WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

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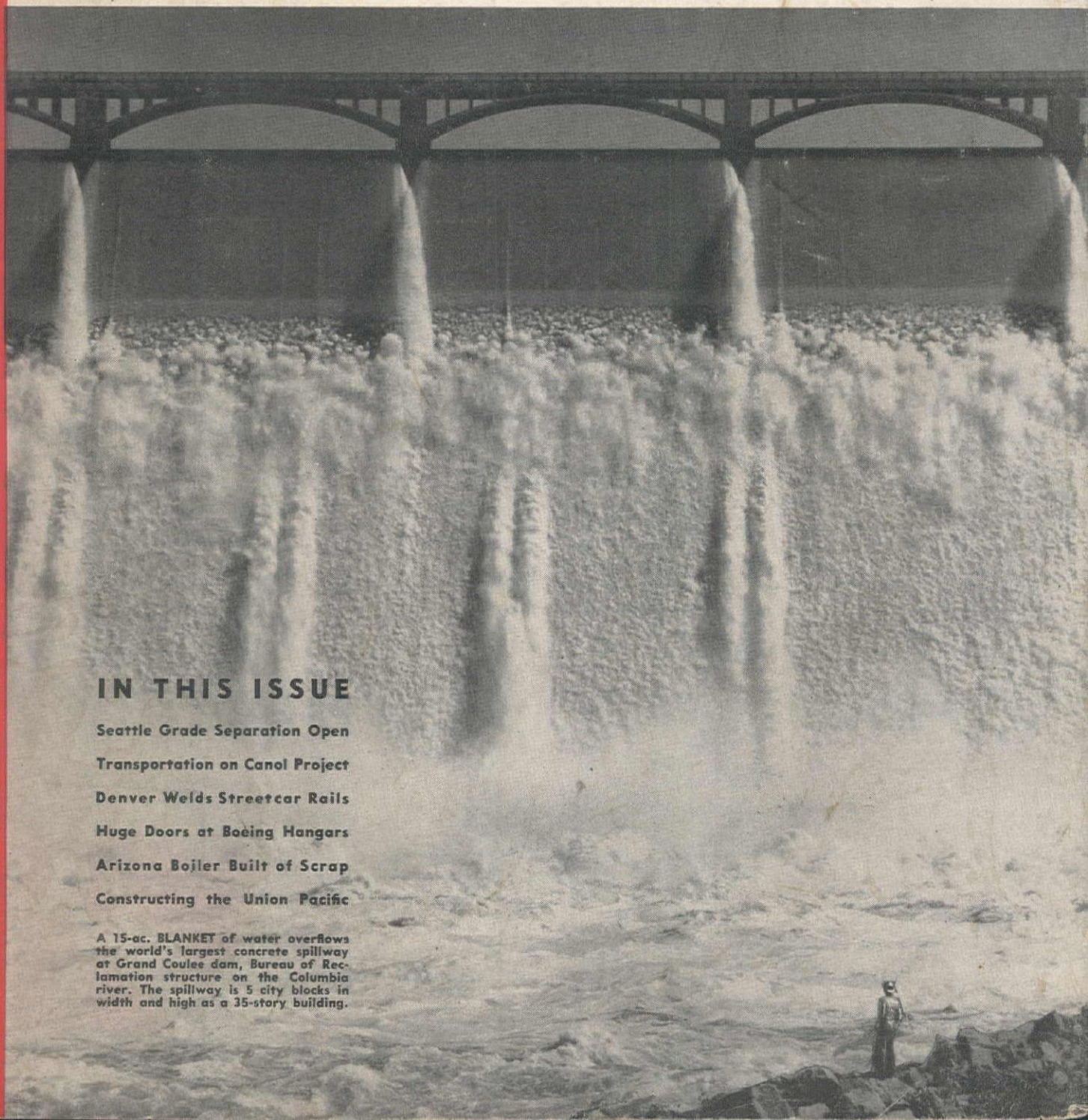

IN THIS ISSUE

A 15-ac. BLANKET of water overflows the world's largest concrete spillway at Grand Coulee dam, Bureau of Reclamation structure on the Columbia river. The spillway is 5 city blocks in width and high as a 35-story building.

Double Duty ROAD BUILDER

LOGGING road or super-highway . . . to speed the double job of breaking and leveling the surface, contractors employ powerful combinations like this Diesel Caterpillar teamed with a LeTourneau Rooter and Angledozer.

But Diesels and heavy-duty gasoline engines can give and maintain top performance only if they are effectively lubricated. So contractors everywhere make sure their lubrication is right by using Texaco.

Texaco Ursa Oil X★★, for example, is an additive type heavy-duty oil that is both detergent and dispersive. Its detergency keeps piston rings free and engine parts clean. Its dispersive ability holds deposit-forming materials in suspension until drained at oil change. *Ursa Oil X★★* protects alloy bearings and prevents scuffing of rings, pistons, cylinders.

For quieter-running, longer-lasting transmission and differential gears, use Texaco gear lubricants.

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

Texaco Lubrication Engineering Service is available to you through more than 2300 Texaco distributing points in the 48 States.

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

THEY PREFER TEXACO

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

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

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

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

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

TEXACO

TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

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

A LETTER

GENERAL CONSTRUCTION COMPANY
337 SOUTH HIGH STREET
COLUMBUS, OHIO
ADams 7823

May 29, 1944

Northwest Engineering Co.
28 E. Jackson Blvd.
Chicago, Illinois

Gentlemen:

We wish to thank you for the prompt and efficient way you have taken care of our requests for repair parts.

Although the maintenance and repairs of our Northwest Shovels are the lowest of any shovel which we use, it is indeed gratifying to know that when an occasional repair part is needed, your firm has certainly co-operated with diligence and promptness. Considering the present times, that is certainly an acnievement, of which you should be proud.

We believe that you not only have a good product, but also that you co-operate with the user from the time the product is sold and for as long as the user operates it, that, gentlemen is just as important as the quality of the product itself.

Thanking you,

Yours very truly,
GENERAL CONSTRUCTION CO

L. A. Guzzo (Partner)

LAG/al

TH INDICA THE KIND OF SERVICE YOU GET WHEN YOU BUY A NORTHWEST

We never have been great believers in testimonial letters. We have always felt that anyone could secure a testimonial letter from his friends. But when this unsolicited letter from the General Construction Company of Columbus, O., came in it was so sincere, so gratifying and so indicative of the type of service we maintain for Northwest users that we decided it was worth your reading, too.

Remember Northwest never obsoletes a Northwest in service. You can always get parts for your Northwest no matter what the model.

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

Northwest Sales Agents:
ARNOLD MACHY CO., INC.,
149 W. 2nd South St.,
Salt Lake City, Utah
BALZER MACHY. CO.
2136 S.E. Eighth St.,
Portland, Oregon

Branch Offices:
255 Tenth St.,
San Francisco, Calif.
1234 Sixth Ave., South
Seattle, Wash.
3707 Santa Fe Avenue
Los Angeles, Calif.

NORTHWEST

SHOVELS . . . . . CRANES . . . . . DRAGLINES . . . PULLSHOVELS

WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

Covering the Western Half of the National Construction Field

Contents for October, 1944

J. M. SERVER, JR.
Editor

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Now
'ON STREAM'
RICHFIELD'S new 100-octane-PLUS refinery is now in full operation. This vast plant is devoted 100% to producing the world's finest aviation gasoline . . . designed to give our fighting planes top performance.
Specialized RICHFIELD lubricants, too, are designed to get top performance out of your equipment. These wear-resisting lubricants protect your equipment and keep it operating at maximum efficiency.
RICHFIELD

Tournapulls are quickly pusher loaded. Single pusher easily handles loading of 3 to 4 Tournapulls, depending on haul length.

HOW TO REPLACE OBSOLETE RIGS and *Reduce Equipment Investment*

USE FAST-MOVING *TOURNAPULLS*...

You'll Load, Haul and Spread with Same Rig...Move More Yardage Faster and at Less Equipment and Labor Cost

With Tournapulls you get Carryall Scraper digging and spreading efficiency plus truck hauling speeds. You eliminate such one-purpose tools as shovels and elevating graders for loading, trucks for long hauls, and special spreading tools on fills. Result: you cut equipment investment almost in half, move more yardage with fewer operators and fewer units.

MORE POWER FOR WEIGHT

The Super C Tournapull has 150 h.p., yet weighs but 31,000 lbs.—22,500 to 39,000 lbs. less than crawler-scraper outfits of comparable output capacity. And Tournapull design centers that weight and power on two big rubber-tired drive wheels to give you maximum traction and flotation for tough grades and soft underfoot conditions. These big drive tires have practically no wearing parts, reduce maintenance costs and downtime by cushioning equipment against shock.

HAUL FROM 300' TO 3 MILES PROFITABLY

What's more, the Super C operates at 2.6 to 14.9 m.p.h.—2 to 3 times faster than the fastest crawling tractors. With it you can move dirt cheaply on both long and short hauls—from 300' to 3 miles.

Why use slow-moving, overweight equipment when you can move more yardage, more profitably with faster-moving, job-proved Tournapulls? Talk to your LeTourneau dealer NOW about replacing obsolete equipment with faster-powered Tournapulls.

Tournapulls spread their own loads on the move. Smooth fills and good haul roads, as shown here on Mannix & Company's job near Banff, Alberta, enable you to get into high gear quicker and stay there, thus increase hourly trips.

LETOURNEAU TOURNAPULLS

PEORIA, ILLINOIS • STOCKTON, CALIFORNIA

Also, LeTOURNEAU (Aust.) Pty., Ltd., Rydalmere, N.S.W., Australia

Manufacturers of TOURNAPULLS*, DOZERS, CARRYALL* SCRAPERS, POWER CONTROL UNITS, ROOTERS*, SHEEP'S FOOT ROLLERS, TOURNAROPE*, TOURNATRAILERS*, TOURNAWELD*, TOURNACRANES*.

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

JOB-PROVED BY ALERT EARTHMOVERS

2000 BUILT & SHIPPED

RUBBER-TIRED POWER FOR FASTER EARTHMOVING

LOUIS XIV OF FRANCE SELECTS ROUTE FOR WORLD'S FIRST CAST IRON WATER MAIN.

280 YEARS OF CONTINUOUS SERVICE IN EUROPE

THE first recorded installation of cast iron pipe to carry water was made in 1664 by order of the King of France. Unless recently destroyed by bombing, it is still in service. Throughout Europe 200-year-old cast iron water mains were in service before the United States and Royal Air Force bombers began their destructive raids—and still may be.

So when you specify cast iron pipe for current or postwar construction, you know one thing for certain—it will serve for centuries, in its original location or elsewhere. If the line has to be relocated or abandoned or replaced by larger diameters, you also know that cast iron pipe can be taken up and re-laid, or salvaged for cash. You may also know that cast iron pipe costs far less to maintain than any other pipe used for water mains, as proved by an unbiased survey.

[Section of world's oldest cast iron water main still (at last reports) supplying the town and parks of Versailles, France, after 280 years of continuous service

CAST IRON

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

CAST IRON PIPE SERVES FOR CENTURIES

This job looked like a real "lulu"!

WE had to put a new concrete floor in the second floor testing room of a busy war plant and do it, mind you, without disturbing the workers in the rest of the plant. We just couldn't run concrete down from the roof or haul it up from the ground without interfering with somebody.

The Rex Distributor had the answer though . . . Rex Pumpcrete. No chutes, no hoists, no towers, no buggy runs . . . just a pipe line. We ran the pipe line through one of the first floor windows, up through the ceiling, along the second floor, past offices to the testing room. That Pumpcrete, outside the building, pumped concrete through the pipe line in a fraction of the time it would have taken with old-fashioned methods. We didn't bother anyone at the plant.

I'm a Pumpcrete fan from here on in. It sure makes tough jobs easy and cuts concrete placing time to the bone.

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

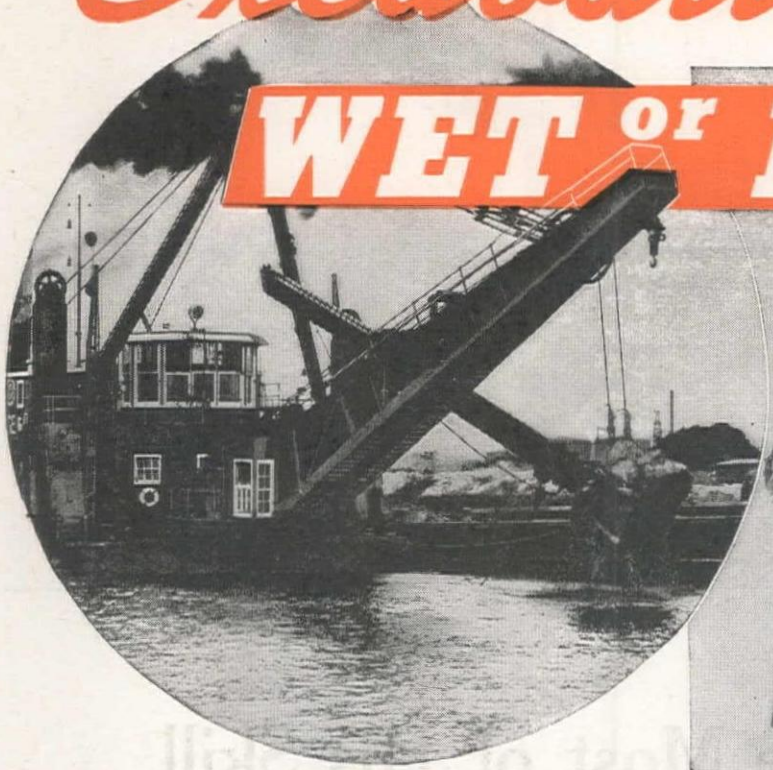
Arnold Machinery Co., Salt Lake City, Utah; Brown-Bevis Equipment Co., Los Angeles, California; Brown-Bevis Equipment Co., Phoenix, Arizona; Construction Equipment Co., Spokane, Washington; Contractors Equipment and Supply Co., Albuquerque, New Mexico; Corson Machinery Co., Ray—Denver, Colorado; Hall-Perry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

Excavating...

WET or DRY



Your excavating problems—whether they involve millions of yards of underwater excavation or peeling off miles of overburden — are never too big for profitable solution with Bucyrus-Erie machines. In dredging as in dry land excavating, you need designed-for-the-job Bucyrus-Eries to get the most in output — and profit. For profit-to-you is the natural result of Bucyrus-Erie's policy, continued for more than 60 years, of studying your needs and manufacturing machines that are **RIGHT** for your work.

That's why Bucyrus-Eries predominate on the toughest excavating jobs — wet or dry — all over the world . . . why **you'll** profit most by using Bucyrus-Erie excavators.

V-57-9

Bucyrus-Erie

SOUTH MILWAUKEE, WISCONSIN, U. S. A.

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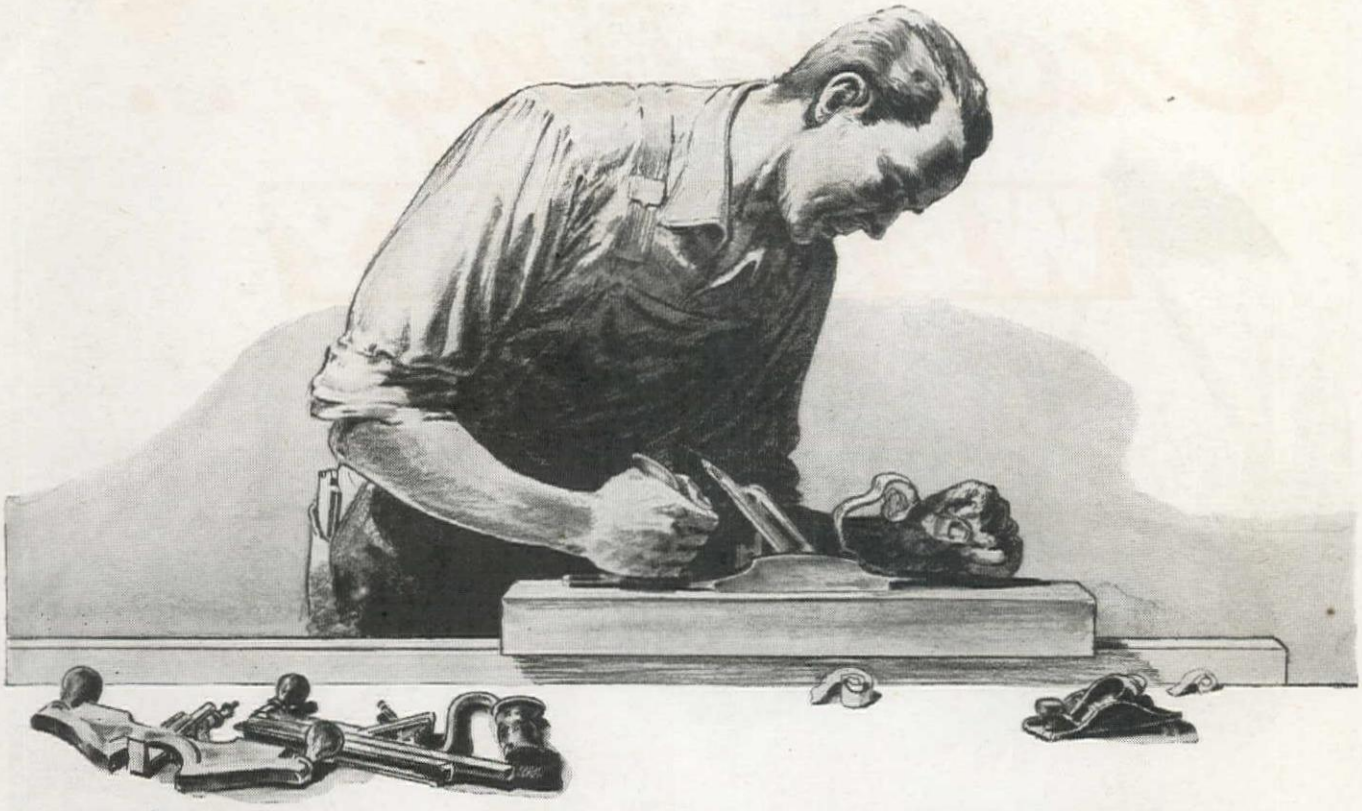


To Make the Most of His Skill He Must Use the Right Tool

Before a carpenter makes a cut with his plane he studies the job—so he'll know *which* plane will produce best results. Is it a deep or thin cut, wide or narrow, with or against the grain? How hard is the wood? Are there knots?

Then he selects the plane that's *built* for that particular job—and *uses* it right. He holds it "just so," applies just the right amount of pressure. Result: A perfect cut.

Explosives, like planes, are also tools. Some explosives produce good breakage on many jobs, but other jobs call for a *special* explosive. And it must be used in the right way. The charge must be planted "just so"— and the right quantity. *Then* you get good blasting, save time, labor, equipment.

Atlas Representatives, with their extensive knowledge of rock formations and explosives, apply synergistic* thinking to the blasting problems of customers—and produce those "2 plus 2 equals 5" results that build blasting profits.

***Synergism:** *The force that produces "2+2=5" results when you and we get together and really "click."*

The Atlas man studies all the facts, discusses the pros and cons with the blaster, combines ideas with him. Then the answer evolves: "Use *this* explosive, in *this* amount and in *this* manner—and you will get utmost in fragmentation."

Let us work synergistically with you on YOUR blasting problems. Consult Atlas.

Offices in Principal Cities

ATLAS EXPLOSIVES *"Everything for Blasting"*

CHEMICALS ATLAS EXPLOSIVES

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

Power...

precedes progress

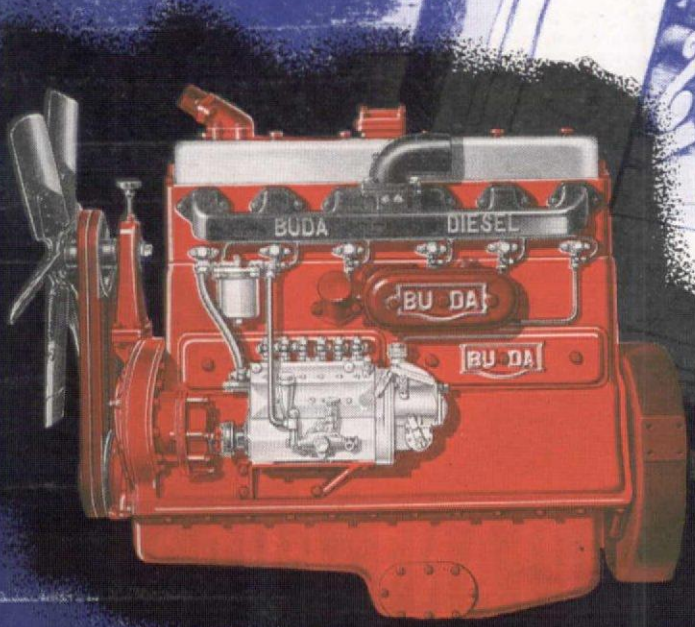
Production of Flour Mills in the 16th century was limited to the local power available.

Today you can have the finest, most modern, efficient power ever developed, by specifying BUDA Diesel Engines.

Write or wire for literature.

Bettman Archive

Flour Mill — 16th Century



BUDA Service is Nation-Wide

BUDA

15424 Commercial Avenue
HARVEY (Chicago Suburb) **ILLINOIS**

YOU CAN DEPEND ON LA PLANT-CHOATE "Know-How" FOR THE BEST IN TRACTOR EQUIPMENT

When it comes to developing new and better tools for your post-war jobs remember—no other manufacturer in the tractor equipment field can match LaPlant-Choate's 33 years of pioneering leadership. This record is your best assurance of tomorrow's best buys in tractor equipment. LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Ia.

1911—LaPlant-Choate started out as a partnership between E. W. LaPlant and Roy Choate—manufacturing horse-drawn stump pullers and house moving equipment.

1919—Introduced a line of trailers with solid disc steel wheels for hauling logs, heavy machinery, etc.

1922—Began manufacturing steel dump wagons with disc steel wheels for hauling dirt behind tractors.

1923—Developed the first tractor-mounted bulldozers to be manufactured on a commercial scale. Original models were hand operated and mounted on Holt and Best tractors, which preceeded "Caterpillar".

1924—Introduced a small two-wheeled hydraulic operated carrying scraper with disc steel wheels for operation in tandem behind tractors.

1925—Developed the first hydraulic operated bulldozers to be produced on a production basis. Also the first tractor-mounted snow plow with both the "V" and wings hydraulically controlled. Became the first company to build earthmoving and snow removal equipment for use exclusively with "Caterpillar" tractors.

1927—Business incorporated April 5, 1927. Introduced a dozer with an angling blade for side casting material.

1929—Introduced a dozer with a tilting blade. Also developed a small hydraulic operated roll-over scraper (Fresno type).

1934—Originated the first front mounted hydraulic pump for use with "Caterpillar" tractors in operating dozers, scrapers and snow plows.

1935-37—Pioneered the first hydraulic operated brushcutters, treedozers, rootcutters and weed eradicators for clearing waste land. Also began manufacturing two-wheeled hydraulic operated scrapers on rubber tires. Introduced the first positive forced ejection hydraulic scraper ever built.

1938—Developed the first successful cable operated carrying scraper to utilize the principle of simultaneous operation of gate and apron in loading and unloading. Also introduced a line of cable operated dozers, rippers and sheepsfoot tamping rollers.

1940—Pioneered the first scraper to dig, carry, dump and spread by means of single valve and jack arrangement. Also developed the first practical inside frame dozer.

1941—Introduced the first hydraulic operated scrapers for use with "Caterpillar" high speed rubber tired tractors.

1942—Originated the first airborne bulldozers and scrapers to be flown in Army transport planes.

1943-44—Became the nation's largest producer of dozers for the armed forces; pioneered first Beach-Dozer and first Tank-Dozer, in cooperation with U. S. Army Engineers and Ordnance.

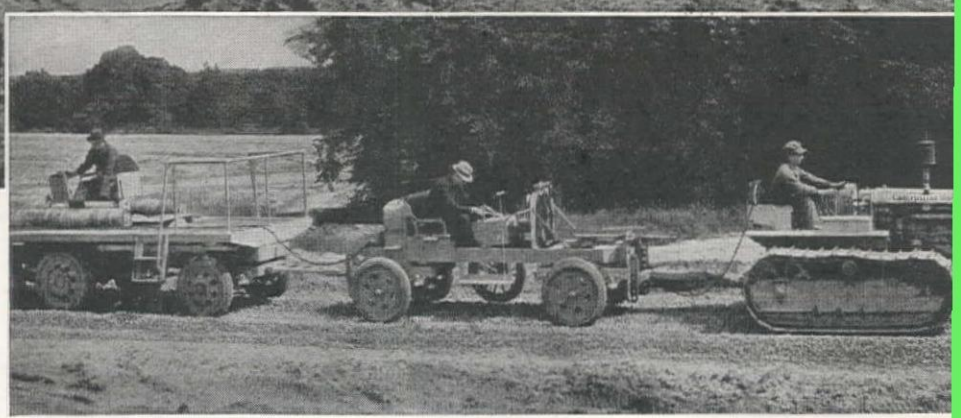
NOTE: LaPlant-Choate now controls over 120 patents and applications covering both hydraulic and cable operated tractor equipment.

LAPLANT-CHOATE

Earthmoving and Land Clearing Equipment

PUTTING THE PROVE IN IMPROVEMENTS

• *This bucking bronco is a "Caterpillar" Diesel D2 Tractor taking one of the many "hurdles" that are designed to test its toughness on the "Caterpillar" Proving Grounds.*



• *A "Caterpillar" Diesel D4 Tractor pulling a drawbar dynamometer and loading car to test the pulling power of a certain grouser design in various kinds of soil surfaces.*

IF YOU'RE a long-standing "Caterpillar" Diesel user, you know that changes and improvements go into "Caterpillar" Diesel products the minute they're ready and right. There's no waiting for "yearly models."

Through the years, "Caterpillar" has given you such notable refinements as copper bellows seals for final drive, oil coolers, absorbent-type oil and fuel filters, finger-tip steering, "Hi-Electro" hardening for many vital parts, multi-speed transmissions and scores of others. Economy and dependability have been constantly improved. Only the basic design remains. It was *right* from the start.

Every improvement that has ever gone into a "Caterpillar" Diesel product has first been subjected to the stiffest laboratory and proving-ground tests that could be devised. The net result is Product Dependability. With every manufacturing step controlled by one organization in one factory, there can be no possibility of compromise with quality.

Dependability is the outstanding characteristic of "Caterpillar" dealers, too. Today they are in a position to give your "Caterpillar" Diesel equipment the kind of inspection, adjustment, maintenance and repair it needs to work at peak efficiency from now until Victory is won. Call on *your* "Caterpillar" dealer regularly.

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

• • •

DEPENDABLE is the word for "Caterpillar" Diesel

CATERPILLAR DIESEL

REG. U.S. PAT. OFF.

TO WIN THE WAR: WORK—FIGHT—BUY MORE WAR BONDS!

• These easy-to-handle, rugged machines can be found on battle fronts all over the globe. Construction battalions everywhere are using them to build landing strips, lay road beds and perform the dozens of other tasks that must be done in order to secure captured territories for further attack on the enemy!

9692

LINK-BELT SPEEDER

Builders of the Most Complete Line of
SHOVELS-CRANES-DRAGLINES

LINK-BELT SPEEDER CORPORATION, 301 W. PERSHING ROAD, CHICAGO-9, ILL.
(A DIVISION OF LINK-BELT COMPANY)

Peterbilt

Simple Arithmetic

Properly Engineered
+ Balanced Design
+ Sturdy Construction
+ Adequately Powered
+ Geared to the Job
+ Plenty of Reserve
+ Good Appearance
+ Low Maintenance
+ Large Capacity

= DEPENDABLE TRANSPORTATION

Peterbilt Motors Company

D7th AVENUE AND MacARTHUR BOULEVARD · OAKLAND · CALIFORNI

Then he said to himself

"BEGINNINGS HAVE BEEN MADE!"

IN April when the Red Army had backed the Nazis beyond Soviet frontiers for the first time—Russia's Foreign Commissar Viacheslav Molotov announced:

> "In the full re-establishment of the Soviet frontier . . . beginnings have been made."

We now see the magnitude of affairs stemming from these simple beginnings.

Well he knew that the principal part of any project is the beginning.

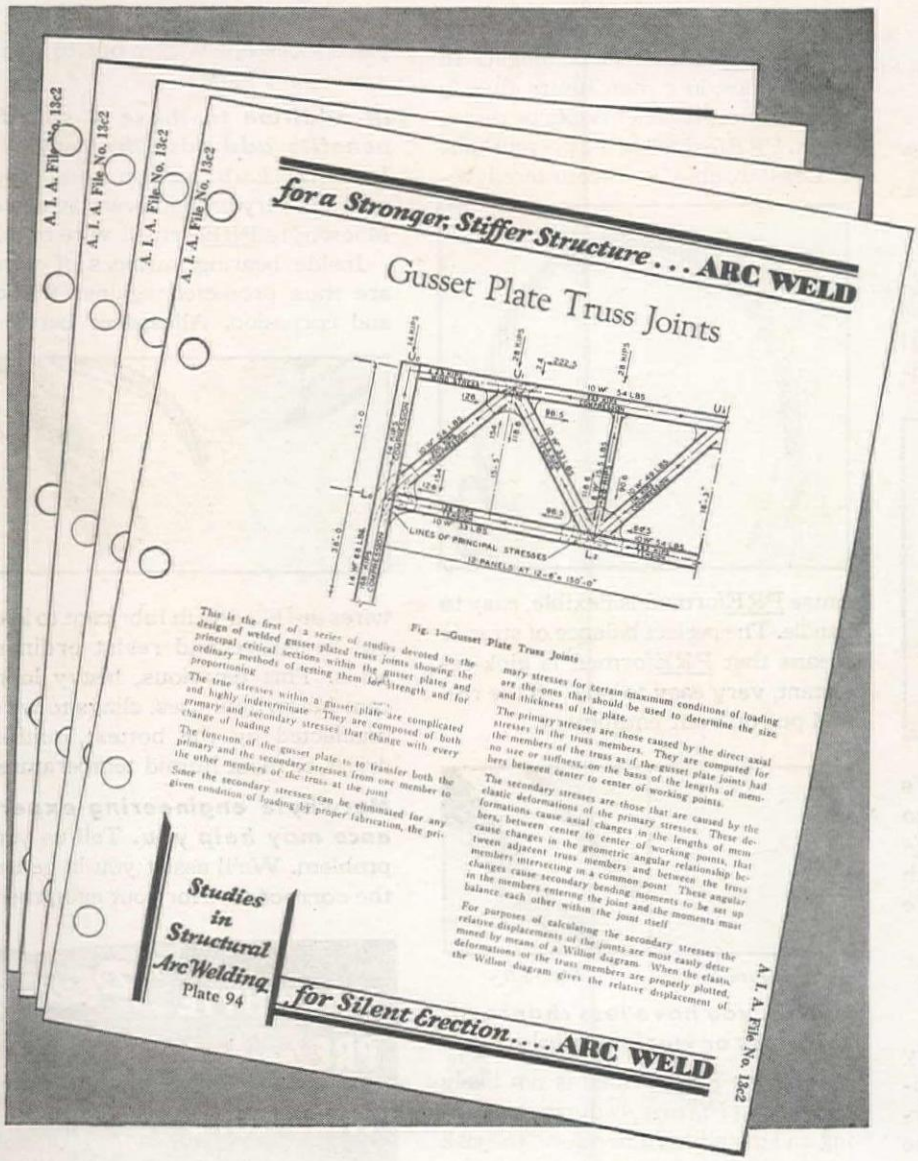
Well he knew that an improved beginning symbolizes an improved whole.

Well he knew that from such successful beginnings comes the ardor of pursuit.

This ardor of pursuit, well exemplified in Russian fields, symbolizes the beginnings of many American factories now preparing for the postwar invasion of markets.

"Beginnings Have Been Made"... *he says*

Look, Commissar, how a simple beginning can achieve a substantial ending in the field of engineering construction.



KNOWLEDGE OF STRUCTURAL WELDING

to keep you abreast of this advancing method

HOW to design and build welded truss joints, rigid frames, beam-to-column connections, and other structural details, is the subject matter of this series of authoritative Lincoln Studies in Structural Arc Welding.

These studies, published regularly, contain design information which is prepared for engineers *by* engineers. Knowledge gained from these studies can help you take advantage of the many benefits of arc-welded construction . . . proved by use in ships, ordnance, aircraft and all kinds of structures during the war.

Sent *FREE* to architects, engineers, fabricators and contractors. Simply write us on your business letterhead and ask to be placed on the mailing list for "S.S.A.W. plates."

ALSO AVAILABLE: The "Procedure Handbook of Arc Welding"; total 1308 pages; 282 pages on structural design, containing previous studies over a 15-year period; price $1.50 C. O. D.

THE LINCOLN ELECTRIC COMPANY
Dept. FF **CLEVELAND 1, OHIO**

America's greatest natural **recourse**

ARC WELDING

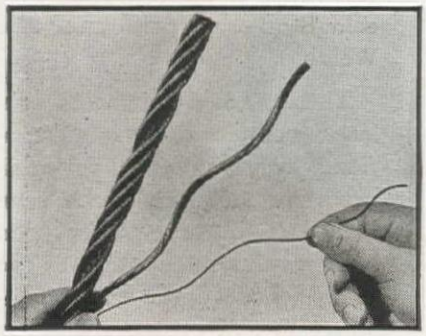
"What can Macwhyte PREformed Wire Rope do for Me?"

Here are specific ways you benefit from the use of Macwhyte PREformed wire rope.

First, you get longer wire rope service for 3 reasons:

1. PREformed has less internal fatigue.
2. PREformed has less internal friction.
3. PREformed has better balance.

Each wire and each strand are PREformed before being laid into the finished rope. The detrimental effects of internal friction and in-



ternal fatigue, two of wire rope's greatest destroyers, are reduced to a minimum in Macwhyte PREformed. There is perfect balance. Each strand and wire carries its share of the load.

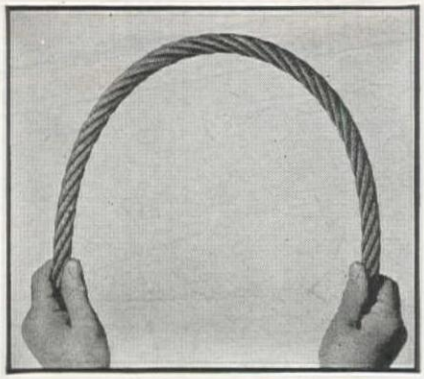
Second, you get lower cost per load carried.

In Macwhyte PREformed, every strand in the wire rope is under uniform tension. There is no "early wearing out" of some strands while the others "loaf." This perfect balance makes possible lower cost per load carried on the job.

Third, you get fewer shut-downs, less trouble.

Fewer shut-downs are the rule, because PREformed lasts longer. In these times, lost man hours due to repairs or replacements can be disastrous. PREformed helps prevent this.

Less trouble is encountered be-



cause PREformed is flexible, easy to handle. The perfect balance of strands means that PREformed is kink-resistant, very easy to take off the reel and put on your equipment.

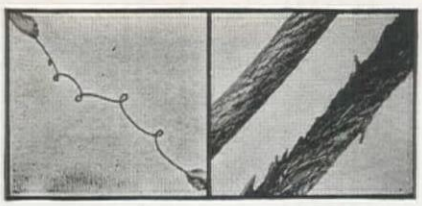


Figure A *Figure B*

Fourth, you have less chance of rope loss or workman injuries.

Macwhyte PREformed is not likely to curl up *(Figure A)* during unreeling and installing. Therefore, the risk of kinking and permanently damaging the rope is greatly diminished.

Nor does PREformed wire rope wicker and become dangerous to handle *(Figure B)*. A wire broken from wear in a PREformed rope lies in place, does not wicker out to injure workmen's hands.

In addition to these 4 specific benefits, add this 5th: Macwhyte Internal Lubrication that goes around every wire in every strand of Macwhyte PREformed wire rope.

Inside bearing surfaces of wires are thus protected against friction and corrosion. All spaces between

wires are filled with lubricant to keep out moisture and resist ordinary acids. This tenacious, heavy lubricant Macwhyte uses, clings to wires unaffected by the hottest, coldest, driest, or most humid temperatures.

Macwhyte engineering experience may help you. Tell us your problem. We'll assist you in getting the *correct* rope for your equipment.

The correct rope for your equipment

NO. 754

MACWHYTE COMPANY

Wire Rope Manufacturers

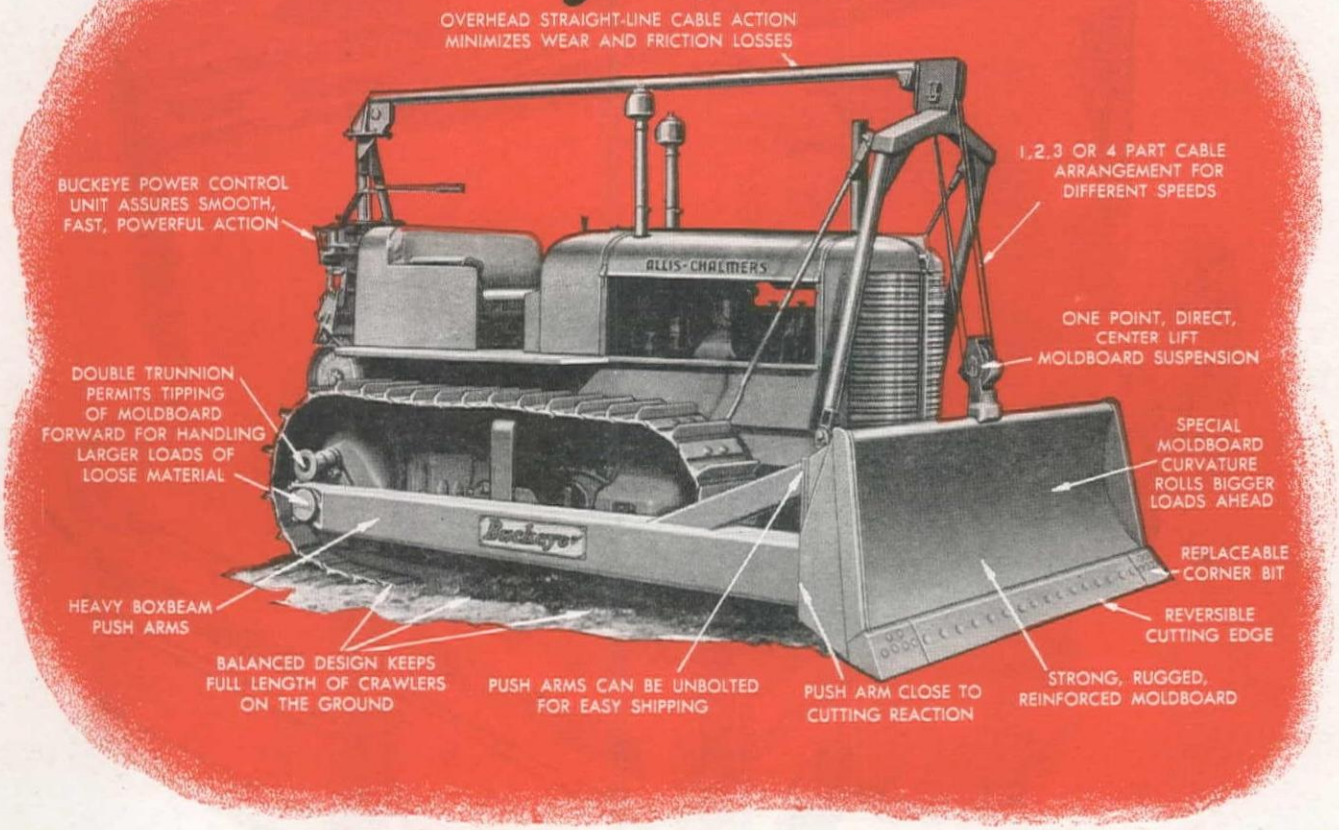
2909 FOURTEENTH AVENUE KENOSHA, WISCONSIN

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

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

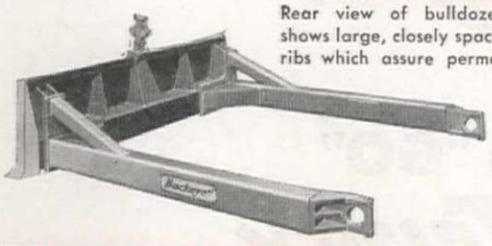
here's why the NEW Buckeye Dozer...

sets new high standards of dozing performance



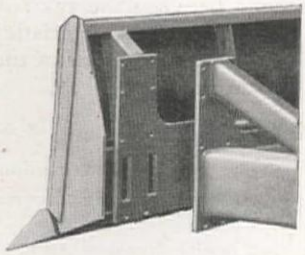
RIGID MOLDBOARD

Rear view of bulldozer moldboard shows large, closely spaced, moldboard ribs which assure permanent rigidity.



REINFORCED PUSH PLATE

Worm's eye view reveals large number of heavy, supporting ribs reinforcing push plate for toughest dozing jobs.



DEMOUNTABLE PUSH ARMS

Push arms can be easily unbolted to save shipping space and facilitate handling. Note large bolting areas which provide the rigidity of one-piece unit.

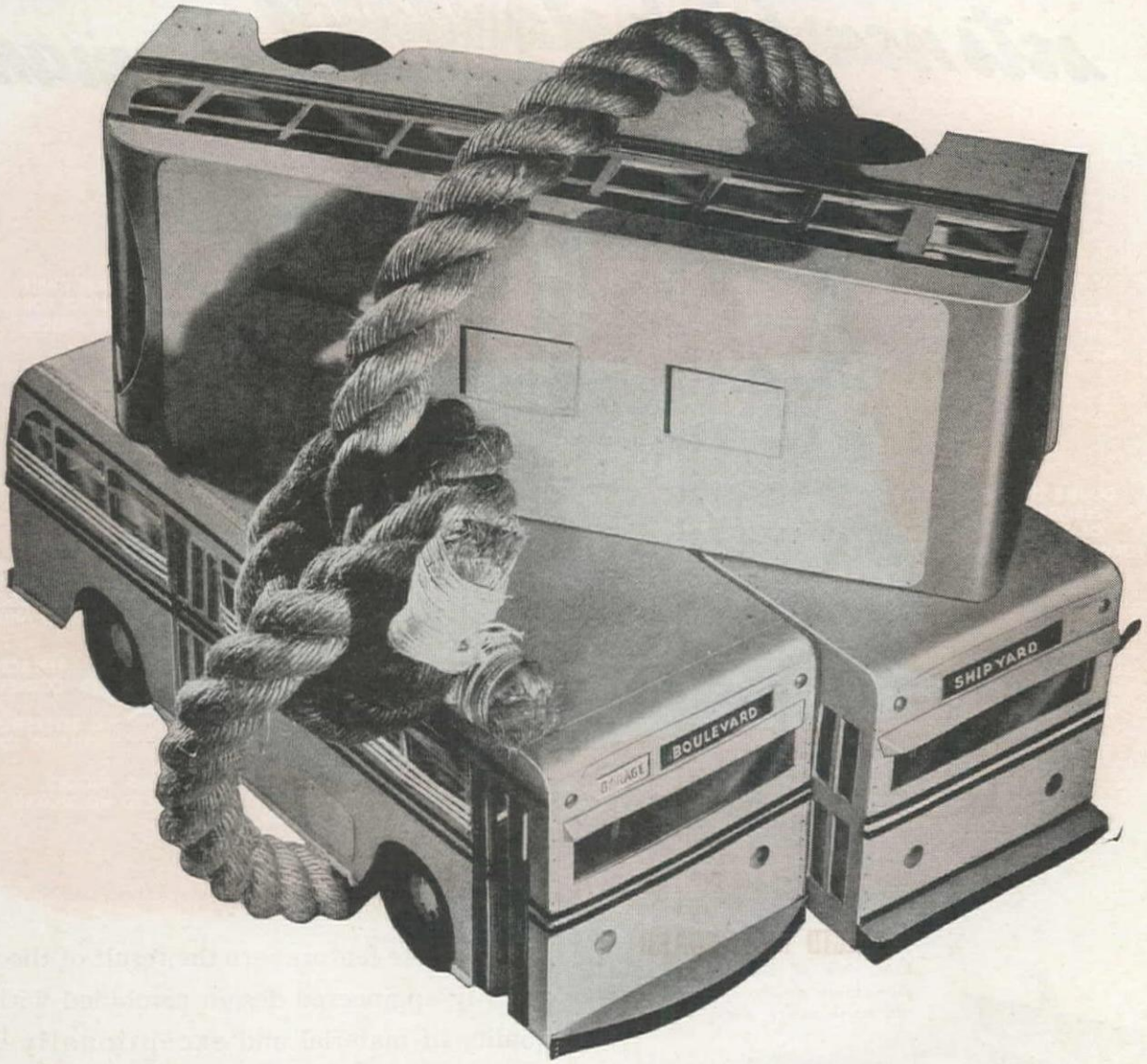
ALL these features are the result of thoroughly engineered design combined with high quality of material and exceptionally rugged construction which enable the new Buckeye cable-controlled dozer to outperform all others. It is strong and rigid enough to take the full power of the tractor on one corner of the moldboard without permanent deflection. Rolling bigger loads, uprooting trees and stumps, digging out boulders, levelling, back-filling, grading in all kinds of ground conditions are everyday jobs for the new Buckeye dozer. There's never more than the minimum of lost time for repairs and maintenance. Here's your postwar bulldozer ready now!

Write for specifications.

THE BUCKEYE TRACTION DITCHER CO.

Findlay, Ohio

Don't let a "LAZY" oil tie up your buses...



...keep equipment on the "GO" with hard-working TALPEX

SHELL

TALPEX

THE NEW, ALL-PURPOSE, HEAVY-DUTY LUBRICANT

For trucks, buses, tractors, shovels, stationary and marine Diesels

EVERY DAY your buses grow older... with few replacements in sight. Parts are scarce, deliveries slow, bearing metals not what they used to be. And many of your experienced drivers are at the wheels of jeeps.

A "lazy" oil can't last long under these conditions. You need a hard-working oil like Shell Talpex. What's the difference between the two? A "lazy" oil is just that... inefficient, short on the performance characteristics an oil must have in order to do a thorough job. Shell Talpex has *all* of the properties necessary to efficient wartime, engine operation.

NEW SHELL TALPEX

IS NON-CORROSIVE to alloy bearings. Protects all lubricated engine parts against corrosion.

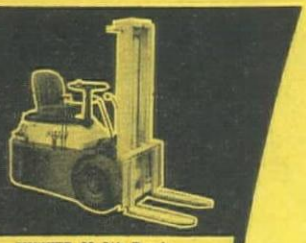
HAS EXCEPTIONAL OXIDATION STABILITY. Holds to a minimum the formation of sludge, lacquer and other deterioration particles.

HAS HIGH DETERGENCY. Helps keep carbon, lacquer and foreign particles from adhering to pistons and rings, valves, ports.

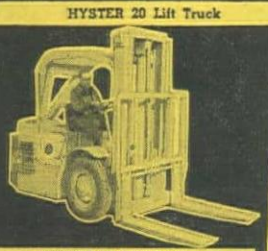
HAS LOW CARBON-FORMING TENDENCY. Reduces ring sticking and wear. Lengthens engine life.

If the oil you now use doesn't have *all* these properties, it's lazy... should be changed to hard-working Shell Talpex. Ask the Shell man to show you why.

HYSTERS are READY with the LIFT..... and the PULL

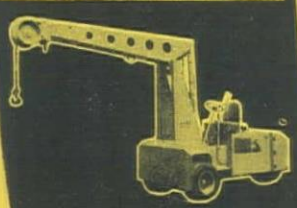


HYSTER 20 Lift Truck

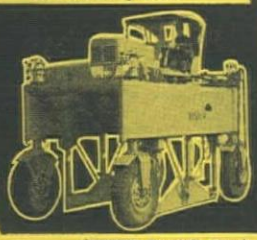


HYSTER 75 Lift Truck

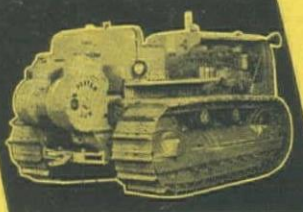
HYSTER 150 Lift Truck



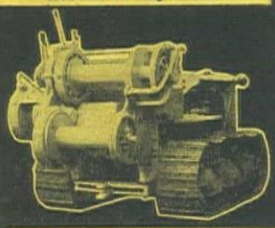
HYSTER Karry Krane



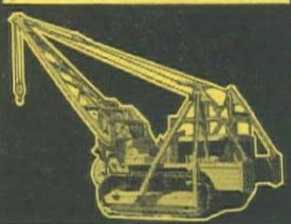
HYSTER Straddle Truck



HYSTER Towing Winch



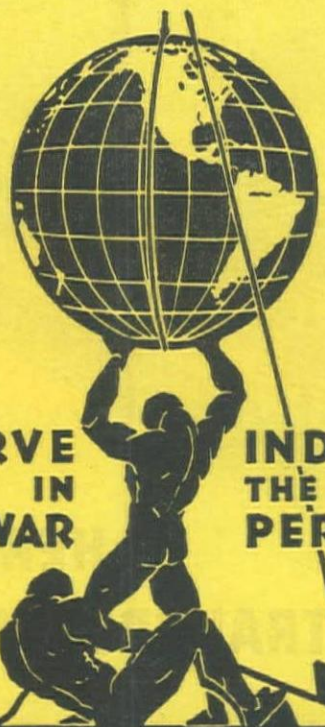
HYSTER Double Drum Donkey



HYSTER Tractor Crane

HYSTER Logging Arch

HYSTER Logging Sulky



TO SERVE INDUSTRY IN THE POST-WAR PERIOD

HYSTER

TRADE MARK REGISTERED

FOR ANY LIFT OR PULL

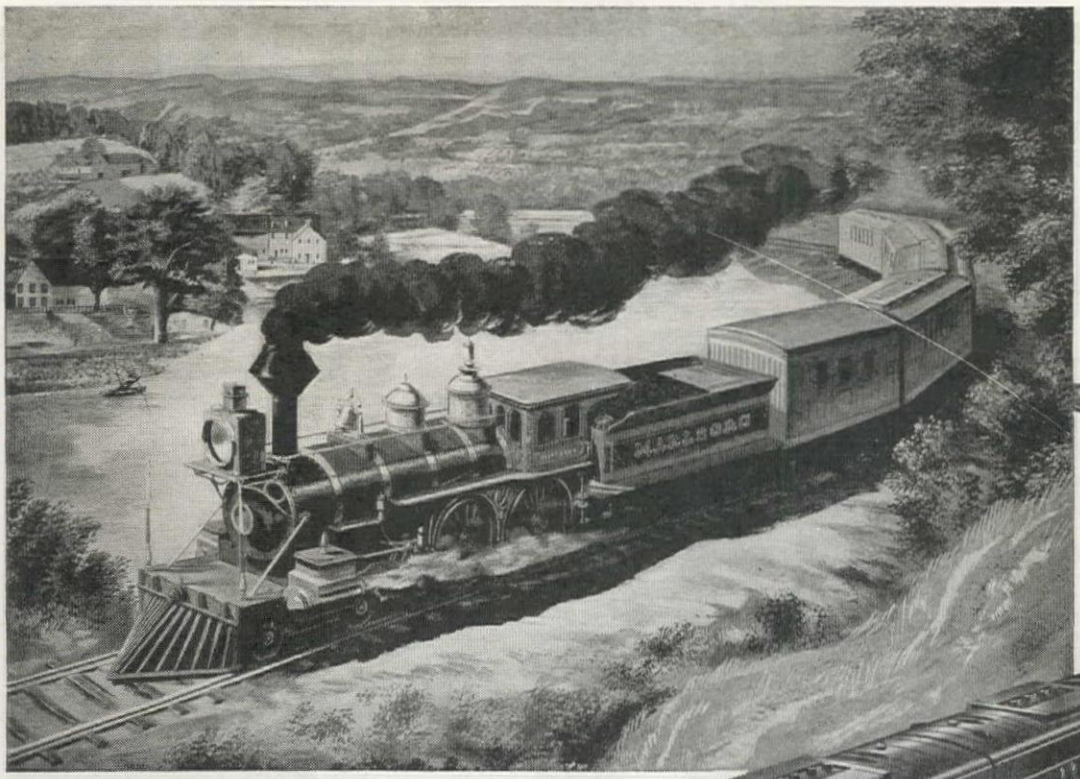
Pioneer manufacturers of mobile materials handling machines . . . Fork Lift Trucks, Crane Trucks and Straddle Trucks; all gasoline powered; all pneumatic tire mounted.

