Diesel Equipment Corp., Chicago, Illinois.

Equipment: Nozzle tester for diesel equipment.

Features claimed: This low-cost tester may be used



to check injector opening pressure and spray pattern and to detect sticking needle valves and injectors. The manufacturers claim rapid and accurate tests, simple operation, and elimination of possible damage to engine.

Vibrators

Manufacturer: Master Vibrator Co., Dayton, Ohio.

Equipment: Electric and gasoline driven vibrators.

Features claimed: The new metal-to-metal, welded, flexible drive is flexible enough to be handled easily and tough enough so that it does not collapse, stretch or shrink. The fabric and rubber covering that goes over the inner lining and into the end ferrules acts to keep the dirt out and the lubrication in. The complete line of vibrators range from the ½ to the 4-hp. size. The latest addition to the line is a vibratory con-

crete finishing screed which strikes off accurately, compacts and leaves enough mortar on top for final finishing. It has a capacity of 6,000 sq. ft. an hour and is manufactured in 6, 10, 13, 16, 20, 25, and 26-ft. lengths. Although standard screeds produce flat slabs, crown or invert screeds can be obtained on special order.

Measuring Scale

Manufacturer: American Molding Co., San Francisco, Calif.

Equipment: Architects' and engineers' scales.

Features claimed: These all-plastic scales are injection-molded of Tenite plastic, have a high degree of accuracy and are not likely to warp. The scales are white with legible black lines and figures. Different colored stripes facilitate finding the desired side of the triangular scales.

Goggles

Manufacturer: American Optical Co., Southbridge, Mass.

Equipment: AO Duraweld welding goggle.

Features claimed: The goggles have smooth edges and fit the contour of the face. The eyecups are manufactured with sufficient height to permit wide vision and sufficient depth to provide adequate protection. The side shields provide adequate ventilation to prevent fogging of the lenses. The ball-chain bridge can be easily adjusted and the one-piece headband resists perspiration, oil, water and grease. As standard equipment, the goggles are fitted with lenses of several shades of color and different degrees of darkness.

Wall Chart

Manufacturer: Cannon Electric Development Co., Los Angeles, Calif.

Equipment: Cannon type K wall chart.

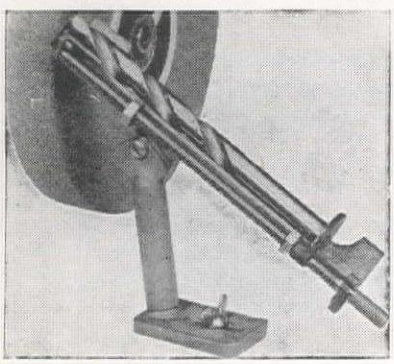
Features claimed: This chart contains in condensed form, practically all the material on K connectors. It has been prepared for use in aviation schools, aircraft plants, air depots, flying fields, aircraft repair shops, and engineering departments for the instruction, identification, assembly, ordering, servicing, or repairing of Cannon type K and RK connectors and accessories. One hundred eighty-nine full scale insert arrangements are listed. Shown are total contacts, identification numbers, wire and contact data, and clearance. This and other information is given in order to insure correct assembly identification.

Drill Holding Jig

Manufacturer: A. D. McBurney, Los Angeles, Calif.

Equipment: "Super" drill holding jig.

Features claimed: The jig, mounted next to a grinding wheel, permits the accurate grinding of a drill in a few seconds. It handles drills up to 11 in. in length and from 3/32 to 1 1/16 in. in diameter. It is adjustable to 59°, 69° or 88° angles.



Folding Ladder

Manufacturer: Duo-Safety Ladder Corp., Oshkosh, Wisc.

Equipment: Folding ladder.

Features claimed: Lightweight and compact, this ladder is manufactured in lengths from 6- to 20-ft. When not in use it folds into a 3-in. by 3-in. bundle because the rungs fit into slots in the uprights. When open, the ladder is held firmly in position by a lock on the bottom rung. It is equipped with safety shoes which provide maximum safety for the worker on all types of surfaces.

Pipe Measuring Gage

Manufacturer: Three-Point Gage Co., Chicago, Ill.

Equipment: Three-point pipe gage.

Features claimed: The new pocket-size gage is simple to operate and consists of two pivoted steel plates with edges curved at three points for contact with the pipe or tubing to be measured, together with scales which automatically register standard sizes of electrical metallic tubing and conduit and the correct sizes of pipe in terms of inside measurement. A third scale shows the drill size for tapping. The new gage is manufactured of steel, finished in black rust-proof finish and has deep etched white enamel numerals. The size when closed is 2¾ x 4½ in. and is available in a leatherette case.

New Electrode

Manufacturer: Wilson Welder and Metals Co., New York, N. Y.

Equipment: Aluminum-bronze electrode.

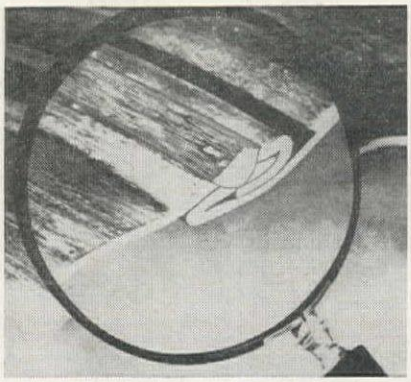
Features claimed: A coated high tensile, bronze, shielded arc electrode which can also be used as a filler rod in carbon arc welding. It will produce welding deposits of great strength and hot ductility, combined with satisfactory resistance to corrosion. This electrode can be used for welding dissimilar metals such as cast iron to brass, steel to malleable iron, and other combinations. Sizes are from ⅛ to $\frac{3}{16}$-in. in 14-in. lengths and ¼-in. in 18-in. lengths.

Prefab Conduit

Manufacturer: The Ric-wil Co., Cleveland, Ohio.

Equipment: Prefabricated insulated conduit.

Features claimed: Helical corrugated conduit housing is now manufactured as a covering for prefabricated insulated pipe units. A full welded lock seam extending spirally along the section, serves as a reinforcing. Automatic machine weld assures a pressure tight, waterproof structure. The 21-ft. sections



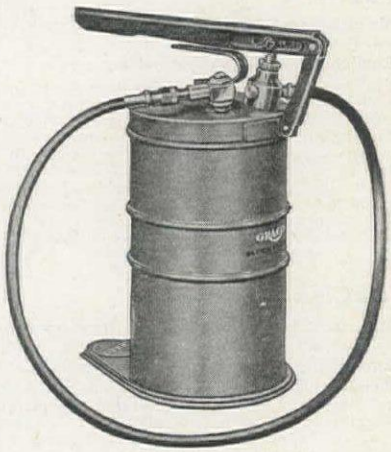
may be obtained with or without pipe, insulation, or pipe supports. The ends of the conduit have a 3-in. smooth section in order to facilitate tight field connections. A drive coupler is adaptable to mechanical or welded closure. Prefabricated insulated conduit is available in several types to take off the different conditions arising in the piping of steam, hot water, oil, or hot or refrigerated process liquids. Expansion loops, elbows, tees, anchors and other accessories necessary for a complete system are factory prefabricated. This reduces installation to mere assembly of units.

Lubricator Pump

Manufacturer: Gray Co., Minneapolis, Minn.

Equipment: "Block Buster" bucket lubricating pump.

Features claimed: The pump has an easy operating double-acting pump which develops a 4,000-lb. pressure, a hardened steel, precision ground piston, a simple positive foot valve, an 18-gauge seam-welded container with an ingenious pump support bracket which keeps the pump from being completely removed when filling, and a strong carrying handle which acts on a



large stud bolt to hold the cover and pump in position on the container. The conical shaped hopper bottom automatically feeds all of the lubricant in the container to the foot valve and prevents channeling and loss of the prime. The pump can be obtained with a 5½ or 10½ ft. hydraulic adapter-equipped hose assembly, giant buttonhead coupler-equipped hose assembly, or a standard buttonhead coupler-equipped hose assembly.