HYSTER Company

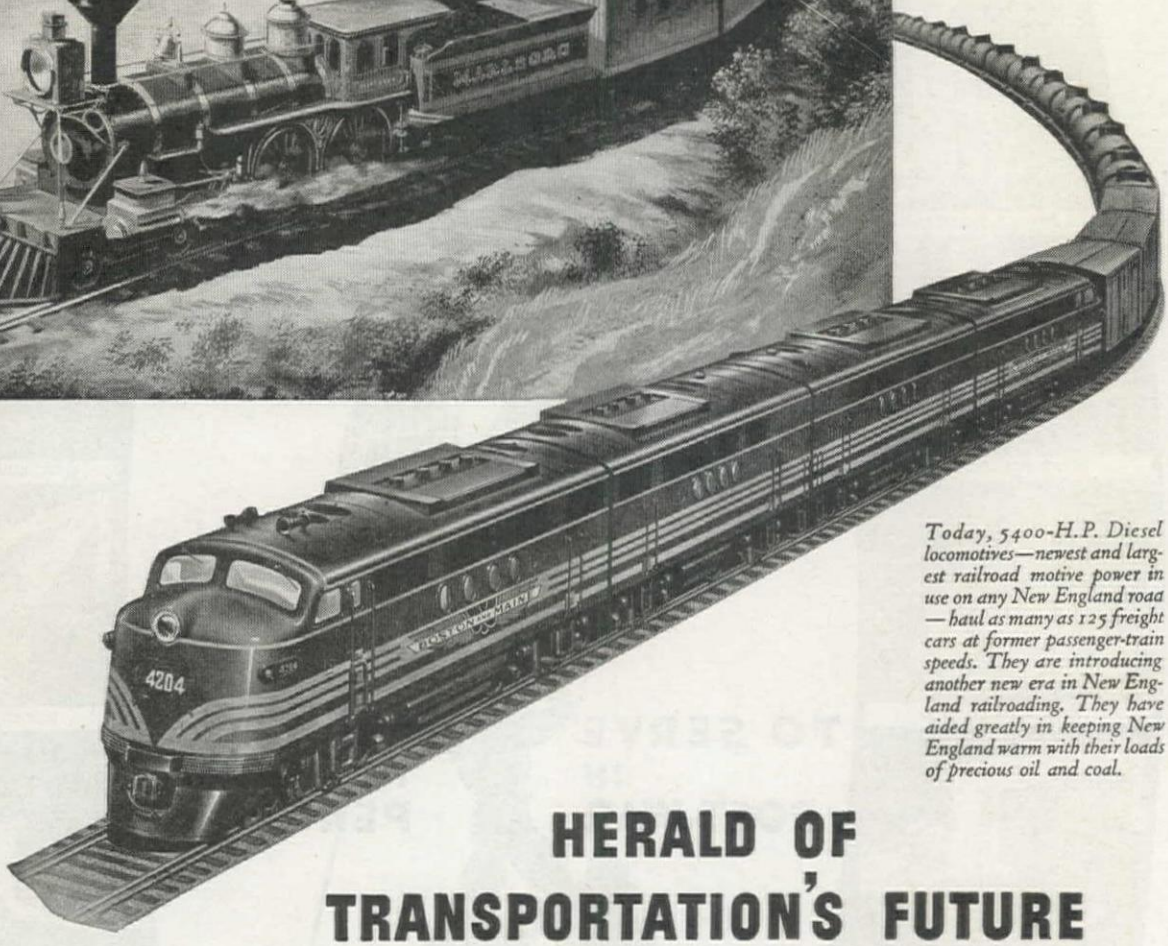
2951 N. E. Clackamas - Portland 8, Oregon
1851 North Adams - Peoria 1, Illinois

BRANCH OFFICES: 221 N. LaSalle St., Chicago 1, Ill.; 90 West St., New York 6, N. Y.; 1022 Denrike Bldg., Washington 5, D. C.; 233 Ninth St., San Francisco 3, Calif.; Masonic Bldg., New Orleans 12, La.; 2724 First Ave. So., Seattle 4, Wash.; 2700 Santa Fe Avenue, Los Angeles 11, Calif.; 215 Euclid Avenue, Cleveland 14, Ohio; 211 Farnsworth Bldg., Memphis 3, Tenn.

Largest manufacturer of tractor hoists and winches . . . Built exclusively for "Caterpillar" track-type tractors. Sold and serviced by "Caterpillar" dealers everywhere.



Back in the 60's, locomotives such as the Marlboro of the Boston & Maine Railroad puffed through the Berkshire Hills of Massachusetts, to give the New England of those days the latest in transportation.



Today, 5400-H.P. Diesel locomotives—newest and largest railroad motive power in use on any New England road—haul as many as 125 freight cars at former passenger-train speeds. They are introducing another new era in New England railroading. They have aided greatly in keeping New England warm with their loads of precious oil and coal.

HERALD OF TRANSPORTATION'S FUTURE

IN the spectacular job America's railroads are doing there is a design for finer future transportation.

It centers upon the performance of the General Motors locomotive.

Part of this performance lies in this locomotive's work. It is quick to get away—carries through its job with few or no stops for service—gets there on clipped schedules.

In run after run these locomotives are hauling heavy freight faster than passengers were carried a few years back.

These achievements are elements in railroad progress. They are forerunners of a great new era of transportation efficiency in the days which lie ahead.

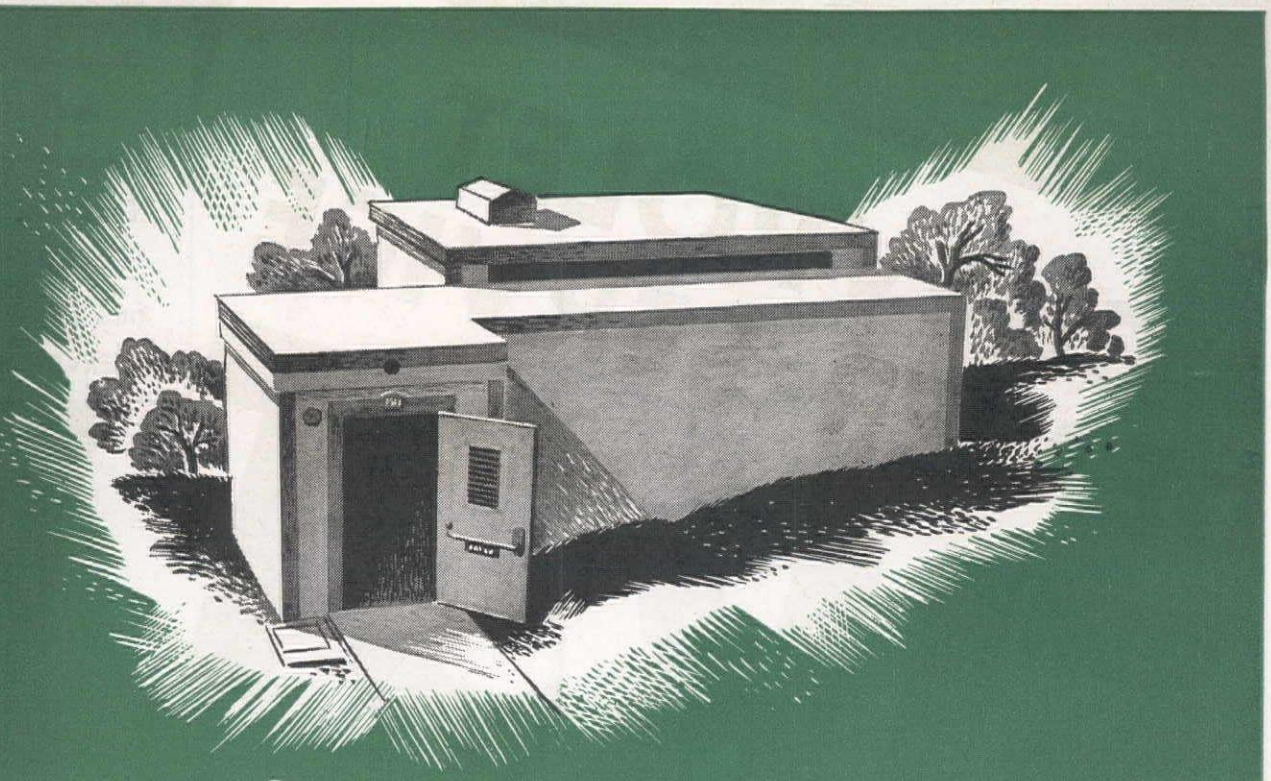
KEEP AMERICA STRONG BUY MORE WAR BONDS

GM
GENERAL MOTORS
DIESEL POWER

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

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

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



Home for a BURST OF DYNAMITE

THIS BOMB-PROOF SHELTER is radically different from those on the war front. Here the "bombs" explode inside—set off by a remote control electric firing panel. A part of the hook-up is oscillographic equipment which permits the recording of firing times of various types of explosives.

Such experimental work, combined with field experience, contributes to the tremendous fund of knowledge which Hercules has accumulated over the years and is constantly enlarging for the benefit of the users of Hercules explosives everywhere.

HERCULES EXPLOSIVES

HERCULES POWDER COMPANY
INCORPORATED
994 King Street
Wilmington 99 . . . . . Delaware

CHEVROLET DEALER SERVICE

FIRST

Originator and Outstanding Leader of "CAR and TRUCK CONSERVATION"

IN CAR SERVICE

EXPERT, DEPENDABLE MECHANICS

All signs indicate—MORE CAR OWNERS GO TO CHEVROLET DEALERS FOR SERVICE THAN TO ANY OTHER DEALER ORGANIZATION.

IN TRUCK SERVICE

MODERN TOOLS AND EQUIPMENT

All reports show—MORE TRUCK OWNERS GO TO CHEVROLET DEALERS FOR SERVICE THAN TO ANY OTHER DEALER ORGANIZATION.

IN CAR AND TRUCK CONSERVATION

AUTHORIZED PARTS

All reports show—1 OUT OF EVERY 4 CARS AND 1 OUT OF EVERY 3 TRUCKS SERVING WARTIME AMERICA—IS A CHEVROLET.

BUY MORE BONDS . . . SPEED THE VICTORY

SUPER CHEVROLET SERVICE

SEE THE LEADER FOR SERVICE AND YOU'LL GET BETTER SERVICE!

SEE YOUR LOCAL CHEVROLET DEALER FOR SERVICE

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

Help Accomplish the Mission!

Roaring defiance, bombers and escort fighters break the Pacific silence as they take off for the next objective. Below are the men with their machines who carved out the base that made this mission possible . . . who even now plan to follow up the bombers with another invasion thrust.

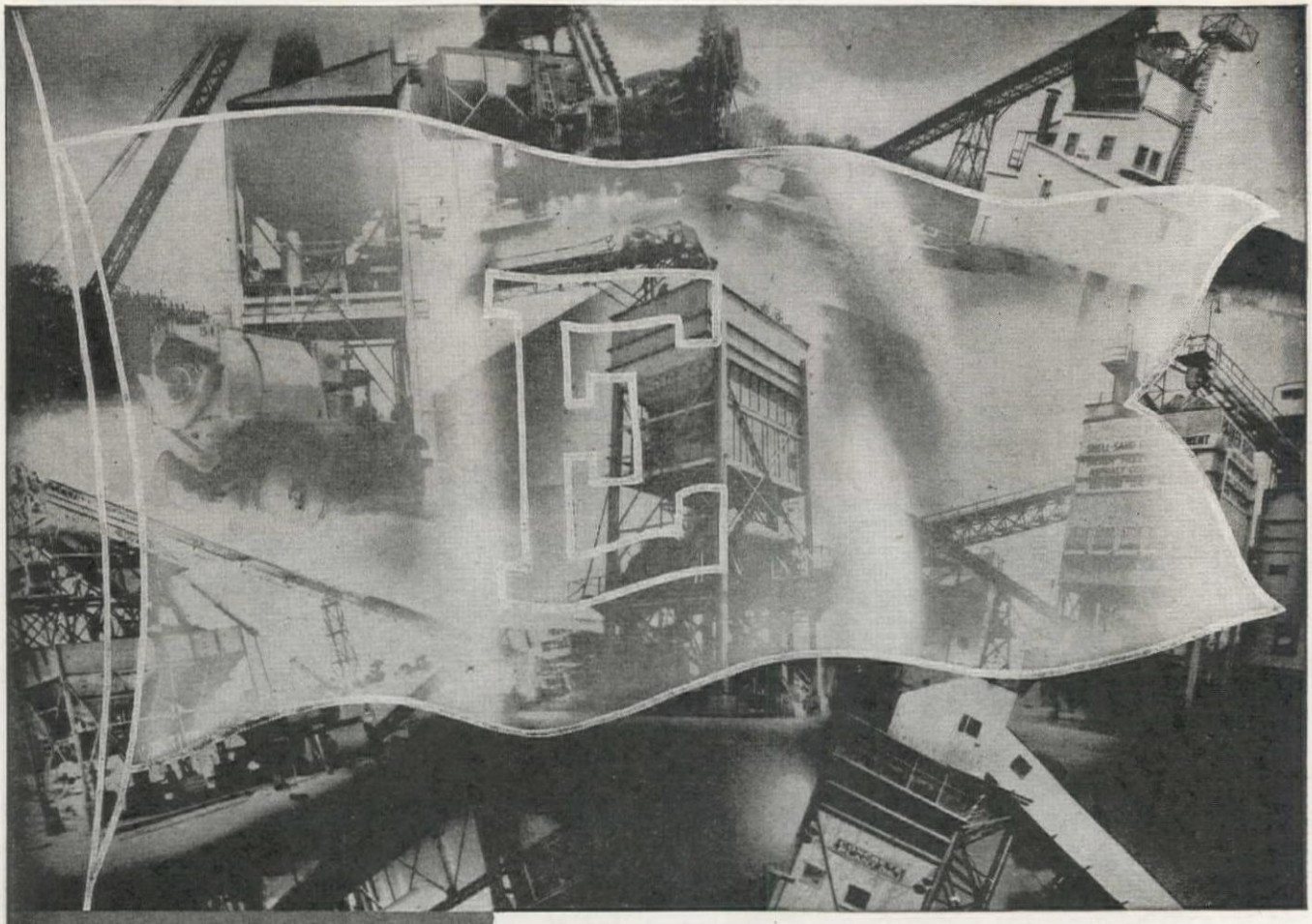
It takes hands and hearts of steel to beat back a swamp-laden jungle, infested with every type of reptile and disease carrying agent . . . to withstand unbearable heat and gnawing homesickness. As one Seabee said, "People back home cannot by any stretch of the imagination realize the tremendous amount of hard work that must be done before the smallest effort can be exerted against the enemy."

Courage and determination to see the job finished . . . modern, fast-moving tractors operating bulldozers, giant-sized scrapers and other grading equipment are the fighting tools of our construction battalions. A winning combination . . . and one that deserves the backing of every last one of us!

While they give all, we can give a little! Let's keep on buying War Bonds, Donate Our Blood, Conserve Food, Salvage Scrap and do the other small things asked of us. Let's help accomplish the mission!

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

BACK THE ATTACK . . . BUY MORE WAR BONDS THAN BEFORE!



these users of BUTLER EQUIPMENT who have won the Army-Navy E*

Austin Company
W. S. Bellows
Brown & Root Co.
Cauldwell-Wingate Co.
Doyle & Russell
Henry Ericsson Co.
H. K. Ferguson Co.
George A. Fuller Co.
Great Lakes Dredge & Dock Co.
S. J. Groves & Sons Co.
Johnson, Drake, and Piper Co.
Peter Kiewits' Sons Co.
Long Construction Co.
Mahoney Troast Construction Co.
Manhattan Construction Co.
Maxon Construction Co.
McLean Contracting Co.
John McShain, Inc.
Merritt-Chapman & Scott Corp.
Raisler Corp.
Frederick Snare Corp.
J. Rich Steers, Inc.
James Stewart & Co., Inc.
T. Stuart & Son Co.
Turner Construction Co.
Virginia Engineering Co.
Walsh Construction Co.
Wigton-Abbot Corp.

BUTLER *Congratulates*

its friends and customers who have won the Army-Navy "E" Award — an honor given only for exceptional service in providing vital facilities for waging our global war.

The Butler Bin Company is proud of the part its equipment has played in the speedy completion of the projects of these outstanding construction firms; proud that efficient equipment teamed with efficient management helped to work production miracles.

No accident is the performance of this equipment. Every plant is an Engineered Design, planned to meet all local conditions and tailor-made for each job; efficient, trouble-free operation is built in.

Butler concrete plants, central mixing plants, aggregate plants, and road building equipment are now at work on vital war construction. Whether you are planning a war or post-war project, plan now to use Butler equipment; our engineers will gladly work with you in this first step toward Excellence in Production.

* We have tried to make this list complete to the best of our knowledge; but to any Butler equipment operators who have won the burgee whom we may have missed, our sincerest apologies.

BUTLER
BIN COMPANY
WAUKESHA, WISCONSIN

More pull, less slip with O-P-E-N C-E-N-T-E-R traction

Le Tourneau Super Tournapull and Carryall Scraper on Goodyear Sure-Grips

THE bigger your prime movers, the greater yardage you're handling, the more need you have for tires that won't cake up and spin.

That's why more and more contractors are specifying Goodyear Sure-Grips. This great tire's time-proved O-P-E-N C-E-N-T-E-R *self-cleaning* tread has no dead-end pockets, no mud traps to fill up.

Its big, wide, unblocked channels sluice out dirt and stones, leaving those big, massive lug bars clean and free to bite deep and pull in any going.

As a result you get more draw-bar pull, more speed, more round trips per shift, more yardage moved per unit—*more work at less cost!*

Add the greater toughness of Goodyear's exclusive multiple-compounded construction, plus the extra strength of Goodyear's Supertwist cord carcass, and you get the longest-lasting, hardest working tire ever built.

Just ask the men who are using them. Once you've heard their story, you'll want Goodyears on all your units.

THE RIGHT TIRE FOR EVERY JOB

HARD ROCK LUG for all rock work

ALL-WEATHER EARTH-MOVER for drawn vehicles

SURE-GRIP for mud and marsh

Sure-Grip, Supertwist, All-Weather—T.M.'s The Goodyear Tire & Rubber Company

A PRODUCT OF GOODYEAR RESEARCH

GOODYEAR

THE GREATEST NAME IN RUBBER

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

WANT QUICK DELIVERY!

Get CHAPMAN Standard

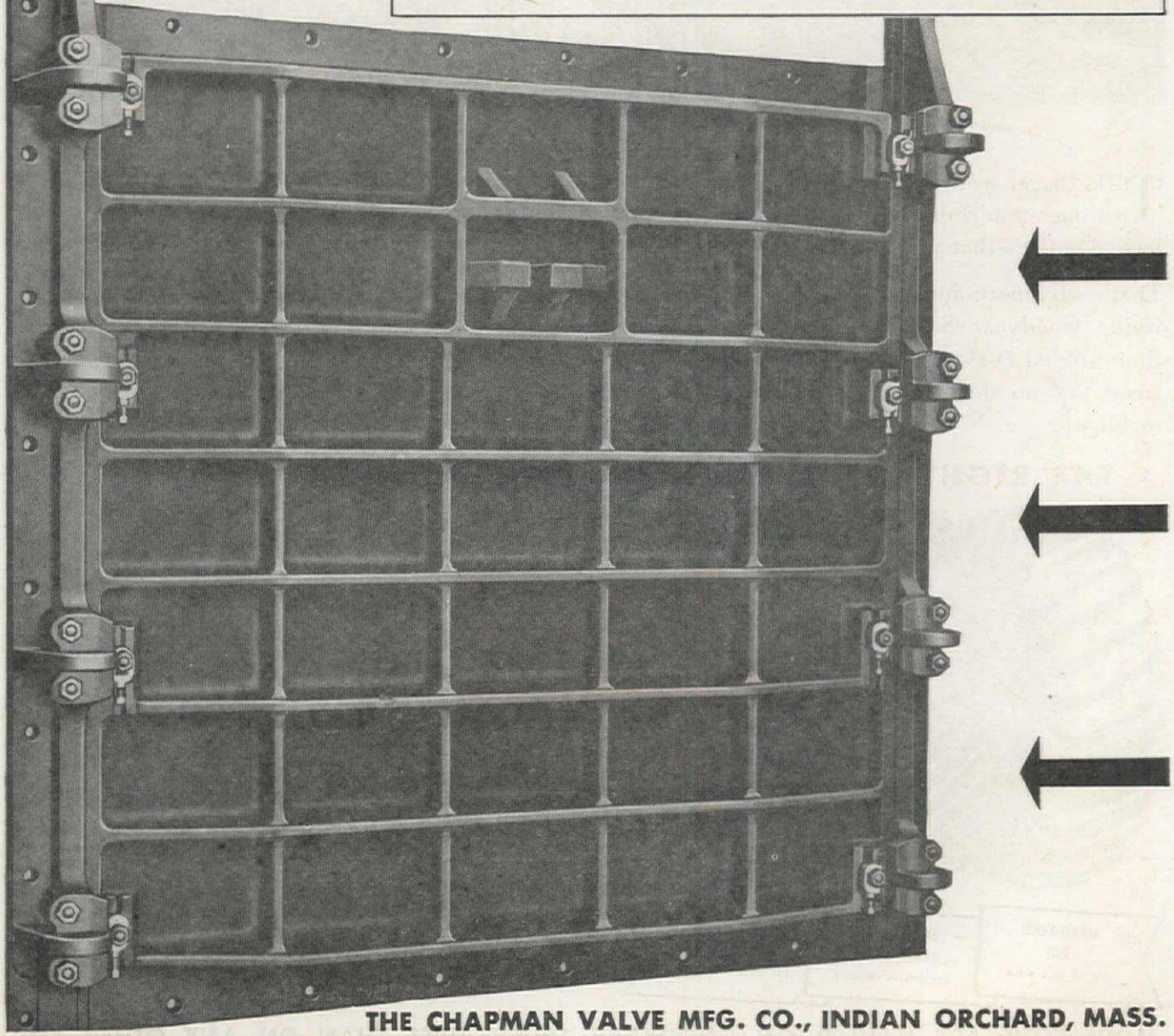
SLUICE GATES

You get fast delivery because Chapman can usually give you the type and size of gate you need from its large selection — without the expense or waiting for specially built pattern equipment.

You get quicker installation because Chapman's interchangeable stems and couplings need not be match-marked.

You get a wide choice of operating controls . . . manual, hydraulic, cylinder, or Motor Unit — Chapman has all types.

And get a copy of Chapman's Sluice Gate Handbook. It gives the complete story on sluice gates, dimensions and specifications. Write for it today!



THE CHAPMAN VALVE MFG. CO., INDIAN ORCHARD, MASS.

WESTERN OFFICES: SAN FRANCISCO, CALIF. • EMERYVILLE, CALIF. • PORTLAND, OREGON • LOS ANGELES, CALIF. • SEATTLE, WASHINGTON

They Cut the WASTE TIME *out of Tunnel Driving...*

Speeding up tunnel jobs is a specialty of Gardner-Denver's Continuous Feed Drifting Drills. These drifters are *fast*. They help drill out the rounds in the shortest possible time. Drill runners prefer them, for they're remarkably easy to handle . . . vibration is "smothered" by the built-in feed motor . . . recoil is minimized.

That's why on practically all major tunnel jobs, Gardner-Denver Drifters played such an important part. Here are a few examples:

Delaware Aqueduct.....37.7% of headings

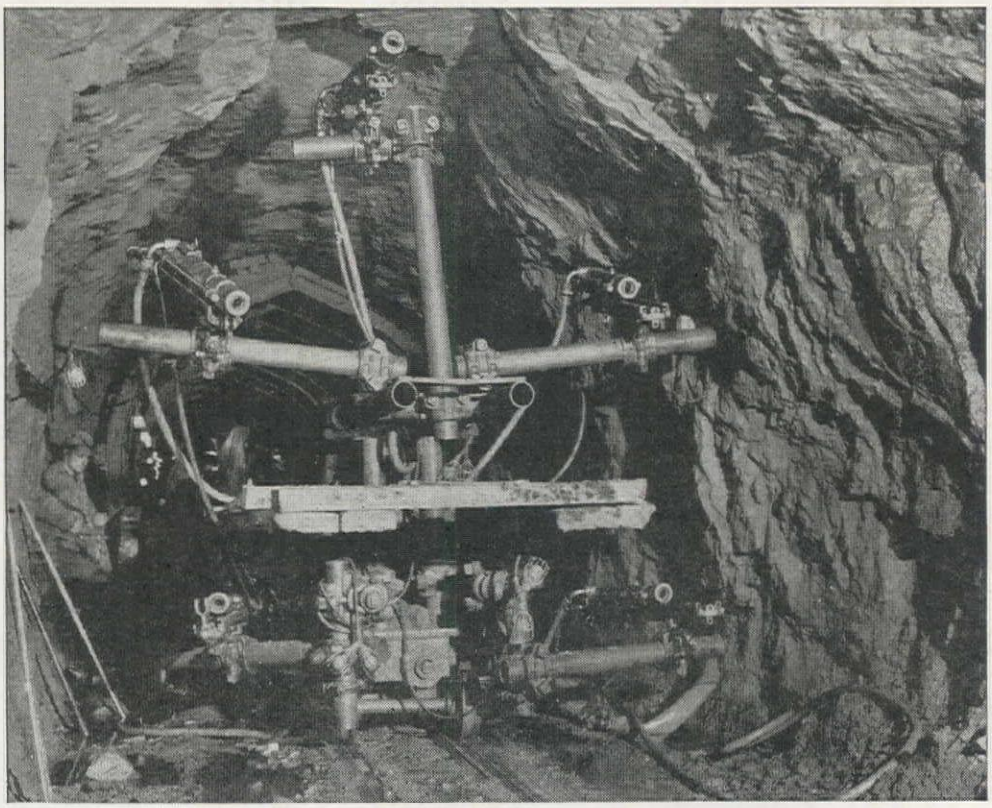
Shasta Dam.....69% of headings

Boston Water Tunnel.....50% of headings

Coulee Dam (Penstock Tunnels)...100% of headings

Roza Tunnel.....100% of headings

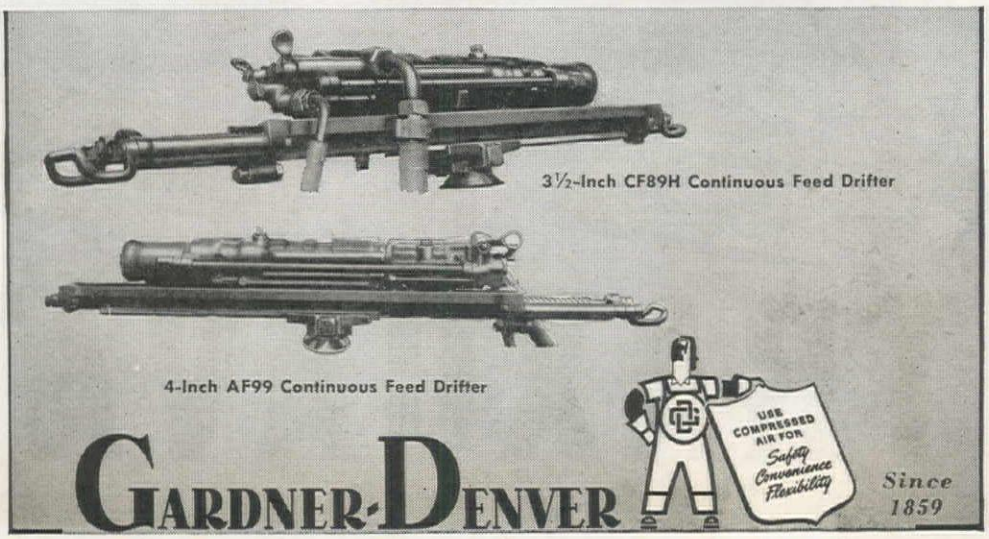
Stanislaus Tunnel.....100% of headings



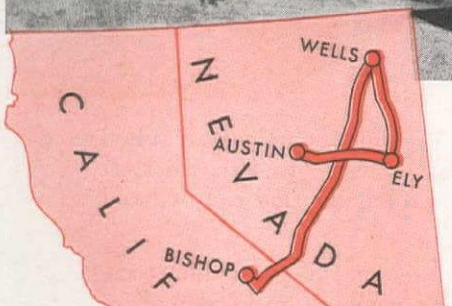
Note These Gardner-Denver Advantages

1. **Convenient controls—always within easy reach of drill runner.**
2. **Far less wear—slow motion piston of feed motor makes only 2½ strokes per inch drilled.**
3. **Higher drilling efficiency—drill is always held in proper relation to the shank.**
4. **No nursing of feed to keep it from crowding.**

For complete information on Gardner-Denver Drifters, write Gardner-Denver Company, Quincy, Ill. Western Branch Offices: Butte, Mont.; Denver, Colo.; Los Angeles, Calif.; Portland, Oregon; Salt Lake City, Utah; San Francisco, Calif.; Seattle, Wash.; Wallace, Idaho.



MOVED THREE TIMES TRAVELED 750 MILES PRODUCED 149,121 TONS in 8 months



...WE STARTED OPERATING IN MARCH AT BISHOP, CALIF.

"At Bishop, we ran 52,480 tons, after which we moved the plant to Wells, Nevada where we ran 20,033 tons. We used it next at Ely, Nevada where we ran 48,019 tons and then moved it to Austin, Nevada where we ran 28,589 tons making a total of 149,121 tons. We finished on November 6th and would have run about 40,000 tons more had it not been for the early storms...."

Reported by ISBELL CONSTRUCTION CO.

... with a Madsen Plant

A BUSINESS TRIP with an asphalt plant can be a faster, more profitable trip when the plant is a Madsen.

Madsen Plants are **easier to dismantle and move** because they're built in three portable units — require a minimum dismantling. **Easier to erect** because they're equipped with the Madsen-patented Jack-Erection System — no cranes, skids or extra devices are required to set up a Madsen Plant.

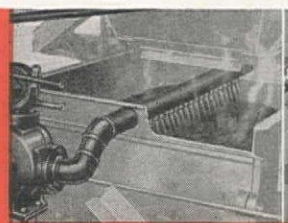
Faster batch mixing because they're equipped with Asphalt Pressure Injection — asphalt is sprayed into the tumbling aggregates in the mixer. Aggregates and oil are more thoroughly incorporated in a shorter mixing time. You get **greater production** because this time-saving means 25 to 40 more batches in an 8-hour day.

Write for new catalog; learn about the many Madsen exclusive features. Unit-Power Transmission; the extra fast mixing cycle; the sectional mixer, and many others. Crane-erection as well as jack-erection plants are available.

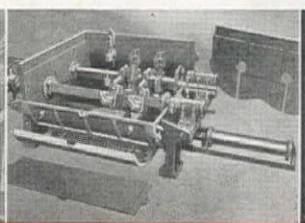
MADSEN IRON WORKS
HUNTINGTON PARK, CALIFORNIA

4 EXCLUSIVE MADSEN FEATURES

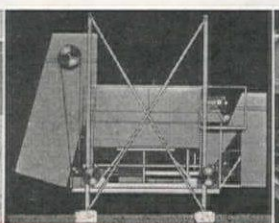
WRITE FOR CATALOG!



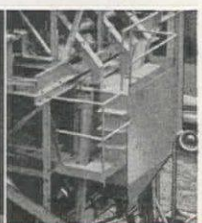
Asphalt Pressure Injection System



Sectional twin-shaft Pug Mill Mixer



Jack-Erection System and Power Lift

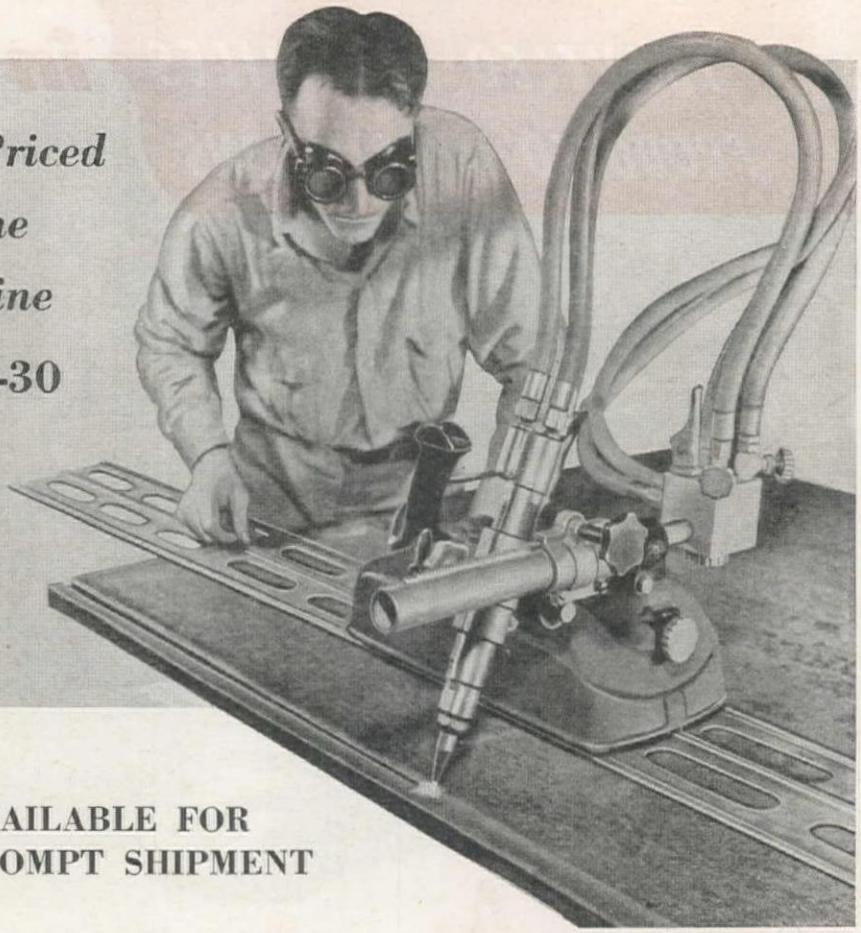


Overflow Bin for easy truck loading

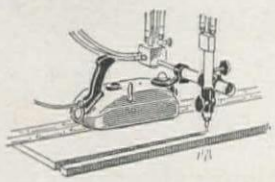
Speed Production...Cut Fabrication Costs

With This Low-Priced Oxy-Acetylene Cutting Machine

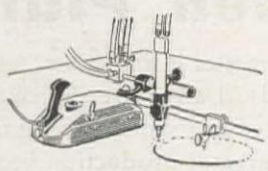
OXWELD CM-30



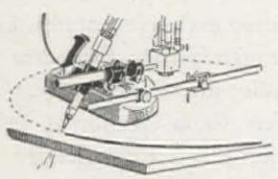
What You Can Do With This Machine



Straight Line Cutting



Circle Cutting



Circle Beveling

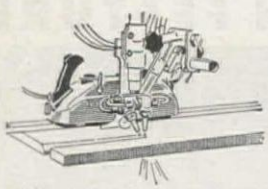


Plate-Edge Preparation

AVAILABLE FOR PROMPT SHIPMENT

The OXWELD CM-30 Portable Cutting Machine is particularly suited for cutting straight lines and bevels on metals up to 4 in. thick. It also will cut circles from 2¾ to 96 in. in diameter, and can be hand guided for simple shapes.

Many metalworking shops and maintenance departments have found this low-cost oxy-acetylene cutting machine an ideal tool for handling many metal-cutting jobs faster and more profitably.

Convenient to Use

The CM-30 weighs only 49 pounds, and can easily be carried from job to job—wherever a supply of oxygen and acetylene is available. It can be set up quickly and can be operated either on lightweight track for straight-line cutting, or on the work itself for cutting circles. A turret-type blowpipe mounting makes possible quick and easy adjustments. A new type of control assures uniformly even travel over a full range of speeds. This machine can be reversed instantly.

Write for a descriptive folder

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

BUY UNITED STATES WAR BONDS AND STAMPS

MARITIME "M" AWARD FOR OUTSTANDING PRODUCTION ACHIEVEMENT

THE LINDE AIR PRODUCTS COMPANY

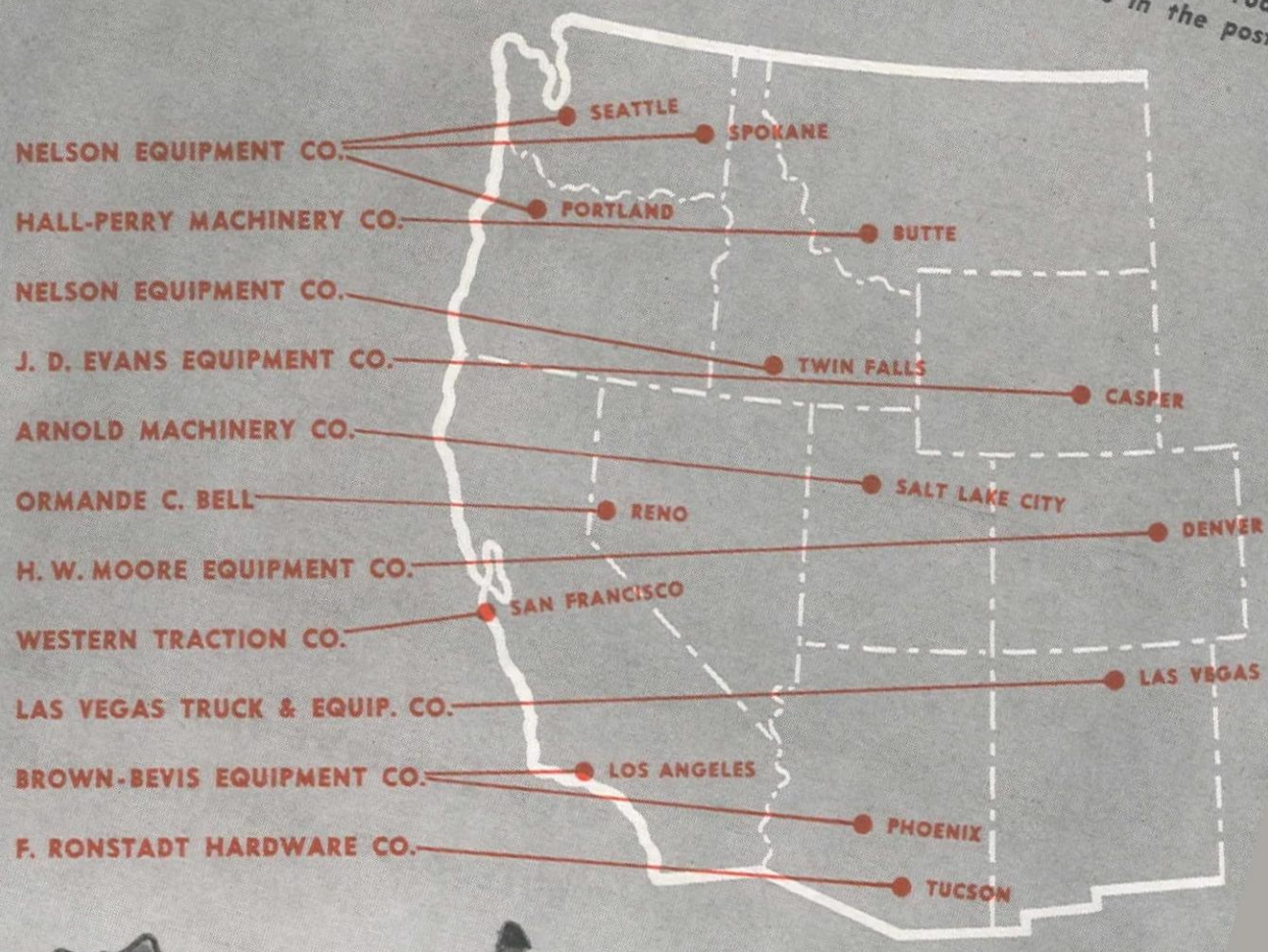
Unit of Union Carbide and Carbon Corporation

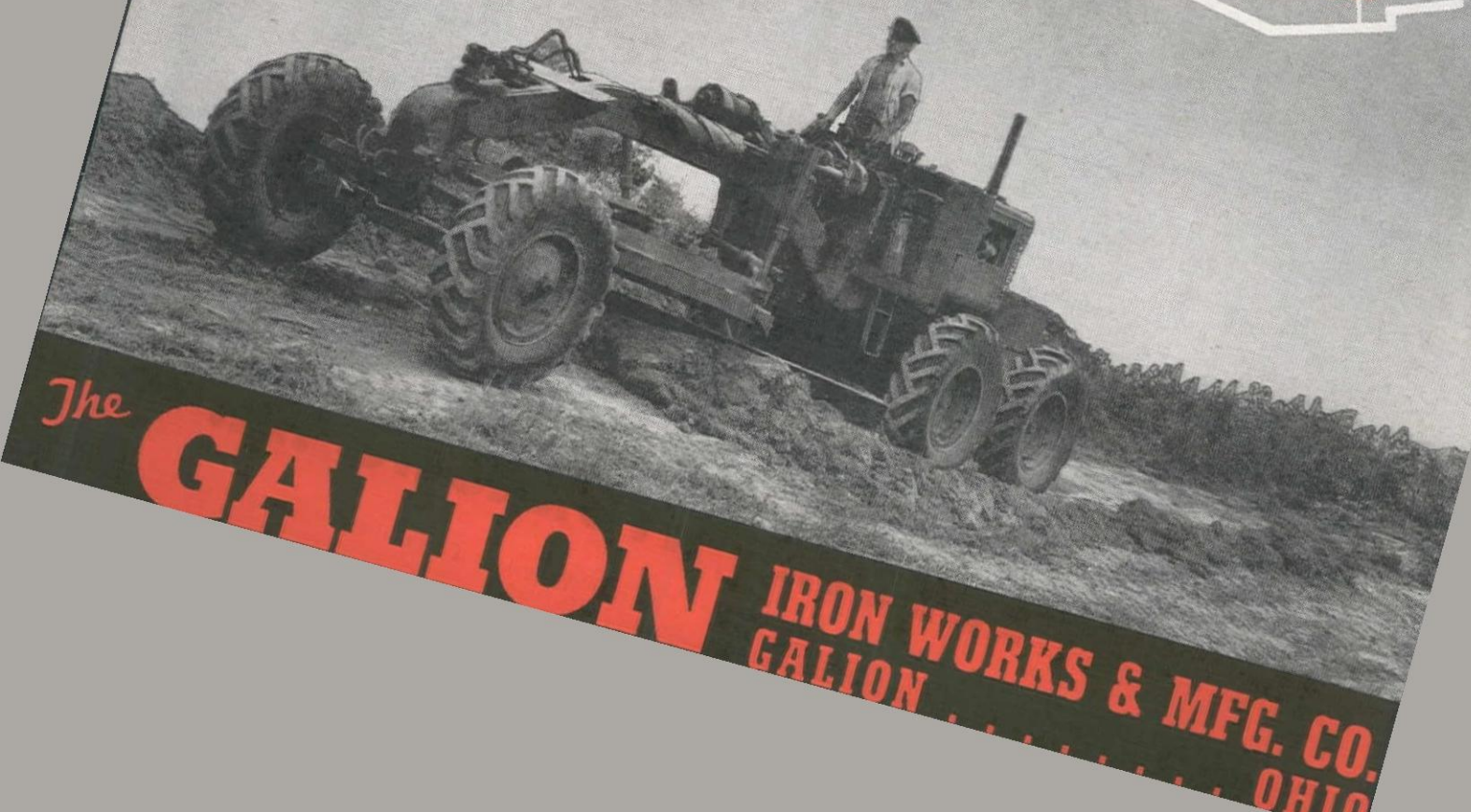
30 E. 42nd St., New York 17, N. Y. UCC Offices in Other Principal Cities

In Canada: Dominion Oxygen Company, Limited, Toronto

GALION SERVICE

There is a Distributor near you. Check with him on Galion motor graders, rollers and spreaders. See him for new developments in road building and maintenance methods in the post-war era.



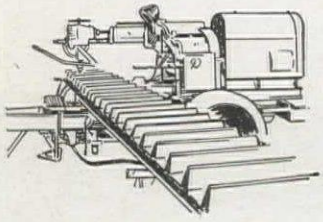


The GALION IRON WORKS & MFG. CO.
GALION . . . . . OHIO

IF IT'S A RODGERS IT'S THE BEST IN HYDRAULICS

"OUR RODGERS TAMED THAT BULLDOZER IN 4 HOURS FLAT!"

NO. 19 OF A
"READY-WITH-A-RODGERS" SERIES



"The first job our Rodgers Track Press did for us opened our eyes. It was on a bulldozer that needed new track bushings—a job that used to take at least a couple of days.

"In four hours flat, that bulldozer was all fixed up snug and tight with new pins and bushings, ready to go to work. We don't mind track repairs any more—our Rodgers takes 'em all in stride."

This experience is typical—maintenance men agree that the Rodgers Track Press shortens layups for tractor repairs—saves time and money. It will pay you to get the full story on the Rodgers Track Press . . . write or wire for complete information and prices. *If it's a Rodgers, it's the best in hydraulics.* Rodgers Hydraulic, Inc., Dept. E-10, St. Louis Park, Minneapolis 16, Minnesota.

RODGERS HYDRAULIC, Inc.

Piping IS OUR BUSINESS!

When you need materials for any piping requirement, remember that dependable Grinnell piping products are available nearby. Grinnell maintains completely stocked warehouses in principal cities. From these warehouses or from your local Grinnell jobber you can get anything you need.

You can also get experienced advice from Grinnell Engineers on any unusual piping problem.

Send for catalogs, and call on Grinnell "whenever piping is involved".

GRINNELL COMPANY, INC.
Executive Offices: Providence 1, R. I.

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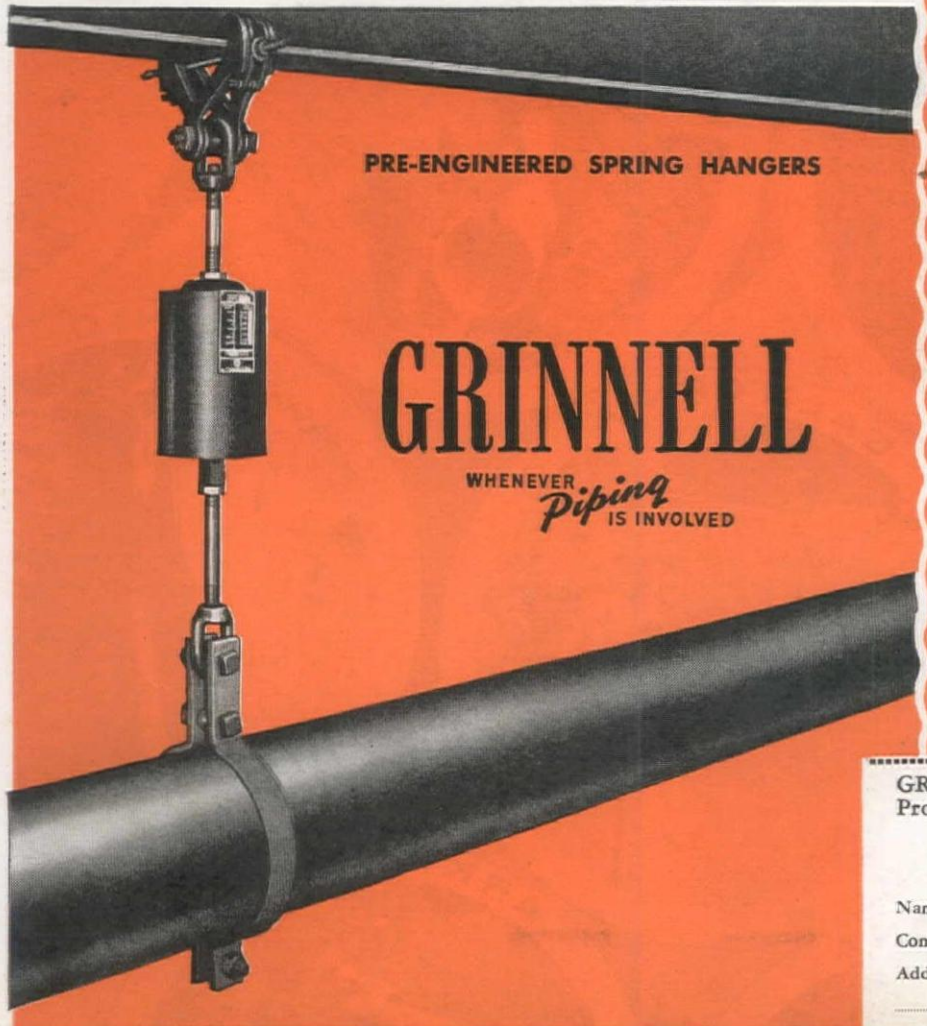
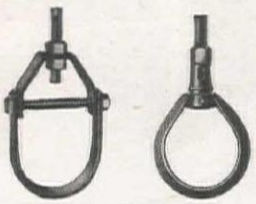


Cast Iron, Malleable Bronze and Steel, Pipe Fittings

Welding Fittings

Pre-Engineered Spring Hangers



Pipe Hangers

Also Pipe – Valves – Specialties for Heating, Water Works, Fire Protection and Pulp and Paper Mills.