Goggles

Manufacturer: Watchemoket Optical Co., Inc., Providence, R. I.

Equipment: Plastic industrial safety goggles.

Features claimed: The one-piece lens is manufactured from shatter-proof methacrylate, withstands heavy impact, and is highly resistant to pitting caused

by sparks. The curved plastic frame fits the face snugly and comfortably and shields the eyes from every angle. The lens is easily replaced, reinforced with a high-brass clip at the bridge and non-fogging. Styles are available that can be worn over prescription glasses.

Screen

Manufacturer: Iowa Manufacturing Company, Cedar Rapids, Iowa.

Equipment: Horizontal vibrating screen.

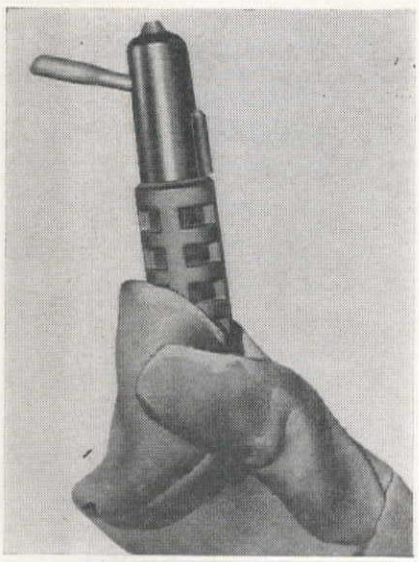
Features claimed: The company features the Cedarapids Horizontal Vibrating Screen for stationary and portable gravel plants as the first full-floating screen with no transmission of vibrations to the subframe and with directional vibration forces that cannot become unbalanced. The motor, driven by a V-belt drive and replaceable by a countershaft, if desired, is mounted to one side of the frame on a detachable platform. When installed on a portable plant, it gives complete access to either roll or jaw crusher by simply removing the crusher hopper. Its use on a portable plant reduces to a minimum the weight added by such an installation, an important item to all portable plant buyers. It operates flat, moving the material by the action of the screen rather than by gravity, and thus affording more accurate control over the screening. Its construction allows the piling on of material without injury to the screen cloth, which means faster yield per hour, or in other words, more capacity. Furthermore, several elements of convenience, such as the ease and simplicity of installing a new section of screen cloth or rearranging the combination of sizes, and the fact that this type of screen saves headroom, an obvious advantage both in working and in transporting, enter into the situation in favor of the new screen. It can be installed in practically any plant, stationary or portable, and is available in a variety of sizes, single, double, or triple deck, ranging from 2 by 4 ft. to 4 by 14 ft.

Holder for Electrodes

Manufacturer: Martin Wells, Los Angeles, Calif.

Equipment: Small electrode holder.

Features claimed: Named the "Stubby," this lighter, shorter, smaller diameter electrode holder has the advantages of adaptability to close quarter work, high electrical conductivity, 60 degree angle grip on the rod, and the ability to burn rods down to the last



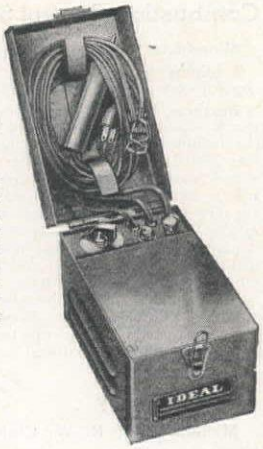
inch—thus saving up to 14 percent in rod costs. It is lighter, well balanced, and has a small diameter handle which lessens fatigue to the hand. The streamlined handle encloses all metal parts and is 100 percent insulated. There are no springs to grip the rod which would tire the hand.

Metal Etcher

Manufacturer: Ideal Commutator Dresser Co., Sycamore, Ill.

Equipment: Machine shop metal etcher.

Features claimed: Anything made of iron, steel or alloys can be quickly and easily etched. It is especially suitable for marking tools, gauges, jigs, fixtures, etc. The depth of mark is controlled by the etching heat and speed of writing. The instrument is equipped with a red indicating lamp, a protected four-heat switch, removable hinged cover, and renewable work plate. All parts are enclosed in a compact case. Both four-ounce and two-ounce etching tools are available—the latter for use on thin delicate parts.



Combustion Control System

Manufacturer: Perfex Corp., Milwaukee, Wis.

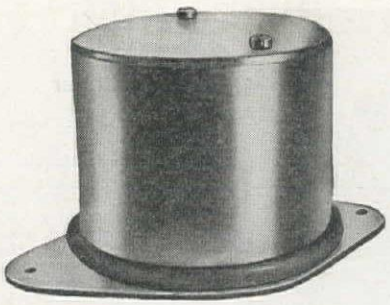
Equipment: Thermostatically-regulated combustion control system.

Features claimed: Incorporated in the system are the Barometric Draft Control with an attached thermo-draulic damper operator, and magic dial thermostat and a limit control. The maximum value is obtained from hand-fired fuel because the rate of combustion is adjusted to the heating needs and the furnace capacity. A lightweight square vane allows great air intake and assures positive checking action. The damper operator operates noiselessly and precisely through hydraulic action and has a safety cutoff device in case of power failure. The magic thermostat registers changes in temperature and checks the fire sufficiently in advance to prevent overheating of the home. Through the complete burning of the fuel, clinker formation is reduced to a minimum.

Electric Relay

Manufacturer: R. W. Cramer Co., Centerbrook, Conn.

Equipment: Moistureproof time-delay relay.



Features claimed: This simple and compact surface mounted time-delay relay automatically resets when the power fails. It has a moistureproof surface type mounting case and a special overtravel mechanism which delays complete recycling in case of momentary power interruptions. It has found extensive use in controlling the closing of plate circuits in radio transmitters and rectifiers.

Chairs and Stools

Manufacturer: Royal Metal Manufacturing Co., Chicago, Ill.

Equipment: Steel chairs and stools.

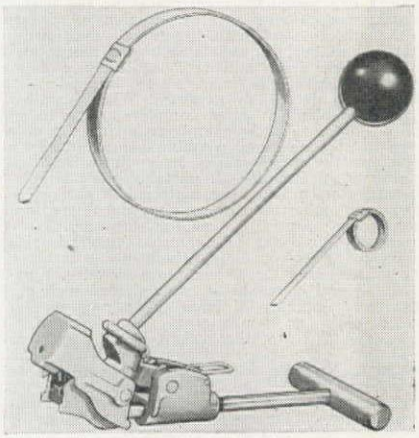
Features claimed: The chairs are constructed of all-welded tubular steel and are finished in taupe enamel. There are no protruding bolts or sharp surfaces. Adjustable models have a single bolt adjustment which is made by means of a sliding, zinc-plated, rust-resistant tube in each leg. The chairs have been designed so that their features are conducive to increasing comfort and efficiency and reducing fatigue of the occupants. Backrests are curved to fit properly against the small of the back and are mounted on adjustable spring steel uprights.

Hose Clamp

Manufacturer: Punch-Lok Co., Chicago, Illinois.

Equipment: PunchLok hose clamp.

Features claimed: The new clamp, available from ¾ in. to 48 in. I.D. is a mechanical device for connecting various kinds of male and female fittings, special nipples, menders or ordinary pipe to hose. All hose from the modern high pressure wire woven and braided hose used in the control of hydraulic machines such as coal excavators and road scrapers to the ordinary air and water hose may be fitted with this streamlined clamp. The clamps are installed without injury to the hose itself and once locked, neither rough handling nor vibration can loosen them. After the locking tool puts a tension of 1,000 lbs. on the clamp, the ends are securely locked without loss of tension and the excess band is cut off so that the entire joint is streamlined for safety. The Punch-Lok method of banding, clamping and splicing has found many uses in production and maintenance jobs in the various industries. For electrical applications, where corrosion resistance is essential, the clamps may be obtained in "Everdur," a copper base alloy.