GRINNELL COMPANY, INC.
Providence 1, R. I.

Please send copy of Catalog describing
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Pipe Hangers....., Spring Hangers.....

Name..... Title.....

Company.....

Address.....

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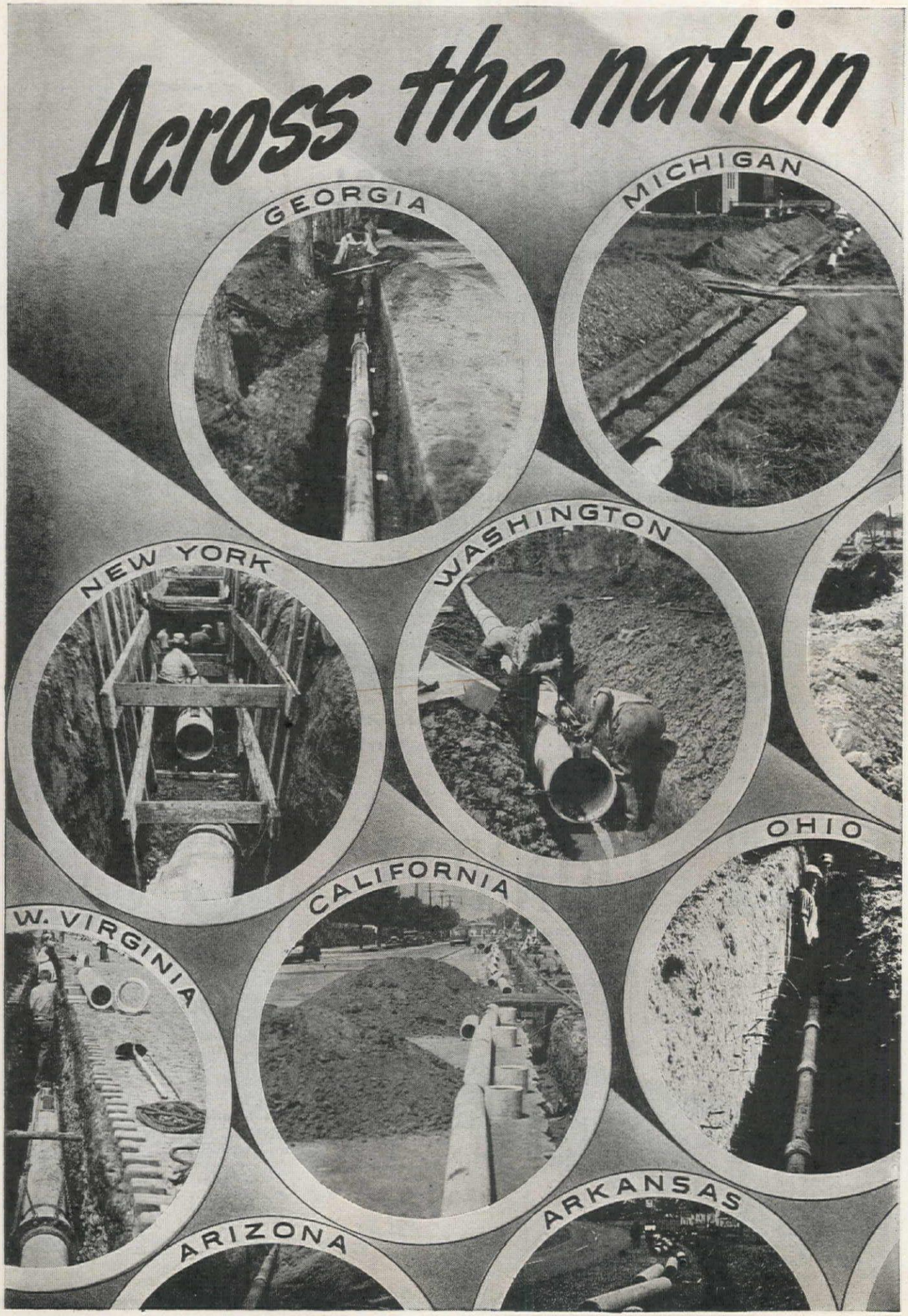
Across the nation
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..they're getting efficient water transportation at low cost with

TRANSITE PIPE

THOUSANDS of Johns-Manville Transite Pipe installations are at work carrying water for cities, towns, and villages all over America—economically providing a high rate of flow that can never be choked off by tuberculation. Made of asbestos and cement, compressed under great pressure, J-M Transite Pipe has these advantages:

Tuberculation No Problem. Non-metallic in composition, Transite cannot tuberculate. Its initial high-flow coefficient (C=140) can never be reduced by tuberculation.

Low Maintenance. Transite's corrosion-resistance and maintained strength contribute to its low upkeep cost.

Tight, Flexible Joints. Wide sweeps can be made with straight lengths because the Simplex Coupling stays tight even when the line is deflected as much as 5° at each joint.

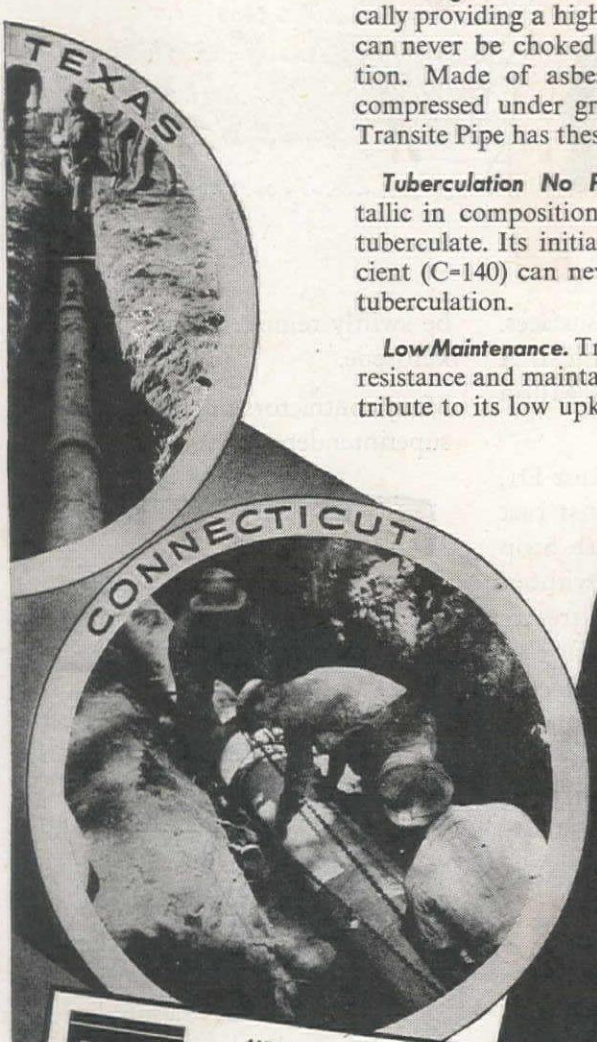
Easy Handling. Light-weight Transite Pipe requires fewer men for handling. Only the larger sizes need mechanical handling equipment.

Rapid Assembly. Even inexperienced crews form tight joints easily, quickly with the Simplex Coupling.

* * *

For the facts, write to J-M for Transite Pipe Booklet TR-11A. For details on Transite Sewer Pipe for more efficient sewage disposal systems, get TR-21A. Johns-Manville, Los Angeles, San Francisco, or Seattle.

TRANSITE PIPE IS AGAIN AVAILABLE FOR PROMPT SHIPMENT



Johns-Manville

Asbestos

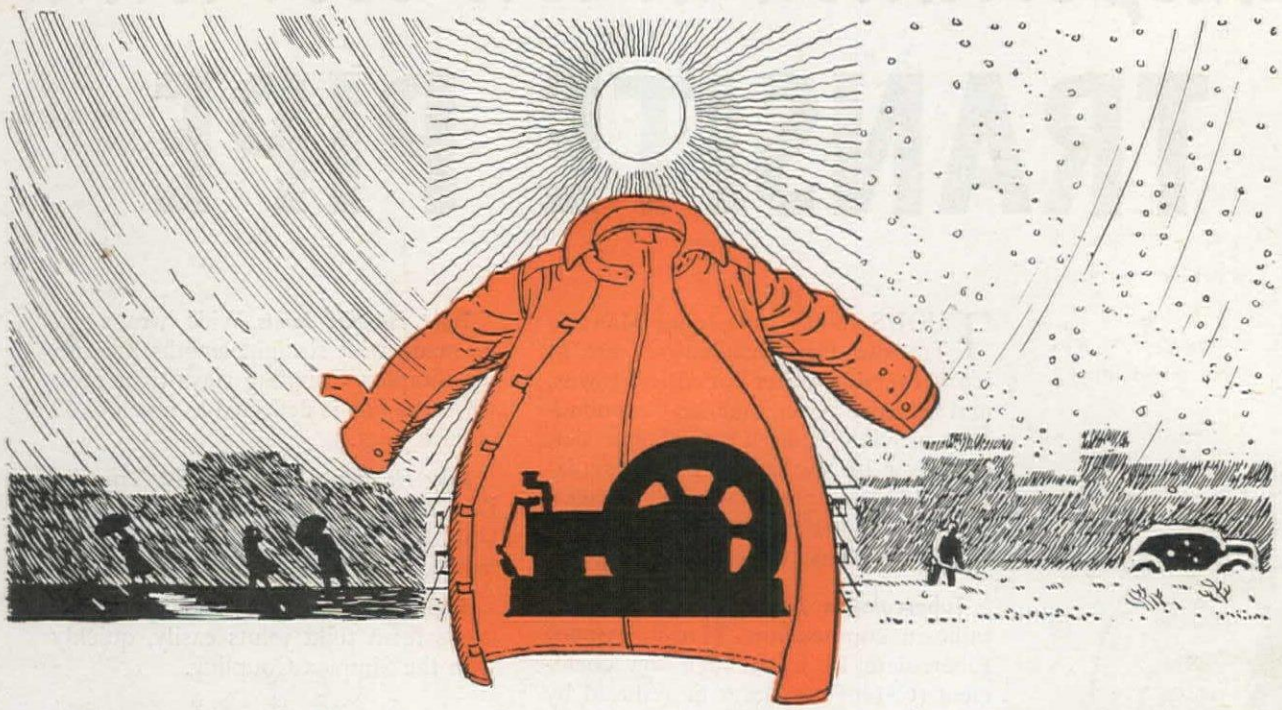
TRANSITE PIPE

JOHNS-MANVILLE JM PRODUCTS

"Blueprint Now!"

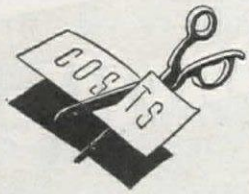
Create jobs for our returning soldiers! And benefit our cities, towns and villages. Plan *now* to improve and expand your water systems. As an aid, the Committee on Water and Sewage Works Development has a booklet entitled "Blueprint Now!" If you do not have a copy, write the Committee at Suite 2110, 500 Fifth Ave., New York 18, N. Y.

Weatherproof your equipment *now* with this revolutionary "postwar" product!



Where weatherproofing of equipment is concerned, your "postwar" product is available now!

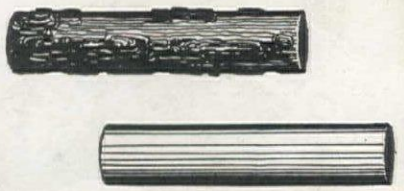
This product—known as Stop Rust D1—is a rust preventive, compounded to give the maximum exterior protection under the most severe conditions of sun, wind, rain, hail or snow.



Stop Rust D1 comes in liquid form and dries quickly to a hard, tenacious film on application. It requires no special equipment to use. You can apply it like paint—with a brush, spray, cloth, or use it as a dip coating. It will not run when applied to walls or other vertical surfaces. Stop Rust D1 is economical. A light coat is effective; one gallon covers many square feet.

When coated with Stop Rust D1, equipment is sealed against rust and dirt. Parts treated with Stop Rust D1 may be handled without damage to the coating. Extremes of temperature do not affect it. Stop Rust D1 has a high dielectric strength and will not cause current leakage. It does not interfere with the use of equipment or material treated with it, but, if desired, it may be swiftly removed with ordinary kerosene.

Many contractors and maintenance superintendents have found Stop



Rust D1 to be the almost perfect answer for the weather protection of tools, machines, sheet metal, engines, etc., whether in storage or in use.

For more information as to how this sensational product can cheaply and quickly weatherproof your equipment—or to have a supply delivered—simply phone your local Union Oil Company agent.

STOP RUST D1

Another

UNION OIL

Success-Tested Product

AMERICA IS *Built with Aggregate!*

Guardian of City Health!

Safeguarding the health of cities is one important job huge sewage disposal plants perform so ably. Contagious diseases which formerly ravaged the country have been practically stamped out by the effective treatment of sewage.

Large quantities of aggregates are used in the construction of filters, settling tanks, and buildings, in addition to the four- or five-foot thick layer of special crushed stone for the trickling filters.

Whether you are producing aggregate for municipal plants, bridges, highways, stadium or airport, you'll get better results and it will cost you less if you use Cedarapids aggregate producing and crushing equipment.

More Cedarapids equipment is now available for contractors. Let us help you secure the necessary releases and priorities.

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FAIRCHILD AERIAL SURVEY

THE CARRYALL YOU'LL NEED *TOMORROW* CAN BE DESIGNED ESPECIALLY FOR YOU *TODAY!*

TODAY special Fruehauf Carryalls are being used to haul giant fighting tanks to the battle fronts and to retrieve them when damaged by enemy fire or mechanical difficulty.

Tomorrow the heavy-duty Trailers that are having their trial-by-fire now will be all the better suited to the requirements of your job. Many of the features of these war-time Fruehaufs have always been incorporated in our units. Many other features are the direct result of war's demands and military experience.

When you work with Fruehauf on your hauling problem, you find this: it is looked upon by our engineers as an *individual* problem. There is no need or inclination to adjust your requirements to our product—because it is just as easy, and far more satisfactory, to fit our product exactly to your requirements.

The Fruehauf you need may range in capacity from 10 to 100 tons . . . it may be either a semi or full-Trailer type . . . single or double-drop-frame . . . side or rear loading . . . may have four tires or up to twenty-four . . . with any one of a number of wheel and axle combinations . . . any width . . . any length . . . the applications to your special needs are endless.

Today, of course, few Fruehauf Carryalls are being built for civilian use. But today is not too soon to consult with our engineers on getting your *postwar* Carryall designed and through the blueprint stage, ready for the production go-ahead. This costs you nothing extra and entails no obligation—but you will find that it saves you weeks in the long run.

World's Largest Builders of Truck-Trailers

FRUEHAUF TRAILER COMPANY

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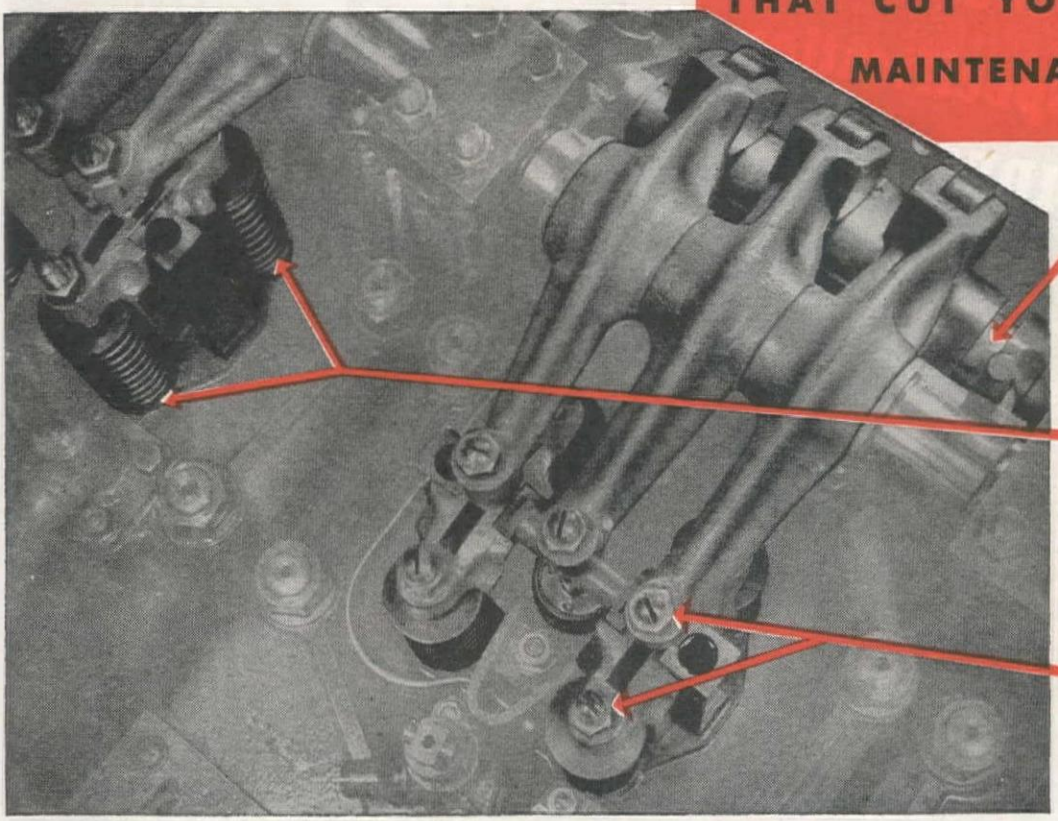
FRUEHAUF TRAILERS

THREE HENDY FEATURES THAT CUT YOUR DIESEL MAINTENANCE COSTS



1. OVERHEAD CAMSHAFT

Reduces maintenance by eliminating parts and complicated linkage.

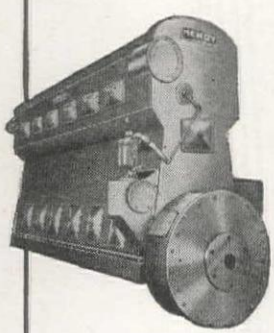
2. DIRECT-ACTUATED DUAL VALVES

Reduce maintenance by prolonging valve-stem and guide life.

3. HYDRAULIC TAPPETS

Reduce maintenance by eliminating manual tappet adjustment.

HENDY SERIES 50 DIESELS



Hendy Diesels—6 or 8 cylinders, from 350 to 675 hp—are designed for marine and industrial use—or with Hendy generators, as complete electric generating plants.

Write today for complete data, ask for the new Hendy Series 50 Diesel Engine Catalog.

These three features of the Hendy Series 50 Diesel contribute directly to the lower maintenance costs a successful Diesel operator expects and must have.

The overhead camshaft eliminates the linkage of push-rods and valve-lifters for each cylinder—cutting maintenance by reducing the number of wear points. The valve mechanism, pressure-lubricated through hollow rocker-arm shafts, lasts longer because positive-acting cross heads, or dividers, assure even pressure on dual intake and exhaust valves and eliminate side thrust. Hydraulic tappets automatically maintain correct tappet clearance at all times, making manual adjustment unnecessary.

Any one of these features in a Diesel is an aid to lower maintenance costs. But the Hendy Diesel has all three. Even more, the Hendy Diesel has many other advantages never before combined in a single engine. Investigate the advantages of this modern Diesel today.

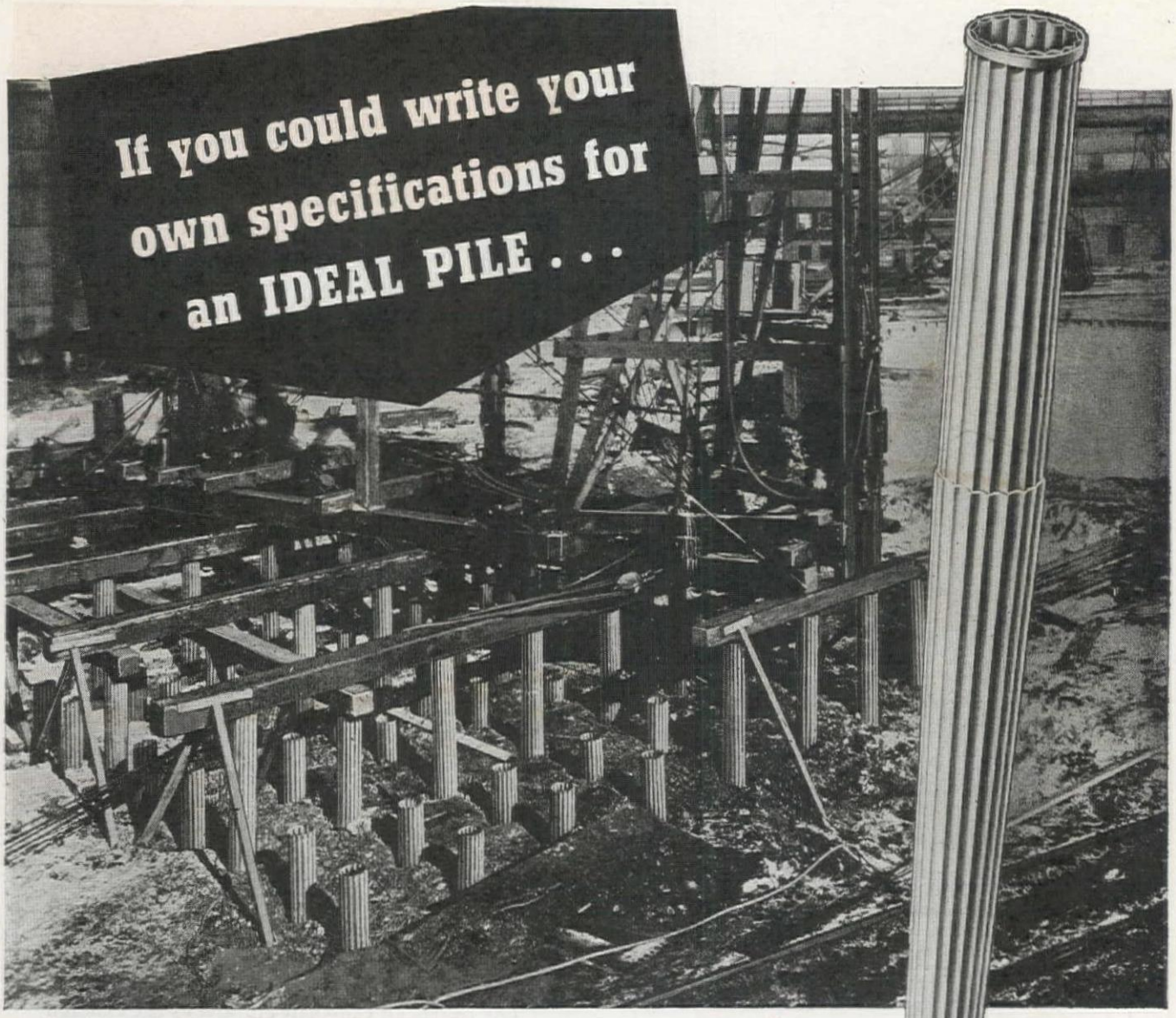
JOSHUA HENDY IRON WORKS

ESTABLISHED 1856

SUNNYVALE, CALIFORNIA

45-V

Branch Offices: BOSTON • BUFFALO • CHICAGO • CINCINNATI • CLEVELAND • DETROIT • NEW YORK • PHILADELPHIA • PITTSBURGH • SAN FRANCISCO • ST. LOUIS • WASHINGTON • LOS ANGELES



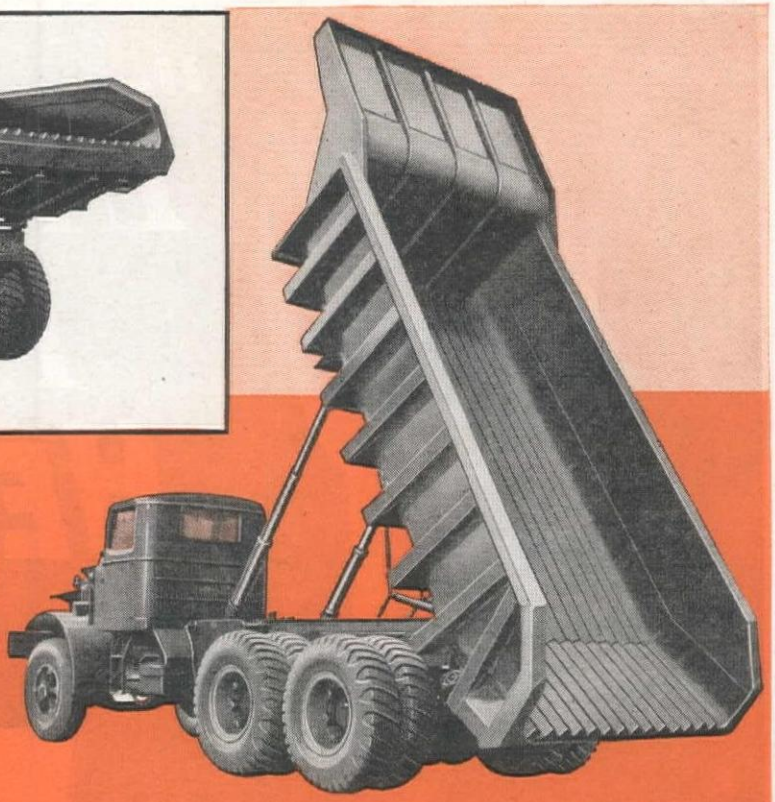
What more would you want than this?

ON thousands of jobs . . . large buildings, bridges, wharves, highway overpasses, and airports . . . Monotube tapered piles have proved themselves the last word in modern cast-in-place piled foundations. These strong, light-weight steel piles go down faster, handle easier, and lend themselves to quick, sure inspection before concreting. Tapered, cold-rolled construction gives them extra strength without extra weight. They can be driven with average job equipment . . . and *quickly extended* on the job to meet varying soil conditions. Available in a gauge, size, and taper to meet any requirement. The services of our consulting engineers are available now as always. Also, write for Catalog 68A. The Union Metal Manufacturing Company, Canton 5, Ohio.

UNION METAL

Monotube Tapered Piles

Body with open or scoop end
(Right) Same body elevated.



X-112 BODIES *and* T-4440 HOISTS *for* OPEN PIT MINING

Body with automatic
downfold tailgate.

Fleets of Trucks, equipped with Gar Wood X-112 Bodies and T-4440 Hydraulic Hoists, are hauling the biggest loads ever moved by trucks on production schedules. Lower mining costs have been made possible by speeding up the handling of overburden, ore and coal.

SPECIFICATIONS

HOIST—Hydraulic, twin cylinder, telescopic.

PUMP—Gear type with aluminum wearplates.

POWER-TAKEOFF—2-gear single speed.

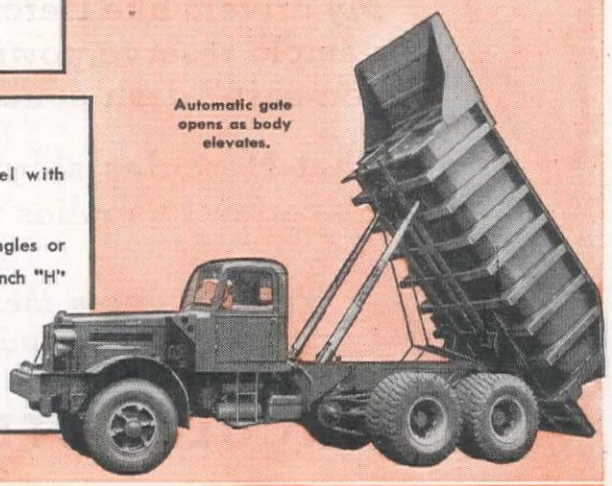
BODY—Heavy duty with pressed-steel, box-type side braces and cross members.

BODY SHELL—1/4" sheet steel with 2" wood filler.

WEARPLATE—1/4" with floor angles or 5/16" without. Longitudinals 8-inch "H" beams.

CAB SHIELD—1/4" plate.

FLOOR ANGLES—Optional.



Automatic gate opens as body elevates.

GW TRADE MARK

GAR WOOD INDUSTRIES, Inc., Detroit 11, Michigan

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

WORLD'S LARGEST MANUFACTURERS OF TRUCK AND TRAILER EQUIPMENT

"I'M SURE GLAD I PICKED HERCULES!"

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

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

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

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

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

HERCULES STEEL PRODUCTS CO.

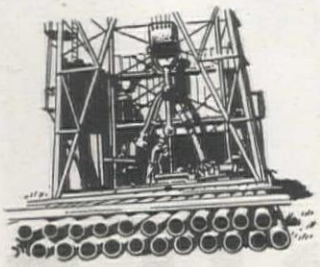
GALION, OHIO

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.

For the new dump trucks, shovels, compressors, locomotives, or the various other heavy-duty construction and material handling equipment you are planning to buy, specify Cummins Diesel power. Practically all of the leading manufacturers offer this diesel as optional equipment.

In the Northwest Woods, Cummins Diesels do the complete job—from show to siding. They power yarders, loaders and tugs . . . trucks that handle up to 240,000 pounds (three carloads). In this service, Cummins Diesels are the symbol for "cheap logs."

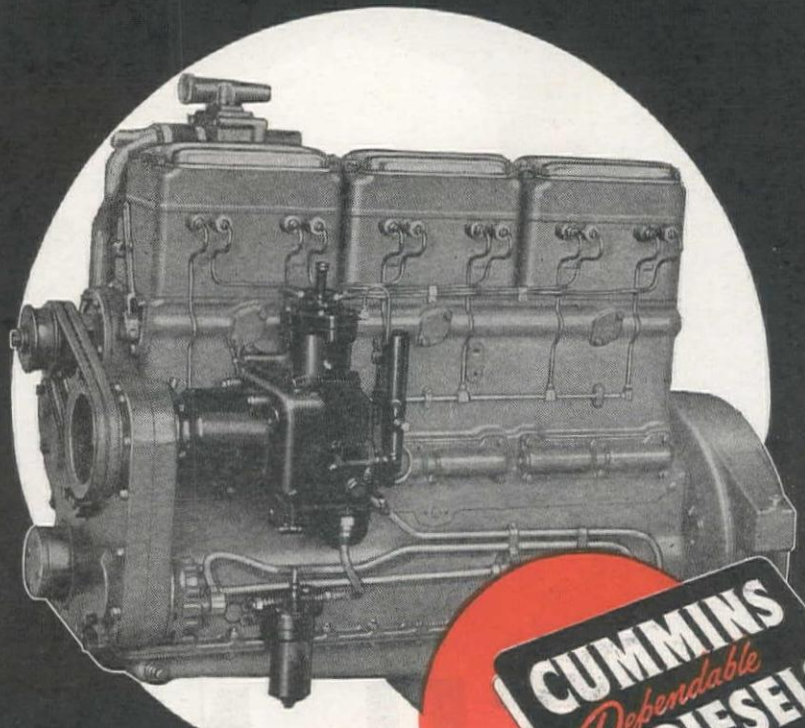
In the commercial fishing fleets of the Pacific, Atlantic and Gulf coasts, and in all types of work boats and pleasure craft, Cummins Marine Diesels—propulsion engines and generating sets alike—have become a byword for dependable, low-cost performance.



In the vast Mid-Continent area, the world's greatest oil producing territory, Cummins Dependable Diesels power more rotary and cable tool drilling rigs and oil well service units than any other make of diesel engine.

Step by Step

Tremendous weight and size greatly limited the uses of early-day diesels. Twenty-six years ago, the builders of Cummins Diesels decided to do something about that—and did! Step by step, and with *each step first tested and proved on the job,* they simplified design . . . improved construction processes . . . turned to lighter, stronger materials . . . steadily boosted the rpm. That, briefly, is the story of the modern Cummins Diesel . . . the *original high speed diesel* that, since 1932, has won its spurs on the toughest, heavy-duty jobs . . . in virtually all types of heavy-duty equipment, automotive, industrial, marine. For tomorrow, continued refinements in diesel manufacture promise a Cummins Dependable Diesel that will do your job still cheaper, still faster, still longer. So plan now to standardize on Cummins Diesel power for the equipment you will build or operate after the war. CUMMINS ENGINE COMPANY, INC., Columbus, Indiana.



CUMMINS *Dependable* DIESELS

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

Thin Grout or No Slump Concrete

...it's All in the Day's Work for Smith-Mobile Truck Mixers!

Smith-Mobile patented "T" shaped blades knead and mix the driest batches... concrete so stiff that most truck mixers would just roll it around in the drum. Then the same blades will discharge thin grout, or *even water*, right down to the last drop. No other truck mixer in the world can do this so easily and efficiently. The Smith-Mobile "T" blades are patented and can't be used in any other truck mixer . . . That's why Smith-Mobile is the undisputed champion among truck mixers.

THE T. L. SMITH COMPANY
2871 North 32nd Street • Milwaukee 10, Wisconsin, U. S. A.

Cut-away view of Smith-Mobile drum. Note spiral "T"-shaped blades which serve in a DUAL capacity, for mixing and discharging.

SMITH-MOBILE

A 4400-1P

Here's How to Protect Your Machines This Winter...

Switch Now to the Extra Safety of ALEMITE Winter Lubricants

• Your machines have really been "taking it" all summer. Terrific schedules, record-breaking heat, 'round-the-clock operation. But now you're facing winter, when ordinary greases actually *cause* friction. Your machines are too valuable, parts are too hard to get to risk breakdown. So, play safe and protect your machines! Change now to Alemite *Winter* Lubricants.

ALEMITE GEAR LUBRICANTS

Risking gears this winter means risking whole machines and your business. Alemite *Winter* Gear Lubricants withstand extreme cold and pressures and still protect hard-working surfaces regardless of conditions. Change now and save a machine.

ALEMITE WINTER MOTOR OIL

Around the clock operation wears out ordinary oil fast. Zero weather increases the risk. Alemite Winter Motor Oil—100% Pure Bradford Pennsylvania crude stock—will stand up under the severest operating conditions. Available in all S. A. E. winter grades.

ALEMITE "Sub-Zero" LUBRICANT

Guard vital bearings against cold-weather friction with Alemite Sub-Zero Lubricant. Unlike ordinary grease which actually created friction in cold weather, Alemite Sub-Zero Lubricant stays on the job at temperatures down to 40° below! Switch now and save a machine!

ALEMITE No. 33 LUBRICANT

Exclusive with Alemite! Developed to provide a working temperature range from 25° below to 205° F. Ideal for equipment where bearing loads are high and resistance to rain and muck is vital. Won't clog grease guns or bearing lubricant grooves. This *exclusive* Alemite lubricant lasts longer, too!

Call in the Alemite Lubrication Specialist to explain "on-the-job" power lubrication for complete winter protection of machines. Write for his name to, Alemite 1819 Diversey Parkway, Chicago 14, Illinois, or Belleville, Ontario.

ALEMITE

First in Modern Lubrication

LUBRICANTS • EQUIPMENT • MAINTENANCE • ENGINEERING • CONSULTATION

Another Product of STEWART WARNER

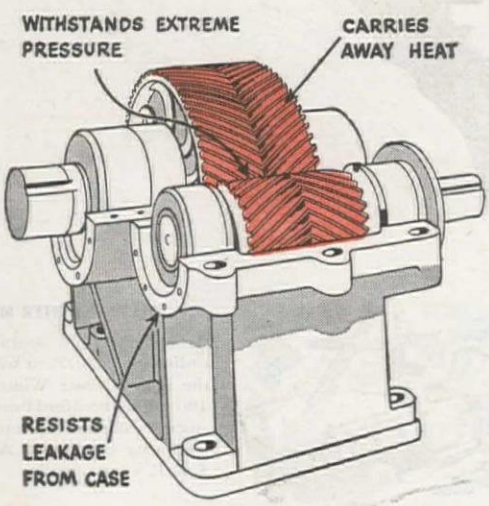
STANDARD ENGINEERS NOTEBOOK

VOL. 1-CO NO. 4

Foam-resistant lubricant minimizes gear case leakage

When incased gears, including worms, are liable to generate high temperatures because of heavy loads and speeds, RPM Gear Lubricant (Compounded) solves the problem of their lubrication. This compounded lubricant carries heat away from gear surfaces and dissipates it. By reducing friction, it also prevents excessive heat generation. Its cooling ability, plus a tendency to resist foaming, minimizes the danger of gear leakage.

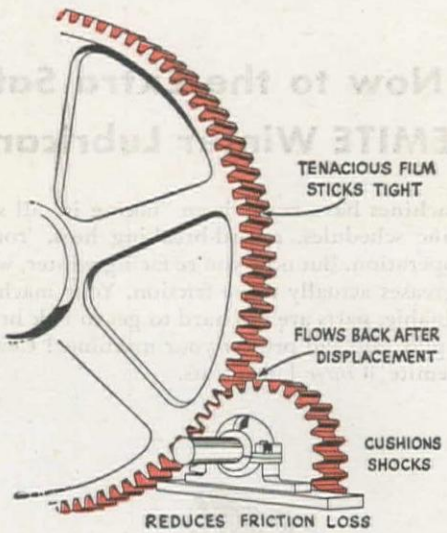
RPM Gear Lubricant (Compounded) is highly stable, resists sludging and thickening and is non-corrosive. It forms a thin pressure-resistant coating on gear surfaces which prevents welding or scoring in the event the oil wedge in front of the meshing teeth is broken.



RPM Gear Lubricant (Compounded) SAE 80, 90 and 140 is recommended for reduction gear boxes and other enclosed gears.

Adhesive greases withstand heavy gear loads

Open gears may be thoroughly and successfully lubricated with Calol Pinion Greases.



Although Calol Pinion Greases have a very high viscosity, they remain fluid enough to return to gear teeth after the sliding action of the teeth has pushed them away. Their adhesive qualities keep a tenacious film on the teeth at all times. This tough film withstands pressures, cushions shocks and reduces frictional losses.

The lightest grade, Calol Pinion Grease-0, is also recommended for grease-lubricated incased gears, particularly where climatic temperatures are low.

Calol Pinion Greases are made in four grades: 0, 1, 2, 5. The heavier grades are increasingly more adhesive and in some cases require heating for correct application.

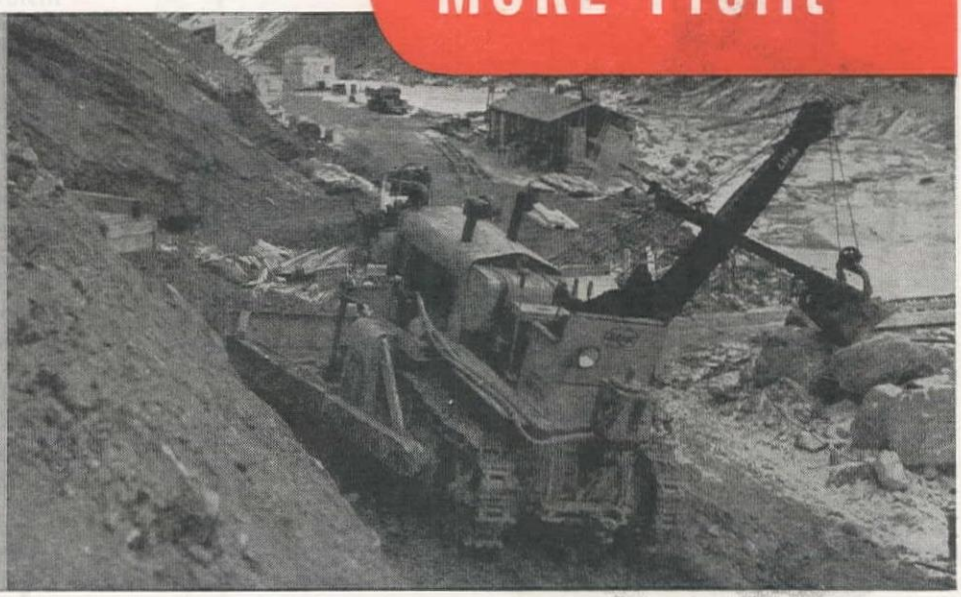
Standard Fuel and Lubricant Engineers are always at your service. They'll gladly give you expert help—make your maintenance job easier. Call your Standard Representative or write Standard of California, 225 Bush St., San Francisco 20, California.

STANDARD OF CALIFORNIA

*Tru-Traction** means MORE Traction FASTER Work MORE Profit

*Tru-Traction is power on BOTH tracks at ALL times—and you get it only with

CLETRAC TRACTORS



WHEN post-war *planning* is converted into ACTION, much will depend on the equipment you have for the big jobs ahead. Power and traction will be most important.

For ordinary jobs of earth moving, bulldozing and hauling, any equipment may suffice, but when the going is tough and competition is keen, the advantage is with the contractor who is equipped with Cletrac power and traction.

There is a good reason why the use of the Cletrac Tru-Traction principle of power on both tracks at all times has been applied to all high-speed full tracklaying military vehicles. The effectiveness of this principle (Controlled Differential Steering) has been proved over and over again, in mud and muck, over rocks and hills, the world over. This Tru-Traction principle is exclusively a Cletrac development and used solely in Cletrac Tractors for more than 25 years. It is a principle that will earn dividends for contractors whose profits depend upon power, traction, and economy of operation.

Prepare now for postwar needs. Write today for complete information about Cletrac Tractors, including the new booklet "In War and Peace Cletracs Do the World's Work."

AVAILABLE for Essential Civilian Use

While Cletrac is still producing to meet the demands of war with a large part of its standard tractor production required to meet present military contracts, over-all production of Cletracs is sufficiently large so that a substantial number of Cletracs are being released for essential civilian use. These tractors are 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.

Write for booklet "In War and Peace Cletracs Do the World's Work"

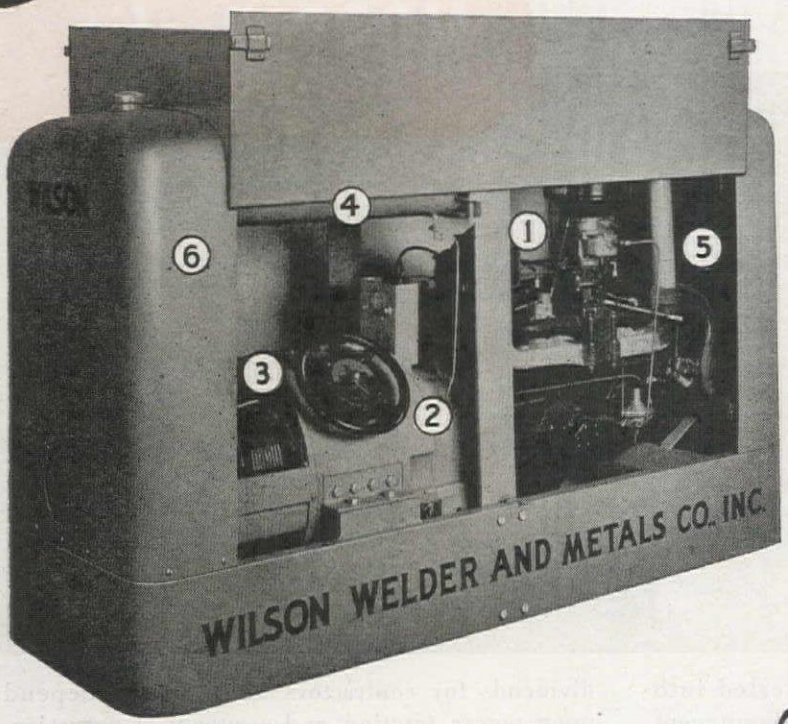
THE CLEVELAND TRACTOR COMPANY • 19300 EUCLID AVE., CLEVELAND 17, OHIO

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.

6 Features that give the "YELLOW JACKET" its famous penetrating "stinger"



1 New, improved idling device acts instantly—needs no maintenance.

2 Convenient handwheel provides easy, and accurate current control.

3 Wide current range divided into 'high' and 'low' by a Selector Switch.

4 Over-size gas tank eliminates shutdowns for refueling.

5 Industrial type radiator with protecting grille for ample cooling of engine.

6 Sturdy, weatherproof case, finished in moisture-proof enamel, completely shields internal parts against entrance of rain, sleet, etc.

THE features above are only a few of the reasons why the Wilson "Yellow Jacket" is recognized as a production-booster for field welding of all kinds. Complete and self-contained, the "Yellow Jacket" is noted for • its deep, penetrating arc • fast response • easy, accurate control • close-coupling between engine and generator • sturdy weather-resistant construction • and trouble-free, reliable performance.

It gives a maximum of service with an absolute minimum of attention and upkeep. In every respect—output, operation, convenience and maintenance—it meets the exacting requirements of pipe line welding, construction and similar field work.

Made in 200, 300, and 400 ampere sizes, the "Yellow Jacket" is supplied as a stationary unit or in two portable types. Mail coupon for free folder giving full details.

Made in Portable Types

The "Yellow Jacket" is available in two portable models: 1. Mounted on a four-wheel, pneumatic-tired* trailer unit, equipped with automobile type springs and steering gear. 2. Mounted on four-wheel trailer equipped with steel spoke wheels.

*Tires not supplied with unit.

★ BUY UNITED STATES WAR BONDS ★

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General Offices: 60 East 42nd Street, New York 17, N. Y.
In Texas: Magnolia Airco Gas Products Co. General Offices: Houston 1, Tex
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WCN

Air Reduction
60 E. 42nd Street
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Please send me free bulletin on Wilson "Yellow Jacket", ADW-19B.

Name.....

Company.....

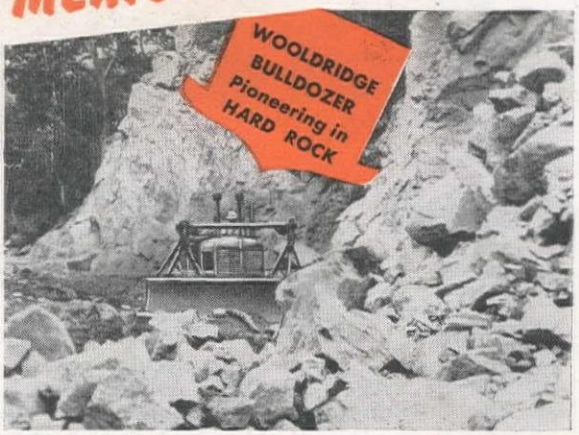
Address.....

City..... State.....

MOVING 2½ YDS. A MINUTE - 24 HOURS PER DAY!

- BUILDING MEXICO'S HIGHWAYS

Maintaining the grueling schedule of 200 trips every 24 hours, moving heaping yardages of earth requires the rugged endurance and consistent performance of Wooldridge Terra-Clipper Scrapers. Operating around the clock on Mexican highway developments, Wooldridge Scrapers continue to set a faster pace loading and spreading, larger loads, trip after trip, with less down-time for repairs. To keep your forthcoming earth-moving operations ahead of schedule, now is the time to thoroughly investigate Wooldridge Equipment. Write today for bulletin TC300 "Move Worlds of Earth in Less Time at a Lower Yardage Cost."



WOOLDRIDGE Heavy Duty Earthmoving scrapers are built in sizes ranging from 4 to 30 cu. yard capacities. WOOLDRIDGE Scrapers operate on the pivot-tilt forced load ejection principle.

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SCRAPERS • POWER UNITS • BULLDOZERS • RIPPERS • TRAIL BUILDERS

BOILING BOWL TERRA CLIPPER PRINCIPLE

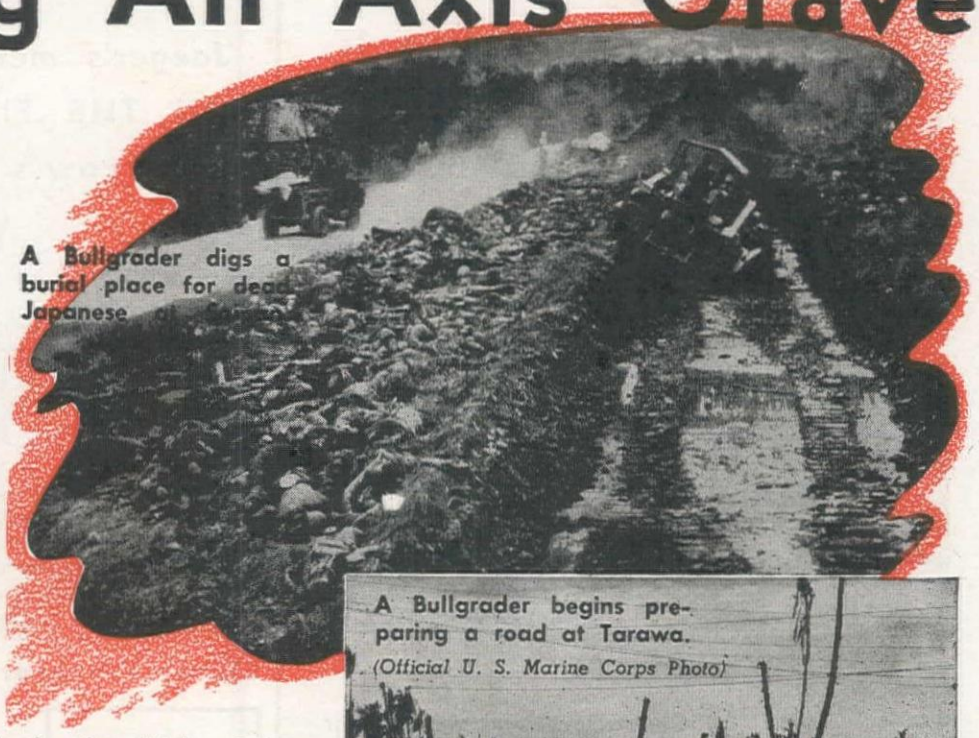
SCRAPERS

Digging An Axis Grave

An American Bullgrader digging, literally, an Axis grave is symbolic of the jobs dirt-moving equipment has done to speed complete Victory. On every front, the work of bulldozers, Dozershovels, scrapers, etc., hastens the final funeral of the frenzied fanatics.