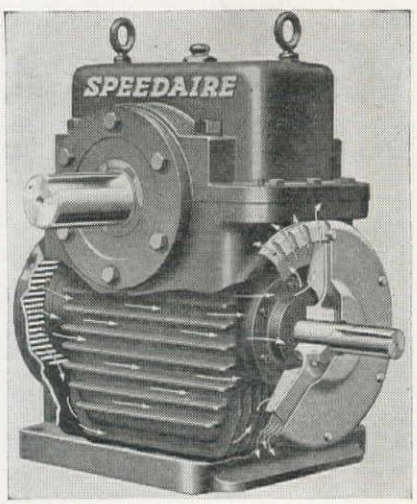


Gear Reducer

Manufacturer: The Cleveland Worm & Gear Co., Cleveland, Ohio.

Equipment: Worm gear reduction unit.

Features claimed: A cooling system permits a pronounced reduction in size of the unit required for a given HP output. A double wall construction provides an air passage completely enveloping the oil reservoir



in which the gear operates. The inner housing wall forming the oil reservoir, is deeply finned on the air side, resulting in a marked increase in heat-dissipating surface. An exhaust fan located on the coupling end of the worm shaft pulls air through the space between the housing walls. The higher operating capacity of these units compared to standard units, results in a reduction in the cost per horsepower transmitted.

Goggles

Manufacturer: Mine Safety Appliances Co., Pittsburgh, Pa.

Equipment: All-plastic goggles.

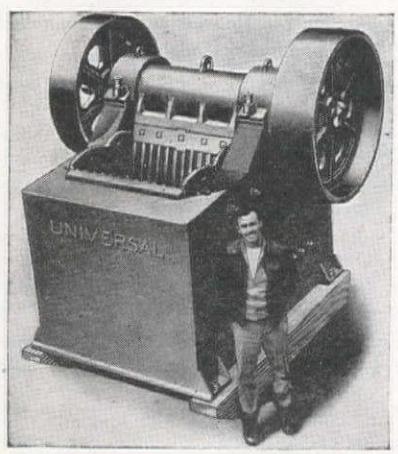
Features claimed: "Looks," the new lightweight, all-plastic goggle, provides comfortable, durable protection for the eyes. Eyecups are molded to fit the facial contours, giving a close seal around the eyes, and the large lenses provide a wide angle of vision. The strong, clear plastic frame is available in the general-purpose model, which provides ventilation through holes at the top and bottom of the eye cups, and the dust model with its indirect ventilation through serrated lens seats. Lenses are manufactured from polished sheet acetate, are clear or green, and are quickly replaced. A wide elastic headband holds the goggles in place under a low tension that assures wearing ease over a long period of time.

Jaw Crusher

Manufacturer: Universal Engineering Corp., Cedar Rapids, Iowa.

Equipment: Welded roller bearing jaw crusher.

Features claimed: This crusher known as the "WRB" series, is now produced in two sizes—one with a 20-in. by 36-in. feed opening and the other with a 30-in. by 42-in. opening. Lateral and transverse ribbing and heavy plate side walls provide the structural strength necessary to prevent distortion of the frame and thus misalignment of the bearings. Four SKF roller bearings, effectively sealed against grit and grease and Alemite lubricated, are used—one on each of the pitman and one on each side of the frame. The "WRB" series employs the same crushing action as the overhead eccentric crushers. Two distinct crushing blows with each revolution of the eccentric shaft are produced by the high eccentric and radial toggle action. The unit is proving economical and efficient.



Exhaust Line Cleaner

Manufacturer: Xzit Sales Co., Los Angeles, Calif.

Equipment: Diesel Xzit.

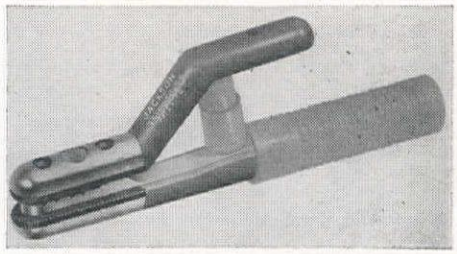
Features claimed: This product is a combination of non-inflammable, non-explosive chemicals in powder form which, when injected into the exhaust manifold, dries out the combustible tar and oil binders which cause soot and carbon to adhere to the metal. These combustible deposits are reduced chemically, leaving a dry, ash-like substance which is easily dissipated through the stack. By keeping exhaust lines clean, Xzit eliminates sparking and stack firing caused by soot or carbon and reduces power loss due to backpressure.

Electrode Holder

Distributor: Victor Equipment Co., San Francisco, Calif.

Equipment: Tong-type electrode holder.

Features claimed: Special metal-clad jaw insulation covers, manufactured by the Jackson Electrode Holder Co., Detroit, Mich., protect the holder and increase its life. Arch-type construction provides strength, rounded surface tends to deflect heat and weld spatter and properly placed vents provide free flow of air which prevents the entrapment of heat.



LITERATURE FROM MANUFACTURERS . . .

General Electric Co., Schenectady, N. Y.—A 16-page illustrated pamphlet, "The Basic Gas-Turbine Plant and Some of Its Variants," has been published by the turbine engineering division of the company. After giving a brief historical review, the pamphlet discusses the relationships between temperature, pressure and power output. Sections are devoted to thermodynamics, the axial-flow compressor, operating characteristics, fuel economy and the applications of the gas-turbine power plant.

George S. May Business Foundation, Chicago, Ill.—"Picking Products That Pay," report No. 153, is a 16-page pamphlet telling the procedures that should be followed in selecting products that would contribute most to the profits of a business. Illustrative discussions are given of the costs, pricing, comparison of products, use of plant assets, use of product classification and effect of product shortages and limitations.

Bros Boiler & Manufacturing Company, Minneapolis, Minn.—A booklet just issued illustrates new models and exclusive features. The new heaters deliver full steam pressure in 20 minutes from a cold water start. They are used for heating railroad tank cars and storage tanks—thawing frozen culverts and heating concrete aggregates.

Caterpillar Tractor Co., Peoria, Ill.—A 16-page pamphlet pictures the difficult tasks tackled by bulldozers and tractors on the battlefields of France and the Pacific, as well as on the home front. Only the power and stamina of heavy equipment can do the work required in amphibious operations, jungle road building, airstrip construction, earth moving and crop harvesting.

B. F. Goodrich Co., Akron, Ohio—The company publishes a 44-page handbook describing the "Industrial Fractional Horsepower V-Belt Drives." The handbook gives an illustrated discussion of the design, application and operation of V-belt drives. A complete table is included of the V-belt interchangeability list for different types of sheaves.

B. F. Goodrich Co., Akron, Ohio—Section 3 of the U. S. Army Training School Manual of this company is a 52-page booklet that tells of the "Design and Construction of Pneumatic Tires." The school aims to instruct selected army personnel in the proper care, preventive maintenance and servicing of tires, tubes, endless and block tracks, and other rubber products. The manual gives an illustrated description of the basic principles of tire design, the functions of tire design, the building of the tire and vulcanization as well as tire data and load-inflation tables.

General Electric Co., Schenectady, N. Y.—Pamphlet GEA-4223 describes the "Electronic Voltage-Regulating Compensator for G-E Resistance-Welding Controls." This compensator is an auxiliary resistance-welding-control panel used to automatically regulate the welding current so that it will be held constant, regardless of the line-voltage variation. The pamphlet discusses the advantages and operation of the compensator.