On every front, too, Bucyrus-Erie tractor equipment like the Bullgrader above is in the thick of it. Outstanding as always, now it is helping prepare the Axis burial.

N-71C

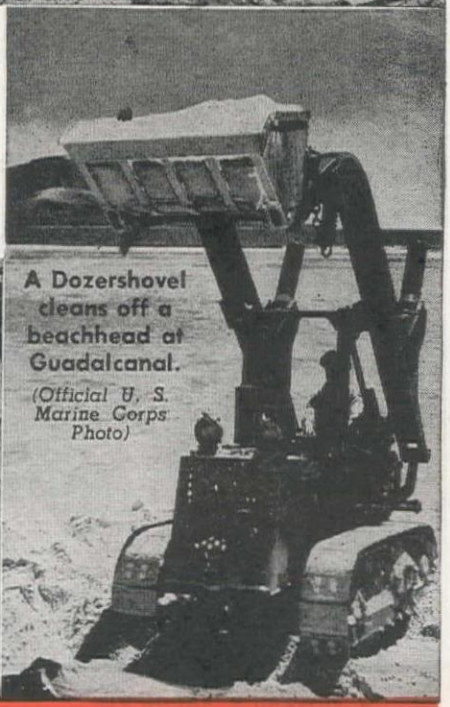


A Bullgrader digs a burial place for dead Japanese

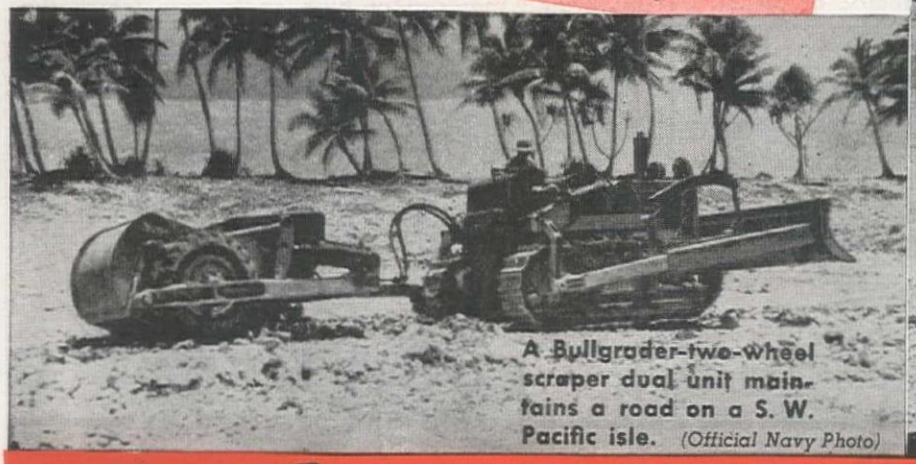
A Bullgrader begins preparing a road at Tarawa. *(Official U. S. Marine Corps Photo)*

Most of our production must still go to our armed forces; a limited number of machines is, however, now available for high priority civilian operations. Be sure to see your International TracTracTor Distributor for information on new machines, rentals, and service.

BUCYRUS-ERIE CO., SOUTH MILWAUKEE, WISCONSIN



A Dozershovel cleans off a beachhead at Guadalcanal. *(Official U. S. Marine Corps Photo)*



A Bullgrader-two-wheel scraper dual unit maintains a road on a S. W. Pacific isle. *(Official Navy Photo)*

BUCYRUS ERIE TRACTOR EQUIPMENT

SEE YOUR INTERNATIONAL TRACTRACTOR DISTRIBUTOR

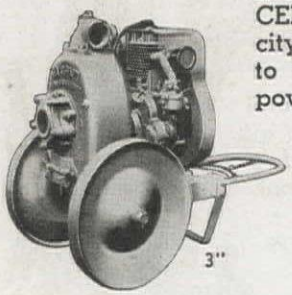
LOOK AHEAD WHEN YOU BUY

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.



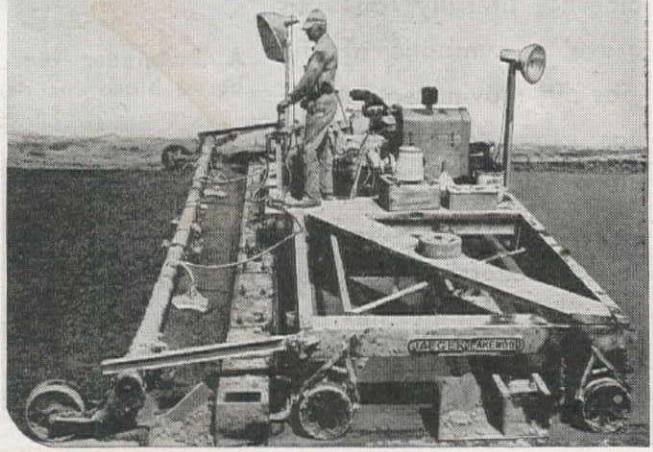
3"

10"

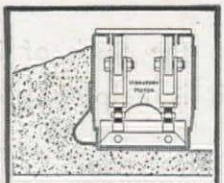
JAEGER DISTRIBUTORS in over 100 cities sell, rent and service "Sure Prime" Pumps.

LOOK AHEAD WHEN YOU PLAN

Jaeger's method of VIBRATION ON THE FINISHER will meet tomorrow's specifications . . .



Either Vibratory Tube or "Bullnose" Vibratory Screed



Gives DEEP INTERNAL Vibration of the Mass

"Bullnose" front screed, equipped with vibratory motors, crowds material under, insures deep internal vibration of entire mass and maximum density of slab from form to form — the original and unfailingly successful Jaeger method. Compare this with mere surface vibration which, tests show, does not efficiently overcome porosity at base and sides.

Although Jaeger can furnish a vibratory attachment for use on Concrete Spreaders if desired, the recommended Jaeger method of *vibration on the Finisher* has proved superior for any true vibratory mix. On an efficiently run job, only the Finisher has time to go back for more than one vibratory pass, as often needed. Also, it is the machine which always finishes to form level, thus insuring an over-all vibrated surface. (No low spots to be filled with unvibrated material or high spots from which the vibrated surface may be torn as is possible when vibration is on the Spreader.)

To meet future specifications we recommend the Jaeger Vibratory Finisher with "bullnose" screed giving DEEP INTERNAL VIBRATION and maximum density from form to form, or, where conditions are suitable, the use of a Vibratory Tube on *the Finisher*.

JAEGER *Engineered* EQUIPMENT

is sold and serviced by

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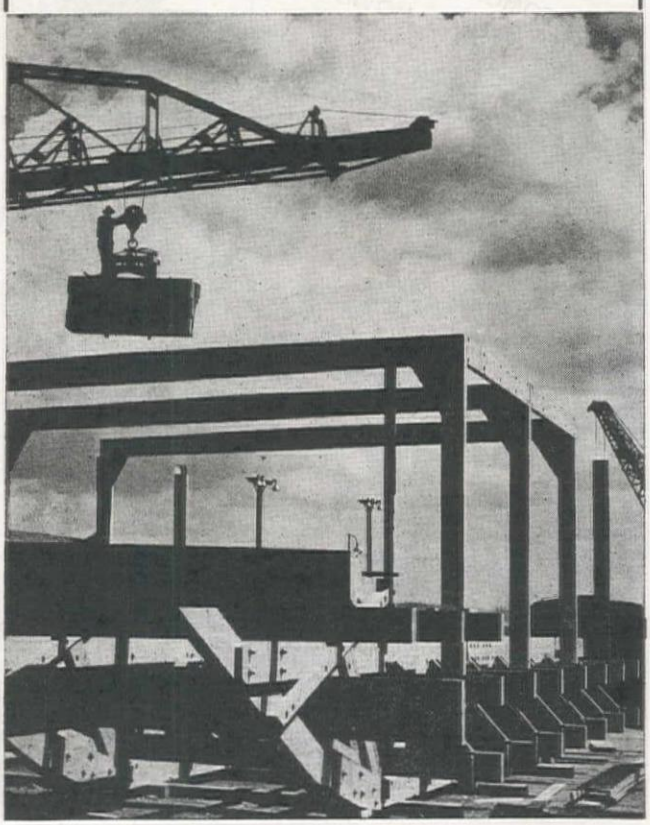
TIMBER *plus* TECO

MEANS MODERN ENGINEERING
APPLIED TO HEAVY-DUTY WOOD STRUCTURES

Test assembly in fabricator's yard of (30' x 100' x 8') knocked-down 300-ton capacity barge with deck cabin 26' x 60' for use by the Army Engineers in northern rivers and lakes designed and fabricated for easy field assembly by Henry Mill and Timber Company Tacoma, Washington.



Postwar projects will profit by the tremendous progress made in the designing and construction of heavy timber structures.

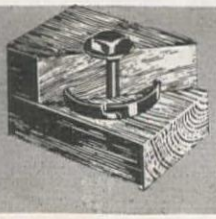
As you work on specifications and designs for after-the-war timber structures it will pay you to check up on what others have done with the aid of TECO connectors.

Heavy structural dimension and timbers are available for essential construction. Expert timber fabricators are ready to quote you.

Write or call our Western service and sales office for quick action on TECO timber connectors and grooving tools. Informative, illustrated booklets and helpful bulletins sent to you on request—use the coupon.

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

Monadnock Building, 681 Market Street, San Francisco



SPECIFY TECO CONNECTORS
SPLIT RINGS • SHEAR PLATES
GROOVING TOOLS

KEEP ME POSTED

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"MEASURED AIR" PROVIDES

- MORE POWER
- LONGER LIFE
- LESS OPERATING COST
- MORE WORK DONE FASTER

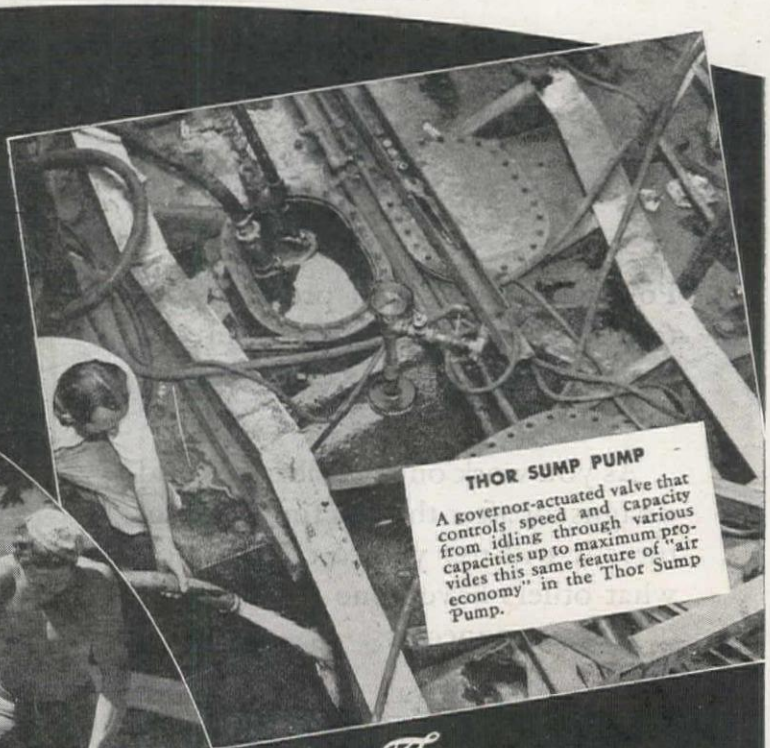
Thor "AIR ECONOMY"

FIGURED IN YOUR POST-WAR EQUIPMENT PLANS WILL SAVE YOU TIME, CUT COSTS . . . GET TOMORROW'S JOBS STARTED FAST AND MOVING!

THOR PAVING BREAKERS

Thor Paving Breakers, light, medium and heavy duty models, are equipped with the same "measured air" type of short-travel tubular valve as Thor Rock Drills.

The Paving Breaker valve actuates a block type piston, powering it with exactly the quantity of air required for both the forward and return strokes . . . minimizes vibration . . . makes the machine easy to handle.



THOR SUMP PUMP

A governor-actuated valve that controls speed and capacity from idling through various capacities up to maximum provides this same feature of "air economy" in the Thor Sump Pump.

HOW Thor "MEASURED AIR" ECONOMY WORKS!

Short-travel valve action is the real secret behind Thor "measured air" economy.

The shorter the travel, the more *positive the action* of the valve in admitting to the tool only the required amount of air—in instantly sealing the inlet against excess air.

Short-travel action *reduces wear* on the valve, retains positive "measure" of air for a greatly extended period of service.

Short-travel valve action powers each stroke of the tool with the same quantity of air—providing *smooth, uniform operation.* Elimination of excess air keeps out of the channel the overload of power that staggers the stroke and causes vibration.

THOR ROCK DRILLS

Six light, medium and heavy duty models for all rock formations.

THOR DRIFTER ROCK DRILLS

One light, and one medium weight model, hand or power feed, for all hard rock drifting.

THOR STOPER ROCK DRILLS

One medium, and one heavy duty model for stoping under all drilling conditions.

THOR PAVING BREAKERS

Four light, medium and heavy duty models for all demolition work.

THOR CLAY AND TRENCH DIGGERS

One light, medium and heavy duty model of each for all tunnel and wall work.

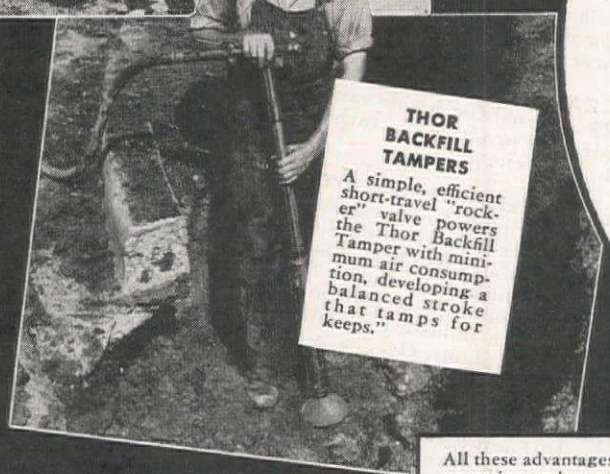
WITH ALL THESE

Thor CONTRACTORS' AIR TOOLS!

The maximum power, balanced stroke and ease of handling provided by exclusive Thor *"measured air"* construction is available in every one of these Thor Contractors' Air Tools to save you time and operating costs on *all* construction jobs.

THOR CLAY DIGGERS

Air that powers the stroke of Thor Clay and Trench Diggers is measured by a new short-travel cylinder "rocker" valve which provides *perfect sealing and control* of required pressure for driving the piston.



THOR BACKFILL TAMPERS

A simple, efficient short-travel "rocker" valve powers the Thor Backfill Tamper with minimum air consumption, developing a balanced stroke that tamps for keeps."

THOR ROCK DRILLS

A short-travel tubular valve, heat-treated for durability and precision-ground for perfect fit, "measures" air that powers all three types of Thor Rock Drills—Sinkers, Drifters and Stopers.

Only the precisely-governed quantity of air required can enter any of these drills—controlled with .0002" between the valve flange and chest shoulders through which the air enters and returns.

This precise control of air consumption provides steady power and smoothness in the *automatic rotation* of these drills. *Controlled air* driving the piston gives the steel on the working end maximum forward and rotative action . . . assures fast drilling speed!

All these advantages of "air economy" are but part of the operating and money saving benefits you get with Thor Air Tools. For particulars about *automatic rotation . . . cushioned action . . . automatic lubrication . . . exclusive retainer design,* and many other Thor features, write today for Catalog No. 42-A.

THOR SUMP PUMPS

One current model, designed for all jobs under most unfavorable conditions.

THOR BACKFILL TAMPERS

One light and one heavy duty model for tamping clay and other stiff materials.

Thor *Portable Pneumatic and Electric Tools*

INDEPENDENT PNEUMATIC TOOL COMPANY

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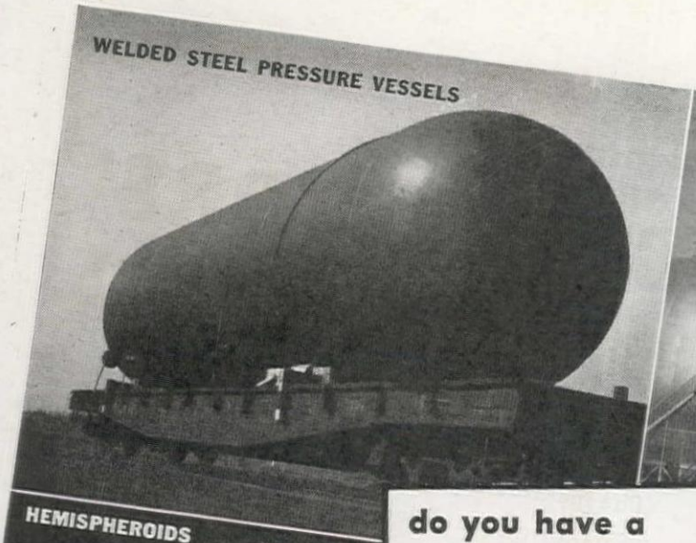

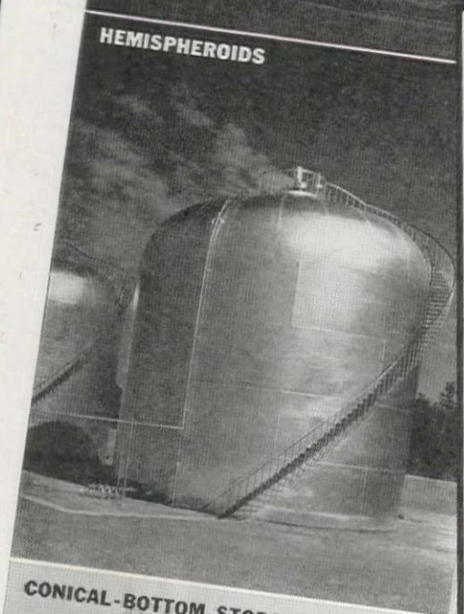

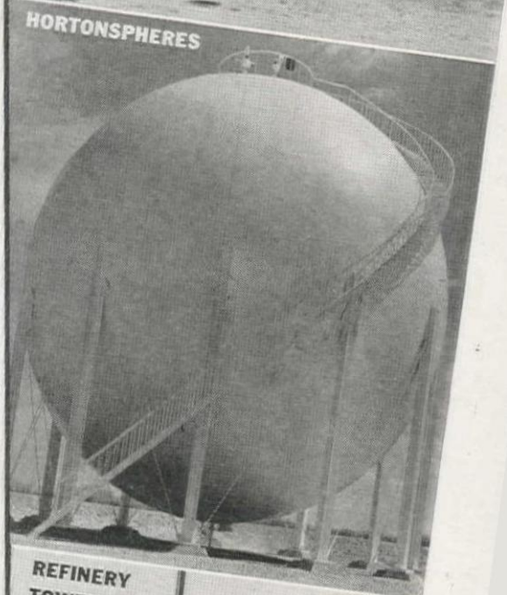

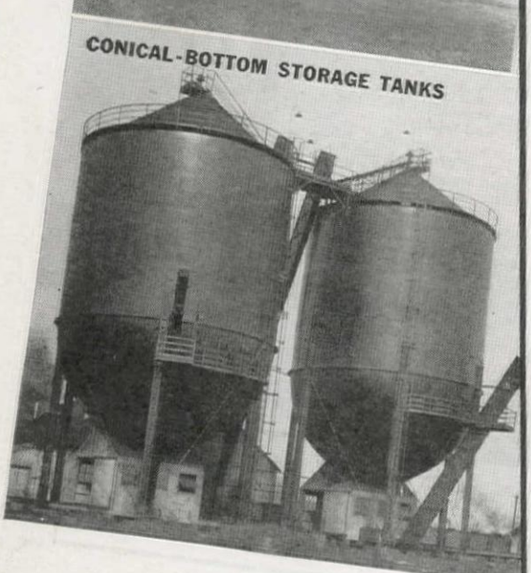

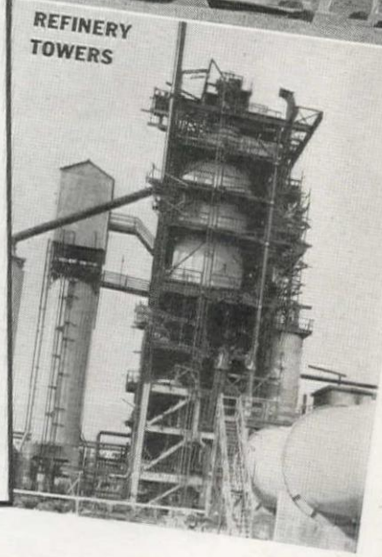

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...find your answer here

HORTONSPHERES . . . for storing highly volatile products such as butane, isobutane, butadiene, helium, and a wide range of industrial gases. Available for pressures up to 100 lbs. per sq. in.

HORTONSPHEROIDS . . . ideal for storing natural gasoline and other petroleum products. Plain type Hortonspheroids are available in standard capacities of 2,500 to 40,000 bbls. for pressures up to 35 lbs. per sq. in. Noded Hortonspheroids are built in capacities up to 120,000 bbls. for pressures up to 20 lbs. per sq. in.

HEMISPHEROIDS . . . for efficient storage of products that are only slightly volatile, such as aqua ammonia and distillate. Available in sizes up to 20,000 bbls. for pressures up to 10 lbs. per sq. in.

CONICAL-BOTTOM STORAGE TANKS . . . used for a wide range of industrial products . . . carbon black, lime, etc.

WELDED STEEL PRESSURE VESSELS . . . Stripper Towers, Regenerator Towers, Fractioning Columns, Reaction Chambers, Flash Towers, Stabilizing Columns for aviation gasoline plants, the synthetic rubber industry, chemical and process plants, etc.

The storage tanks and pressure vessels shown here represent only a few of the types designed and fabricated in our plants to meet the needs of industry. Let us know your specific storage problems . . . write our nearest office.

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CHICAGO • HOUSTON • TULSA
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WESTERN CONSTRUCTION NEWS
WITH WHICH IS CONSOLIDATED WESTERN HIGHWAYS BUILDER

October, 1944 Vol. 19, No. 10

Construction Guys Are Tough

CONSTRUCTION GUYS are tough, generally. The camp of a gang of steel workers or tunnel men is no place for a pantywaist, and the amateur at poker had better stay out of the game. The Seabees, Navy construction battalions, are said to build their various assignments with the tools of their trade in one hand and a machine gun in the other. Their almost unbelievable accomplishments are well known to everyone.

But as is so frequently the case with tough people, many of them have hearts as big as the great projects they build, and appeals for help from genuinely needy people never fail to gain a generous response. For instance, ever since about 1200 American civilian construction men were captured by the Japanese at Wake, Guam and Cavite, and interned in prison camps, their welfare and that of their families has been the concern of their fellow workers in this country, through an agency quietly set up to receive the voluntary donations and disburse them to the best advantage.

For this reason, *Western Construction News* has no hesitancy in urging its readers to listen carefully to the call now being made by the War Chest campaign in practically every community. We know that the need is real, brought on by circumstances beyond the control of the victims, and that our readers will respond heartily and generously.

It is true that there is some hope of an early conclusion of fighting in Europe. But this will not end the war. It must be fought to victory in the Pacific, too. The U. S. O. installations on the Pacific Coast will be more crowded than ever with service men going to and returning from the Pacific action. The end of the war will not signalize sudden plenty for all of the people of enemy-held countries. Our aid, through the various War Chest groups, will have to be continued until they can rebuild their native economies.

Our help to prisoners of war will have to be continued. They will not automatically be released the day that firing ceases. Their rehabilitation and that of wounded men will be a long and, if done properly, an expensive process, one in which all of the Chest agencies will have a part.

The merchant fleet will be very busy for a long time after the war, supplying armies of occupation, transporting released men home, and commencing normal trade relations between countries. Work in behalf of the huge force of merchant seamen will have to be continued.

Then the local welfare agencies have had, not a decrease, but an increase in their work due to the war. Homeless families, juvenile delinquents, unfortunates of other kinds will continue to need help and guidance in 1945 as much as in 1944, and their number will not decrease.

We appeal, then, to every reader, for a generous response to the call of the War Chest. If you've given already, call the Chest, and give some more. Don't give because the boss has handed you a pledge card. Don't give because someone else is, or because this magazine or anyone else urges you to do so. Give because there is suffering, and sorrow, and hardship, all about us, and because these move you, and because your money, wisely administered through the Chest agencies, can accomplish a real benefit to unfortunate humanity.

Christmas Is Coming

CHRISTMAS IS in fact here and gone for quite a few people. The millions of Americans who last month sent Christmas packages to loved ones overseas, have already experienced the annual thrill of giving some small gift to a friend or relative as an expression of continued love and high regard.

But there still remain those to whom gifts will be sent at the regular Christmas season. Our readers are engineers and construction workers. Their friends are in the same business. They read *Western Construction News* because it carries information of value and pleasure to them. Almost daily we receive letters approving our material—just look at "The Editor's Mail" column on page 93 of this magazine.

We suggest, then, as a fitting and very acceptable Christmas gift to construction men, either at home or in the armed forces, a subscription to *Western Construction News*. Due to the paper shortage, the number of new subscriptions we may accept is limited, but it is still possible to take some and guarantee immediate delivery, starting with whatever month is desired. For economy's sake, and to be sure of continuous service, we suggest the two- or three-year subscription. A subscription card will be found bound into this issue. Use it now, or if more than one is desired, just write your wishes in a letter. If it's to be a Christmas gift, mention the fact and we will send you a special gift card to be signed and forwarded with the first issue.

Watch Out, California!

WESTERN CONSTRUCTION NEWS does not enter into politics, and although the editors have strong personal opinions on candidates and issues, they are not injected into the pages of the magazine.

But because the issue transcends politics, we feel obliged to call California's attention to Proposition 11 on that state's November ballot.

This is known as the "60 at 60" amendment, and is a new version of the Ham & Eggs proposal beaten a few years ago. Its undesirable features are covered over with a commendable apparent desire to adequately care for our aged citizens. Incidentally, the term "60 at 60" is misleading, since sixty dollars is the minimum pension, and it may run as high as $180 per person. We call attention to these facts:

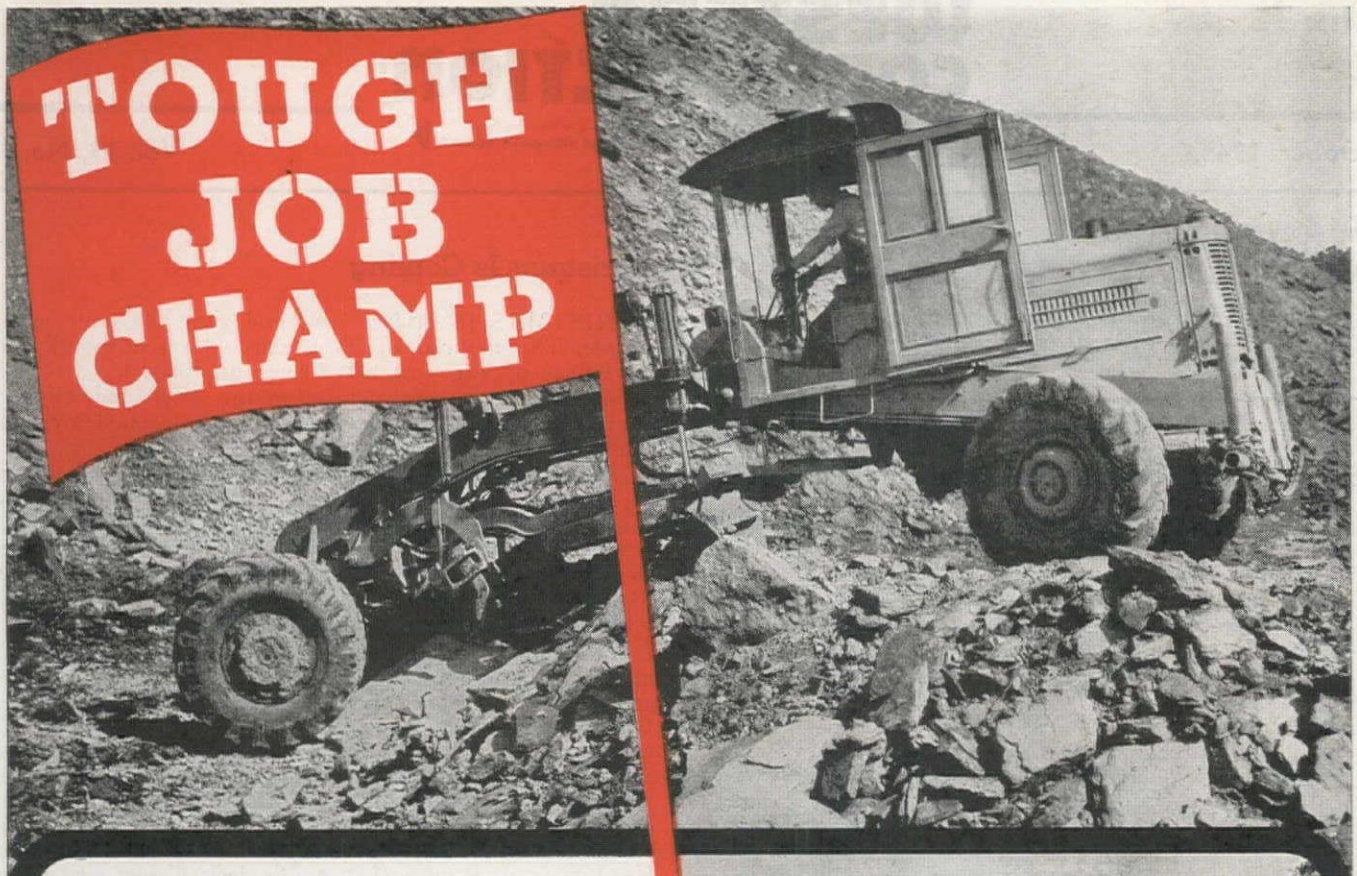
1. The 2½ per cent retail sales tax will be abolished and a 3 per cent **gross** income or receipt tax, which would be added over and over as a given object travels from the producer to the consumer would be substituted. Each purchaser's tax would be several times 3 per cent.

2. The "purchasing power" argument is that it is beneficial to give the fruit of a worker's effort to one who does not work, because that increases purchasing power. The mere statement of the proposition is its own answer.

3. It is claimed that removal of those over 60 from the labor market will increase employment opportunities. True, within limits. If all over 40, or 30, or 20, were removed and put on pension, the same argument applies, but obviously to a ridiculous extent. No worker, holding an important position will desire to leave it for a modest pension. Those who will retire are the ones who hold undesirable or insignificant positions, and those who, after years of sloth, would suddenly be in receipt of what amounted to a fortune.

With every respect to our retired citizens, this editor urges Californians not to approve an economically unsound pension system at the polls. Vote "No" on No. 11.

TOUGH JOB CHAMP



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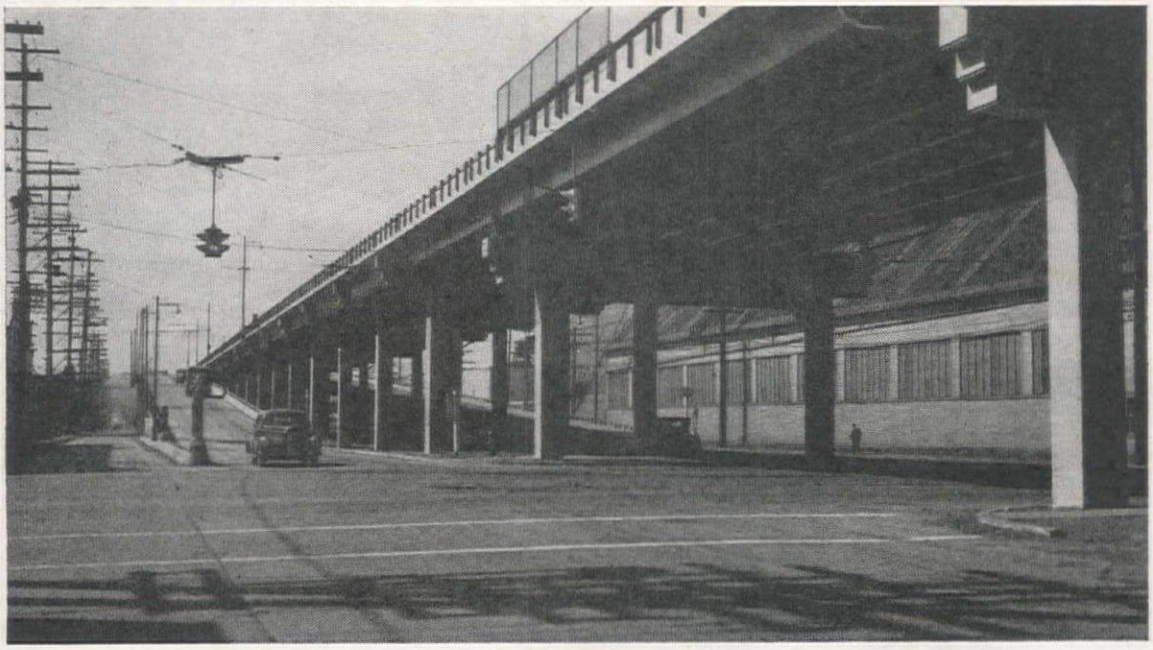


Grade Separation—
Seattle Completes 4300-ft. Viaduct

Wartime traffic congestion on Spokane Street has been remedied by construction of a 4-lane structure crossing 4 railroad tracks and 4 arterial highways—Completion handicapped and delayed by material shortages—Interesting removable column forms developed by contractor

By RAY. M. MURRAY
Member Am. Soc. C. E.
Resident Engineer, Washington Dept. of Highways, Seattle, Wash.

A 4300-FT. VIADUCT structure has recently been completed on Spokane St., one of Seattle's most heavily travelled thoroughfares carrying, normally, a traffic volume of approximately 40,000 vehicles per day.

The structure conveys traffic on that part of Spokane St. crossed by eleven railroad tracks and three primary cross-arterials for motor vehicles.

History

Some 40 years ago Spokane St. was marked only by railroad trestles and a street car trestle leading to West Seattle. As is true today, this was the only land access to West Seattle within a distance of two miles from the central business district of the city. At that time the street lay across tide flat area inundated at high tide. Later, hydraulic filling reclaimed a large area in the south part of the city for industrial sites, waterway, railways and business enterprise. Subsequently, Spokane St. became a major thoroughfare, occupied to some extent by railroad tracks which gradually were removed until now it is given over wholly to vehicular use.

With rapid growth of the city, consideration was given to grade separation projects. Four major trunk-line railroads, running north and south, together with subsidiary tracks, cross this arterial. East Marginal Way, First Ave. South and Fourth Ave. South, crossing Spokane St., carried almost 60,000 vehicles per day as shown by traffic figures for 1942.

On August 24, 1911, Virgil G. Bogue, planning engineer, in conjunction with the Municipal Plans Commission, submitted a "Plan of Seattle" report. This study and report contemplated some grade separation work in connection with Spokane St.

Under date of May 31, 1930, the Grade Separation Commission of Seattle submitted to the Mayor and City Council the results of their studies of the subject of grade separation in the south end industrial district. This report conveyed recommendations, plans and estimates of cost covering proposed general grade separation projects in the district and included elevated structures on Spokane St.

The next incident in the consideration of grade-separation projects for Spokane St. was in 1935. Country-wide work programs being set up at the time included grade separation proposals wherein allotments of Federal funds were made to assist railroads in the elimination of hazardous crossings.

In the list of grade separation projects of that series Spokane St. was not consummated although considered important. It was largely on account of the cost that it was not carried through at that time.

Increasing traffic volume on Spokane St. pointed to the necessity of better means of handling the crossings of railroads and streets, particularly during periods of heaviest travel to and from defense projects and war industries.

Preparation of plans

Preparations were begun early in 1941 looking toward a prompt start on construction of the project. An agreement contemplating the expenditure of approximately $1,000,000 for construction was entered into by the United States Government, the City of Seattle, the four railway companies, and the State Department of Highways represented by Burwell Bantz, Director. George H. Shearer is District Engineer for the Department at Seattle. The work has been designated as a Federal Aid Grade Crossing Project.

Of the total cost, somewhat in excess of $1,000,000 including right-of-way, the Government furnished $340,000 of federal grade crossing funds and $150,000 of federal access road funds. The railroads contributed $250,000. The remainder of cost was made up by the city from the allotment of state gas tax funds. Chas. L. Wartelle is City Engineer.

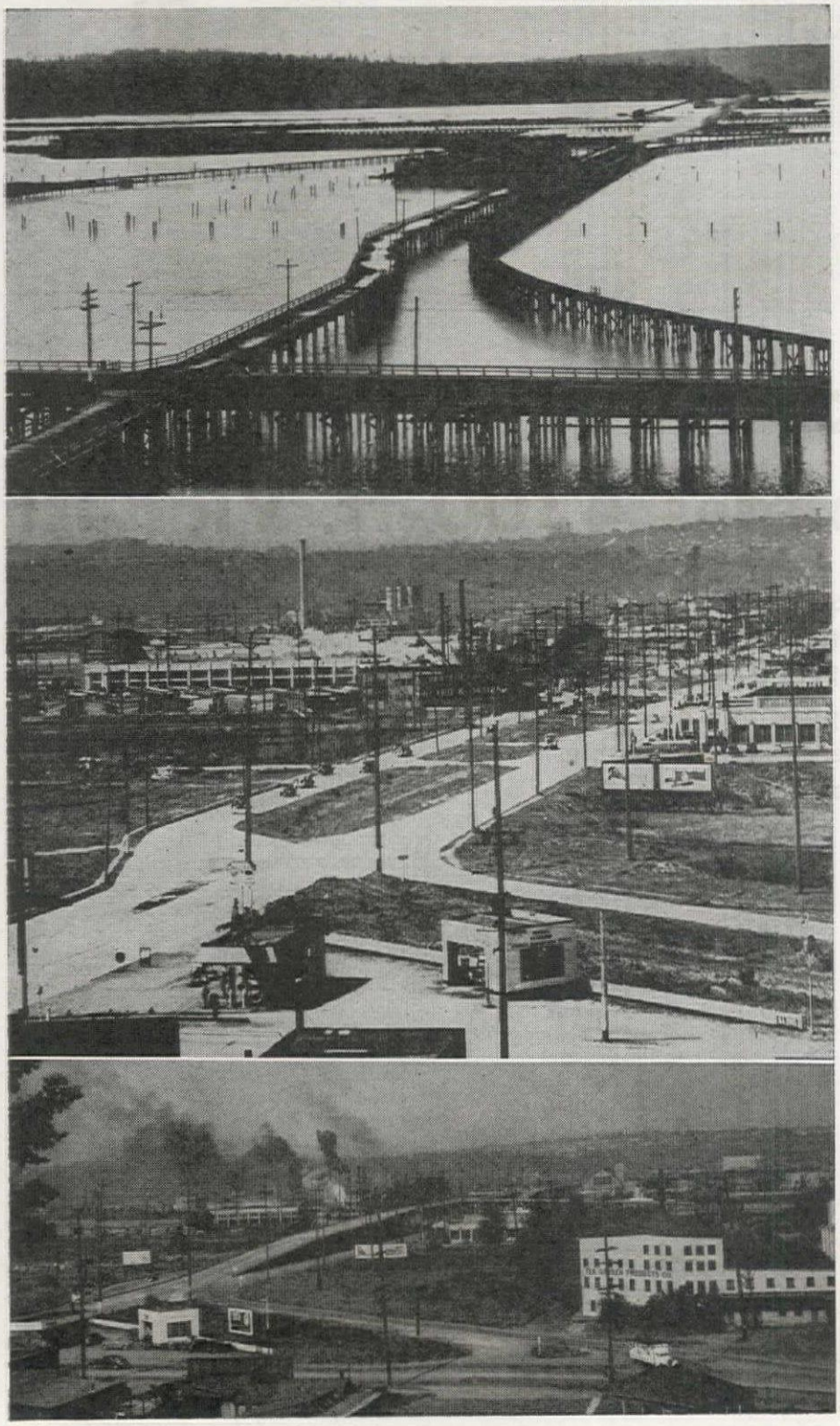
Surveys and foundation explorations were completed by the City Engineering Department. Plans were drawn in the offices of the City Engineer. In view of federal funds contributed, the design and construction were required to conform to specifications and regulations of the U. S. Public Roads Administration. W. H. Lynch, Portland, Ore., is District Engineer for the P. R. A.

On improvements of city streets, as well as on State highways outside of city corporations, wherein federal funds by way of P. R. A. participate, direct administration of preparation of plans and specifications and construction operations is handled by the State Department of Highways. R. W. Finke is State Bridge Engineer.

Standard specifications of the American Association of State Highway Officials, 1941, were used as the guide in preparation of plans and specifications. The writer was placed in charge, for the state, cooperating with City Engineer's designing force, in the drawing of plans and specifications.

Construction details, materials and workmanship conformed to the Standard Specifications for Road and Bridge Construction adopted by the State of Washington Department of Highways, January, 1941.

IN 1905, SPOKANE ST., built on trestles, lay across tide flats (upper). Hydraulic filling reclaimed this area and by 1941 the street became the principal cross-arterial (middle). Traffic congestion necessitated the building of a viaduct (lower).



Structural design

Design live loading is A. A. S. H. O. Standard H-20. Principal construction materials are wood, steel and concrete. Early in the preparations for construction it was realized that, with the funds available, only a portion of the length of Spokane St. could be elevated.

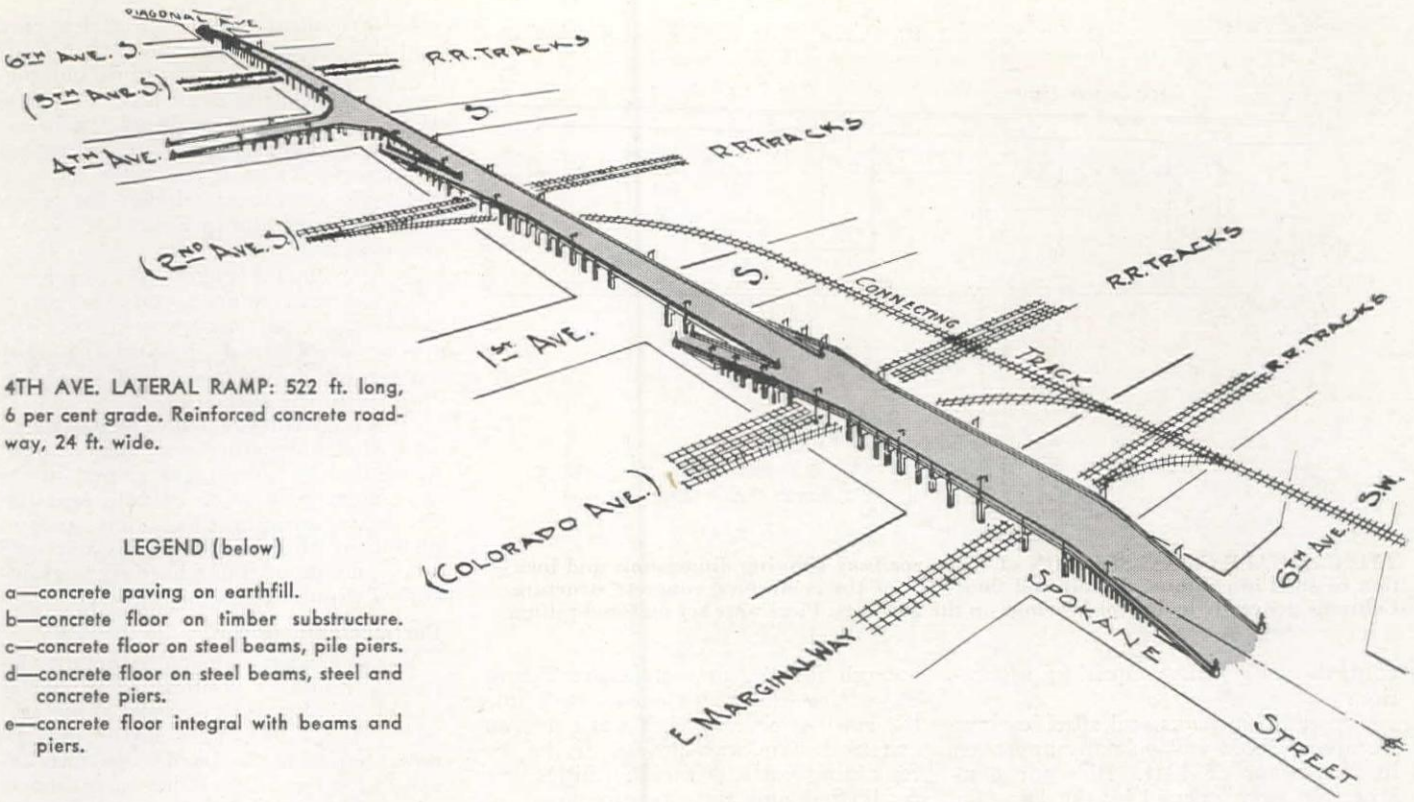
It is planned to eventually carry the elevated structure for the full distance of about 7,500 ft. from Eighth Ave. South to the West Waterway Bridge. Total length of the presently completed structure is 4,284.2 ft. Of this distance approximately 1,180 ft., at the ends, has been built with timber substructure and timber stringers supporting a reinforced concrete slab floor. There are about 3,100 lin. ft. of permanent construction of steel and concrete. The semi-permanent construction comprises the west ramp from Sixth Ave. S. W. to East Marginal Way and the east ramp from Diagonal Ave. to the Fifth Ave. S. railroad tracks. When the continuation of elevated construction is undertaken, only the 1,180 ft. of present timber end ramps will have to be removed.

A clearance of 24 ft. over base of rail at railroad crossings was maintained with a straight profile line over the length of the permanent construction.

The side ramps between First Ave. So. and the Colorado Ave. railroad tracks had to be held to 22 ft. between curbs because of limited width outside the ramps for two traffic lanes on the ground.

The general width of Spokane St. is 150 ft. Where side ramps come to street grade a sidewalk 5 ft. wide is provided for, leaving a width of 20 ft. 6 in. outside the ramps, at street level, for two lanes of traffic.

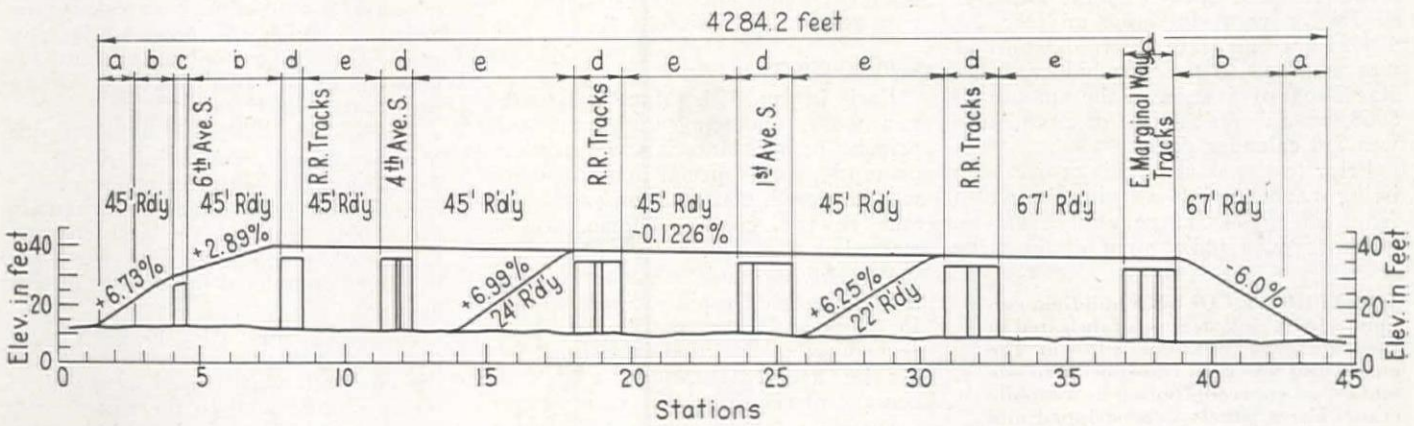
Primarily to facilitate interchange of traffic between the new structure and



4TH AVE. LATERAL RAMP: 522 ft. long, 6 per cent grade. Reinforced concrete roadway, 24 ft. wide.

LEGEND (below)

a—concrete paving on earthfill.
b—concrete floor on timber substructure.
c—concrete floor on steel beams, pile piers.
d—concrete floor on steel beams, steel and concrete piers.
e—concrete floor integral with beams and piers.



Fourth Ave. S., toward the city, a side ramp just west of Fourth Ave. carries westbound traffic up to elevated roadway. A lateral ramp from the structure at Fourth Ave. conveys traffic north toward the city. These ramps have 24 ft. roadways. Crossing traffic lines on the structure at Fourth Ave. are controlled by signal lights.

There are no sidewalks on the elevated structure. Curbs are 18 in. in height. Rails are of steel angle posts with timber strings.

The three side ramps and one lateral ramp are of permanent construction, although bids were received on alternate semi-permanent design for them.

Not counting the four permanent ramps of reinforced concrete and fills amounting to approximately 1,750 lin. ft., there are 2,188 lin. ft. of reinforced concrete elevated structure made up generally of 3-span or 4-span units—each span being 40 ft. 6 in. center-to-center, except where different lengths were required to fill intervals between crossings.

Columns and girders

Piers common to two units were slotted

VIADUCT CROSSES 4 sets of railroad tracks, has 3 side ramps and 1 lateral ramp. The roadway has a minimum width of 45 ft. and ramps have a maximum grade of 6.99 per cent.

to provide for temperature deformations in the "rigid frame" units. Except at fixed posts the columns of units have "pivot" bearings on footings. All piers of elevated structure are founded on wood bearing piles—treated where cutoff is at or above low water plane, and, untreated for continually wet penetrations. Several piers required special treatment of footings where conflicting with locations of utilities. Bearing piles were driven to a safe load-carrying capacity of 15 to 22 tons.

At railroad and arterial crossings wide-flange steel girders were used, the spans ranging in length from 22 to 84 ft. Longer spans were incorporated in 3-span continuous or cantilever arrangements. At First Ave. S. the 3-span crossing has a middle opening of 84 ft. Side spans are 53 ft. each. The symmetrical suspended span is 60 ft. long and the cantilever arms are 12 ft. each.

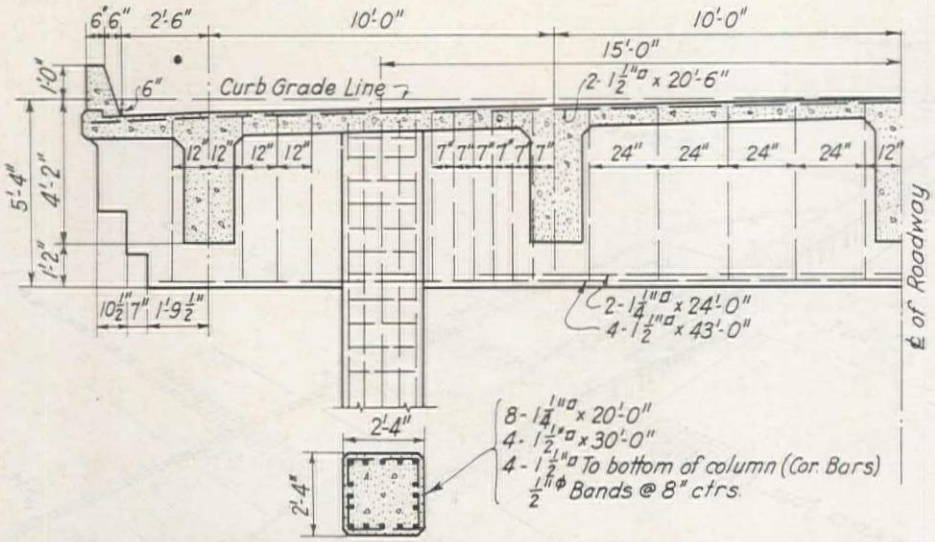
East Marginal Way crossing, 183 ft. 6 in., is a continuous-girder arrangement with a middle span of 57 ft. 6 in., each side-span being 63 ft. long.

The semi-permanent approach ramps at the ends of the elevated structure are of standard design timber trestle. Piles and outside stringers are creosote treated. Timbers in framed bents and the inner stringers are untreated fir. A standard reinforced concrete floor was placed on wood stringers.

End ramps leading onto the main structure are earth-filled from 0.0 up to a height of about 5 ft. Retaining walls of these fills are of 4 x 12 in. creosoted fir bulkhead planks retained by 7-in. 80-lb. railroad-rail stanchions driven on 8 ft. 1-in. centers and anchored.

Pendant lighting units are supported by tubular steel poles attached generally at cross beams outside the curb. At the bottoms of ramps and on the structure where side-ramps leave the main roadway, sodium-light safety island beacons were installed on concrete pedestals.

About 1,450 lin. ft. of pre-cast, white-cement-faced reflecting curb on the center-line of the roadway assists traffic



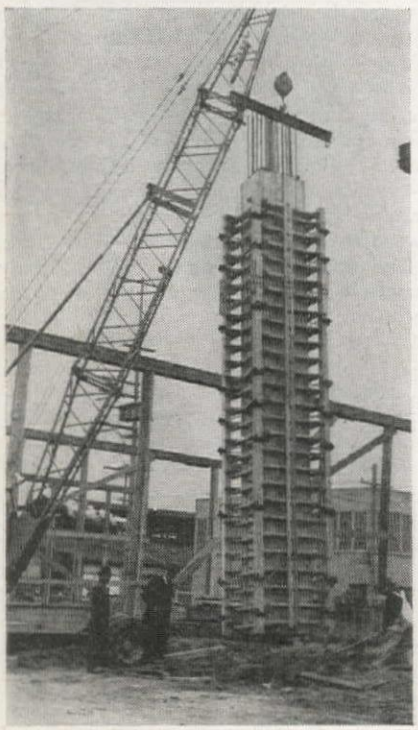
TYPICAL HALF CROSS-SECTION of 45-ft. roadway showing dimensions and location of steel in columns, beams and floor slab of the reinforced concrete structure. Columns generally had pivot bearings on the footings. Piers were set on wood piling.

control along runs requiring separation.

Construction plans and specifications were completed and officially approved in November of 1941. Bids for construction were opened by the Director of Highways at Olympia on Dec. 23, 1941. Four bids were received. Contract was awarded to the low bidder, MacRae Bros. of Seattle, in the amount of $968,855. Scheduled time of completion was 360 calendar days.

Prior to the start of this project, existing paved strips, varying in width from 30 to 44 ft., generally, left an unimproved middle strip about wide enough for the new structure excepting where side-ramps occur. Preceding the start of construction work this unoccupied strip was cleared of the few remaining railroad tracks; utilities were readjusted and the area prepared for construction activities.

TO EXPEDITE COLUMN building, column reinforcing steel was fabricated in yard and placed in assembled form. The entire unit was then transported to site and set on concrete footing by a mobile crane. Form panels were stripped and re-used.



Construction

Early in Jan., 1942, MacRae Bros. began work, operating under an A-1-e priority rating. Materials were ordered promptly, some special items of equipment ordered, construction yard set up and re-use concrete form sections started.

Pile-driving and substructure footings progressed rapidly. Some columns for piers and bents of reinforced concrete were poured and false-work piles for the superstructure over a large percentage of the distance were driven.

Due to war demands and the nature of priority regulations it presently became difficult to secure deliveries of reinforcing steel even approximately on schedule. Numerous changes were made to permit alternate reinforcing steel that could be obtained reasonably soon. Even so, progress was slow and it became evident that a higher priority rating would be required to effectuate deliveries.

On June 30, 1942, the A-1-e priority expired and no preference rating was in force. Use of materials on hand or available through small incidental purchases, and work that could be done by changes or substitutions, progressed slowly until August, when the work came to a stop.

Concurrent with the shortage of reinforcing steel and timber for forms and false-work, schedule delivery of the steel girder beams for crossing openings was frustrated. Some of the structural steel had been delivered, and other sections were in the fabrication shop. However, not enough steel members were on hand, or on the way to delivery, to complete one of the crossing units.

With no immediate relief in sight, consideration was given to the use of what structural steel had been delivered and the shapes in the fabricating shop. By re-design and substitution, completion of the spans over East Marginal Way and over the railroad tracks on Colorado Ave. to such an extent as would afford use of the outer lanes of the main structure and the side ramps from the west end to First Ave. S. was possible.

A supplementary agreement was made with the contractor, a consignment of reinforcing steel necessary in concrete work was obtained on special priority arrangement, and the work done according to the special plans.

Although this procedure increased the cost of the structure materially, it was warranted by advantages gained in the movement of traffic. Middle lanes of the main structure were left uncompleted in this temporary layout and heavy, concrete traffic barriers were installed around such openings.

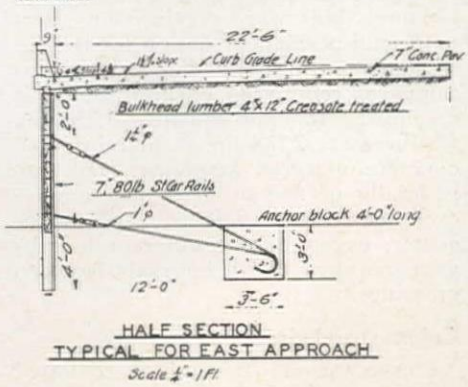
Partial completion

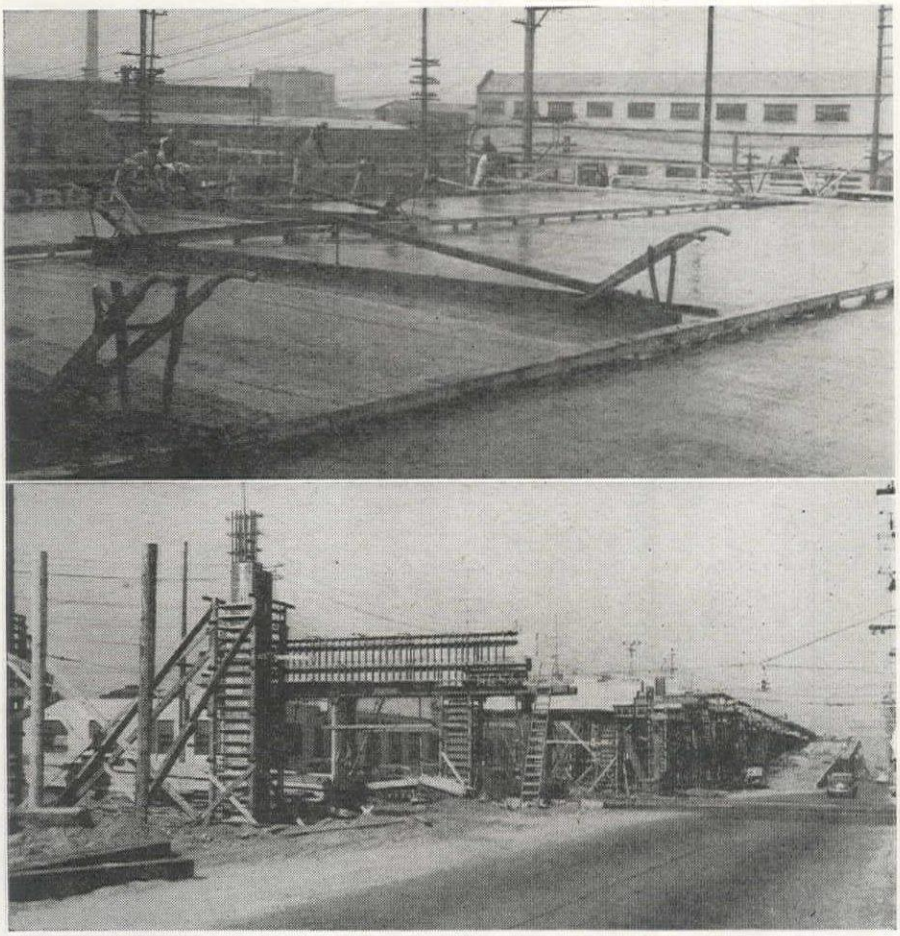
For several months construction materials remained critical. The partly completed structure was placed in service in Jan., 1943. This move substantially bettered the traffic situation insofar as it extended. With no prospects in sight for obtaining necessary materials to finish the project, the contract was by mutual agreement terminated at a "final" estimate of approximately $637,000.

Much of the remainder of the project had been built, consisting mainly of foundation piles in place, some piers, a considerable proportion of the remaining timber work at the east end and false-work piles. Some form-work also had been completed but could not then be used.

Not long after the partially completed project was opened to use, and the contract work closed, renewed interest was devoted to the urgent need of a completion of the whole plan. Through the offices of the Director of Highways, O. R. Dinsmore, Construction Engineer, and J. W. Hoover, Office Engineer, assisted by the City Engineer and other interests, a new priority AA-3 was obtained. Remaining work was advertised. On this, the successful bidder was MacRae Bros., at a price of $496,169.80.

CREOSOTE-TREATED bulkhead timber used for the east approach was retained between ball and flange of second-hand streetcar rails, anchored to buried concrete blocks.





SCREEDS USED during placing and finishing roadway slabs (upper) were laid longitudinally. They were removed and slab finished just after initial set of concrete. West approach to viaduct during construction (lower).

Construction work was renewed on May 5, 1943. Materials came forward in reasonably prompt order. The job was completed, dedicated and turned over to full use on Jan. 25, 1944.

Final amount of the two contracts for the complete project was $1,155,553.21. That portion of the above figure caused by delays, substitutions, partial completion, traffic guards, etc., was in excess of $100,000.

Construction methods

No decidedly unusual methods for construction were required. However, the contractors should be credited with a number of unique processes in their conduct of operations. In spite of difficulties in securing materials, numerous occasions on which labor shortage became serious, and compliance with the regulations in force covering equipment and procedure, the job was well equipped and handled.

Limited yard space was utilized in an orderly way, provided with storage shed, temporary sawmill and portable tools for fabrication of sectional form units, assembly of reinforcing steel and fabrication of some units of it in the yard. A 15-ton electric yard crane, a blacksmith shop, portable power saws, air-compressors and acetylene burner combinations were among the yard items of equipment.

Piles were driven with a single-acting hammer in 70-ft. leads on skids, and a ¾-yd. power shovel when rigged with suspended leads.

Pre-mixed concrete was delivered to the portable job-hopper by Pioneer Sand and Gravel Co. of Seattle. The contractor's hoist and tower lifted the concrete to pouring elevations. From an elevated hopper, on wide area pours, the concrete was buggied to the forms. Concrete was vibrated by six air and electric vibrators.

Semi-trailer trucks, dump trucks, a flat-bed 2-ton truck equipped with cherry-picker and 5-ton hoist attachments, and the usual smaller tools, attended the job.

A 15-ton "General Supercrane," with outriggers, mounted on three axles with heavy-duty duals, procured particularly for this task, performed worthy all-round service.

The special design of sectional re-use form work for columns, developed by the builders, proved very efficient in use. Generally the column reinforcing steel was fabricated in the yard and placed in its assembled form. The whole was then transported to the site and set on the concrete footing.

For the floor slabs on spans ¾-in. plywood forms were used with well-arranged means for easy removal.

The writer was Resident Engineer for the state, on construction, until Nov., 1942. The work was completed under supervision of H. H. Damman, Resident Engineer.

Water, Sewage Needs are Inventoried in Report

DEFICIENCIES IN WATER SUPPLY, sewage disposal, and other sanitary facilities in many urban and rural areas throughout the United States now menace the health of millions and cause huge economic losses each year, the Sanitary Engineering Division of the U. S. Public Health Service, Federal Security Agency, reported recently.

The report was contained in a summary of four studies completed to date in a National Inventory of Needs for Sanitation Facilities conducted by the Public Health Service.

New sanitation facilities which would cost an estimated total of three and a half billion dollars — but which would largely pay for themselves in savings of health and economic laws—are needed as quickly as supplies of labor and materials and other practical considerations, permit their construction, the Public Health Service sanitary engineers reported.

The latest of the series of studies, an inventory of rural sanitation needs, shows that more than 5,000,000 rural homes now need new or improved water supplies, and that more than 5,000,000 rural homes—including 846,148 entirely without toilet facilities—need sanitary privies as a minimum.

The inventory, based on an analysis of census reports, shows that an estimated 50,000,000 people, or 12,000,000 families, are not now served, and probably could not readily be served, by public water supplies, and that a total of approximately 6,550,000 rural homes are not supplied with running water.

It would cost about $265,000,000 to provide safe water supplies for the 5,294,000 rural homes which need them, Public Health Service sanitary engineers estimate.

They also estimate that it would cost about $180,000,000 to provide privies for the homes now without sanitary facilities and to replace half of the 8,505,572 existing outside toilets, about 50 per cent of which are insanitary.

An inventory of public water supply facilities, another study in the series, indicated that new and extended public water supply systems costing $803,300,000 are needed to serve adequately the 86,300,000 people who now are served, or could be served, by public water supply facilities in the Nation's communities with a population of 200 or more. This total includes $180,960,000 to construct 4,863 new water supply systems for 4,863 communities, $502,340,000 for extensions and improvements of existing systems in 6,455 communities, and $120,000,000 for softening of all water supplies needing such treatment but not now receiving it.

An inventory of public sewage needs in states indicated that there is need for $2,255,150,000 worth of new or additional sewers and sewage treatment systems for 13,915 out of 16,752 communities in the United States.

Canol Project—
Construction's Biggest Transport Job

BRIDGE OVER the Macmillan River on Canol Road is blanketed with snow. Telephone line will be used in operation of pipeline. Piling covered with sheathing for winter protection.

—All photos by Richard Finnie

River steamer and barges, tractor and truck trains, dogsleds and airplanes used to send men, equipment, material and supplies across the unexplored north to build Canol pipeline and refinery — Winter road building program equalled Alaska military highway in audacity

BEFORE CANOL'S pipelines and refinery could be built it was necessary to spend a tremendous amount of time, energy and planning in transportation of men, suppljes and equipment across unbelievably vast expanses of virtually unexplored terrain, through weather often well below freezing. Access to the region simply did not exist and not a foot of pipe could be laid until a road was cut through.

A discussion of the location of the Canol system and construction techniques employed on the pipeline and accessories was presented in *Western Construction News* for September, but the rigorous battle of transportation was not discussed at that time.

Under strict Army regulations which kept its existence unknown to the American public for many months, the Canol project started about the first of June, 1942, with the arrival at Edmonton, Alta., of organizations of officers of the Corps of Engineers, U. S. Army, and representatives of the organizations of the contractor, Bechtel-Price-Callahan, San Francisco, Calif., and the architect-engineer, J. Gordon Turnbull, Cleveland, Ohio, and Sverdrup & Parcel, St. Louis, Mo. U. S. Engineer troops numbering about 2,500 were on the way to Waterways, rail terminal, 300 mi. north of Edmonton, and with them went the first consignment of pipe, 15,000 tons of it. This was for use in the Norman Wells to Whitehorse crude oil line.

For exploration of a route for the crude oil line, an airplane was sent north from Edmonton to Norman Wells on June 6, 1942, and thence to Whitehorse over the Mackenzie Range on June 12.

Headquarters were established at Edmonton, the most northerly city in Canada. This was to remain and grow into Canol's general headquarters for the life of the project.

The greatest problem

Since transportation offered the biggest problem of the entire project, it was responsible above all else for the length of time required to complete it, and for the cost involved, some $134,000,000, according to the Secretary of War. Thousands of workers and hundreds of thousands of tons of materials, equipment and camp supplies required transportation from Edmonton through 1,600 miles of inaccessible country, normally closed to heavy movement during a large part of the year.

People with experience in northern transportation were called in and plans laid. By July 1 the entire river-lake route from Waterways usually is open. As quickly as possible the 1942 stream of men and materials started. By mid-June the first consignments started on

the long water route, 300 mi. by rail from Edmonton to Waterways, 285 mi. by barge and boat down the Athabaska river, across Lake Athabaska, and down the Slave river to Fitzgerald, then a 16-mi. portage around rapids to Fort Smith, down the Slave 190 mi. to Great Slave lake, 150 mi. across the rough waters of Great Slave to the head of the Mackenzie river, and 500 mi. on to Norman Wells, 75 mi. south of the Arctic Circle.

The water route

Canadian carpenters and laborers hurriedly built a camp and loading facilities at Waterways; prefabricated barges were assembled, and with troops handling the first pontoon-supported rafts, freight started from Waterways.

Hudson's Bay Company and the Northern Transportation Company owned the principal existing facilities for water travel, were prepared to handle about 10,000 tons in a summer season. The normal volume of movement had not abated; it was, in fact, stepped up. Add to this the contractor's need for moving at least 30,000 tons in the first season, and the sizable nature of the problem becomes apparent.

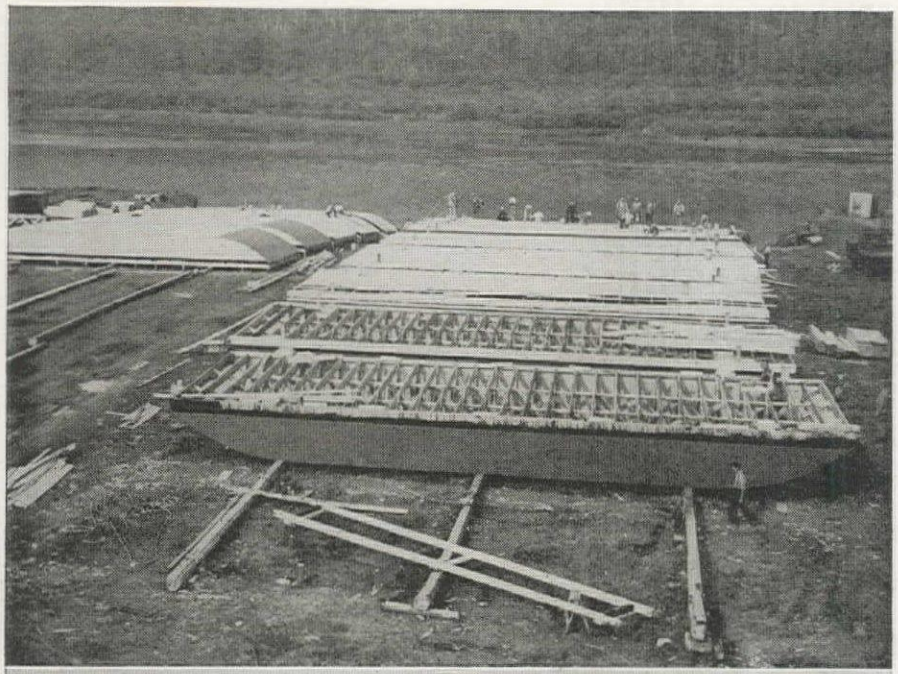
The Army Engineers and the contractor almost at once moved into Fitzgerald and Fort Smith at opposite ends of the 16-mi. portage on the Slave river to expand wharf facilities and improve the connecting roads. To eliminate delays attendant upon handling and rehandling for portage transshipment, equipment was installed for lifting the loaded barges bodily out of the water on to special rubber-tired, low-bed carriers for the land trip, and for launching them into the river again at Fort Smith.

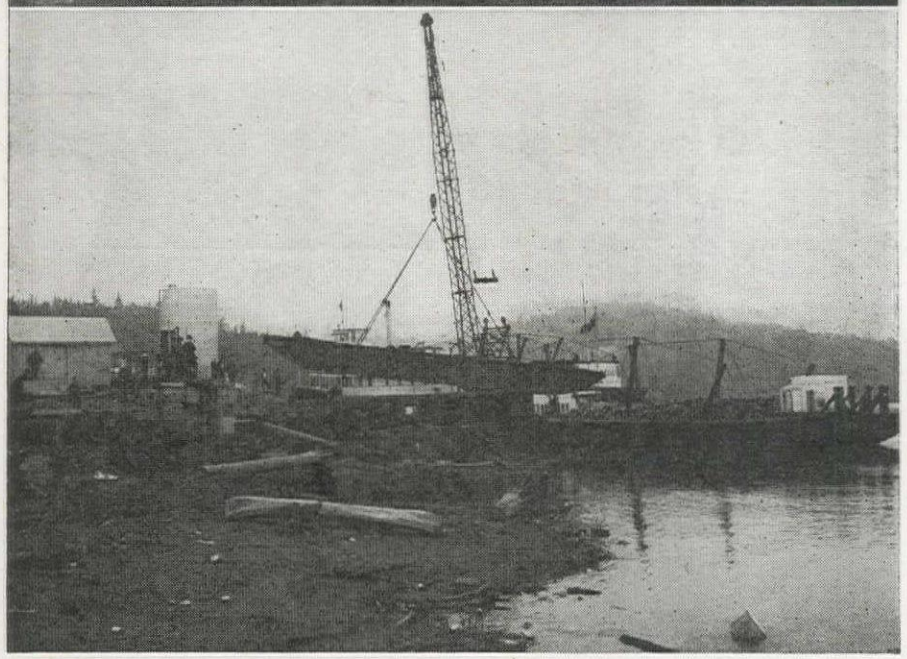
For movement on the lake, a number of the loaded barges were grouped around the Hudson's Bay Co. stern-wheel steamer "Distributor," much in the manner of a mother hen with chicks, and moved together. As many as six barges, hauling 1,300 tons of freight, could be handled simultaneously by this procedure. The empty barges were returned up-river by tugs.

Considering the lack of existing transport, the length of the water trip, and the great volume of freight needed in the north, the first short season of water transportation accomplished a near-miracle. Approximately 21,500 tons of construction equipment, camp supplies and pipe had crossed the portage. But much of it was still far from Camp Canol when the freeze came in late October. It was plain that another means of moving goods and men must be created before the spring breakup came many months later.

Airports were being built while the expansion of water facilities went on. Past practice had been to equip planes with pontoons in summer and skis in winter, but this resulted in a loss of a month or more at each change of season when neither type of landing gear could be used. With bulldozers and scraper-wagons the contractor hewed out ten landing strips, suitable for wheeled landing gear, all the way from Edmon-

ALASKA HIGHWAY crosses the McClintock River, east of White Horse (upper). Truck convoys hauled freight up the Mackenzie winter road (middle) while tractor trains transported it on to the north (lower). Truck convoys were used as far north as Mills Lake, where freight was divided, part going north by tractor train and part waiting water transportation down the broad Mackenzie River during the spring and summer months.





DURING THE SUMMER of 1942, materials for the Canol pipeline were hauled by water from Waterways on the Athabaska River to Canol camp on the Mackenzie. Barges used in this voyage were constructed in a shipyard at Waterways (upper). Between Fitzgerald and Fort Smith, it was necessary to portage around 16 mi. of rapids. Barges were lifted bodily out of the water (bottom), pulled across portage road by tractor (middle).

ton to the oil field. Many were in use three weeks after the first clearing operations started. Planes were essential for rapid movement of emergency supplies, small tools and personnel, but planes could not supply the answer to winter transport in volume.

During this first summer (1942) the great base camp at Canol was built on a site across the 4-mi. wide Mackenzie from Norman Wells. At Norman more than a dozen new wells had been drilled and the tank farm was under way. But with mid-October the flow of freight ended, and Camp Canol was made ready for the long winter.

The winter road

By late summer it was apparent that construction could not wait for freight to come by water route, which would be closed from October until late the following June. So, through the cold sub-Arctic winter men and machines toiled in the darkness to build a winter trail into the project.

This long access road started at the town of Peace River, 310 mi. northwest of Edmonton, the end of a branch line of the Northern Alberta Railroad. It followed an existing road for 80 mi., then struck out for a point below Fort Providence at the head of the Mackenzie, with a spur to Hay River on Great Slave lake, and to Fort Smith on the Slave river. Below Fort Providence the road crossed the Mackenzie and ran along the east side of the valley for a distance of 500 mi. to Norman Wells. The total length of road approximated 1,000 mi.

For much of the route the road was little more than a trail, comprising cleared areas passable only when the ground was frozen solid. Rivers were crossed on ice. The road was used to move heavy construction equipment into the project in readiness for the opening of the 1943 season, and to completely supply the remote camps.

On Oct. 3, 1942, the chief engineer of Bechtel-Price-Callahan gave the order for this road to go forward from Peace River. Materials for the job were requisitioned: 130 more tractors, 600 pairs of freight sleds, 23,000 drums of diesel fuel, and a great deal more. By Oct. 15 the Peace River base was under way. In addition, many camps and supply bases had to be established along the route. Each required electric power, emergency repair equipment, fuel storage facilities, and construction materials, not to mention housing requirements, hospitals, commissaries, and the other necessities of life.

This problem was met directly by the construction of "cabooses," truly portable housing mounted on sled runners and comparable to the familiar caboose at the end of every railroad freight train. The carpenter shops at Edmonton, working two shifts, became a mass production factory complete with assembly lines. At the end of the line the cabooses were hauled out, and fitted with bunks, stoves and cupboards. The following night, after the rail trip, the cabooses would reach Peace River and be in use. Within a few days or a few

weeks they were strung out across the northern wilderness, on the way to the Mackenzie Valley.

Ten miles per day

To meet the time limits imposed, road building crews were given a ten-mile-per-day work quota. More and more men were poured in, as the difficulties piled up and work fell behind schedule. On Dec. 18 the temperature dropped to 65 deg. below zero, but the work went on.

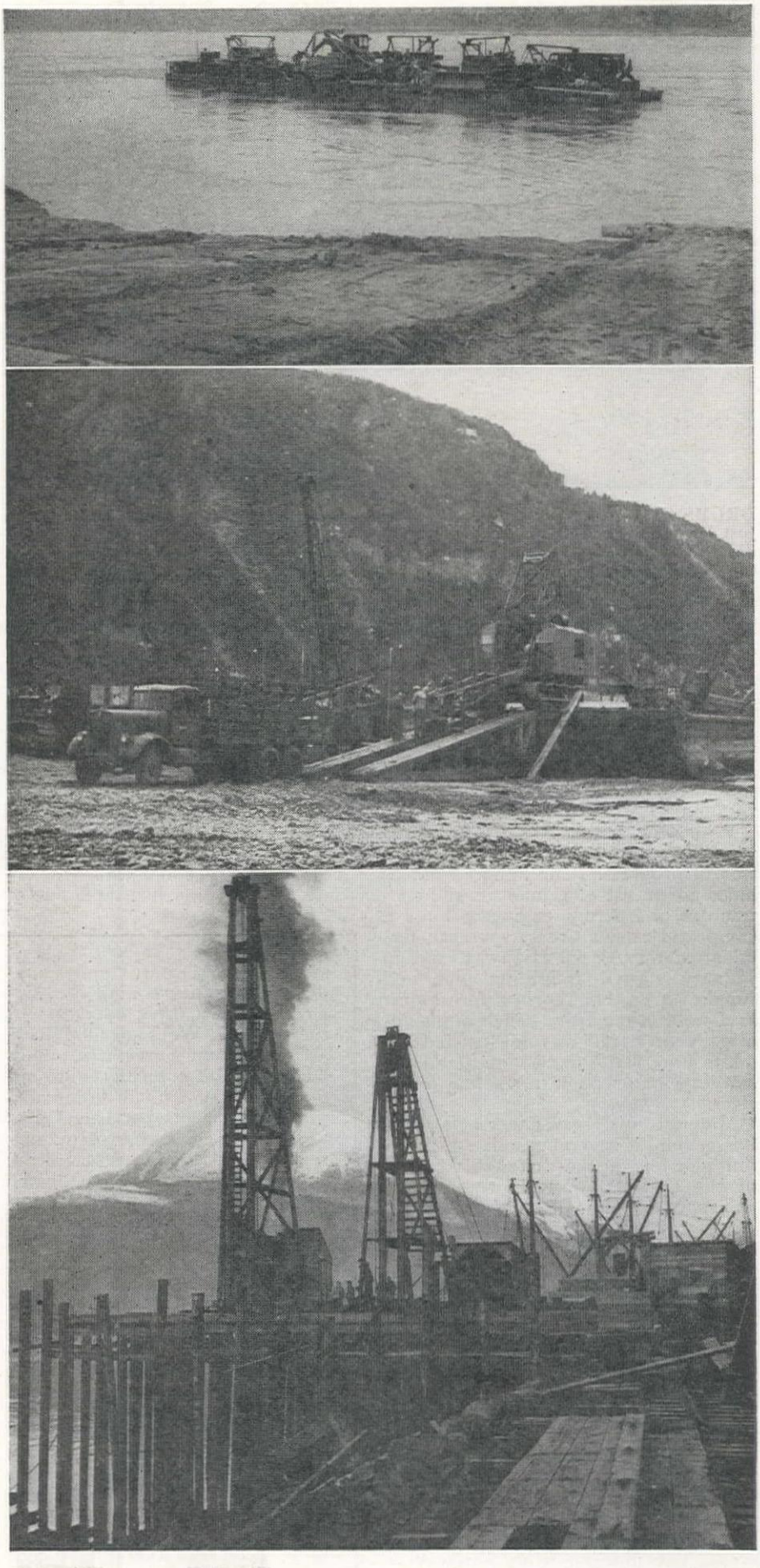
Communications, too, gave constant trouble. The short wave radio of the Army ran into the difficulties that plague radio transmission in the north. Food problems arose, when trucks could no longer get through to the advanced crews without freezing their cargoes of food en route. Meeting each new obstacle with resourcefulness had become routine by this time. In short order the contractors rebuilt their truck bodies, utilizing the exhaust heat to warm the food-carrying compartments, and by the use of a novel vane arrangement, permitted the driver to control the truck's internal temperature within reasonably close limits.

Meanwhile, out of Norman Wells, other road building crews worked southward. On the 24th of February two north and south bound crews met at Blackwater Lake. No ceremony marked the meeting, on the contrary when two tractors collided, one from the south, the other from the north, an old-fashioned Donnybrook was barely averted.

The main job of moving 9,000 tons of essential freight over the Peace river winter road still lay ahead. To add to the contractor's worries, the winter of 1942-43 was developing into one of the most severe within the memory of the country's pioneers. On Dec. 23 the first tractor train of freight left Peace River. But Nature was adamant . . . for all the cold, the snows had not come and the frozen, brittle sled runners were no match for rough, hard ground. A solution could be found if trucks carrying up to 10 tons each could get through.

Road crews doubled back to improve the trail into the semblance of a road. Every truck available in the region . . . Army, contractor and privately owned . . . was impressed into service. Convoys began to move out in increasing numbers. Perhaps in the roughest going ever undertaken by American-built trucks they pushed on, surmounting a combination of difficulties that would have stopped any effort less determined, but they got through.

The truck convoys transported freight as far north as Mills Lake, where it was divided, part to go forward by tractor train, part to await water transportation down the broad Mackenzie which would open above Great Slave lake far earlier than the remainder of the water route north from Waterways. Many of the tractor trains moved ahead twenty-four hours a day, preceded at some points by bulldozers breaking trail. Boulders, mud and other potential causes of failure were conquered as part of every day's work.



MATERIAL OF ALL KINDS was transported on the barges. In the upper photo, a full load of road-building equipment is ready to leave Fort Smith after the 16-mi. portage. Six loaded barges were clustered around the sternwheel steamer "Distributor" for movement across Great Slave Lake. A crane is unloaded from a beached barge (center). To accommodate cargo, Skagway docks were extended (lower).

DRUMS OF GAS were moved to the Bechtel-Price-Callahan "Fokker" over the ice just before the ice breakup at Fort Simpson. Since no maps contained accurate descriptions of this far north region, aerial surveys were made to determine the topography. Planes were also used for supply in winter months.

When the road was finally open a great stream of men and materials from Peace River poured into Canol, ready for action at the first sign of spring. With the departure on April 4 of the last large freight load, the winter trek was over. It was an accomplishment seldom, if ever, equalled. Ten million ton-miles had been achieved in the winter darkness.

While the Peace River to Norman struggle went on, another operation was in progress. Four hundred ninety miles northwest of Edmonton the contractors and Army engineers built a camp at Dawson Creek, southern terminal of the Alaska Highway, and in January started freighting pipe and supplies over that thoroughfare as far as Fort Nelson, from which point another winter trail was constructed 300 mi. to Fort Simpson, also on the lower, early-opening section of the Mackenzie river.

Materials for the refinery at Whitehorse, and the several gasoline distribution pipe lines at the Yukon-Alaska end of the Canol project, however, were transported by less difficult means.

The Yukon operation

At the start, the only route open for shipping materials to the Yukon divisions of the project cleared through Skagway, already overtaxed with supplies necessary for the building of the Alaska Highway and airports along that road. With confinement of the Japanese to the outer Aleutians, it was possible in August, 1942, to move men and materials from Edmonton by rail to Prince Rupert, by ship to Skagway, and over the 110-mi. rail line to Whitehorse. Camps were set up at Prince Rupert, Skagway, Whitehorse and Carcross. The pipeline from Skagway to Whitehorse was laid without delay, and early in 1943 trucks on the Alaska Highway were fueled by tanker gas pumped from Skagway through the new line.

All the difficult transportation problems thus far met, however, were solely for the purpose of getting the pipe and other necessary equipment to the eastern and western termini of the crude oil line. Since no road existed across the mountainous 550-mi. stretch between the Norman oil field and the refinery site at Whitehorse, nor in fact did accurate maps of the region exist, it was necessary first to make aerial surveys of the entire distance, then to lay out the most economical and direct route for the pipe line, and finally to construct a road for the entire distance so that the pipe could be distributed, and necessary equipment be conveyed to the site of operations.

By July, 1943, as soon as the first road-building machinery arrived by the water route from Waterways, work commenced on this pipeline road across the broad Mackenzie Valley from Canol Camp toward the mountains. During the winter tractor crews and dog team parties were breaking trail from both ends of the line, determined from the aerial surveys, and by the time the spring breakup came in May the access roads were well under way and the pipe laying organization was ready to move in. The road was opened all the way through on Dec. 31, 1943.

While the general route of this road and pipeline was plotted from aerial maps, the local alignment was determined entirely by the road-building crews, depending on the ground surface encountered. That portion of the road over the mountains was in general quite similar to the supply road from Peace River, but the final 50 mi. out of Canol Camp in the Mackenzie Valley crossed almost continuous swamp. This unstable foundation was made into road by piling small trees and brush in the right-of-way, and covering them with the excavated material from side-ditches dug several feet deep to the permanently-frozen sub-soil. On this foundation more stable material hauled from other spots was piled and graded to final elevation.

In order to facilitate construction and permit checking on overall progress, as well as for later use in pipeline operation, a telephone line was constructed, linking all units of the Canol project. It follows the course of the Canol road and the pipeline, generally being immediately adjacent. Poles were cut at the site, and wire strung from reels on sleds pulled by tractors.

The Canol road, following the pipeline, will be maintained for purposes of maintenance and inspection, but the winter supply road will not be kept open.

The United States and Canadian governments and the Imperial Oil Co., Ltd., operators of the Norman Wells oil field, have arrived at an agreement under which the oil company will supply oil to the United States at a price of 20 cents per barrel plus production costs, Canadian currency. The U. S. has reserved the right to purchase at the same price after the war, up to an additional 60,000,000 bbl. of oil. The original contract granted to Imperial Oil Co. a price of $1.25 per bbl. plus production costs, for the first 1,500,000 bbl., to reimburse the company for its exploration and development costs. However, the reserves have proved so extensive that these costs can be reimbursed by selling the greater quantity of oil at a lower price.

Oil field equipment rented by the United States will be bought by Imperial Oil Co., Ltd. and paid for at the rate of 5 cents per bbl. of oil sold to the U. S., the rental to be deducted from the 20-cent price. The equipment will become the property of Imperial Oil after a rental of $3,000,000 has been paid.

Tacoma Officials Object to Seattle-Tacoma Airport Name

CITY OFFICIALS of Tacoma, Wash., are objecting to the proposal of the city of Seattle that the newly completed Seattle-Tacoma airport at Bow Lake be named in honor of Philip G. Johnson, late president of Boeing Aircraft Corporation. It is the contention of the Tacoma officials that such a plan would make the port known as "Johnson Field, Seattle," while the cost of the project was divided between the two cities and it is anticipated that its use will be for the benefit of both. Total cost of the field was approximately $6,000,000.

The field was constructed by Minnis & Moody, Johnson, Inc., and Vista Financing Co., contractors of San Bernardino, Calif., under direction of the Seattle office of the Civil Aeronautics Administration.

No Expansion Joints in Welded Rail

Tramway Corporation of Denver, Colo., has designed a welded rail joint that is easy and economical to install, makes allowances for different rail heights, avoids excessive internal stresses and has been found to give satisfactory service

By NELSON R. LOVE
Chief Engineer, Denver Tramway Corp.
Denver, Colo.

A WELDED RAIL JOINT having as its essential feature the base plate which is welded to the flanges of the two rails being joined, has been developed by the Denver, Colo., Tramway Corporation. The advantages of this type of joint are (1) low cost, (2) ease of installation, (3) ready adaptability to offsets and compromises, (4) economy of material.

Cost under present conditions approximates $2.75 for all labor and material, and requires about one hour for complete welding. Compromise joints are readily constructed by offsetting the base plate for slight differences in rail height, and by welding a metal shim of correct thickness under the low rail for larger differences in rail heights. Welders are able to secure any compromise from 1/8 to 7/8 in. by carrying base plates of 1/8 and 1/8 in. offset and standard shim of 1/4, 1/2 and 3/4-in. thickness. Base plate offsets may be either added to or subtracted from the shim thickness.

In order to realize the advantages of this type of joint it must be installed as a "suspended" joint, which places the base plate in tension and the head-weld in compression. Base seam welds are loaded in shear and the tension stresses in the rail base at the ends of the base welds are minimized, avoiding rail failures at these points.

The base plate is made of mild steel 3/8 x 9 x 30 in. for all weights of rail in order to secure full bearing on the adjacent ties. Experience has shown that welding rod of high ductility is essential to the success of this joint, best results being obtained with rod which contains organic material in the coating.

Welding procedure

Excessive internal stresses are avoided by welding the base seams on one rail first, then the head weld, and without waiting for cooling, the base seams for the other rail. If a shim is used, the shimmed end is completely welded first. If this procedure is not followed, the base plate will be of a different temperature than the head of the rail and upon cooling the joint will cock upwards or downwards, usually up, causing tension in the base of the rail at the ends of the base seams with predisposition to failure at these points.

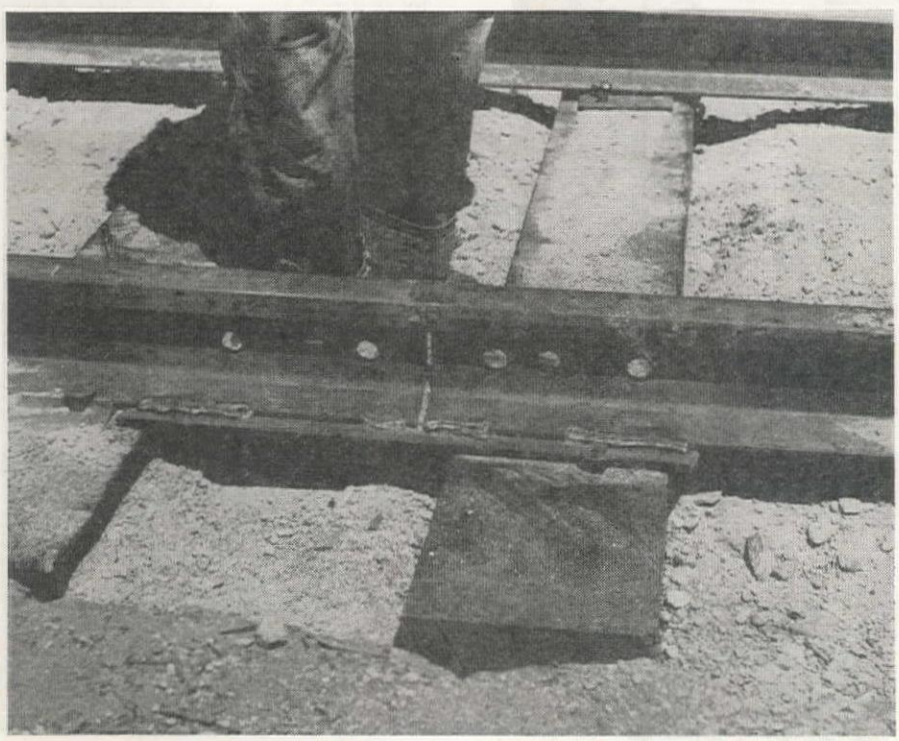
BASE PLATE is wedged up to rails after tops of rails are lined up. Welds are peened and brushed to remove scale.

The procedure outlined will leave enough compression in the head weld to insure the transmission of stresses in the track structure as variations in tension in the base plate. A static load of 75 to 100 tons on 14-in. centers is required to break a finished joint.

No provision is required for expansion in paved streets as the stresses are taken up continuously by the surrounding pavement. In oiled streets it has been found advantageous to install an expansion joint about every 700 ft.

The joint has been found to be very satisfactory, there being no evidence of the existence of the joint after installation in most cases. About 10,000 have been installed up to the present time.

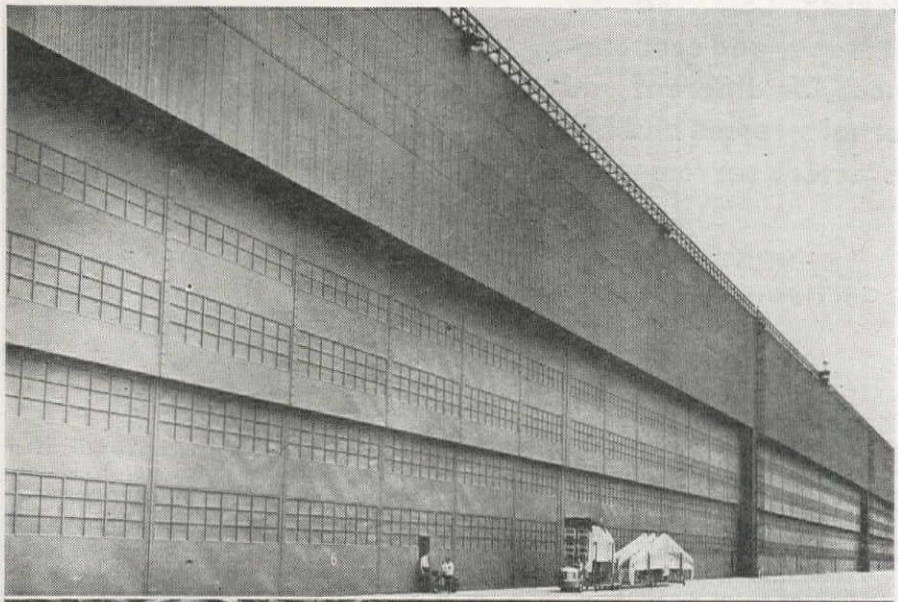
JOINT IS INSTALLED as a suspended joint with the base plate in tension and the head weld in compression. Order of welding is: first rail base plate and then its head, and second rail base plate and then its head. Procedure avoids excessive stresses.



Los Angeles Seeks Abatement Of Factory Smoke Discomfort

RESIDENTS of Los Angeles, Calif., and neighboring cities are suffering severe discomfort as a result of fumes and smoke from factories in the area, particularly synthetic rubber plants and oil refineries. City health officials are trying to secure passage of ordinances requiring abatement of the nuisances. The ordinances propose that all plants, residences and others burning fuels with a volatile content of more than 23 per cent must employ mechanical burning equipment or smoke damping attachments, and railroads be requested to employ diesel locomotives in switching and in train movements within the city limits. In addition, incinerator and public garbage disposal burning pits are not to be operated in the mornings, which are generally the serious air pollution periods.

Hangar Openings for the B-29



Wide-span doors suitable for clear passage of super-fortress required bridge design and construction techniques to support the immense weight. Simple push-button operation opens and closes 2-leaf openings

DOOR OPENINGS 300 ft. wide, with 45-ft. head clearance, have recently been completed by the Austin Co., engineers and builders, for the Renton, Wash., plant of the Boeing Aircraft Co., where the huge B-29 super-Fortresses are being built. A similar plant with identical doors has also recently been completed for Boeing by the Austin Co. at Wichita, Kans.

These doors are at the completion end of the B-29 assembly line. They lie three abreast, and behind them are three assembly bays, each with a clear span of 300 ft. and a depth of 650 ft., comprising the largest area of such wide span in any industrial plant. During assembly operations the huge planes travel two abreast through the plant, and finally pass through the great doors to a flying field outside for delivery.

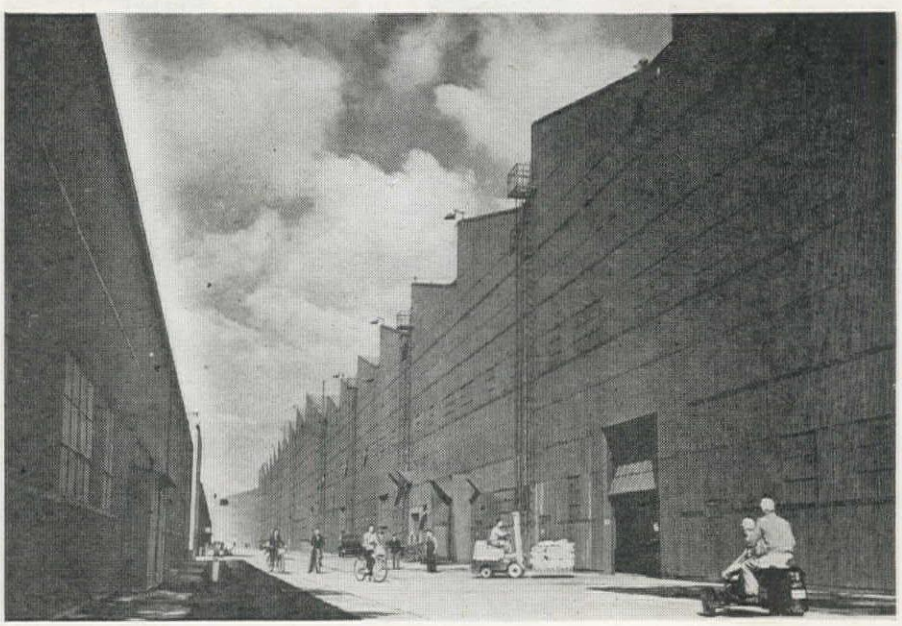
Because of the span of the roof trusses in the plant, regular bridge design and construction techniques were employed by the builders in the overhead planning. Steel truss members are used throughout.

Cantilever arms extend for 64 ft. on either side of the supporting columns. These arms support a suspended truss 174 ft. in length, being fastened with pin connections, so that primary stresses will not be altered by possible settlement in the pile foundations.

The plant was designed for daylight

THREE 300-FT. DOORS abreast are at the completion end of the assembly line at the Boeing plant in Renton, Wash. (upper). Each door is divided so that either end alone, or the whole door, can be opened. The lower leaf rises to the same height as the upper and then the two sections open out to form a canopy. Interior view of the huge 900x650-ft. working area in the main assembly plant (center). Steel trusses are used in the roof construction and the columns are built of structural steel. Beneath this floor of the assembly-room are lockers and storage rooms.