R. G. Le Tourneau, Inc., Peoria, Ill.—This company publishes a 12-page brochure, G-1060, which lists five questions that should be considered when selecting postwar construction equipment. The questions ask if the equipment is job-proven, is it used by successful earthmovers, do the manufacturers understand construction problems, do the manufacturers specialize in earthmoving equipment, and will it make money.

West Coast Lumbermen's Assn., Seattle, Wash.—Farwest 10M 7-44 is a 4-page pamphlet which discusses certain difficulties that have arisen during war time construction from the use of unseasoned lumber. The pamphlet lists ten essential standards for fabricated timber structures, describes the servicing of these structures and tells of their proper fabrication.

George S. May Business Foundation, Chicago, Ill.—Twelve-page report No. 154, "Common Blunders of Modern Business," reports the findings of a study of the faults, mistakes and shortcomings of present-day business and makes suggestions as to possible methods of correction. The study found that many businesses lacked definite company policies, failed to secure maximum production per worker, employed inadequate methods of controlling expenses and production, lacked profitable sales plans, failed to delegate authority in the form of specific responsibilities, and did not employ efficient office procedures. The pamphlet gives an illustrated description of an efficient and desirable organization.

Hyster Co., Portland, Ore.—The company published a 146-page book, "One American Business," which gives the complete history of Hyster. It is claimed that Hyster products have modernized the logging and lumber business in the Pacific Northwest. The book describes the dynamic personnel that has directed and managed the affairs and destiny of the company and traces the development of the modern construction equipment. With the exception of newcomers and absentees, the book contains photographs of every employee of the company. Illustrated descriptions are given of each department, office, shop, plant and employee activities, committees, athletic clubs and parties, as well as a list of the former employees who are now in the service of our country.

Douglas Fir Plywood Assn., Tacoma, Wash.—Section eight, "The Design of Flat Panels with Stressed Covers," of the "Technical Data on Plywood," has been recently published by the company. This set of six loose-leaf sheets presents in considerable detail the definition, design and method of calculation of stressed skin panels.

Blaw-Knox Co., Pittsburgh, Pa.—A 50-page booklet, catalog No. 2002, simplifies the problem of selecting the proper bucket with single drum hoists and hook-on applications. The catalog describes in considerable detail and illustrates many types of buckets. These include the single line hook-on type of normal weight, the single line hook-on type of extremely low headroom, the single line and two-line ship's tackle buckets, the single line direct reeved type, the single line hook-on type for heavy duty, and the heavy duty two-line hook-on type.

American Hoist & Derrick Co., Saint Paul, Minn.—An 8-page bulletin illustrates many steam hoisting engines ranging from 7,500 to 11,000 lb. line pull. These hoists are equipped with expanded V-type frictions and it is claimed that their quality has been proven by years of use in the construction and materials handling service. A detailed description of the construction of the hoists is given in order to account for their speed, responsiveness, durability and flexibility.

The Cleveland Worm & Gear Co., Cleveland, Ohio—Catalog No. 300 is devoted to a description of the Speedaire fan-cooled type worm gear reduction units. The catalog reviews the history of the development of the modern gear. Illustrated cutaway diagrams depict the movement of the air as it is pulled through the unit by the exhaust fan. The construction, installation, rating tables and dimensions of the various units are also described.

Preferred Utilities Manufacturing Corp., New York, N. Y.—A 14-page booklet, "New Approaches to Surface Protection," gives a technical discussion of oxidation and corrosion problems. It is claimed that "White Hot" and "Pyro-Chrome" are materials that prevent oxidation, stop corrosion and withstand high temperatures. A series of graphs show the relative reflectance values of different colors which might be applied on heat-resisting surfaces such as boiler combustion chambers, electric furnaces, kilns, ovens, exhaust pipes, stacks, and furnace side-walls and roofs.