The plant was designed for daylight illumination but because of the possible danger from bombing, the windows have been blacked out and light is furnished by fluorescent and high intensity globes. Parallel buildings (right) at the plant form a canyon which is used as a passageway for light trucks and other equipment to haul the various parts that are needed during the construction of the planes. The sawtooth roof construction for light and ventilation can be seen at the top of the wall.



NIGHT VIEW of a completed B-29 ready to be moved through one of the 300-ft. door openings of the Renton, Wash. plant of the Boeing Aircraft Co., to the flying field outside. The complete operation of opening a set of doors requires 2 min.

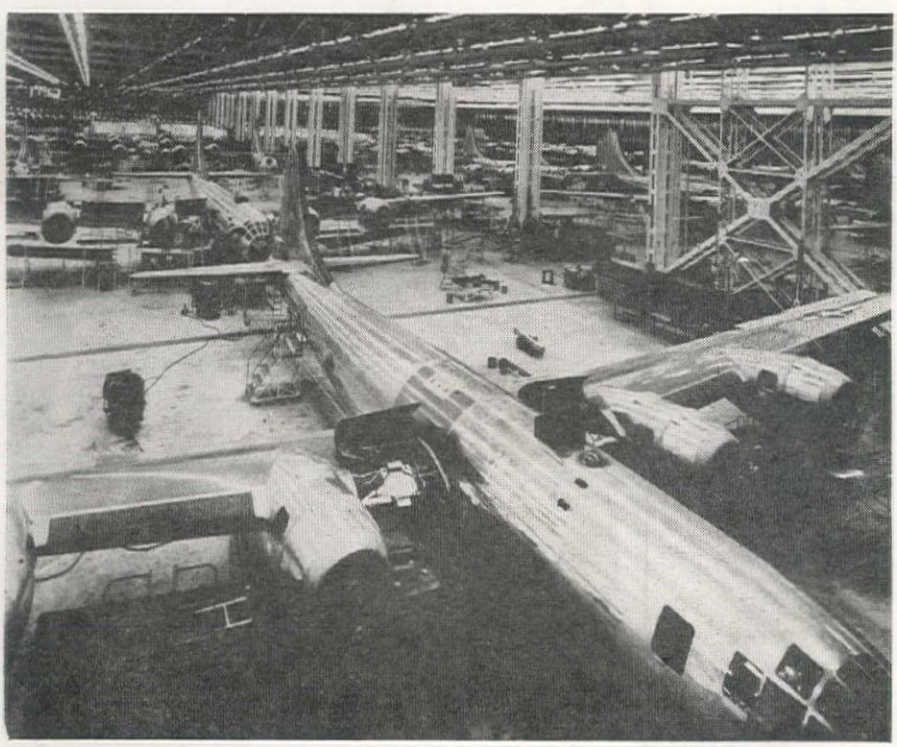
illumination, having a sawtooth roof and continuous bands of window sash on all sides, including the doors, but for security reasons these are all blacked out at present and all operating illumination is from banks of fluorescent and high intensity mercury vapor lamps, mounted at a height of 45 ft., and a light-reflecting white cement floor.

Beneath the floor is a network of corridors and rooms, including locker space, lavatories, and parts storage.

Sub-assemblies and partially finished planes are handled inside the plant by a system of interconnected monorail bridge cranes, spanning the three 300-ft. assembly bays.

The doors are very simply operated by pressing a button. They open in halves, that is, 150-ft. sections, and either one or both may be opened as desired. They are also constructed in two sections horizontally, the lower half being offset inside the upper. In opening, the lower section first rises vertically until at the same height as the upper portion, then the two open out, forming a canopy over the opening. About two minutes are required for the complete operation.

CLEAR SPAN ASSEMBLY bays of the Boeing plant are 300 ft. wide and 650 ft. long. The B-29 super-fortresses move continuously through the plant on an assembly line. These planes travel two abreast down the line.



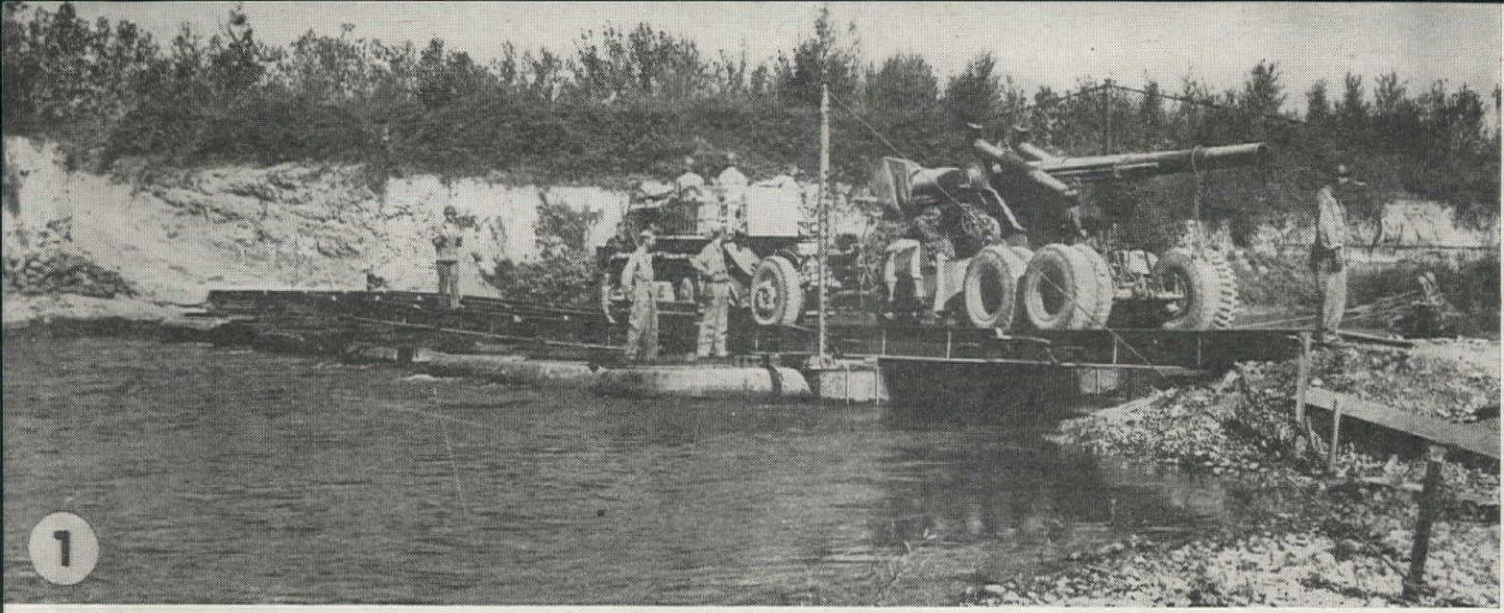
Gongwer Made Chief of Nisqually Construction

UTILITIES COMMISSIONER C. A. Erdahl of the city of Tacoma, Wash., has announced the dismissal of the Charles T. Main Co. as consulting engineers in charge of construction of the Second Nisqually power project now being built by the City Light Department and the reinstatement of Verne Gongwer as chief engineer. The project was designed and construction inaugurated under the direction of Gongwer, but rapidly advancing material and labor prices considerably raised the original estimated cost of the project, and in May, 1943, the Main Company, a Boston engineering firm, was engaged to supervise construction.

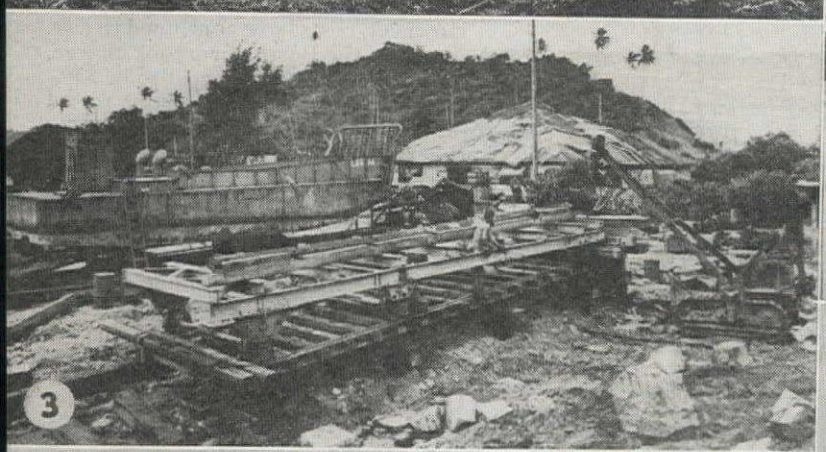
However, costs have continued to rise. At the time the Boston firm took charge, its officials estimated the cost to be $19,650,000, but this figure was later raised to $21,000,000 and in June of this year another estimate of $23,000,000 was announced.

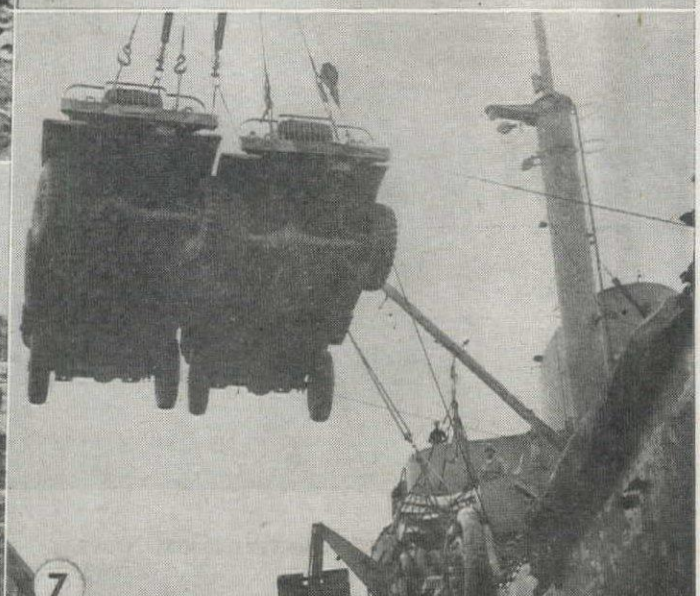
The project embraces Alder and La Grande dams, a new powerhouse below Alder dam and an enlarged one at La Grande. A 6,400-ft. diversion tunnel, highway and railroad relocation and enlargement of existing power lines are also included. Power produced by the city of Tacoma will be augmented by 115,000 kva. when the project is placed in operation.

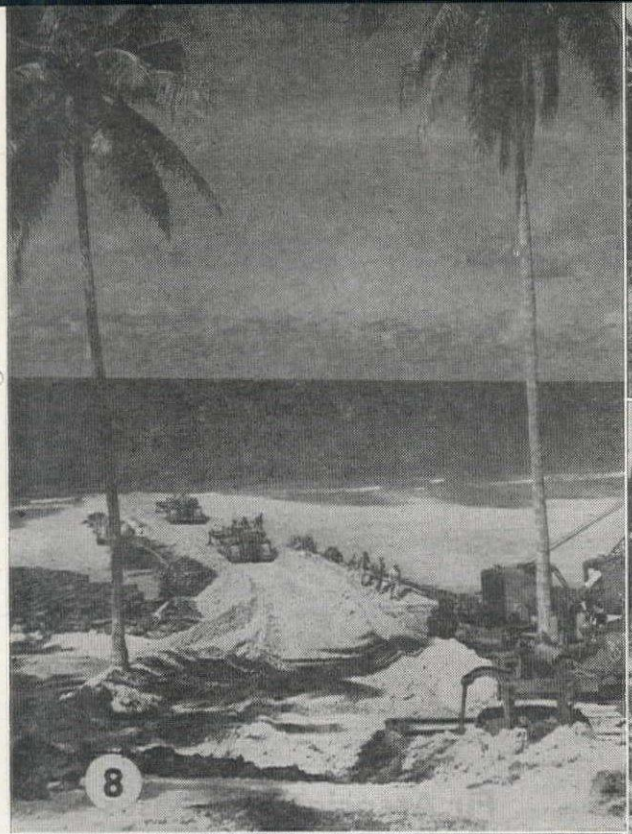
COLONEL Robert C. Hunter, District Engineer of the Corps of Engineers at Sacramento, Calif., has announced the total cost of construction at Hammer Field, near Fresno, Calif., at $8,685,900. Included in the project are 1,562 ac. of air field and 5,465 ac. additional of target and bombing ranges. There are more than 2 mi. of heavy duty runways, 4 mi. paved taxiway and 45,000 sq. yd. of parking apron.



Construction Equipment in War







ON MANY FRONTS, construction equipment is helping to win the war. Pictures on these pages, furnished by International Harvester Co. show: (1) A heavy-duty pontoon bridge in Italy; (2) Tractors mop up after capture of Namur; (3) Tractor and crane erect and assemble a marine railway on Gavutu Island; (4) Carryalls prepare base for a bomber strip on a South Pacific island; (5) Sheepsfoot rollers compact base material on the same bomber field; (6) Diesel tractors landed at Tarawa with the first landing wave, after voyage through high tide; (7) Ingenious lashings permit two heavy trucks to be loaded on a Liberty ship simultaneously; (8) An access road to the site of a dock on Emirau Island is built into the surf; (9) Motor graders are used in preparation of sub-grades for roads and airfields; (10) to (13) Steps in construction of a coral-paved airfield — first the clearing and grading, then quarrying in the coral pits, transportation to final site, and finally compaction to final grade. These coral fields were found to be very serviceable, and because of the abundance of material, easy and quick to build. It was also used for roads and many other purposes.

Purchasing on War Projects A Tremendous Responsibility

By SEABEE R. P. DAY
In the South Pacific

SCATTERED OVER the face of the globe from Australia to Europe and back again are bases the Americans have built. Considering the variety of materials that have gone into any one of these camps, and taking stock of priorities, coordination and transportation, the purchasing of the right amount of construction machinery and supplies was a tremendous job. Looking backward, we wonder how they ever did it.

Many of the earlier projects were built by American contractors, with civilian help, operating dangerously close to war fronts. They did their job well. Unlike the Army and Navy, drawing whatever is needed from a stock of material already available and stored in warehouses, these civil contractors had to buy the machines, materials and literally thousands of items and then run the same risks in having them sunk on the way across as any armed forces construction job.

There was always the problem of purchasing "overages," or extras, and it was always a headache. There are always men in authority who fail to see the necessity for procuring anything beyond the bare specification requirements. The supply man on a construction job must visualize waste, unforeseen emergencies and transportation losses. Ironically, the better he does his job the more he becomes a forgotten man.

Extensions are headaches

It is doubtful if any construction job ever done was built exactly to contract size, or was ever cut down. They start this way: In January the order comes through for 50 buildings and a flight strip. Before the 50 buildings are up, someone starts moving the troops in to occupy them. It looks like a better camp site than they figured, so 75 more barracks buildings and water development facilities are authorized as a contract extension.

While the purchasing agent is moving heaven and earth to get lumber, pumps, well casing, tools and other items he had no way of figuring before, an air force general decides to build hangars and repair shops as a further extension. This places the purchasing agent in combat with the entire priorities system, for a hangar is structural steel and anyone knows the difficulty in buying structural steel shapes.

This process of enlarging goes on and on. A sewage disposal plant is authorized. Power generating plants must be set up. Long before the company is ready to receive the Army-Navy "E" award for excellence, the purchasing agent is either a raving maniac or a downright scoundrel for stepping on so many toes.

The main headache, according to one good purchasing agent for a big contractor, was shipping space. This was in the days when submarines were still a menace. Much of the equipment being used was excavating and drilling machinery, and replaceable parts were bulky and heavy. Several times, in those days, shipments of repair parts for Caterpillar diesel tractors were sunk.

Added to this, the contractor was more than bedeviled by the petty thievery of natives he had to use. Pliers, wrenches, carpenter tools — anything that could be concealed in a lunch basket — was carted away. Multiplied by hundreds, the thefts became so serious as to create a critical shortage of tools. Through the contract manager and the base security officer, a more alert gate guard was established and all of the "floating" stock was intercepted.

Conserving wire rope

The company was training natives to operate bulldozers, power shovels and drills, and for some time the natives were so rough that cable replacement was frightful. The purchasing agent, in defense, began buying preformed wire rope exclusively on the theory that it would resist sudden shocks because each wire in this new type of rope shares its part of the load equally with the others. He and the equipment superintendent got the natives together and explained that cable was almost impossible to get, and that much more care would have to be shown in using it. Actually this was a bit of psychology. Preformed rope is available for general use, but believing what the superintendent said, the natives took it to heart. They began nursing wire rope, and in a short time the wearing life of shovel hoist lines jumped to 750 hours.

The purchasing man's job is always more than buying. It is protecting what he buys, seeing to it that the supplies are judiciously used. This man established a central warehouse system integrated with the prospective use of his supplies. Machinery parts were stored and issued from a warehouse next door to the heavy equipment shop. Building materials and the carpenter shop were placed together. Electrical supplies were made convenient to the electrical shop.

Bookkeeping control

Once each day, the record of supplies issued to these necessary key departments passed over this man's desk. In a half hour he not only had the supply needs of the job at his fingertips but he could spot waste and take the steps necessary to correct it. Moreover, if his subordinates slipped a little in forgetting to request necessary replacements of stock items, he was in the right position to remind them. He controlled all miscellaneous requests for material by insisting that they be routed over his desk. In passing on the validity of material requests, he developed a thousand ways of saying "no."

In seeing that the materiel was used wisely where it belonged, his department helped to get the coveted Army-Navy "E" for his company and it finished the job with a minimum of surplus parts and material.

Purchasing for army and navy construction by the engineer branches of the armed forces is also difficult, but because of the extensive nature of these operations, central supply departments can be established for a specific theater of operations. Materials and supplies are simply issued to the subordinate supply warehouses and all unused stock (there isn't very much of it) can be returned for credit. Priorities are now routine and easy to get.

It is still the civilian purchaser who is gradually going crazy doing his job excellently. He has it the hardest.

Fir Association Revises Plywood Standard Grades

A RECOMMENDED revision of the Commercial Standard for Douglas fir plywood is now being circulated to the trade for written acceptance, by the National Bureau of Standards. The proposals have been submitted by the Douglas Fir Plywood Association and approved by the standing committee of the Bureau.

The rules cover six grades of moisture-resistant plywood and eight grades of exterior type, and there are included in the proposed standard grade specifications for door panels, tests, standard sizes, size tolerances, re-inspection rules, and nomenclatures and definitions. It is felt that adoption of the revised standard will lead to better understanding between buyer and seller, and that architects, engineers, home owners and other users of plywood will be able to specify their needs from nationally accepted grading standards.

"United" Seeks to Operate Alaska-Seattle Air Line

UNITED AIR LINES has applied to the Civil Air Board for permission to operate a passenger service to Fairbanks, Alaska. The route and stops on the line would be as follows: Seattle to Ketchikan, 726 mi.; Ketchikan to Juneau, 294 mi.; Juneau to Yakutat, 208 mi.; Yakutat to Anchorage, 368 mi.; Anchorage to Fairbanks, 256 mi., making a total line extension of approximately 1,850 mi. Officials of the company pointed out that its fliers have had much experience operating to Alaska for the Air Transport Command and declare that the new route would place Fairbanks within 12 hr. flying time of Seattle. A chain of auxiliary airports and airstrips has been constructed along the Alaska Highway and would be available for emergency landings.

Power Boiler Built of Scrap

When war plants in Central Arizona demanded more electric energy, engineers of a utility company scanned 40 states to secure parts for a boiler needed to step up the output at their steam power plant by at least 20 per cent

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

THE CENTRAL ARIZONA Light and Power Company of Phoenix, Arizona, recently improvised a much needed high pressure boiler for their modern steam plant out of junk obtained from 40 out of the 48 states in the Union.

Importance of the war plant load in Central Arizona made it advisable to increase the steam station capacity at the company's modern steam electric plant. Fortunately, there was an excess of turbo-generator capacity over boiler capacity, which made it possible, by installing another boiler, to raise the station net output 7 or 8 thousand kilowatts over the maximum 40,000 then available.

"It can't be done"

The Central Arizona Light and Power Co., shortly after Pearl Harbor, told the War Production Board in Washington, "We've got to have it." The War Production Board's answer was, "You need it and you must build it, but you can't do it."

The power officials laughed at the WPB. Sure they knew it couldn't be done. They had been told back in 1928 that you couldn't build a steam plant like the one then planned, so far from an adequate water and fuel supply, but they did.

The Utility engineers rolled up their sleeves (they didn't need to take off their coats, for it was too hot in Phoenix for coats anyway), and accepted the WPB'S attitude as a challenge to the ingenuity that has characterized American industry from its infancy.

They built the boiler out of junk. It cost $450,000 but is now in operation.

It required 13 months to find a boiler and enough necessary materials to start construction. With the aid of the WPB, the power company found a boiler in Chicago which had been dismantled by the Commonwealth Edison Co., after having been used since 1928. This boiler was the only one available which was suitable for operation at the desired pressure and temperature and of sufficient capacity to generate the additional power required.

In dismantling the boiler, workmen proceeded to cut it all apart with torches. For example, the huge affair—requiring a three story building—had 438 tubes, each one cut off at both ends with a blow torch.

Added parts hunted

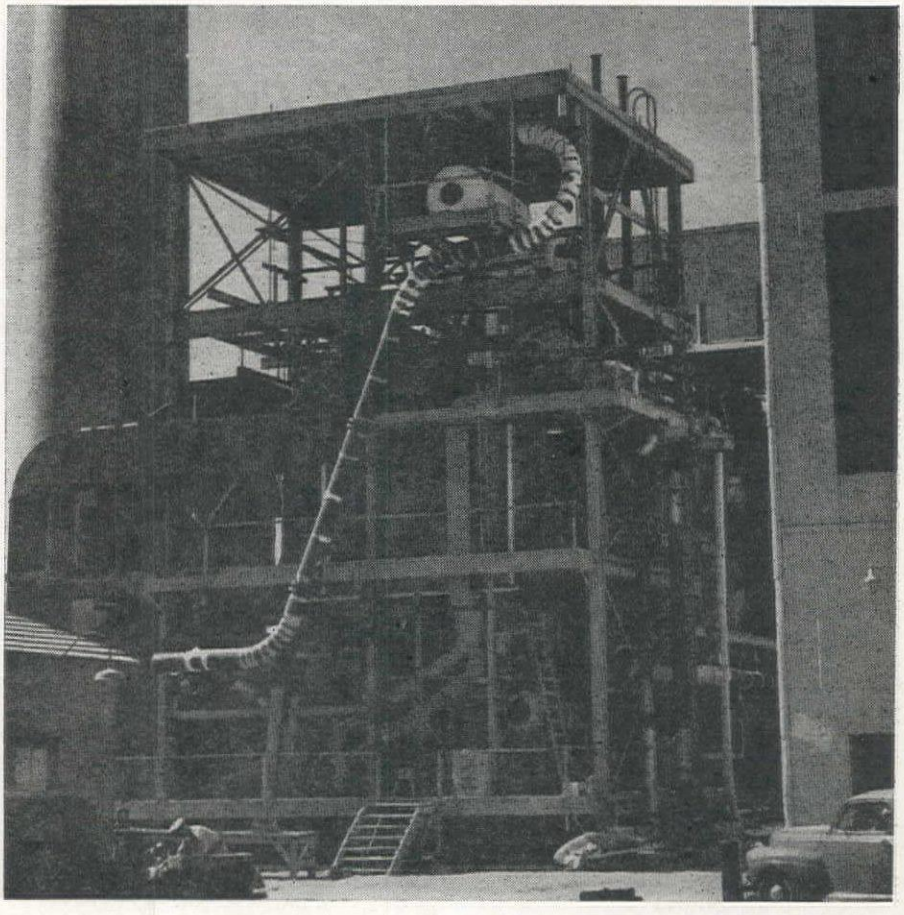
This pile of junk was loaded on 17 railroad cars and shipped to Phoenix and a "Scavenger Hunt" started to supply missing pieces. The company scoured the country. They obtained parts here; valves there; in fact getting something from each of 40 states in the Union. Parts that could not be obtained, were designed and manufactured in the company's machine shop.

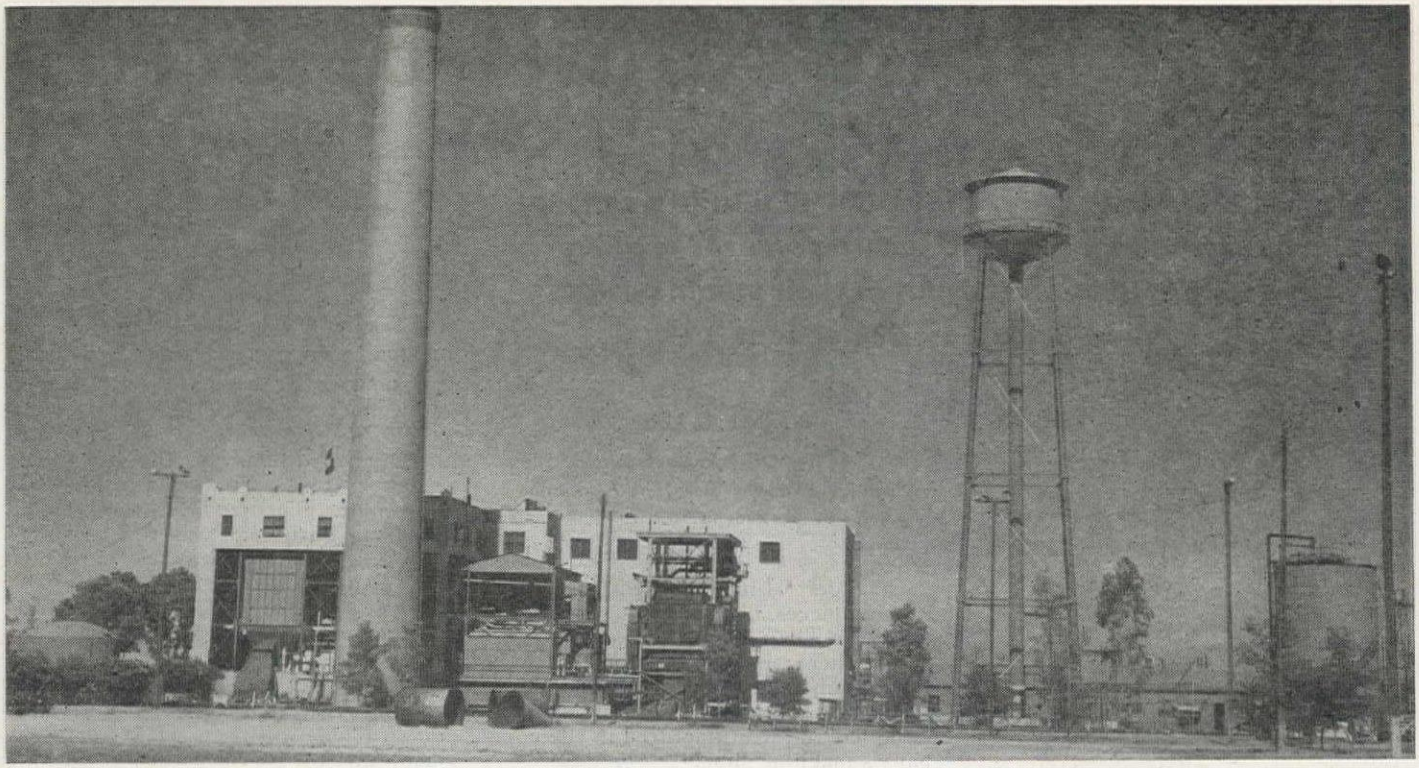
Some of the valves came from unbelievable places. Valves are on high priority and new ones were out of the question. The originals had been sold when the boiler was dismantled. The valves started coming in, some were gummed with paper pulp; others had oil goo from Texas and Oklahoma; still others were just plain rusty; but after 13 months, there were enough materials on hand to start construction. It was costly fun. The original estimated cost of $365,000 eventually ran to $450,000. One small valve which should only have cost about $2.50 originally, cost exactly $170 to locate.

After the "Scavenger Hunt," the job of piecing the gigantic jigsaw puzzle together was started. It took 16 months to fit the many thousands of pieces back together. It took 876 welds for the boiler tubes alone. The fire box originally designed to burn coal, was redesigned to burn oil or natural gas. Seventy men were kept on the job for over a year. They cut, pieced, put in, took out, made and remade, until finally the job was completed.

Due to the demand for steel for the war effort, housing for the boiler was not available. So they set it up in the open. Ebasco Services Inc., consulting engineers, assisted in redesigning the boiler for outdoor installation and aside from a reinforced concrete roof, the boiler is virtually the same as when erected for indoor installation and protected by a three-story building.

BOILER AS BUILT and placed in service. Although main parts came from Chicago on 17 railroad cars, it was necessary to secure valves, gauges, pipes and other accessories from every corner of the United States. When finally completed, the new boiler plant, 3 stories high, cost $450,000. It took 13 months for engineers to round up all needed parts.





COMPLETE STEAM plant of Central Arizona Light and Power Co. at Phoenix, with the new boiler and the present existing unit. Output was raised from 40,000 to 48,000 kw. by the addition of the new equipment.

The boiler contains 1,910 sq. ft. of water wall surface and 6,811 sq. ft. of boiler heating surface, with an economizer surface of 5,250 sq. ft. The boiler has four main drums of one-piece forged construction, and in addition, there is a dry drum located between the main steam drum and the superheater, for minimizing carryover. Designed steam conditions are 425 lb. per sq. in. and 730 deg. Fahrenheit.

L. K. Doutrick, vice-president and chief engineer of the power company, was in charge of the project. The Central Arizona Light and Power Co., of which Edward H. Coe is president, is the second largest distributor of electrical energy in Arizona and is interconnected with the Salt River Valley Water Users' Association, the Tucson Gas and Electric Co., the Arizona Power Corp. of Prescott, and the U. S. Indian Service at Coolidge. These companies, together with the Bureau of Reclamation Parker power dam constitute the Arizona Power Pool. This Pool is in turn interconnected through the Bureau at Parker with Boulder power, forming the Pacific Southwest Power Pool which covers the southern portions of California, Nevada, and all of Arizona.

Order Controlling Sale of Critical Construction Machinery Is Revoked

THE War Production Board has revoked Order L-196, which controlled the sale of certain critical types of used construction machinery.

The order required distributors and contractors owning shovels, cranes, draglines, motor graders and track-laying tractors to register their equipment in WPB regional offices, to report change of status of the equipment, and to obtain WPB approval of sales, with certain exemptions. Through these controls over used equipment, civilian needs that could not be filled from new production due to heavy military demand were filled insofar as possible by idle used equipment.

When first issued in August, 1942, Order L-196 covered more than 100 separate items of construction equipment. The number was reduced through successive amendments and exemptions as certain types became less critical or were found to change hands readily without assistance.

Reasons for revoking the order are summarized by WPB as follows:

(1) The great majority of used cranes, shovels, motor-graders and track-laying tractors in good condition are busy. According to a survey made in June, 1944, by the Construction Machinery Division, only 10 per cent of the items listed in regional inventories through L-196 registration were idle. Many of the idle machines were awaiting repair or were only available for sale or rent in combinations with other items. Some of the idle machines were old models and their rental or purchase was not economically feasible.

(2) Contractors now want new machinery, not used items.

(3) Most users of construction machinery have adjusted themselves to war-time conditions. They are getting along with the equipment they own by keeping it in repair, and are themselves taking advantage of opportunities to buy used equipment.

In the two years during which L-196 was in operation, approximately 16,000 items of used construction machinery were placed at work. Used construction machinery placed in service as a result of the order is estimated at one-half the total value of new construction machinery released to civilian applicants since the spring of 1942.

Congress Asked for Money to Complete Indian Irrigation

CONGRESS has been asked to allocate money at the rate of $60 per ac. to complete the partially finished plan for irrigation of 80,000 ac. of Indian land below Parker dam on the Colorado river. At the present time, only 3,000 ac. of land are in cultivation by Colorado Indians, but completion of the project, one of the oldest in the United States, would furnish farm homes for Apache, Hopi and Navajo Indians, according to John Collier, U. S. Indian Commissioner. At the same time, Collier expressed opposition to plans for dams on the upper Rio Grande in New Mexico, which would create reservoirs covering valuable farm land and some Indian pueblos.

After many years of gradual decline in the Indian population of the United States, Collier reports that the tribes are now growing and additional irrigated land must be supplied them.

The Pioneer Railway Miracle

HAMPERED by political interference, inadequate finances, unknown territory and hostile Indians, Irish tracklayers made records still unequalled as they pushed the Union Pacific westward from Omaha to meet the Central Pacific coming eastward across the mountains from Sacramento

TO HAVE THE PROPER understanding of not only the magnitude of the task involved in building the first transcontinental railroad in the United States but also the fact that only this epochal project permitted the proper development of more than half the area of this country, a brief study of certain other historical events is necessary.

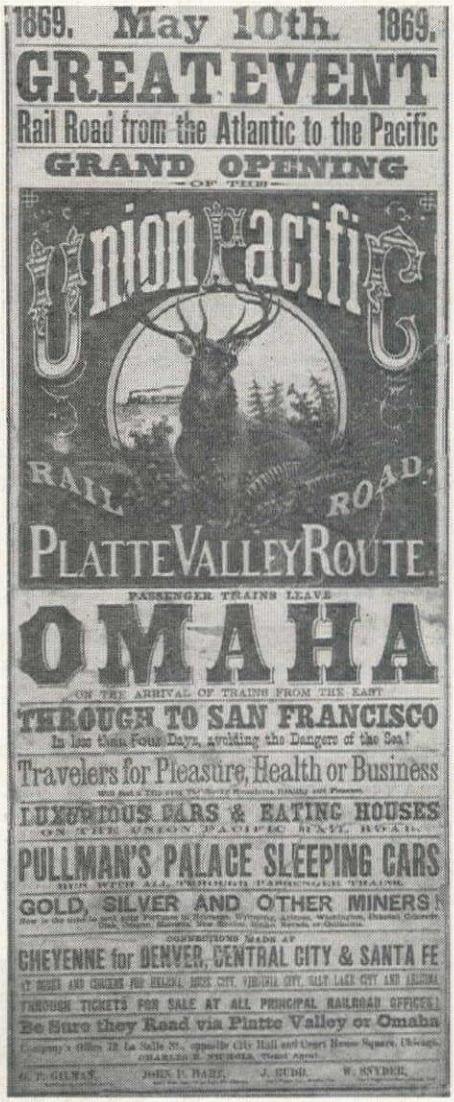
The idea of a transcontinental railroad was not conceived in a day. Neither was its accomplishment a mere matter of decision to do it. In fact, it was not until 50 years after one Robert Mills of Virginia made the first suggestion of a "rail way" linking the Atlantic and Pacific coasts (to Congress in 1819) that the historic driving of the golden spike (May 10, 1869) brought fruition to the thought. And the general need for some rapid, safe and all-purpose method of transportation across the continent had been realized even 15 years earlier, after the Lewis and Clark Expedition, so familiar to every school child, had brought first news of the vast "Louisiana Territory," which the United States had bought from France for $15,000,000 in 1803.

Yet, with all this background, it is hard to say when the project would have been pushed to completion if it had not been for the stimulating influence of a tremendous national emergency, the Civil War, which focused the attention of statesmen and public alike on the need for spanning the country by rail, and during those hectic war days the work really was begun.

Western exploration

After Lewis and Clark returned and reported their findings, officials of the nation, which still was concentrated mainly on the Atlantic seaboard, realized that there was a vast territory teeming with worthwhile things west of the eastern mountain ranges. In a few short years the fur trappers and traders, who recognized no frontiers, pushed westward across the unexplored continent, and by 1812 several bands of men working for John Jacob Astor and his associates in the fur business reached the west coast, where Astoria was founded near the mouth of the Columbia river.

While they were not the first white men to penetrate through the virgin wilderness, they prepared the first chart of the Platte Valley route, which was to become so famous in the later rush for the West. This trail covered the whole of what is now the state of Nebraska and part of Wyoming, leading from the Missouri River a few miles south of the present site of Omaha and into the Rockies.



GRAND ANNOUNCEMENT of the opening of the new ocean-to-ocean railway route. The first trains started from each end before driving of golden spike, and passed in Utah with their loads of pioneer passengers.

Many others followed, among them the great pathfinder, John C. Fremont. New trails were charted. The South Pass through the Rockies was discovered. Maps now could be made with some measure of authenticity, and men again were thinking of Robert Mills' prophetic suggestion about "steam-propelled carriages for quickened service across the continent, to run from the headwaters of inland navigation westward over a direct route to the Pacific," uttered eight years before steam had even been successfully applied to motive power in this country.

In the meantime, experiments were being made with steam locomotives which drew conveyances on rails of wood and later of iron. By 1850 the railroad had advanced into the building era. But still no transcontinental route.

Industrial and congressional leaders began taking it up. In 1853 Congress passed a bill introduced by Sen. Salmon P. Chase of Ohio, later to be an important Civil War figure, which provided for the survey of four possible rail routes to the Pacific Coast. Jefferson Davis, then Secretary of War and later President of the Southern Confederacy, sent five other engineering corps into the field and surveyed five other routes, and reported on the results some time later. There continued what a contemporary historian calls "a period of storm and stress in which sectionalism and localism were engaged in drawing and quartering Pacific railway measures," which was brought to an end only by secession of the southern states and outbreak of the Civil War.

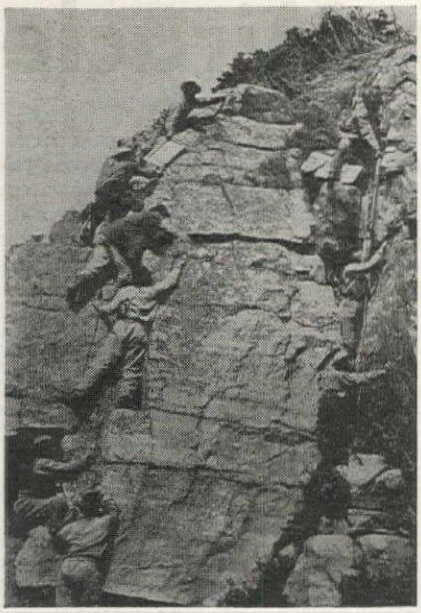
The northern statesmen, desiring to link California, developing fast by this time because of the "gold rush," to the Union states, pushed through Congress the "Enabling Act" which embodied features from most of the previous recognized plans for a transcontinental railroad and which President Lincoln made law on July 1, 1862.

This act created the Union Pacific Railroad, commissioned to build a line westward from "a point on the western boundary of Iowa to be selected by the President of the United States," through a designated point in central-southern Nebraska to the "western boundary of Nevada Territory," and the Central Pacific, to build eastward from the Pacific Coast to join the Union Pacific.

Start of the work

In accordance with the railroad act, the Union Pacific Company was organized and the directors qualified on June 27, 1863. On December 2, 1863, ground was broken officially at Omaha for the Union Pacific Railroad, amid great civic festivity, with Gov. Saunders of Nebraska wielding the spade.

The Civil War was at its height. Manpower was scarce, since most of the able-bodied men were under arms. Material had to be brought great distances. Engineers could not agree on certain portions of the route. Wooden ties had to be brought from forests to the east and rails and fittings were needed by the hundred-thousand tons. And there was no railroad westward beyond central Iowa, so these heavy materials had to be brought overland by wagon from the



SURVEY CREWS on reconnaissance for the transcontinental railway had to explore totally unknown country. Here a survey party climbs precipitous cliffs as it stakes line for the graders to follow.

end of the railroad or shipped by the long and slow water method up the Missouri River.

Consequently, it was July 10, 1865, before the first rail actually was laid at Omaha. Nearly ten weeks later only 10 mi. had been completed but there was material on hand for 100 mi. more. In addition, four locomotives, thirty flat cars and five box cars were in use on the short stretch.

The track had been extended 40 mi. by January, 1866, and after that the builders really went to work. More than one million ties had been delivered to the end of the track. Most of them were cottonwood and they were being impregnated with a zinc solution at the rate of 1,000 per day. Over 6,000,000 ties were used for the entire job and more than 300,000 T. of iron rails. A few cedar ties were available and oak ties had to be brought from as far east as Pennsylvania and New York. This made them cost $3.50 each delivered at Omaha. The iron rails cost $138 per T. delivered at Omaha during the early part of construction, but after the close of the Civil War the cost dropped somewhat. Several thousand cords of firewood for the use of the engines had been piled up. Preliminary surveys had already been run as far as Humboldt, Nev., 200 mi. west of Salt Lake City, and grading had been completed as far west as the 100th meridian. By the end of 1866 the builders had laid 260 more miles of track, which covered more than half of the present state of Nebraska.

A "first class road"

It had been determined that the new Union Pacific Railroad was to be a "first class road," regardless of expense. Col. Silas Seymour, consulting engineer for the company, specified that the locomotives should be from 28 to 30 T. in weight, with 5-ft. driving wheels and cylinders of 16-in. bore and 24-in. stroke. Rails weighing 50 lb. to the yd. should be laid on ordinary grades, and they should be increased proportionately to the friction generated by steeper grades and heavier engines. Ties should be 8 ft. long, 6 in. deep and at least 8 in. wide. Rails should be fastened together either with standard fishplates or a wrought iron chair. Roadbed should be of adequate width and proper material.

In order to accomplish this construction feat the grading gangs, numbering 3,500 men, were often 200 mi. in advance of the track layers. Four hundred and fifty men were employed on track construction and the train operating forces totaled 300. The company operated nine sawmills and several steamboats. A machine shop was put into operation at North Platte and the main shops of the railroad were established at Omaha. These facilities turned out 20 new cars a week, as well as repairing all locomotives.

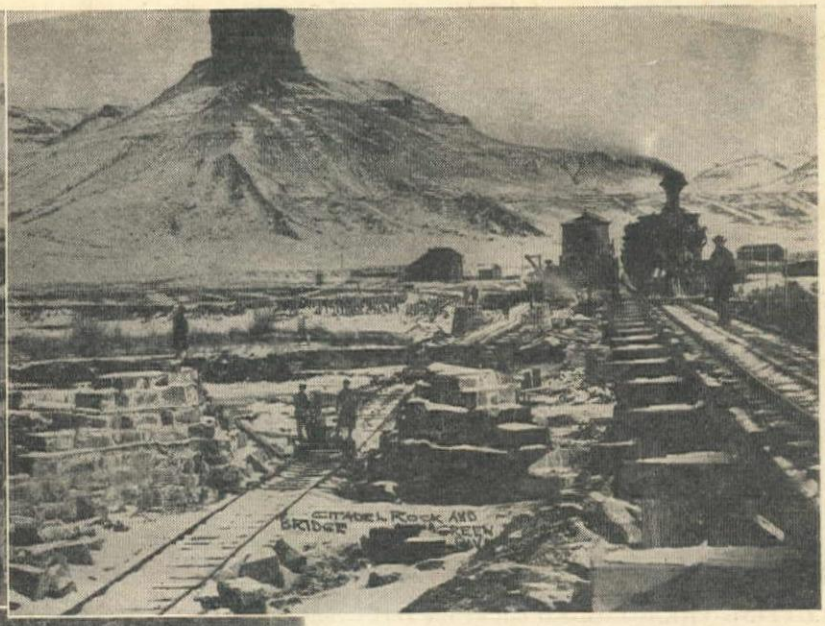
The daily order of procedure was for a train load of iron to be pushed to the end of the track. There the rails were dumped opposite the track and train removed. Flatcars pulled by horses were then loaded with the rails and pulled to the end of the track. Here squads of five men each were waiting on each side of the track. Two rails were picked up simultaneously, carried ahead and placed on the ties. The wrought iron chair had been fastened to the end of the preceding rail and the rail carriers slipped the new addition into its place. Spikers jumped to position, drove sufficient spikes to hold the new rail in place and the flatcar rolled forward for a repetition of the procedure. Thirty seconds were required for each pair of rails.

Help fom the Mormons

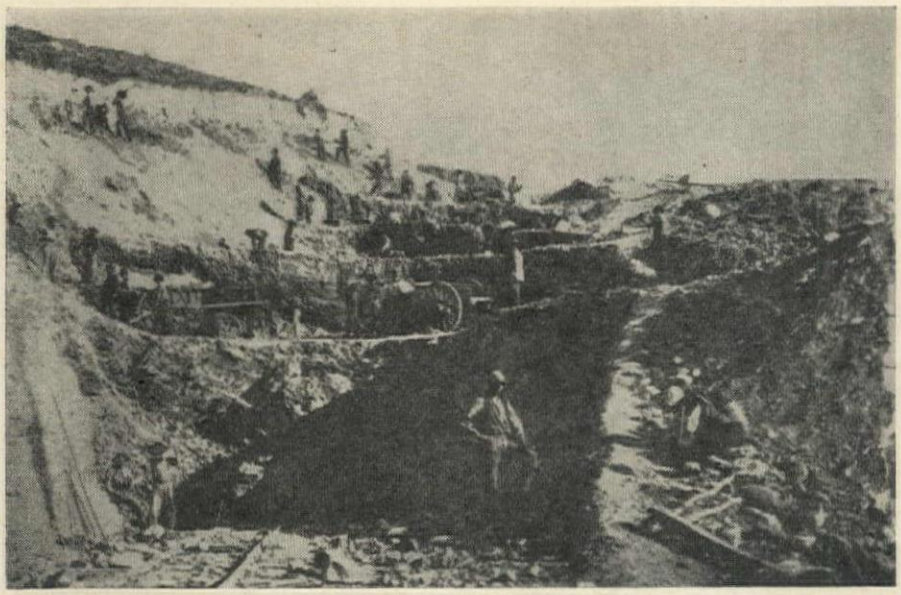
It was the hope of President Brigham Young of the Mormon colony in Utah that the transcontinental railroad would pass through his metropolis of Salt Lake City but none of the several surveys carried out by both Union Pacific and Central Pacific engineers indicated that this was a feasible route. Both the Mormon Church and the State of Utah protested

IN THE JUNE ISSUE of *Western Construction News*, the story of construction of the Central Pacific over the rugged Sierra Nevada was told. Here is presented the story of the westward drive of the Union Pacific from Omaha, to meet the Central Pacific and close the first transcontinental railway. Both stories are epics of construction skill and pioneer valor.

TRANSCONTINENTAL railroad is completed and "No. 119" (right) of the Union Pacific meets "Jupiter" of the Central Pacific at Promontory Point, Utah, on May 10, 1869. Champagne was drunk, golden spikes driven to celebrate opening of West.



BRIDGE ERECTION was an important part of the construction of the transcontinental railroad. Masonry piers supported the bridge (upper left) across Green River, Wyoming. Derricks were improvised to do much of the heavy lifting. A supply train crossed this same river (upper right), under the shadow of Citadel Rock, and carried material and equipment farther west as the construction of the roadbed advanced. Visitors were taken by special train to the end of constructed track at Devil's Gate, Weber Canyon, Utah (left). Many bridges and several long tunnels were constructed on the mountainous part of the road. For its day, the famous Dale Creek Bridge (lower left) was a remarkable piece of engineering and construction work. It was one of the largest of the bridges on the road and was built on an intricate system of timber bents. The hewing of logs (lower right) was an important part of tunnel construction work. Nine sawmills were built to supply most of the timber and logs for track and bridge building. Grading gangs were often 200 mi. ahead of the track layers and much of the bridge building was done far ahead of the completed track.



CUTTING THE ROADBED out of the rocky canyons of Utah, laborers are at work on deep cut No. 1, west of Wilhelmina Pass, Weber Canyon. Construction men had the use of only crude rock drilling and breaking equipment to do this heavy rock work.

vigorously to Washington, and Utah citizens were prohibited from working on the railroad. Later, however, Brigham Young saw the impossibility of routing the railroad directly through his city and permitted his followers to assist in the work. In fact, he himself took a $2,000,000 grading contract for a long stretch of the right-of-way. Had it not been for the assistance given by the Mormon laborers the meeting place of the two railroads would have been much farther east and the time of completion would have been considerably delayed. The section of road most particularly credited to the Mormons was the 120-mi. stretch from Echo Canyon to Promotory Summit.

Across the mountains and desert the actual track laying was also contracted, this time to Casement Brothers. Their contract read $800 per mi. for anything less than 2 mi. a day; $1,200 per mi. for over 2 mi. a day, and for delays caused by unfinished grade $3,000 a day. Laborers, practically all Irish, were paid $3 a day.

In descending from the mountain summit into Echo Canyon it was necessary to construct a tunnel 770 ft. long, at each end of which trestle approaches were required, one 230 ft. long, the other 450 ft. long. Construction of these works would consume a considerable amount of time, so a temporary route was constructed down the mountainside, around the tunnel site. This steep grade was called the "Z" and was used in order that materials might be advanced to the railhead and work advanced without interruption. The tunnel was eventually driven at an expense of $3.50 a cubic yard.

The year 1867 saw 240 mi. added and the line had reached Sherman Hill, 8,247 ft. high, in the Rocky Mountains, and the highest point on the present Union Pacific lines. These intrepid builders, who had to work while heavily armed and under guard of troops because of the almost daily attacks by hostile Indians, laid 425 mi. of track during 1868 and another 125 mi. brought them to Promontory, Utah, where took place the historic "Wedding of the Rails," on May 10,1869.

While the Union Pacific was building its 1,085.8 mi. of westbound rails, the Central Pacific, of course, had been coming eastward. Its contribution to the continental span was 690 mi., including the crossing of the rugged Sierra Nevada. Naturally, these two routes didn't just converge perfectly. Actually, the grading gangs of the two companies passed each other and graded mile after mile of parallel route before the actual junction point was determined by a conference of officials of the two companies, because each organization received a premium for the amount of track laid.

The Union Pacific survey extended almost to the California border. Grading was completed as far as Humboldt Wells in Nevada and some 80 mi. of Union Pacific rails had been laid west of Promontory Summit. At the same time the Central Pacific engineers made a survey as far eastward as the head of Echo Canyon and filed a map in Washington claiming right-of-way to that point. However, it became obvious that this needless duplication of endeavor was a great mistake and officers of the two companies held a conference to determine the actual meeting point of the two lines.

Wedding of the rails

At last all was arranged. Promontory Point was chosen for the junction and on the historic morning of May 10, 1869, there gathered a great crowd of officials and laborers for the laying of the last tie, which was to be clinched with spikes of silver and gold.

Building of the first transcontinental telegraph line had sped ahead of the road for the iron horse, so by this time the country was spanned by telegraph wires to the main cities and, though they didn't realize it at the time, those in charge of the rail ceremony created the first "national hook-up."

By an arrangement of signals and hooking up of telegraph wires so they would register the blows, both coasts and intermediate cities were apprised immediately that the great task was done as Dr. Thomas C. Durant, vice-president of the Union Pacific, drove home a silver spike and Gov. Leland Stanford of California, official of the Central Pacific, pounded down the golden spike.

There were, in fact, several spikes of precious metals—having been furnished for the occasion from the states or territories of Montana, Utah, California, Arizona and Nevada. Each was about seven inches long, slightly longer than the average spike, and they were driven with a silver-headed maul into a special tie of California laurel wood, eight feet long, eight inches wide and six inches thick, bearing a specially inscribed silver plate. Immediately after the ceremony, both the tie and spikes were removed and placed in various historic museums.

The spikes driven, the two locomotives which had been brought up to the rail ends moved forward until they touched each other, the christening wine was poured and the ceremony was over.

Prepared for completion of the line, trains from both coasts had started toward the opposite end of the country several days prior to the actual joining of the rails, and so transcontinental service was established at once.

Early travelers from the Atlantic to the Pacific seaboard, using first class and sleeping car facilities, paid approximately $225 for the trip, which took seven days and seven nights. The fare was $173, the sleeper fare came to $28 more and meals at the dining stations at special stops along the road used up about $24 more.

Later the fare was reduced to $139 first class, which made the trip cost about $190 until further reductions were made both in fare and time, which also reduced the cost of sleeping car accommodations and meals.

Complete 3,400-ft. Tunnel On the Deschutes Project

TUNNEL No. 2 on the North Unit Main Canal of the Deschutes irrigation project of the Bureau of Reclamation has been completed by Wixson & Crowe, Redding, Calif., contractors, to whom the contract was awarded early this year. The 3,400-ft. tunnel, having a lined inside diameter of 11 ft. 3 in., passes under the pinnacles of the Smith Rock mountains near Terrebonne, and will be used for a roadway by the contractors to facilitate their operations on the 3,564-ft. Sherwood Canyon tunnel, upon which work has now begun. The second tunnel (No. 1 in the contract) will have a similar inside diameter.

It is anticipated that the tunnels and canal work will be completed in the summer of 1945 and that about 20,000 ac. in the North Unit project will be irrigated next year. Contract price of the two tunnels was $451,690.

Water Meet Proposes Bill Change

Representatives of 29 states consider changes to Flood Control and Rivers, Harbors bills to insure protection of states rights in disposition of water and assure its use for the most beneficial purposes—Senators O'Mahoney and Millikin agree to proposed revisions, which are believed to insure cooperation between the Federal and State agencies dealing with water

A MEETING of representative water conservation authorities from twenty-nine states was held in Chicago in the early part of last month to consider the implications to states' rights in the several bills now pending in Congress, dealing with stream operation. The stated purpose of the conference was: (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 amendments to the Rivers and Harbors Bill and the Flood Control Bill now pending in Congress, (4) to insure adoption of such amendments, and (5) to consider other matters dealing with water conservation.

The conference was called jointly by the Interstate Commission on the Delaware River Basin; the Texas Delegation to the National River and Harbors Congress; the Committee on Preservation of the Integrity of State Water Laws, from the National Reclamation Association; and the Northeastern States Conservation Conference. A total of more than one hundred delegates responded to the call, including many governors, congressmen and state engineers.

The principal result of the meeting was a resolution calling attention to the fact that provisions now existing in the Rivers and Harbors Bill (HR 3961) and the Flood Control Bill (HR 4485) are inimical to the sovereign rights and interests of the individual states and the people thereof, and perfecting certain amendments to be offered as substitutes for the so-called O'Mahoney and Millikin amendments to the bill. Both Senators O'Mahoney and Millikin were present at the conference and the new amendments were approved by them. It is felt that if the revised amendments are adopted by Congress, the rights and interests of the states will be protected and the correct distinction between the functions of the states and the United States would be provided in the development and control of the water resources of the country. Full cooperation on the part of the Federal agencies involved and the several states would be required.

Flood bill amendments

The proposed amendments to the Flood Control Bill are as follows:

In connection with the exercise of jurisdiction over the rivers of the Nation through the construction of works of improvement, for navigation or flood control, it is hereby declared to be the policy of the Congress to recognize the interests and rights of the states in determining the development of the watersheds within their borders and likewise their interests and rights in water utilization and control; to preserve and protect to the fullest possible extent established and potential uses, for all purposes, of the waters of the Nation's rivers; to facilitate the consideration of projects on a basis of comprehensive, basin-wide development; and to limit the authorization and construction of navigation works to those in which a substantial benefit to navigation will be realized therefrom and which can be operated consistently with appropriate and economic use of the waters of such rivers by other users.

In conformity with this policy, (a) Plans, proposals or reports of the War Department for improvements to navigation or flood control shall be submitted to Congress only if investigations leading to their preparation shall have been conducted so as to give the affected states all information developed, and opportunity for consultation regarding the proposals. Also, if such investigations are concerned with the use or control of waters arising west of the 97th meridian, the Secretary of the Interior shall likewise be informed of all investigations and given the opportunity to consult in the plans. (b) Certain eastern river developments are specifically placed under the requirements of paragraph "a" above. (c) The use for navigation of waters arising west of the 98th meridian shall be only to such extent as does not conflict with any beneficial consumptive use, present or future, in states lying west of that line. Such beneficial consumptive use includes domestic, municipal, stock-water, irrigation, mining and industrial purposes. (d) The Secretary of the Interior shall be subject to the same requirements as the War Department (stated in paragraph "a") when making investigations or reports on irrigation projects, in that he is required to furnish information and permit consultation by the states and the War Department.

Other amendments delete the section relating to the authority and supervision of the War Department over dams on navigable rivers and their tributaries; and provide for a re-examination of the development of the Missouri River basin by the War and Interior Departments, requesting a new joint comprehensive plan.

Rivers bill amendments

Amendments to the Rivers and Harbors Bill, in addition to terms essentially similar to those listed above, include: (1) reference to the Snake River in Oregon, Washington and Idaho, authorizing construction of such dams as are necessary and open channel improvement for the purpose of providing slack water navigation and irrigation after the two departments have consulted together, and specifically providing that surplus electric energy generated at such dams shall be delivered to the Secretary of the Interior for disposition in accordance with laws governing disposition of Bonneville power; (2) restoring to the bill a portion previously deleted reading as follows: "The excess land provisions of the Federal reclamation laws shall not be applicable to lands which will receive a water supply from the Central Valley Project, California, reauthorized by Section 2 of the River and Harbor Act, approved August 26, 1937."

Propose Simplification Of Air Heating Fittings

A PROPOSED Simplified Practice Recommendation for Pipes, Ducts and Fittings for Warm Air Heating and Air Conditioning has just been submitted to all interests for acceptance, according to an announcement of the Division of Simplified Practice of the National Bureau of Standards.

The proposed recommendation is an outgrowth of considerable study given the subject by a Simplification Committee of the industry over a period of several years. In 1942 the War Production Board studied the advisability of issuing a mandatory Limitation Order covering these commodities, but decided that no such action was necessary.

The current proposal contemplates the establishment of a voluntary established stock list of pipes, ducts and fittings representing the best thought of the industry, its distributors and customers as to what constitutes desirable practice for the present and the post-war days to come.

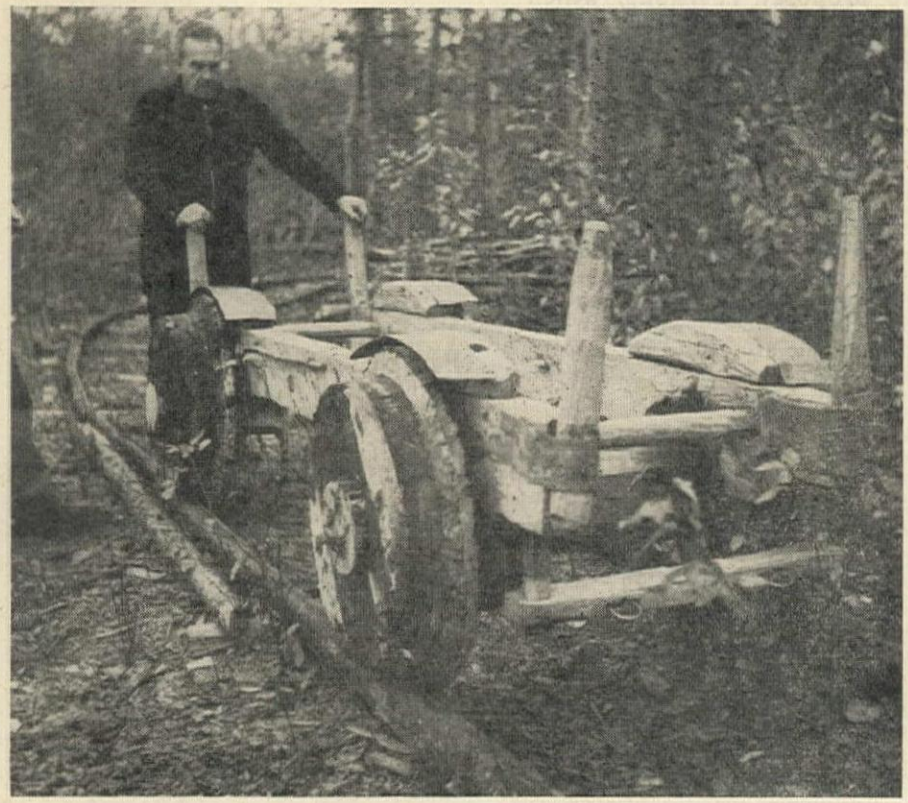
There is a total of about 1,223 items in the proposal, whereas at least one large producer has recently cataloged not less than 5,580 varieties of pipes, ducts and fittings for the same types of installations covered by the proposed recommendation. On the basis of information submitted by manufacturers when the Division was cooperating with the War Production Board on this subject, it is estimated that the recommendation would, if generally adopted, effect a reduction of inventory of about 40 per cent.

A limited number of mimeographed copies of the proposed recommendation may be obtained without charge from the Division of Simplified Practice, National Bureau of Standards, Washington 25, D. C.

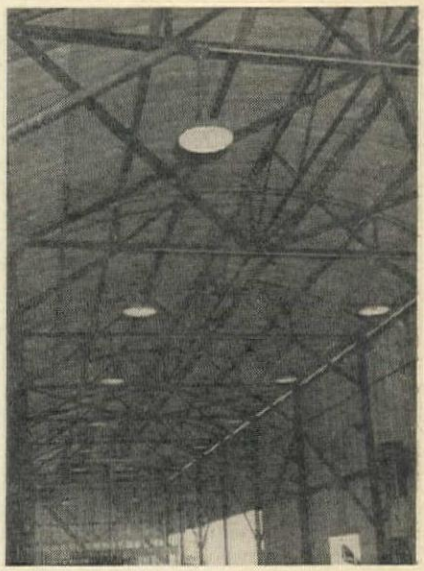
HOW IT WAS DONE

JOB AND SHOP TIPS FROM THE FIELD EDITOR'S NOTEBOOK

One Man Logger Transports Logs Over Wooden Railroad



THIS WOODEN RAILROAD is used by a man on Bear Island, Canada, to haul cordwood. Construction men working on the Canol project encountered this local man while they were constructing the winter highway to Norman Wells, which road was required for the transportation of equipment and supplies to build the oil pipeline across the Canadian mountains to White Horse. The improvised car was equipped with wooden wheels that were flanged to the shape of railroad car wheels. The bed of the car was built of heavy timber and metal strips were used to hold the end uprights in place. Metal fenders were built to prevent the load from rubbing against the wheels. The rails consisted of small trees that had been trimmed of all their branches, and fastened together so as to form a continuous track that was spiked to occasional cross ties. The car was designed to be pulled by oxen or other animal power through addition of a yoke to the front.

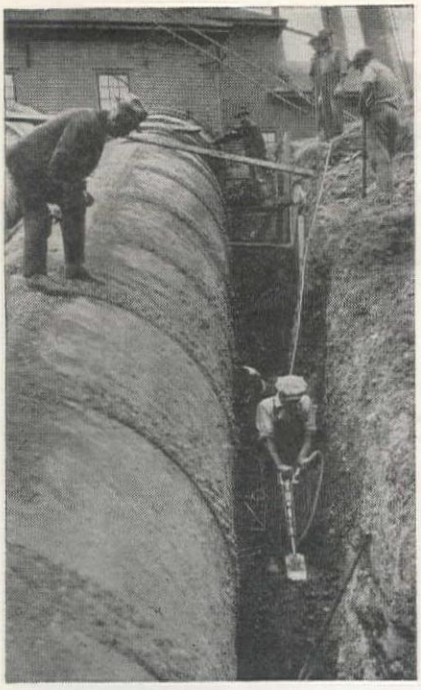


Scrap Pipe Used in Frame of Building

KAISER'S OREGON shipyard at Portland, Oregon, has found use for scrap pipe that would otherwise be carried to the salvage yard. Scrap pipe was used in the framework of a new sand-blasting building at the end of one of the ways. In order to give clear space for operations, the 180 x 20-ft. structure has a truss ceiling with no central supports. The sturdy ceiling trusses and wall frames were cut and welded during slack periods between contracts. The new facilities to be housed in this building will include sand-blasting units, threading and bending machines and work benches. This equipment will alleviate the critical problem that has arisen at the yard because of the increased demand for pipe systems that are installed on ships being constructed for the government at the present time. A full crew has recently moved into the new quarters and the shop is now in full operation.

Power Shovel Digs in—Loads Itself on Truck and Trailer

THIS FRUEHAUF carryall trailer eliminates the necessity of a loading platform or ramp on excavation work. A power shovel digs a suitable hole, the truck and low-bed carryall trailer unit backs into the hole, the shovel crawls aboard and the truck hauls the equipment away. This action picture was taken at Klamath Falls, Oregon, airport. The truck and trailer, owned by E. C. Hall of Eugene, were working on a subcontract awarded to Harry I. Hamilton, also of Eugene, Oregon.



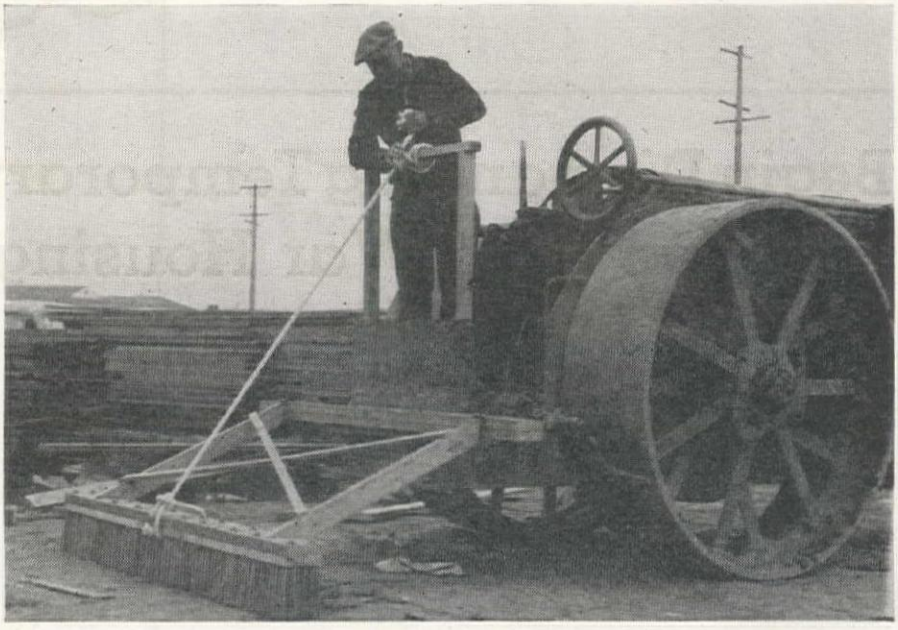
Pneumatic Digger Cuts Clay Packed Around Pipe

AN AIR-OPERATED clay digger was used to loosen the clay that had packed around a penstock at a hydro-electric station. This type of work is essential in the proper repair and maintenance of sub-surface pipe installations. The compressed-air digger receives considerable credit for making it possible for progressive contractors to continue to break construction records during periods of manpower shortage. The digger is used to loosen gravel and other materials for loading, and to cut clay, hardpan and frozen ground for trenching.

Various types of spades, chisels and flat picks are now available for use in their operation and suitable accessories are manufactured for their many applications. Hard steel points are employed for light and medium demolition work. The piston stroke of the pneumatic digger ranges from 2½ to 4 in. and the weight from 19 to 25 lbs. The Compressed Air Institute cites many instances of the rapid and economical digging operations that have been performed by this useful construction tool.

Power-Roller Pulls Brush to Smooth Out Pock Marks in Pavement Sub-base

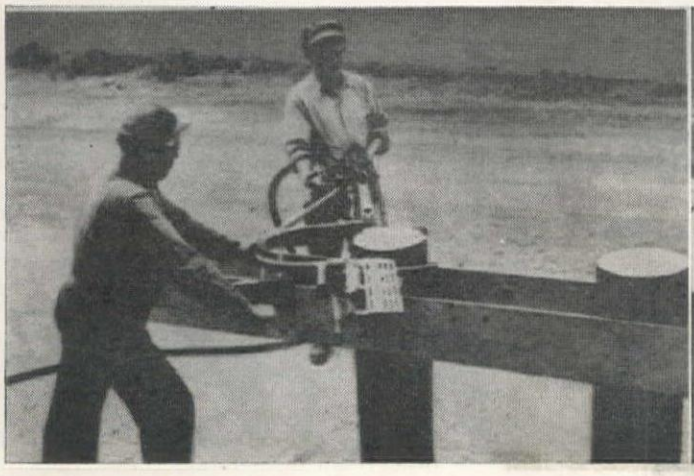
A ROAD-BRUSHING device was improvised by construction men during the building of the San Lorenzo Village, near Oakland, Calif. *(Western Construction News,* Sept., 1944). The attached road brush smoothed out the pock marks after the roller passed over the crushed rock base and swept fine material into them. A rope was fastened to the brush to lift it clear when the roller backed, or when its use was not desired. The application of such ingenious devices and the general use of power equipment greatly expedited the construction of this large housing project consisting of 1,329 homes.

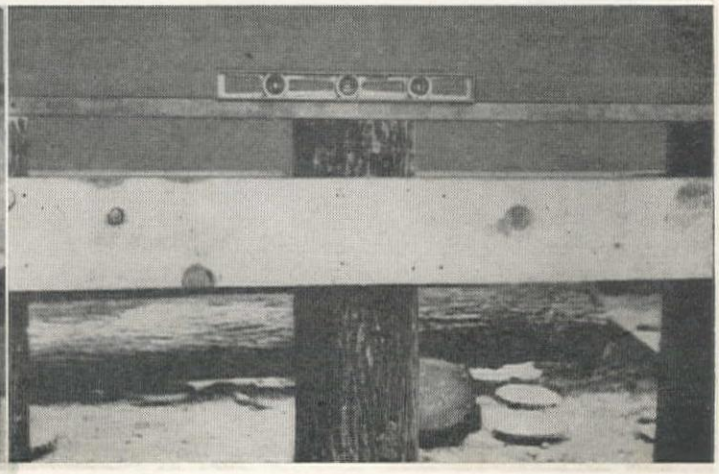


Guide Attachment Assures Accurate Pile Topping at Established Height

THE SPECIAL ADAPTATION of a pneumatic saw to the topping of piles in construction work on ferry docks, wharves, bulkheads, piers and dry docks has eliminated the need for tedious and costly manual cutting. Consisting of two lengths of pipe or bar stock secured beneath the unit, the device acts as a guide runner on the battens and insures a uniform, level cut within the tolerances of the battens. Although the Davey Compressor Company will manufacture the device upon request, it will furnish any marine or building contractor with detailed information explaining its construction. The photo illustrates the saw cutting a section of piling that must be cut within one-sixteenth in. of an established elevation. The method is also applicable to any construction problem where piling must be cut or notched to place header beams in pile bents.

The compact, tubular design of the saw permits working between piling spaced as close at 21 in. and allows one man operation in tight quarters. Compressed-air operated, with built-in oiler, the unit works efficiently under water.





NEWS OF WESTERN CONSTRUCTION

OCTOBER, 1944

Begin Dismantling Temporary Portland Area War Housing

VANCOUVER, WASH., which has more war housing units than any other city in the United States, is attempting to make its first steps toward disposal of this huge property. The Vancouver Housing Authority has made application to the federal government to acquire the 1000 units of permanent public housing located in the Fruit Valley, Fourth Plain Village and Harney Hill projects after the war. In its application the authority asked for time and opportunity to procure these units either through purchase, based on the ability of the local authority to finance their purchase; or through an outright grant from the government to the local authority.

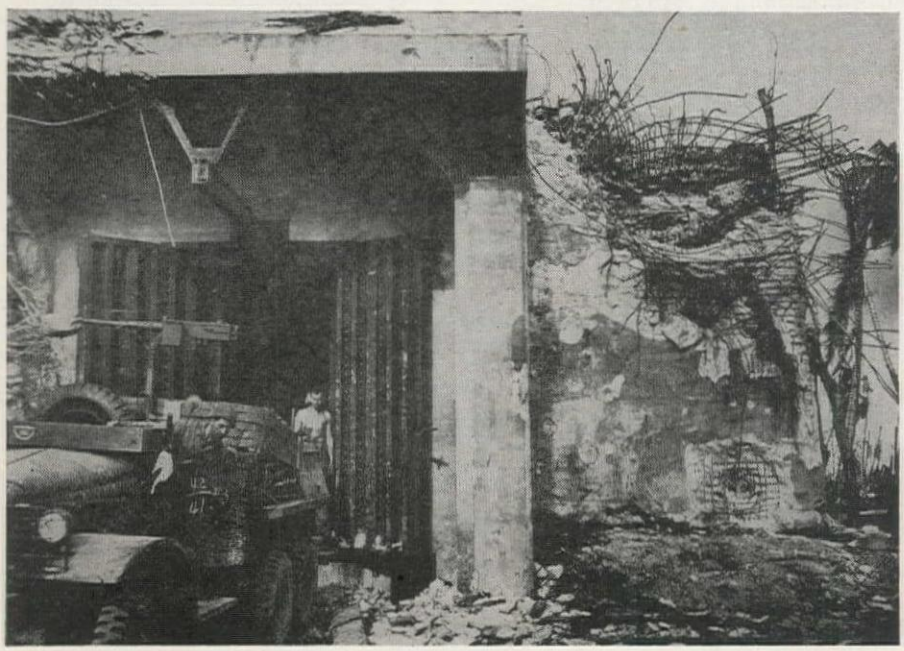
The remaining 11,350 units in the area are definitely billed as "temporary." The Authority recommended that when these units are removed, as required by law, the land be impounded by the federal government and placed on the market gradually to prevent speculation.

The Burton Homes project of 1,500 units began being dismantled about September 1 (at the same time a few buildings are still going up at Vanport). Many of these units, however, will be moved to other war industry areas, it is said. At its peak this project (one of the worst) never had more than a thousand families in occupancy. On August 1 there were only 685 families. Oddly enough, the project will start to be dismantled just exactly a year to the day from the time it was opened.

In Portland the situation is somewhat different. Of the 18,000 units (including Vanport) built by the Federal Public Housing Authority, only 400 units, those in Columbia Villa, can be classed as permanent. There are, however, 725 "Gartrell-type" single-family homes which are of panel construction and can be dismantled, shipped and reassembled somewhere else. Beach property owners are expressing interest in this type of housing.

JAPANESE INSTALLATIONS WRECKED BY U. S. SHELLFIRE

A JAPANESE AMMUNITION storage blockhouse on Namur Island in the Marshalls after capture by U. S. Marines. These buildings had double walls of reinforced concrete, each about 4 ft. thick. Shellfire from U. S. battleships ruined outside wall, but could not penetrate interior. Heavy bombs were handled by overhead monorail crane. Marines are removing unexploded Japanese ammunition for destruction elsewhere.



Manpower Controls Not To Affect War Veterans

THE WAR Manpower Commission has announced the lifting of all manpower controls for veterans of the present war.

This action was taken to speed the reemployment of returning veterans and to remove all employment obstacles in the way of their return to civilian life.

Relaxation of manpower controls for war veterans is provided for in the following manner:

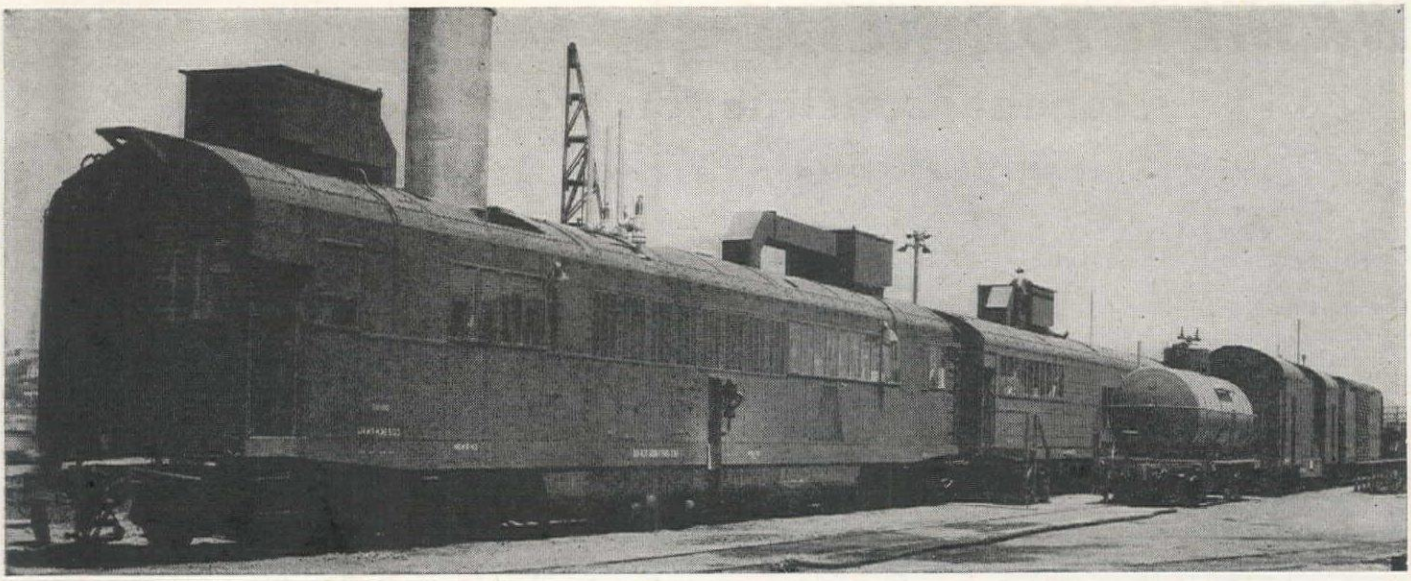
1. Veterans of the present war will not be required to secure or present statements of availability in order to change jobs.

2. Veterans of the present war may be hired by any employer without referral by the United States Employment Service or other authorized referral channels.

3. Any veteran of the present war who seeks employment through USES will be entitled to a referral, as a matter of right, to any job of his choice, without regard to the essentiality or priority status of such job.

4. Veterans of the present war may be hired without regard to employment ceilings. However, all employes who are veterans of this war will be counted against an established employment ceiling unless the applicable local employment stabilization program provides for the exemption of such veterans from employment ceiling determinations. No workers other than veterans of the present war and any other groups that may be exempted locally may be hired if employment is at or above the established ceiling.

Veterans of the present war are defined as those who have served in the armed forces of the United States subsequent to December 7, 1941, and have other than dishonorable discharges.



EXTERIOR VIEW of the 10,000-kw. mobile power plant consisting of 6 specially built railway cars housing complete steam-turbine generating station.

Mobile Steam-Turbine Generating Unit Supplies Emergency Power to the Navy

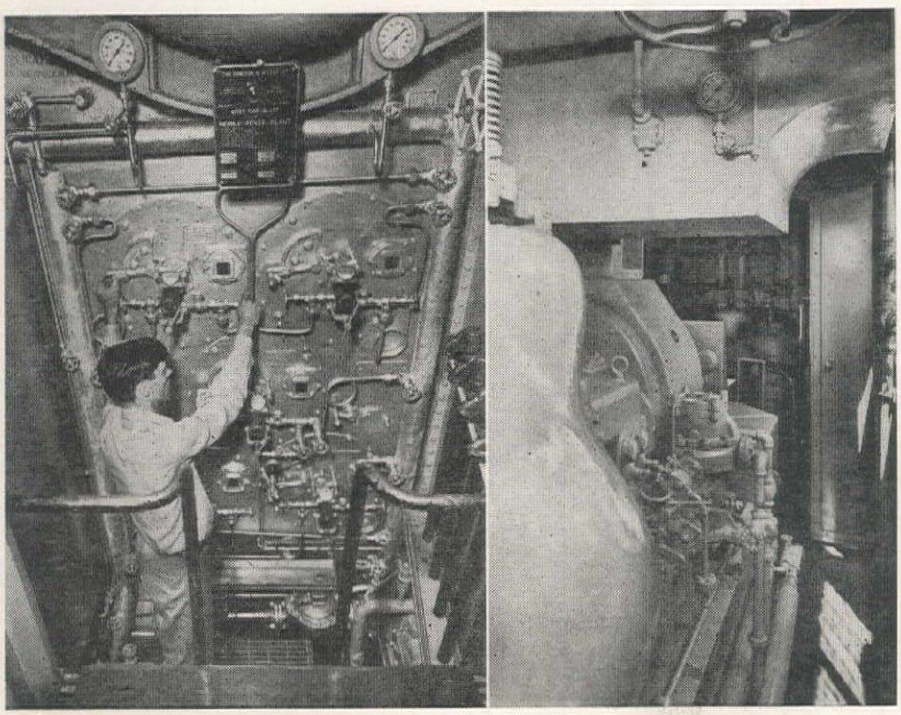
ONE OF THE NAVY'S newest possessions neither floats nor flies but does its travelling over railroad tracks. The non-nautical unit is a 10,000-kw. mobile power plant, just delivered by the General Electric Co. to Mare Island Navy Yard, for the Bureau of Yards and Docks. Based at Mare Island, it is now ready to supply power to Naval establishments on the West Coast during emergencies.

The mobile plant is one of two such units General Electric supplied to the Bureau. It comprises six specially built railway cars housing a complete steam-turbine generating station as well as the switchgear and transformer apparatus for controlling and distributing the 10,000 kw. of electric power it is capable of producing. The mobile plant was conceived, initiated and financed by the Bureau of Yards and Docks, and the detailed design was developed by General Electric.

The unit has no motive power of its own, but it can be hauled over the rails by a locomotive at speeds up to 40 mi. per hr. Thus it can be transported quickly to any point where additional or emergency power may be required by the Bureau's many domestic projects. Engineers have estimated that the unit can be put on the line within 24 hours after arrival at any operating point. Bunker C fuel oil is used to fire the boilers, and a sufficient supply is carried in the mobile unit for two hours' operation so that power can be generated before tank cars are hauled up and connected.

Generation is at 13,800 volts. The transformer included with the unit provides other voltages which correspond to those of the electric distribution system at any naval shore establishment where the unit may be needed.

COMPACT ARRANGEMENT of main boiler equipment (left) showing side air ducts which supply forced draft to air heaters and spare burners on right. Turbine car (right) contains 350-kw. auxiliary turbo-generator with lubricating oil cooler and strainer. Main air ejector and condensate pumps are located at the far end of car.



Literature Available on Metal Lath & Accessories

PRINTED COPIES of Simplified Practice Recommendation R3-44, Metal Lath (Expanded and Sheet) and Metal Plastering Accessories are now available, according to an announcement of the Division of Simplified Practice, National Bureau of Standards. This recommendation will be effective when the critical materials used in the manufacture of the commodities covered, become available. They are now restricted by War Production Board order.

This recommendation planned for post-war use will enable the industry to make quickly available an adequate supply of metal lath and plastering accessories for the anticipated post-war expansion in building activities. It further simplifies the types, weight and sizes of items in the issue which it supersedes, and broadens the coverage of the recommendation to include bullnose corner bead, corner lath, strip lath, base screeds, metal casings, concealed picture mould, tie wire, hanger wire, and metal studs for hollow partitions.

Copies of Simplified Practice Recommendation R3-44 may be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., for 5 cents each.

WASHINGTON NEWS

. . . for the Construction West

By ARNOLD KRUCKMAN

WASHINGTON, D. C.—The heavy construction industries of the West slope will feel the effect of the elections on Nov. 7. Many elements involved will influence the future one way or another. Most directly apparent will be what happens to the reclamation and road building programs. The advent of new people in Congress inevitably will make a difference. And a complete turnover in administrative policies obviously will make still a greater difference. From the purely personal and human side of the picture we, here in the Capital, are bound either way to lose many valued friends. When they come back on Nov. 14, we know some will be with us only a few more weeks, and there will be considerable genuine sadness hereabouts.

Whatever the change may be, we feel generally any shift in over-all control in the highest places of the Interior Department will be good. It might be worse than it is at present, so far as the controls imposed on the Bureau of Reclamation is concerned, but apparently the people of the irrigation areas do not feel it should get any worse. The word filters through that if the election does not automatically cause a change in relation to the ultimate administration of the affairs of the Bureau of Reclamation, the people of the West slope most concerned **are going to do something about it,** vigorously and noisily.

The irritation does not center on Commissioner Bashore, and his administrative and professional associates in the Bureau of Reclamation. It is held they are doing a good job, within the difficulties with which they are hedged. Nor, surprisingly, is there such violent objection to the cantakerous little man at the head of the Department of Interior, Spitfire Harold, the Terror of Winnetka. On the whole, if you can swallow his rather unfair spitefulness, he is regarded as a reasonably fair person, after you break through the Siegfried line he has around him. The trouble is the line. It is an intangible entity consisting wholly of an aggregation of more or less youthful humanity with a more or less ardent hankering for anonymity.

It would be dishonest as well as unfair to imply that these anonymous Household Guards of Harold mean anything but that which is sincere, and real. The trouble is, from the standpoint of the people in the West, the Household Guard has not the remotest understanding of the fundamental problems that make reclamation tick. But they do have political influence, and they are so placed that they can meddle with the plans, purposes, and work of those in the Bureau of Reclamation.

Cause of apathy

This kind of situation has come within the experience of most humans. You observe it in the unhappiness that envelops a home in which the two who make the home are honest and earnest but are worlds apart in their concept of what makes a home. You have run into it in business when the administrative heads are out of tune with the staff. The Bureau of Reclamation consists of scientists, engineers, technologists, men of highly trained skill and abilities, probably the highest types of specialists of their kind in the world. For almost a half century this organization has been consolidated into a unique body with a very fine understanding of the West, and with ideals symbolized in the great works typified by the hundreds of jobs done in the West, outstandingly brought to mind by Boulder Dam, and by similar works which have made communities for thousands, greatly augmented the national wealth, and supplied foods, fibers, and electrical energy needed by the West.

It would be foolish to claim the Reclamation people are invariably right, and that they are anything but human; but they do know their business. And like all highly trained technological people, they do not work at their best under conditions of strain and persistent discord. It is this depressing jangling atmosphere you sometimes feel when you have business with the Reclamation people. You find much the same atmosphere in other Government agencies where some forms of regimentation and autocracy have been allowed to creep in during the past 12 years. It leaves the best of people dull and dispirited.

Undoubtedly this is one of the effects Washington, Jefferson, and other historic founders of the Republic wished to avoid when they insisted that frequent change in general administration would keep the government vigorous, lively, and vital. There are responsible persons here in the Capital who will tell you that John Page would still be the Commissioner of Reclamation if the nervous strain had not ruined his health. People obliged to work under such conditions become not merely discouraged but lose that self-assurance inherent in the professional man.

The water bills

Some of the troubles involved in all this may be discussed when the Flood Control and the Rivers and Harbors Bills come before Congress shortly after its members come back in November. The issues will primarily be whether irrigation, power, and similar beneficial uses of water in rivers shall be subordinate to navigation, and whether the job to be done shall be under the control of the Corps of Engineers, or whether the Reclamation Bureau shall have complete and independent control over the type of work within its geographical and technological orbit. And, of course, down deep under all these issues will lie the basic consideration whether these enterprises shall be controlled by the Federal Government, or the States shall have the rights and powers presumably retained by them in the original compact we know as the Constitution.

It is clear the States' rights issues are as important in this impending fight as are any of the others. The recent Water Conservation Conference at Chicago, between the representatives of 29 States, coming from the West and the East, laid emphasis on States' rights repeatedly. The startling aspect is that this insistence comes from the 17 States of Western America, and the 12 States of northeastern United States. In other words, the States' rights issue, which dominated the conflict of the Civil War, and which was championed solely by the South, now is basic in the water fight championed by the West and the northeast.

It is extremely interesting to contemplate the fact that the thought of the conferees from the 29 States at Chicago was completely unanimous in relation to water problems. They agreed, in substance, that inland navigation is not as important to the welfare of the nation as is irrigation, mining, and the use of water for domestic needs, for municipalities, for stock, and for industrial purposes. It is apparently clear that the people regard rail, highways, and air as the essentials for transport. And it is striking that the conferees repeatedly emphasized the complete subordination of navigation on the waterways west of the ninety-eighth meridian.

The result of the Chicago conference appears to show that at least 29 States out of the 48 have formed a bloc to rewrite the Flood Control and the Rivers and Harbors Bills wherever these proposed laws would interfere with the industrial, agricultural and domestic use of the river-waters. Roughly, it would seem the States opposed to the paramount claims of navigation now represent two-thirds of the votes in Congress.

Basin authorities?

It remains to be seen whether or not there is any substantial support for the creation of more Authorities after the pattern of the TVA. It is generally assumed the President's proposal to create a Missouri River Basin Authority was prompted by Lilienthal of TVA. Superficial comments would lead to the impression that the suggestion came out of the memorial addressed to the President by the Governors of the Missouri Basin States after their meeting at Omaha. Close study of the document does not support the thought. Nor does there appear to be any strong backing for an Authority among the people of the Missouri Basin States; and it is reported here there is no warm response to the suggestion that another Authority be established in the Columbia River watershed, including the States of Washington, Oregon, Idaho and Montana. The President also suggested that an Authority be established in the Arkansas River watershed, from the Mississippi westward to the Colorado. A few days

after the President's message was delivered to Congress, HR 5377 was introduced by Rep. John J. Cochran of St. Louis, presumably prompted by the St. Louis Post-Dispatch, to establish a Missouri Valley Authority "to provide for unified water control and resource development in the Missouri River and surrounding region in the interest of the control and prevention of floods, the promotion of navigation and reclamation of public lands, the strengthening of national defense, and for other purposes."

The Missouri river

Late in September, the so-called Sloane Plan, the method of developing the Missouri River resources, submitted by Assistant Regional Reclamation Commissioner W. G. Sloane, of the Montana headquarters, was the subject of public hearings before the Senate Irrigation and Reclamation Committee. The hearings were conducted by Sen. O'Mahoney. In addition to Mr. Sloane, testimony was offered by Comm. Harry W. Bashore, Asst. Comm. William E. Warne, Liaison Officer W. G. Lineweaver, Chief N. E. Dodd of War Food Administration, Dr. John L. Coulter, former U. S. Tariff Commissioner; Carl H. Wilken, economist; Floyd Hagie, National Reclamation Association, and others. The Sloane Plan is the Bureau of Reclamation rejoinder to the Pick Plan, offered by the Army Engineers. It provides for more than 30 projects at an initial cost of $396,000,000, of which $200,000,000 would be spent in the earliest stages. The record made in these hearings will be helpful when the battle begins in Congress over the Flood Control and Rivers and Harbors bills. It is expected further supporting data will be developed at Denver in November at the annual meeting of the National Reclamation Association, which promises to be exceedingly interesting. The unity of the 29 States which met in Chicago is demonstrated by the call sent to the members of its Conference Committee to meet in Denver two days before the NRC convenes in order to prepare its members for participation in the National Reclamation Association sessions. It is anticipated States not represented at Chicago also will appear at Denver.

There is every evidence that a National Water Conference movement, as a permanent organization, is about to come into existence. Such nation-wide Conference obviously will give tremendous momentum to the building of 236 irrigation projects proposed as a postwar undertaking in the West, particularly in the 11 states of the Pacific slope. This huge project, to cost ultimately $3,000,000,000, creating 135,000 new farms with an additional population of 20,000,000, recently was discussed in a national radio hook-up by William E. Warne, Assistant Commissioner of Reclamation. If the West slope snaps into it, and vigorously, as well as actively, helps to push the program, it is apparent further reclamation of the arid but rich lands of the West is on the march. The idea appeals to the East, and especially to the people in the Capital who are responsive to public sentiment.

At present the chief drawback for immediate progress stems from the lack of personnel in the Bureau of Reclamation. Plans already are in various stages of preliminary development; some have advanced further than others. It is difficult to make headway with a staff that is reduced from 60 to 70 per cent by the demands of war. There are now 500 people in the Denver office. Not more than 350 are professional workers. Upwards of 2,000 are required for the postwar designing job . . . HR 5364, introduced late in September, would authorize construction and operation of the initial unit of the Mountain Home reclamation project in Idaho . . . Geological Survey reports the latest survey shows stream flow in the central inter-mountain area is subnormal. Water supplies in southeastern Arizona and southern New Mexico are better. In the Pacific Northwest and British Columbia stream flow is still deficient but has slightly improved.

The highway bills

Shortly before Congress began to slip away home to attend to electioneering, Administration leaders awoke to the fact that the country wants action on highway legislation, particularly since 45 State Legislatures meet in January and should know what Federal funds may be available. In the Senate the highway bills were placed ahead of other legislation. The House had acted. Senator Hayden, Chairman, Senate Roads Committee, reported a bill which had slashed the House bill to $1,350,000,000. It provided for the expenditure of $450,000,000 annually during three postwar years, to be matched with an equal sum, 50-50, by the States. Funds for purchase of rights-of-way were eliminated. Provision, annually for three years, was made for $200,000,000 for the Federal-aid system; $125,000,000 for farm-to-market roads; $125,000,000 for urban highways. The Federal-aid system funds are to be apportioned by the old formula, one-third area, one-third population, one-third post-road mileage. The secondary roads are to be apportioned one-third area, one-third rural population, one-third rural-delivery roads and star mail routes. Where population has a density of 200 per sq. mi., funds may be expended without regard to municipal boundaries. In some States secondary road funds may be spent on the Federal aid system with the Federal Government's permission. Cities of 5,000 or more will be the yardstick in determining distribution in States with rural areas. Upwards of 10 per cent of all classes of funds must be used to eliminate highway-grade crossings. There may be no need for matching funds if the railways pay 15 per cent of the construction costs.

Where matching is difficult or not feasible in relation to any class of funds, the Government will waive the requirement when the State spends all motor vehicle transportation taxes on highways; applies not less than 90 per cent to operation, maintenance and administrative expenses and upon interest and amortization of highway bonds; when the State has not reduced its special taxes since Sept. 1, 1944; and when funds available from all sources for highway purposes are not sufficient to match Federal funds.

Forest highways get $25,000,000 per year; forest roads and trails, $12,500,000; national parks, $4,500,000; and parkways leading to national parks, $5,000,000. Not to exceed 1½ per cent of Federal funds may be applied on expenses in planning extensions of Federal-aid and secondary roads. When the law becomes effective the sum of $100,000,000 may be used by the States for surveys, plans and essential construction.

With State funds, the program would involve the expenditure of $2,700,000,000 —or $900,000,000 per year.

When Congress comes back it will be necessary to adapt this act, passed on Sept. 15 by the Senate, with the act passed by the House, which provides $1,950,000,000 and which would make the division 60 per cent supplied by the Federal Government and 40 per cent by the States. Public Roads Administration is now engaged in working out the difference the requirement imposes on the States, making allowance for some variations in the application of the several classifications. It is anticipated there will be very little difference in the overall exaction. There seems some doubt, however, whether or not the post-election Congress will hurry to adjust the acts. It may allow them to lapse, placing the burden for the new loan on the next Congress.

Identical Bids Offered By Six Equipment Firms

WHEN THE Bonneville Power Administration called for bids on delivery of disconnecting switches to Ampere, Wash., recently, six firms out of eight submitting proposals offered the same bid, $1,505. The six with identical bids were: General Electric Co., Westinghouse Electric & Manufacturing Co., and Line Material Co., all of Portland, Ore.; Pacific Electric Manufacturing Co., San Francisco, Calif.; Railway & Industrial Engineering Co., Greensburg, Pa., and Southern States Equipment Corporation, Birmingham, Ala. The other two bidders submitted offers higher than $1,505. Contract award was held up pending investigation of the bids.

WPB Approves Construction Of Bonneville Power Link

CONSTRUCTION of a new power line to conduct Bonneville power from Eugene to Drain, Ore., has been approved by the War Production Board and a contract awarded to Tri-State Construction Co., of Portland. At Drain the new line will connect with the Douglas county rural electrification system. The line will be 43 mi. long and will conduct 33,000 volts of electricity.

NEW BOOKS...

CANAL LINING EXPERIMENTS in the Delta Area, Utah—By Orson W. Israelsen and Ronald C. Reeve. Bulletin 313 of the Utah Agricultural Experiment Station, Logan, Utah. 52 pages, 9 x 6.

This bulletin reports data collected in a three-year experimental study of seepage losses from typical canal sections in the Delta Area, Millard County, Utah. It includes analyses of the justifiable cost of lining irrigation canals based on the value of the water saved and on the assumed or estimated annual maintenance costs of the lining. With present water values and interest rates and with canal lining maintenance costs not greater than 9 per cent annually, Delta Area irrigation companies can justify initial lining costs of 9 cents per square foot on some of their canals.

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FLOOD FLOWS AND STAGES IN SACRAMENTO AND NORTHERN SAN JOAQUIN VALLEYS 1942-44—by the State of California Department of Public Works, Division of Water Resources, Sacramento, California. 188 pages 8½x11.

This is the 10th of a series of reports prepared by the Division of Water Resources presenting for the 31-year period from October, 1913, to May, 1944, data on flood flows and stages in the Sacramento and northern or lower San Joaquin valleys. The report presents descriptive and historical information on 105 stream gaging stations used in taking flood stage or magnitude measurements and in gathering available data on daily mean and crest flood flows and stages at those stations, together with an account of the functioning of the Sacramento River Flood Control Project between the fall of 1942 and the spring of 1944.

Flood stage and flow conditions in the Sacramento Valley have been progressively altered since the great floods of 1907 and 1909 by the construction of reclamation works and the development of the Sacramento River Flood Control Project which was substantially completed prior to the period covered by this report. Similarly, the development of irrigation and power reservoirs on the San Joaquin River and its main tributaries since the notable flood of 1911 has materially reduced the magnitude of flood flows on that stream. The construction and operation of the Shasta Reservoir on the Sacramento River and Friant Reservoir on the San Joaquin River are resulting in further appreciable reduction in the magnitude of flood flows.

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A POSTWAR FEDERAL TAX PLAN FOR HIGH EMPLOYMENT—by the Research Committee of the Committee for Economic Development, 285 Madison Ave., New York. 48 pages, 8½x11.

Full employment and the creation of millions of new jobs through expansion of private business should be the goal of federal tax revision after the war, according to the tax recommendations issued by this research committee. The committee is of the opinion that (1) the graduated personal income tax should provide at least half of total federal revenues, (2) excise and sales taxes should be lightened as much as possible, (3) taxation applied directly against business operations should be lightened, (4) serious inequities of the present tax system should be removed and (5) federal taxation should be heavy enough to pay federal expenses as they occur and to reduce the federal debt when a high level of production and employment has been reached. These proposals are designed to give as full encouragement as is possible to the creation of more employment, to apportion the tax burden fairly among persons and to provide adequate revenues. The book contains many diagrams and tables summarizing the effects of the various tax suggestions.

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PACIFIC NORTHWEST GOES TO WAR—by Associated Editors. Published by Art Ritchie and William J. Davis in the State of Washington. 224 pages, 8½x11.

This book presents the story of the State of Washington at war. It pictures men and women of industry and commerce building ships, planes, tanks and guns, raising crops and producing food so that our armed forces might fight and eat. Cheap electric power from the mammoth government-built dams of Grand Coulee and Bonneville, on the Columbia River, transformed this vacation state of scenic grandeur into a veritable industrial empire. Heavy industry followed cheap power. The story of Washington State's outstanding war production record is the story of the birth of one of the nation's new major centers of industry—an industrial empire built on permanence—built for the post-war era when the Pacific will become an important center of world activities and American influence.

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CUMULATIVE INDEX FOR VOLUMES I TO VI OF THE CHEMICAL FORMULARY—by H. Bennett. Published by the Chemical Publishing Co., Inc., Brooklyn, New York. 164 pages, 6x9. Price $4.00.

This comprehensive index covers all the formulae included in the complete six volumes of the "Chemical Formulary." It indicates at a glance the volume and page number for each item. The material has been arranged in alphabetical order to facilitate quick reference. Numerous cross references will instantly lead the user to all possible subjects relating to certain formulae or processes of interest.

Volume of Timber Treated Against Fire, Decay and Termites Greatly Increased

THE VOLUME of flame-proofed lumber in 1943 increased 300 per cent over 1942 figures, according to statistics released Sept. 15 by R. K. Helphenstine, Jr., of the U. S. Forest Service. The production increase indicated in the 65,636,518 bd. ft. of lumber flame-proofed in 1943 is particularly astounding when it is noted that only late in 1942 were standard Federal specifications set up for the then "infant" industry.

The tripled production was interpreted as a reflection both of increased demands for fireproofed lumber in the war effort and of growing acceptance among civilian engineers and architects of this relatively new product of the lumber industry.

The Forest Service statistics reveal that the entire output for all categories of treated lumber, including that treated to resist decay and termites, totaled 3,133,667,760 bd. ft.—16 per cent less than the total for 1942, but almost at a level with production for 1940, the last peacetime year. This indicates a general leveling-out of production for the wood-preserving industry since the wartime construction pace has slackened.