American Iron and Steel Institute, New York, N. Y.—"Steel's War Record" is the 34-page pamphlet describing the important aspects of the wartime record of the steel industry in the United States. Detailed discussions are given of expanding the steel capacity through increasing the output of the mines, and the capacity of the furnaces, and encouraging the collection of scrap through scrap iron drives, making steel and breaking records, alloy steels and the manufacturing of plates, ships, bombs, and rifle sights.

Caterpillar Tractor Co., Peoria, Ill.—This company has published a 16-page pamphlet, "Diesels with a Pedigree," which describes the present-day diesel tractor. Photographs and cutaway diagrams show the mechanical construction of the engine and many working parts. Illustrations are given of the tractors doing various kinds of work and using different attachments.

C. S. Johnson Co., Champaign, Ill.—Two bulletins describe the use and general specifications of portable cement plants. The road builder's "Dutchmill" cement plants are equipped to unload from hopper bottom cars, from box cars, or from ramps built up to a receiving hopper. A description is given of the mechanical construction and the operational features of the plants. The portable plants are manufactured in 240, 375, and 500-bbl. capacities.

Ralph B. Carter Co., Hackensack, N. J.—A bulletin describes the use and operation of the Markley-Carter dust collector. Portable units have been manufactured for use during rock drilling in general excavations, in mines, tunnels and quarries, and for foundries, stone-cutting sheds, and power and industrial plants. Photographs picture the dust collectors at work.

Western Pipe & Steel Co. of Calif., San Francisco, Calif.—The company has recently published a 50-page illustrated booklet giving the historical background of the company, the range of its facilities, and its diversified products and their uses. Through the predecessors, the history of the company dates back to the days of the pioneers. The booklet contains photographs of the different plants of the company and of different operations in the manufacture of culvert pipe, water pipe, penstocks, water well casing, structural steel, bridge caissons, silos, tunnel forms, boilers, tanks, and ships.

Madsen Iron Works, Huntington Park, Calif.—Bulletin MP-120-6W presents the Madsen mix-in-travel road pug, for which its manufacturer claims a production capacity of 200 to 500 tons per hour. Pictures show the pug in action, and complete explanation of mechanical features is given. Further facts are supplied in a list of parts and assemblies and a page of specifications.

Farm Equipment Institute, Chicago, Illinois—"A Few Facts About the Farm Equipment Industry" were presented at the National Training School of the United Farm Equipment and Metal Workers of America. With little difficulty ahead in conversion problems, the equipment industry anticipates an expanded post-war activity. Appreciating the Yankee trading instinct in the American farmer, the manufacturer is eager to develop a product at an attractive price in order to build volume. The Farm Equipment Industry is accepting its responsibility as the provider of agriculture's machine tools in order to keep the wheels of industry turning and to re-employ those that will soon return from the armed services.

The Farval Corporation, Cleveland, Ohio—Bulletin No. 25 is a 16-page booklet, printed in three colors, that portrays graphically the theory and practice of mechanical lubrication. The bulletin presents a study of the machinery lubrication problem. It explains how the measuring valve operates to deliver a measured amount of lubricant without recourse to springs, check valves or small ports. It tells of the construction and operation of both manual and automatic pumping units that provide the high pressure source of lubricant supply. A section is devoted to describing the economics of positive mechanical lubrication and the final section pictures methods of locating and mounting pumping units and feed lines on many different kinds of machinery.

Bros Boiler & Manufacturing Company, Minneapolis, Minn.—A 4-page full color folder illustrates every detail of operation of a new circulator. A phantom view shows the simple, effective working principle. Details are given on the design features and specifications.

Galion Iron Works & Mfg. Co., Galion, Ohio—Catalog 285, a 28-page booklet in several colors, illustrates and describes in detail many features of design, construction and operation of motor graders. While the catalog features diesel power, specifications covering gasoline power can be obtained. A number of photographs and diagrams illustrate various parts of the 68½-hp. Model 101 and the 50-hp. Model 201.

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Cleveland Baby—Digs 6 ft. deep, 22 in. wide
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P.& H 10-30—Digs 13 ft. deep, 35 in. wide
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