All but 1,961,770 bd. ft. of the fireproofed output was impregnated by the pressure type of treatment, with the leading fire retardant being Minalith salts, of which the total quantity used was 10,672,321 lb. Southern plants accounted for 42 per cent of the flameproofing volume and West Coast plants flameproofed 37 per cent of the total volume.

Among the salt-type preservatives, the Wolmanizing process led all others in the treating of lumber for protection against decay and termites. The 1943 figures show chromated zinc chloride and zinc chloride as runners-up, in the respective order.

The nation's wood-preserving plants during the year administered anti-decay and anti-termite treatment to more than 48 million railroad cross-ties, more than 30 million lineal feet of piling and poles, and more than 475 million board feet of lumber and timbers for a wide variety of military and industrial construction purposes.

New Skeena Road Opens Central British Columbia

ISOLATION of North-Central British Columbia was broken on Labor Day at the opening of the new $12,000,000 Skeena Highway.

People from towns and cities scattered between Prince Rupert and Prince George gathered on a sunny hillside to cheer the ribbon-snipping ceremony symbolizing their union by road with the rest of Canada.

It was the most important event to them since the Grand Trunk Pacific Railway was pushed through to the Pacific more

than thirty years ago. Access by car and truck from Vancouver and the rest of Canada is now afforded.

Nine contracting companies worked on the 111-mi. project, comprising 78 mi. from Terrace to link with an 11-mi. road out of Prince Rupert to Prudhomme Lake and 33 mi. from Cedarville to join a 25-mi. stretch of old highway east of Terrace.

A caravan of 40 cars led by Mayor H. M. Naggett sped from Prince Rupert to the opening ceremony. The visitors, including a party from Vancouver, saw a gravel highway designed for express speeds with grades that a railway train could easily negotiate.

The tremendous achievement of its construction could not be appreciated, however, until it was realized that some of the project cost $275,000 a mile.

For most of its length it lies along the north bank of the Skeena River to Terrace where it crosses to the south bank. The big fear is that the Skeena might repeat its 1936 rampage and tear out much of the rip rap. If all goes smoothly, however, it is expected that the upkeep to be paid by the provincial government when hostilities end will not exceed $100,000 a year, and will diminish as the construction becomes stabilized.

Contractors Hold Huge Inventory of Machinery

CONTRACTORS have on hand construction equipment and machinery valued at approximately $2,000,000,000 and they are prepared to handle new construction at an annual rate of from $11,000,000,000 to $12,000,000,000 within one year after the end of the war, the National Associated General Contractors' office has reported.

"Total valuation of privately-owned construction machinery is estimated by persons in the industry at $1,300,000,000," the AGC said, "and an independent estimate made by the Bureau of Labor Statistics gives the same figure. To this should be added at least $400,000,000 for trucks and $250,000,000 for miscellaneous equipment, making a total inventory of $1,950,000,000 for all construction equipment."

According to a recent report by the Bureau of Labor Statistics, productive capacity for all types of construction materials, except plumbing and lumber, is sufficient for a construction rate of $15,000,000,000 per year, the AGC continued. In the lumber industry, sawmill capacity is sufficient, but logging equipment has deteriorated. Capacity for plumbing fixtures is adequate for a construction program of $12,000,000,000 per year, with a likelihood of expansion before this rate is reached.

The construction industry is the second largest industry in America and is the largest employer of labor, the AGC declared. It can put from 7,000,000 to 10,000,000 people to work on construction projects on and off the site without any time-consuming retooling and reconversion of plants and equipment.

The Editor's Mail...

Dear Sir:

Enclosed find my remittance for three years subscription.

I have been receiving my copies regularly, even down here, although I get them two or more months at a time, but would surely miss not getting them.

I would like to mention the editorial in the July copy concerning the hazards to the private contracting industry in the postwar years. Being attached to the Navy Seabees, I think it a very important problem that the idea be discouraged now.

Yours truly,

A SEABEE,
In the South Pacific.

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Dear Mr. Server:

Your editorial on waste in government spending is timely and true. But isn't it like a voice crying in the wilderness? Not a person you meet who does not tell you a similar story—of materials wasted, of time, of poor planning—but who gives a damn?

Surely not the contractors to whom these contracts are given. Surely not the worker, who is working at inflated wages.

But perhaps there is a small minority who do not profit and maybe the American conscience is appalled at such waste and maybe those who died at Anzio, Guadalcanal, Tarawa, Normandy care—but their voices are stilled forever. Unless the voices of the American press become the voices of our dead, our freedom, too, will die—strangled by avarice and stupid bureaucracy.

Thanks, John; it was a damn good editorial.

Sincerely yours,
JAMES B. COCHRANE.

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Gentlemen:

Enclosed you will find a money order for the sum of $5, which renews my present subscription for three more full years. You will also find enclosed a change of address card, with my past and present address.

Your magazine brought many hours of enjoyment to me and my colleagues while I was overseas. It gave me many very good ideas which were used very successfully.

Trusting that everything is in order and that I may keep on receiving your swell magazine.

Sincerely yours,
AL SWIATKOWSKI,
U. S. Corps of Engineers,
Fort Lewis, Wash.

Caltech Contracts for First Unit of Expansion Program

A NEW MECHANICAL engineering building to cost $200,000 will be erected at the California Institute of Technology in Pasadena by Ray Gerhart, contractor of Pasadena. The structure will have three stories above ground and two below. Laboratories will be housed in the ground floor and basement and the second and third stories used for offices and classrooms. This building is the first unit of an extensive construction program outlined by the Board of Trustees of the institution.

Construction Volume Rises Slowly; Still Less Than Half of 1943 Value

TOTAL NEW construction activity in the United States in August amounted to $316,000,000, a 2 per cent increase over the previous month's level of $310,000,000 but less than half the $638,000,000 volume of August, 1943, the War Production Board reports.

August activity brought the total volume put-in-place during the first eight months of 1944 to $2,540,000,000, or but 44 per cent of the $5,793,000,000 activity registered during the corresponding period of last year. Overall activity is expected to decline slightly in September, with sharper declines estimated for the last quarter of 1944, WPB officials said.

Construction work financed by private funds in August accounted for a $127,000,000 volume, or 40 per cent of the total August activity. In August a year ago private work totaled $143,000,000, which was but 22 per cent of that month's total work.

Publicly-financed construction activity in August amounted to $189,000,000 or only 38 per cent of the $495,000,000 publicly-financed construction activity during August a year ago. Construction of military establishments (camps, airfields and bases, storage facilities, etc.) amounted to $63,000,000; government-financed industrial plants, $41,000,000; government-financed housing, $14,000,000; and all other public construction, $71,000,000.

Machinery and equipment deliveries at government-financed plants totaled $69,000,000 in August, which contrasts with the $201,000,000 rate of August a year ago. Deliveries during the first eight months of 1944 amounted to $706,000,000, which was but 34 per cent of the $2,067,000,000 volume of deliveries during the same period in 1943.

Estimates for new construction activity in the United States for the year 1944 indicate a total volume of $3,600,000,000, or 47 per cent of the 1943 and 27 per cent of the 1942 volume. Work financed by public funds is expected to account for 61 per cent of the 1944 total as contrasted with a ratio of about 80 per cent in 1942 and 1943. On the other hand, the percentage of construction applicable to private account is expected to rise from 20 per cent in 1943 to 39 per cent in 1944.

Construction Machinery Production OK'd by WPB

THE WAR PRODUCTION Board recently revoked Order L-217, the construction machinery and equipment simplification and conservation order, and its 10 schedules which limited the manufacture of the items to certain sizes or types.

The 10 revoked schedules cover:

Portable jaw and roll crushers; portable construction concrete mixers; truck mixer-agitators; pumps; tank car heaters and pumping boosters or circulators; bituminous paving finishers; bituminous heating kettles; bituminous materials maintenance units; bituminous patch plants, and asphalt surface heaters.

L-217, issued in November, 1942, was designed to conserve materials that were critical at that time, WPB said. It provided for the application of simplification and conservation measures through issuance of schedules covering specific equipment. Of the 14 schedules issued between November, 1942, and April, 1943, three were revoked in March, 1944—scrapers; angledozers or trailbuilders; bulldozers; and bituminous distributors and bituminous distributor pumps.

The recent revocation of the remaining 10 schedules and the basic order itself removes former manufacturing restrictions on sizes and types. However, WPB officials pointed out, the items covered by the 10 schedules are still subject to production and distribution control under Order L-192. Producers of these items are required to obtain authorization to produce them. Any desirable action in limiting both the quantity of production and the size and type to be produced can be taken under L-192.

OBITUARIES...

Charles R. Watts, since 1908 a distributor of construction equipment and material in Seattle, Wash., died at Edmonds, Wash., on Sept. 8 at the age of 66. He operated the Charles R. Watts Co., and was one of the best-known men in his field in the Northwest. He had recently retired after selling his business to Willard R. Yeakel.

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William F. Hanrahan, general contractor of San Francisco, Calif., died in that city on Oct. 4 at the age of 73. He was associated in construction of the Pit River No. 5 project, recently placed in operation by Pacific Gas & Electric Co., and many other important western developments. His son, Marshall S. Hanrahan, is also in the contracting business.

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William N. Bowman, architect of many of Denver's most important buildings, died in that city Aug. 28 at the age of 76. He had been in business in Denver since 1910, and among others, designed the Mountain States Telephone & Telegraph Co. building, the city's largest office structure, the Denver Theater, the Cosmopolitan Hotel, and numerous church and school buildings.

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L. K. Reinhardt, supervising construction safety engineer of the California Industrial Accident Commission, died Aug. 27 in Sacramento, Calif. He had been on the staff of the Commission since 1921, and had supervised safety installation on all the largest construction projects of the state.

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William A. Sharp, designer of stained glass windows for the famous Mission Inn at Riverside, Calif., and many churches and other structures in California, died in Alhambra, Calif., on Aug. 29. He was 80 years old.

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Roy F. Koster, retired hydraulic and constuction engineer of Pasadena, Calif., died there on Sept. 5. He had been employed as superintendent for Pacific Pipe and Steel Co., and Consolidated Steel Corp.

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Edward H. Heinneman, assistant regional director of the Bureau of Reclamation, stationed at Amarillo, Tex., died in that city Sept. 10, after having served the Bureau for many years.

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Richard G. McDonald, assistant director of power for the Bureau of Reclamation at Boulder dam, died in Boulder City on Sept. 21, at the age of 58.

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Rupert K. Stockwell, 62, died Aug. 24 at Oakland, Calif. He was western district manager for Robins Conveying Belt Co., and had represented that company in Shanghai and other foreign points.

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Ernest F. Nickerson, plastering and brick contractor of Pasadena, Calif., died there on Aug. 14. He came to the United States from Nova Scotia forty years ago.

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Clarence A. Best, construction engineer with the General Petroleum Corp., Los Angeles, Calif., for the past 28 years, died in that city Sept. 27 at the age of 56.

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John F. Minahan, contractor's engineer, died in San Francisco, Calif., on Aug. 14.

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Col. Leonard J. Mygatt, contractor of Arcadia, Calif., died in South Pasadena, Calif., on Sept. 13.

Unused Power Dam Blasted by Army as Demolition Practice

A SMALL DAM owned by a private power company which was recently taken over by the Public Utility District serving Lewis county, Wash., has been blown up by Army engineer troops from Fort Lewis as a practice maneuver.

The dam, on the Tilton river near Morton, Wash., had been used for power generation. It was 20 ft. high and 75 ft. long, and was not included in the operating program of the new owners. The engineer troops considered two plans of attack, one of which would destroy the entire structure with one blast and the other which would cause it to crumble as a result of several smaller shots. The latter plan was adopted.

The removal was also sponsored by the State Fisheries Department in order to open the upper reaches of the river to trout and salmon spawning.

President Proposes TVA's in Columbia, Missouri and Arkansas River Basin

THE ENACTMENT of legislation to procure "a single coordinated plan for the development of the Missouri River basin" was recommended to Congress on September 21 in a special Presidential message. Excerpts from the message follow:

"The benefits which have resulted in the Tennessee River Valley include flood prevention, irrigation, increased electric power for farms and shops and homes and industries, better transportation on land and water, reforestation and conservation of natural resources . . . and many kindred improvements which go to make for increased security and greater human happiness.

"I have heretofore suggested the creation of a similar Authority for the development of the Arkansas River watershed from the Mississippi all the way west to its source in Colorado.

"I have also suggested the creation of an Authority to render a similar service in the Columbia River watershed, including the states of Washington, Oregon, Idaho and Montana.

"I now make a similar recommendation for the Missouri River basin. May I also ask that renewed consideration be given to a study of the Arkansas and Columbia River basins? The fact has been established that such legislation can do much to promote the welfare of the great mass of citizens who live there—as well as their fellow citizens throughout the United States."

The Chamber of Commerce of the United States has gone on record against creation of any additional regional authorities, as has also the National Reclamation Association and the Rivers and Harbors Congress. These agencies claim states' water rights are jeopardized and the Authorities "would tend to socialize the waters of the nation."

PERSONALLY SPEAKING

D. B. Jett, Las Cruces, has been re-elected chairman of the Board of Registration for Professional Engineers of the State of New Mexico, **Earl M. Conwell,** Albuquerque, was re-elected as vice-chairman, and State Engineer **Thomas McClure** as secretary.

Professional engineers certified by the Board are: **Ned V. Tanner, Whitney Ashbridge,** and **Capt. Samuel P. Davalos,** Santa Fe; **Stephen E. Reynolds,** Albuquerque; **D. W. Harris,** Carlsbad; **William H. Cann** and **Frank J. Velsey, Jr.,** Silver City; **Pierce Timmis,** Wayne, Pa.; **William G. Paton,** Cleveland, Ohio; **Karl Hellson,** Chicago, Ill.; and **Howard E. Wittig,** Vallejo, Calif. **Donald S. Tedford,** Albuquerque, received a land surveyor certificate, and the following received combined certificates: **Victor J. Van Lint,** Raton; **Thomas E. McCarthy,** Tucumcari; **Joseph Rudolph,** Albuquerque; and **Michael Baker, Jr.,** Beaver, Pa.

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Capt. Malcolm Brown, Capt. W. B. Matlock, Capt. Walter Little, Capt. John X. Stark, and **Lt. Byron Clark,** engineer officers of the Seattle, Wash., District Office of the U. S. E. D., have been ordered to the Army Service Forces training center at Ft. Belvoir, Va. Brown has been in camouflage work and sector engineer; Matlock was a sector engineer; Little has served as office engineer on several important Northwest projects; Stark has been resident engineer on the Auburn railroad project; and Clark has been employed on Alaska work for the District.

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Special awards were recently given by Lockheed Aircraft Corp. to employees for engineering and construction developments. Those honored were: Plant engineering and construction: **James O. Howard, Willard T. Cotton, Leslie E. King, Donald O. Anderson, Paul D. Pendleton** and **Paul E. Phrend;** Fabrication construction: **Halie M. Irwin, Eva M. Maize, W. E. Parker** and **Ralph Vawser;** Tool engineering: **Henry A. Gibson;** Construction engineering: **Mary A. Grant;** Manufacturing engineering, **Oliver Starr.**

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Maj.-Gen. John Peter Mackenzie, Vancouver, B. C., formerly general manager of the Hamilton Bridge Co. plant in Vancouver, has been named Dominion construction controller, with headquarters at Ottawa. He succeeds **John Schofield,** who has resigned to resume his position as chief architect of the Canadian National Railways. Gen. Mackenzie has served in both wars, being recently in the Department of Munitions and Supply.

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Maj. E. H. Rausch, Jr., has been made head of supply in the Seattle district office of the U. S. E. D., succeeding **Lt. Col. James M. Wild,** who has been transferred to Pacific division headquarters in San Francisco, Calif. Rausch was formerly head of the district's Alaska division, and his duties there are being taken over by **Capt. Douglas M. Pelton.**

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H. L. Thackwell, construction engineer of San Antonio, Tex., has been named field secretary for the American Society of Civil Engineers, for the 11 Western states and Texas, with headquarters at Pasadena, Calif. He will serve as a contact man for all the work of the Society, but will particularly assist local sections in collective bargaining activities.

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Roland G. Manning, formerly chief of party and field engineer with Utah-Pomeroy-Morrison on construction of the Geneva Works at Provo, Utah, is now working with **Glenn B. Woodruff,** formerly chief engineer at Geneva, on a Navy contract held by J. H. Pomeroy Co., San Francisco, Calif., for maintenance of timber structures on stations throughout the Western states.

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R. G. McCrady, who for the past six months has been acting as assistant superintendent of the Vancouver, B. C., waterworks, has been appointed to the position, succeeding **James Whyte,** retired last May.

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Milton W. Melzian, recently returned from two years on the Canol project with Bechtel - Price - Callahan, contractors, has been made a member of the market development and public relations staff of the Southern California chapter of Associated General Contractors. He is a former professor of architecture at the University of Idaho.

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P. D. Hanson, assistant regional forester in the California region for the U. S. Forest

Service, has been transferred to the position of Regional Forester for the northern region, with headquarters at Missoula, Mont. The region covers Montana and portions of Washington, Idaho and South Dakota. He has been with the Service since 1925, and succeeds **Evan W. Kelley,** who is retiring after 40 years with the agency. Kelley recently was in charge of the guayule rubber project in California.

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Stanley A. Kerr has been appointed acting chief of the regional planning project of the Bureau of Reclamation at Sacramento, Calif., and **Garfield Stubblefield** has been made chief of hydrology in the same office. **E. Court Eaton** has been transferred from Sacramento to the McAllen, Tex., office of the Bureau.

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Col. W. G. Swan, chief engineering officer in the Canadian Army's Pacific Command since July, 1942, has retired from active military service, and will be succeeded by **Lt. Col. Frank S. Milligan.** He has been in charge of all army construction and engineering activities in Western Canada.

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Col. Joseph O. Killian, engineer of Pasadena, Calif., has been awarded the bronze star for meritorious achievement on the 5th Army front in Italy, where he commands an engineer regiment. Last November he received the Legion of Merit for constructing engineering structures under stiff enemy fire.

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Former President **Herbert Hoover,** representing his son, **Herbert Hoover, Jr.,** recently accepted the Army-Navy "E" for Consolidated Engineering Co., Pasadena, Calif. The younger Hoover is president of Consolidated, and is at present in Iran on a secret government mission.

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Theron W. Ragsdale, formerly chief of the construction and operations division, U. S. E. D. office in Portland, Ore., has been promoted to executive assistant to the district engineer. He is succeeded by **Robert E. Hickson.**

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Dr. E. K. Soper, associate professor of geology at University of California at Los Angeles, is serving as technical advisor to the U. S. Embassy in Mexico, in connection with construction there for the petroleum industry.

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Conrad Peterson has been made city engineer of Sidney, Mont., succeeding **H. J. Hale** who is now in the armed forces. Peterson was for many years maintenance engineer with the Montana state highway department.

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Maj. Deming W. Morrison, formerly in charge of the San Bernardino, Calif., office of U. S. E. D., and more lately stationed at Salt Lake City, Utah, has been transferred to the Sacramento, Calif., office of the Engineers.

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Dillard Bradley has been appointed road supervisor of Skagit Co., Wash., filling the position made vacant by the death of **Arthur Johnson.**

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C. W. Dorwin, formerly a staff member of the National Housing Authority in San Francisco, has been named executive director of the Oakland, Calif., Builders' Exchange. He will supervise especially the postwar planning of the group.

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Bert Lucas has been sent to Phoenix, Ariz., by the Bureau of Reclamation, where he is an assistant engineer on investigation on the several proposals for diverting Colorado river water to central Arizona.

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N. P. Browne is temporarily engaged on engineering work at the Naval ammunition depot at Fallbrook, Calif., but on completion of his duties there, will return to the 11th Naval District office in San Diego.

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Reorganization of the Utah State Road Commission puts Assistant Chief Engineer **M. C. Moffett** in charge of all planning and locating, including post-war plans, and **D. F. Larsen** in charge of the materials laboratory and construction, the work formerly handled by **Levi Muir,** deceased.

CAPT. DANA R. TYSON, who originally headed the camouflage section of the Sacramento, Calif., office of U. S. E. D., and is now in charge of mechanical equipment repair, has been promoted to Major.

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Brainard Plehn has left the civil engineering faculty at Stanford University to take a position in the materials testing laboratory of the Standard Oil Co., in Richmond, Calif.

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Fred L. Weiss, civilian engineer with the Sacramento, Calif., district office of U. S. E. D., has resigned that position to become affiliated with Stolte, Inc., contractor of Alameda, Calif.

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Maj. John S. Detlie, formerly in charge of camouflage work for the Seattle, Wash., U. S. Engineer District, and later control and personnel officer in the same office, has been appointed executive officer of the District.

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S. S. Gorman, San Francisco, Calif., has been awarded the Meritorious Civilian Service emblem by the Navy for his excellent services on special work with the Bureau of Yards and Docks.

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Dr. Edward G. Locke has been appointed to the staff of the Pacific Northwest Forest and Range Experiment Station in Portland, Ore., as a chemical engineer, coming from the Bonneville Power Administration.

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Prof. L. M. K. Boelter, associate dean of engineering on the University of California campus at Berkeley, on Nov. 1 becomes dean of engineering at the University's Los Angeles campus.

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Bay Construction, Inc., Seattle, Wash., has moved to new headquarters at 1762 Airport Way. The company is operated by **H. K.** and **J. G. Wasson.**

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C. Garth Dickens, 1943 engineering graduate of the University of Washington, has joined the Seattle staff of Westinghouse Electric & Manufacturing Co. as an application engineering assistant.

SUPERVISING THE JOBS

Ben Williams is project manager and **F. M. Ireland** is superintendent for Sound-Kiewit, on the multi-million dollar contract awarded that firm for three sections of the Shelton - Bremerton naval railroad, in Washington. Foremen on the job include **Sam Lyons, Roy Basto, Jerry Walch,** and **"Pop" Kline. Robert Toneman** is superintendent of equipment, and **Steve Irwin** is master mechanic. This is one of the largest construction projects in the Northwest, and a very considerable number of Northwest contractors are engaged in either prime or sub-contracts.

S. M. Fisher is project manager for H. B. Nicholson and Associates, one of the contracting groups engaged on the Navy's Bremerton-Shelton, Wash., railroad project. He is assisted by **H. T. McNeil,** general superintendent, and **James Terry,** foreman. **B. R. Briscoe** and **H. B. Nicholson** are also on the job.

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Lewis (Blackie) Armstrong is general superintendent on the quarry at Riverside, Calif., which is the source of the rock being used on the Guy F. Atkinson contract at

the Naval ammunition and net depot at Seal Beach, Calif. **Walter Hill** is assistant superintendent and **Roy Haver** is night superintendent. **C. L. (Monty) Montgomery** is master mechanic, **Frank Cronin,** operating engineer foreman, **Fred F. Garrett,** compressorman, and **Chris Neilson** and **Ted McDaniels,** powder bosses. **Cecil Cole** is office manager on the project, and **H. L. Scott** is chief timekeeper. The quarry is being operated by Atkinson.

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H. V. Crawshaw is project manager on the $1,690,000 contract recently awarded to the joint venture of Ben C. Gerwick, Inc., San Francisco, Calif., Morrison-Knudsen Co., Inc., Boise, Ida., and Ford J. Twaits, Los Angeles, Calif., for dredging and filling at Hunters Point Navy Yard, San Francisco. The superintendent on the job is **Adolf Haldlen,** and other key men are: **F. J. King,** office manager; **L. A. DeMers,** purchasing agent, and **E. J. Burnett,** engineer.

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Ben Evenett is gravel plant superintendent and **Henry Earhart** is hot plant superintendent in the production of rock products by the Herndon Rock Products Co., Herndon, Calif. Foremen on the operation are **K. W. Herriford** and **Larry Long,** and equipment operators include **John C. Hart, M. MacAlexander, Fred Russell, Lloyd Dunkin,** and **George Thomason.**

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J. S. Reynolds has been appointed superintendent by M. W. Kellogg Co. to direct construction of additional refinery facilities for General Petroleum Co., at Torrance, Calif. Assisting Reynolds are **E. E. Cole,** purchasing agent, **Fred Wiant,** warehouse manager, and **R. D. Tweedie,** chief accountant. It is a $4,000,000 job.

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Norman C. Smith is job superintendent at the Clearfield, Utah, naval depot, for R. J. Daum, Inglewood, Calif., on construction of barracks and other buildings, and facilities, for which the contractor received a $721,996 award. Assisting him are **Edward Jockola,** general foreman, and **Earl R. Payne,** auditor. **Don Willard** is district manager for the area for Daum.

NORMAN C. SMITH

JAMES L. GARRISON, left, and PAUL KISTLER, respectively road and bridge superintendents on the Canol project for Bechtel-Price-Callahan, San Francisco contractors, are again working together, this time on a C. B. & Q. maintenance job for Marsch-Peterson, at Chariton, Iowa.

H. W. (Spike) Eliason is superintendent in charge of two contracts now being carried out by H. Earl Parker, contractor of Marysville, Calif. They are a $449,670 levee job on the Feather river from Yuba City, Calif., northerly for 12 mi., and a $268,486 contract for enlarging the levees on Bear river and Dry creek, near Bear River, Calif. **C. L. Anderson** is office manager and **L. Bouska** is purchasing agent on the two projects.

* * *

Earl Pursel represents Macco Construction Co., Clearwater, Calif., as superintendent at the San Diego naval air station, where the company has a $3,420,840 contract for additional taxiways. **Harry Porter** is engineer for the contractor, and **E. W. Leppert** is office manager.

* * *

O. D. Cowart is acting as superintendent for Walter L. Denison, contractor of Albuquerque, N. Mex., on a contract valued at $104,441 for base, surfacing and oil on 15 mi. of state highway between Mills and Abbott, N. Mex. **Walter Gott** is bookkeeper and purchasing agent for the contractor on the project.

* * *

O. W. Welton is shop superintendent for Stewart & Nuss, Inc., at their Fresno, Calif., repair shop. Others in the shop are: **Jack Flamming,** heavy duty maintenance foreman; **John Hansen,** machinist foreman; **Holmer Linderman,** truck maintenance foreman; and **Gus Lucas** and **Clovis Lantia,** welders.

* * *

Roy Barthel, job superintendent, and **Don Jack,** general superintendent, are in charge of operations of L. C. Anderson, San Diego, Calif., on construction of 5 wood frame buildings to serve as barracks for Waves at Coronado, Calif. The contract amounts to $137,890.

* * *

Edward Holmdahl is supervising construction of a wood frame office building and a shop building at the naval operating base in San Diego, Calif., for Wm. C. Crowell, Pasadena, Calif. Project manager of the $322,712 project is **L. R. Parker,** and **Paul S. Walker** is purchasing agent.

* * *

A. V. Peterson is general superintendent and **H. M. Mason** is project manager of a $228,893 contract awarded to Ross B. Hammond Co., Portland, Ore., for conversion of a building into an ice and cold storage cisco. The superintendent on this job is **Ralph J. Gibbs.**

* * *

R. P. Downs has been appointed superintendent of a $273,238 contract awarded to Bressi & Bevanda Constructors, Los Angeles, Calif., to enlarge the Sacramento river levee in the Butte City, Calif., area. **R. C. Lewis** is timekeeper on the job.

* * *

J. H. Tempest, Jr., superintendent, and **Fred Yates,** general foreman, are directing work for Wheeler & Tempest, Salt Lake City, on construction of water facilities at Orem, Utah, a $55,514 contract.

* * *

W. E. Westberg is directing work for Kemp Bros., Los Angeles, Calif., at the auxiliary air station at Camp Kearney, Calif., where the contractor has a $230,900 contract for additional aviation facilities.

* * *

Jim Bonner, superintendent for Morrison-Knudsen Co., Inc., on many important war projects, is now in charge of the company's new shops at South Gate, Calif., succeeding **Al Helmle.**

* * *

Stephen A. Brown is superintending construction of nine nurseries in Seattle, Wash., for David Brazier, Seattle, to whom the contract was awarded for $134,700.

* * *

G. T. Kirkendall is job superintendent for L. H. Lacy & Co., Dallas, Tex., on a contract to extend parking aprons at the Abilene, Tex., army airfield.

* * *

Gilbert E. Marshall, formerly employed by Stanley H. Arkwright, Inc., Billings, Mont., as a superintendent, is now the owner and operator of a cabin court at Coeur d'Alene, Ida.

ADAMS MOTOR GRADERS ARE *Easy to Start*

One of a series of ads on Adams motor grader features

One of the most appreciated features of Adams Motor Graders is the ease with which the engine can be started. The International Diesel engines used have built-in gasoline equipment which permits starting the engine with gasoline on low compression. As illustrated above, all the operator has to do is to pull up a conversion lever, press the starter button, and the engine starts immediately. (In the absence of electrical equipment, two or three quarter-turns of the hand crank do the trick.) After a brief warmup period, the operator pushes the conversion lever down, opens up his Diesel throttle and the engine is raring to go as a *full Diesel engine* doing continuous hard work on an average of two gallons of low-price fuel per hour.

This feature saves time, trouble and tempers in cold weather though its simplicity makes it valuable in all seasons. Let your local Adams distributor explain this feature to you in more detail along with other Adams advantages which you will want in the next motor grader you buy.

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 ☆

UNIT BID SUMMARY

Highway and Street...

Utah—Salt Lake County—State—Pave.

The Young & Smith Construction Co., Salt Lake City, bid low at $33,864 to the Utah Road Commission to construct 0.4 mi. of concrete pavement and channelize U. S. 91 and Victory Road in Salt Lake County. The engineer's estimate was $22,433. Only one bid was received.

2,200	sq. yd. conc. pave.	5.00
610	T. plant mixed bitumin. surf.	7.00
1,700	gal. bitum. material, Type MC-1	.10
7,200	gal. bitum. mat'l, 200-300 penetration	.10
1,100	gal. bitum. mat'l, Type RC-5	.10
40	T. cover material	5.00
1,900	T. cr. rock or cr. gravel surface crse.	1.00
3,000	cu. yd. unclass. excav.	1.50
21,000	sta. yd. overhaul, Class "A"	.02
100	yd. mi. overhaul, Class "B"	.30
30	hrs. rolling	10.00
20	1,000-gal. watering	2.00
333	lin. ft. 12-in. conc. pipe	2.00
50	sq. yd. remove exist. pave.	3.00
150	cu. yd. excav. for struct.	3.00
5.0	cu. yd. conc., Class "A"	40.00
500	lb. reinf. steel	.10
1,200	lb. struct. steel	.30
2,100	lin. ft. precast white conc. reflect. curb	2.50

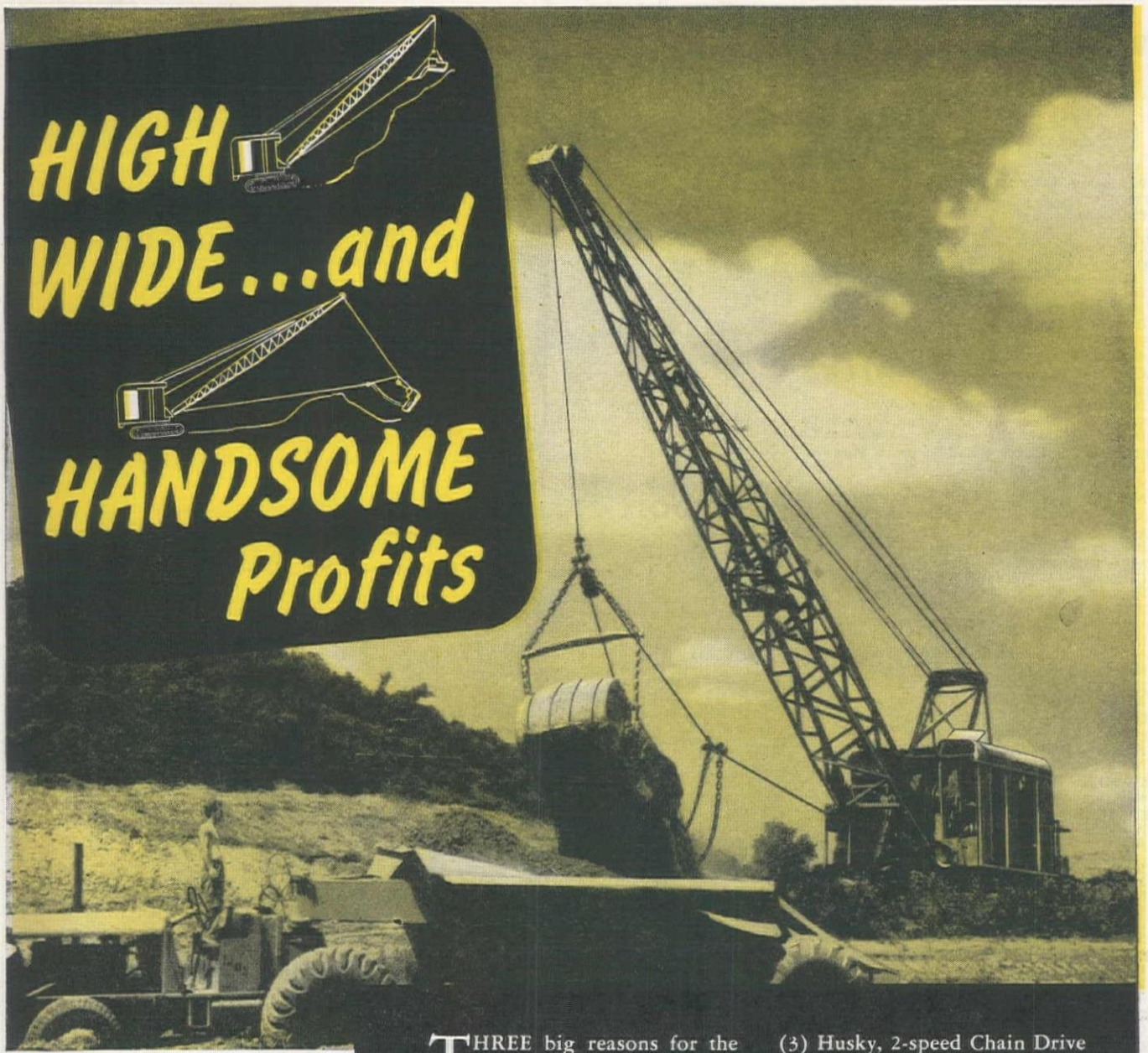
Oregon—Clatsop County—State—Grade & Pave

J. A. Terteling & Sons, Boise, Idaho, bid low at $297,728 to the State Highway Department for grading and paving the Astoria-Naval Hospital section of the Nehalem highway. Work on the east unit is from station 5+30 to station 189+00 and work of the west unit is from 70+50 to station 5+30. The bids submitted were:

(1) J. A Terteling & Sons.....$297,728
(2) Warren Northwest, Inc..... 300,865
(3) E. C. Hall Co..... 309,258
(4) Grimstad & Vanderveldt $353,067
(5) Empire Const. Co. 365,458

EAST UNIT		(1)	(2)	(3)	(4)	(5)
Lump sum,	clearing and grubbing	$3,900	$7,500	$10,000	$5,000	$8,500
6,050	sq. yd. removal of pavement	.60	1.00	1.00	2.00	.90
770	cu. yd. structural excavation, unclassified	2.00	2.25	2.00	2.00	3.50
200	cu. yds. trench excavation, unclassified	3.00	1.50	2.00	2.00	1.50
135,000	cu. yds. general excavation, unclassified	.35	.39	.40	.50	.64
349,700	yd. sta. short overhaul	.02	.01	.02	.03	.04
20,000	cu.-yd. stas. long overhaul	.30	.50	.25	.50	.35
5,500	lin. ft. rounding cutbanks	.10	.12	.15	.20	.04
3.39	mi. finishing roadbed and slopes	350.00	525.00	800.00	500.00	$1,000
2,000	sq. yds. mortar-bound slope paving	1.65	.60	1.75	4.00	2.00
220	lin. ft. 8-in. concrete drain pipe	1.00	.75	.75	.60	1.50
130	lin. ft. 4-in. sewer pipe	.60	.67	.50	.50	1.00
500	lin. ft. 8-in. sewer pipe	1.15	.80	.85	.75	1.75
900	lin. ft. 12-in. concrete pipe	1.85	1.50	1.25	1.40	2.50
600	lin. ft. 18-in. concrete pipe	3.65	2.75	2.50	2.50	4.00
160	lin. ft. 24-in. concrete pipe	5.30	4.25	4.00	3.50	5.00
180	lin. ft. 48-in. concrete pipe	16.00	13.25	10.00	10.00	12.00
12	lin. ft. 60-in. concrete pipe	35.00	24.00	20.00	22.00	20.00
120	lin. ft. extra for installing pipe under pave.	1.30	2.00	3.00	3.00	2.00
130	lin. ft. salvaging culvert pipe	.65	1.00	2.00	2.00	2.00
2	MFBM lumber and timber	100.00	80.00	100.00	100.00	60.00
30	cu. yd. rock or gravel backfill in drains	5.00	3.00	2.75	3.00	4.00
36	cu. yd. Class "A" concrete in stock pass.	45.00	40.00	35.00	40.00	40.00
4,800	lbs. metal reinforcement	.09	.08	.10	.20	.09
15,500	cu. yd. 3-in. - 0 rock in base	2.30	3.00	2.75	3.00	2.38
8,000	cu. yd. 1¼-in. - 0 rock in leveling course	2.50	3.00	2.75	3.25	2.86
2,900	cu. yd. ¾-in. - 0 rock in shoulders	2.75	3.00	2.75	3.50	3.38
400	M. gal. sprinkling	3.50	2.00	1.50	3.00	2.00
1,300	cu. yd. salvaging surfacing materials	1.20	1.00	1.00	1.00	2.00
12,000	T. Class "B" asphaltic concrete	7.15	6.00	7.00	7.00	7.50
34	T. furnishing and placing emuls. asph. in seal coat	45.00	35.00	40.00	35.00	35.00
150	T. furnishing and placing fine aggreg. in seal coat	4.50	4.00	5.00	5.00	4.00
WEST UNIT						
Lump sum,	clearing and grubbing	300.00	$1,000	$1,000	$1,000	$2,000
150	sq. yd. removal of pavement	.60	1.00	1.00	1.00	.90
200	lin. ft. removal of curbs	.35	1.00	1.00	.50	.25
60	sq. yd. removal of walks	.60	1.00	1.00	1.00	.50
3	only removal of catch basins	66.00	20.00	5.00	15.00	15.00
350	cu. yd. structural excavation, unclassified	2.50	2.25	2.00	2.00	3.50
30	cu. yd. trench excavation, unclassified	3.00	1.50	2.00	2.00	1.50
3,700	cu. yd. general excavation, unclassified	.40	.60	.40	.75	.64
300	yd. sta. short overhaul	.02	.02	.02	.03	.04
0.47	mile finishing roadbed and slopes	350.00	525.00	800.00	500.00	$1,000
350	lin. ft. 8-in. sewer pipe	1.00	.80	.85	.70	1.75
70	lin. ft. 12-in. concrete pipe	1.90	1.50	1.25	1.40	3.00
60	lin. ft. 18-in. concrete pipe	3.65	2.75	2.50	2.50	4.00
50	lin. ft. extra for installing pipe under pavement	1.30	2.00	3.00	2.00	2.00
150	lin. ft. salvaging culvert pipe	.65	1.00	2.00	1.00	2.00
7	only concrete catch basins	75.00	45.00	35.00	70.00	100.00
7	only concrete inlets	50.00	45.00	25.00	40.00	100.00
4	only adjustment of manholes	50.00	10.00	50.00	30.00	25.00
58	cu. yd. Class "A" concrete in retaining wall	40.00	40.00	35.00	40.00	40.00
2,600	lbs. metal reinforcement	.09	.07	.10	.20	.09
114	cu. yd. concrete in curbs and miscellaneous structures	50.00	40.00	35.00	40.00	40.00
24	cu. yd. concrete traffic separators	50.00	50.00	35.00	40.00	40.00
60	cu. yd. concrete traffic islands	50.00	35.00	35.00	40.00	40.00
Lump sum,	constructing recesses for traffic control markers	650.00	300.00	100.00	400.00	100.00
2,000	lin. ft. ¾-in. electrical conduit	.24	.35	.15	.50	.35
200	lin. ft. 1-in. electrical conduit	.30	.40	.25	1.00	.50
10	only metal pull boxes, standard cover	18.00	10.00	10.00	20.00	15.00
3	only metal pull boxes, special cover	55.00	11.00	15.00	25.00	20.00
2,500	cu. yd. 3-in. - 0 rock in base	2.30	3.00	2.75	3.00	2.38
700	cu. yd. 1¼-in. - 0 rock in leveling course	2.50	3.00	2.75	3.25	2.88

(Continued on next page)



THREE big reasons for the outstanding performance of Lorain Draglines are (1) Balanced, big capacity turntable with Center Drive power transmission, engineered to develop higher hoist line speed and more "dirt-digging" pull and power—(2) Patented "cable-miser" Fairlead that improves dragline operation, increases hours of cable life, reduces maintenance costs—(3) Husky, 2-speed Chain Drive Crawler, easily maneuverable, agile and "sure-footed" in soft ground or cross-country travel.

Lorain Draglines—planned for postwar—will have many more advantages worth investigating. Be sure to see your Lorain distributor and discover why Lorain Draglines fill the bill for moving dirt HIGH . . . WIDE . . . and produce HANDSOME profits.

THE THEW SHOVEL COMPANY • LORAIN, OHIO

LORAIN DISTRIBUTORS:

***LeROI-RIX MACHINERY CO., Los Angeles; CATE EQUIPMENT CO., Salt Lake City; *LIBERTY TRUCKS & PARTS CO., Denver; *COAST EQUIPMENT CO., San Francisco; WILSON EQUIPMENT & SUPPLY CO., Cheyenne, Wyo.; *A. H. COX & CO., Seattle 4, Wash.; *COLUMBIA EQUIPMENT CO., Portland, Ore., Spokane, Wash.; BUNTING TRACTOR CO., LaGrande, Ore.—Boise & Twin Falls, Ida.; STATE TRACTOR & EQUIPMENT CO., Phoenix, Ariz.; CONNELLY MACHINERY COMPANY, Billings and Great Falls, Mont.; SANFORD TRACTOR & EQUIPMENT CO., Reno, Nev.; THE MOUNTAIN TRACTOR COMPANY, Missoula, Mont.; THE TRACTOR & EQUIPMENT CO., Sidney, Mont.**

**Carries a representative stock of spare parts.*

Reg. Trade Mark

thew Lorain

CRANES • SHOVELS • DRAGLINES • MOTO-CRANES

600 cu. yd. ¾-in. - 0 rock in shoulders	2.75	3.00	2.75	3.50	3.38
50 cu. yd. ½-in. - 0 material in cushion course	3.30	3.50	2.75	4.00	3.63
100 M. gals. sprinkling	3.50	2.00	1.50	3.00	2.00
500 cu. yd. salvaging surfacing materials	1.30	1.00	1.00	1.50	2.00
1,800 sq. yd. Portland cement concrete pavement	5.50	3.90	3.50	3.50	4.00
130 lin. ft. expansion joints in pavement	.15	.20	.25	.30	.25
1,000 lin. ft. contraction joints	.065	.07	.10	.05	.10
130 only dowel bars	.23	.50	.30	.30	1.00
800 lbs. tie bars and reinforcement	.09	.08	.10	.10	.15
2,200 T. Class "B" asphaltic concrete	7.50	6.00	7.00	7.00	7.50
8 T. furnishing and placing emuls. asph. in seal coat	45.00	35.00	40.00	35.00	35.00
34 T. furnishing and placing fine aggreg. in seal coat	5.00	4.00	5.00	5.00	4.00

New Mexico—Colfax & Union Counties—State—Surf.

Henry Thygesen & Co. of Albuquerque, New Mexico, bid low at $55,727 to the New Mexico Highway Department for the repair of 43.1 mi. of highway No. 58 between Springer and Clayton. The work includes the hauling and placing of a rock base course and an asphalt surface. Bids were:

(1) Henry Thygesen & Co. $55,727
(2) Walter L. Denison 58,727
(3) Brown Bros. $60,518

	(1)	(2)	(3)
686 hr. roll, steel tired roller	5.00	4.00	6.00
229 M. gal. water	2.00	4.00	4.00
3,612 bbl. emulsified asphalt, Type AE-100	1.20	1.20	1.50
1,425 bbl. cut-back asphalt, Type MC-3	1.20	2.00	1.50
71,808 sq. yd. scarify and relay old oil mat	.05	.04	.04
14,586 cu. yd. crush surfacing	.90	.70	.93
11,469 cu. yd. haul and place base course surf.	1.25	1.25	1.08
3,117 cu. yd. haul and place old treated surf.	2.35	2.60	1.90
4,120 cu. yd. screen sand for seal coat	.40	1.75	1.00
4,120 cu. yd. haul and place cover material	1.40	1.25	2.20

Airport . . .

California—Kern County—U.S.E.D.—Landing Field

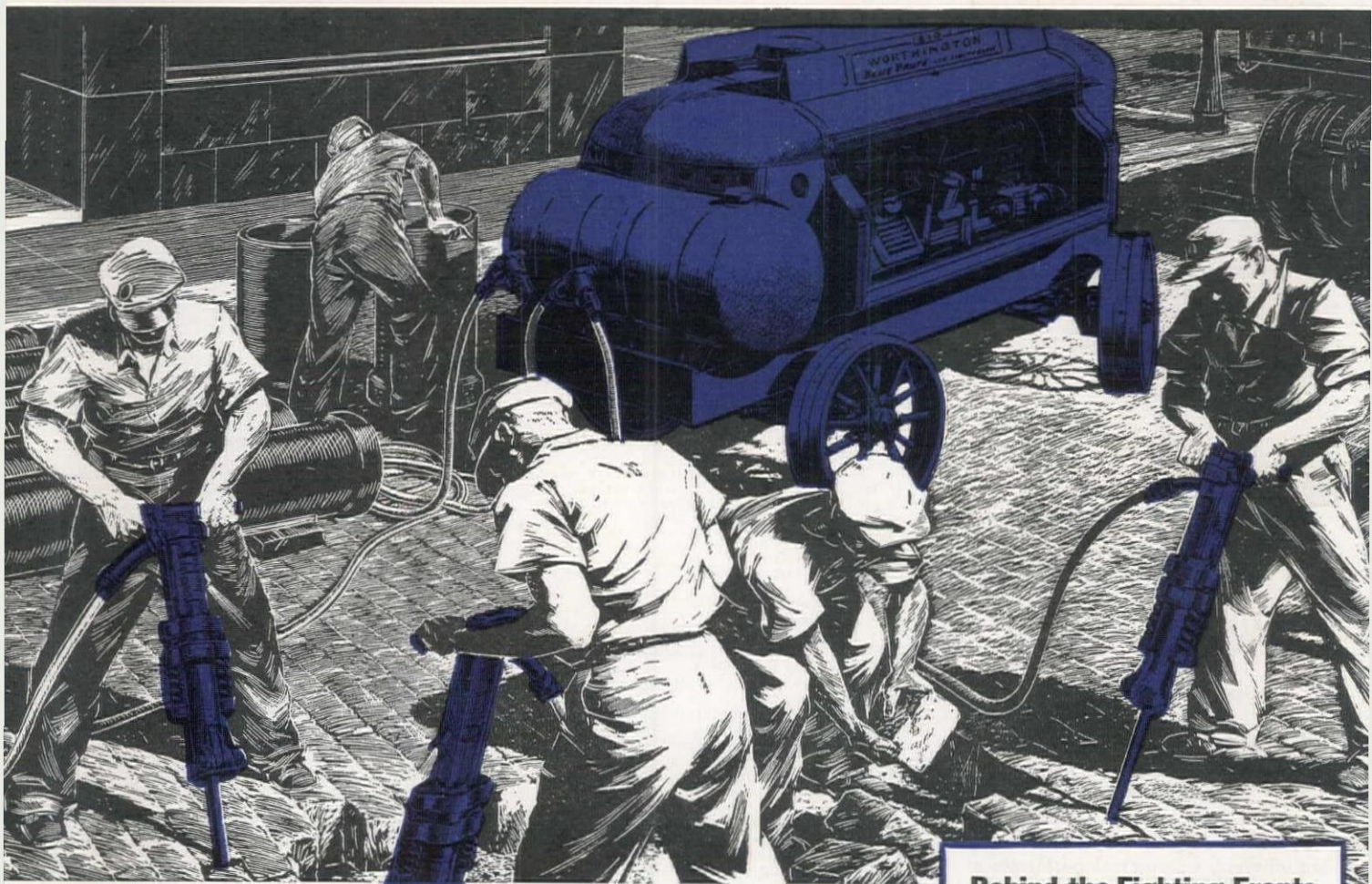
Peter Kiewit Sons Co., Western Construction Corp., and Al Johnson Construction Co., all of Los Angeles, submitted the low bid of $6,165,271 to the U. S. District Engineer Office, Los Angeles, and were awarded the contract to construct additional landing facilities at Muroc Army Air Base. The bids were:

	Base Total	Non.-reinf. Conc.	Asph. Conc.
(1) Peter Kiewit, Western Construction Corp., & Al Johnson	$6,165,271	$5,194,538	$5,813,577
(2) Clyde W. Wood Co.	6,278,391	5,565,399	5,711,616
(3) Morrison-Knudsen & Winston Bros.	6,314,036	5,548,429	5,781,768
(4) Bressi-Bevanda & J. A. Terteling & Sons	6,427,053	5,587,430	5,930,547
(5) United Conc. Pipe Corp.	6,831,634	6,023,980	6,649,455

	(1)	(2)	(3)	(4)	(5)
46 acre clear. & grub.	51.79	25.00	17.00	30.00	14.00
40,000 sq. yd. rem. conc. pave.	1.01	1.00	.80	.85	.55
3,300 cy. yd. rem. mass conc.	1.69	2.00	1.72	2.50	1.00
200,000 cu. yd. excav. and grade	.46	.75	.32	.50	.67
200,000 cu. yd. replace stockpile material	.46	.25	.44	.20	.30
288,000 sq. roll earth fills & subgrade, smooth roll	.077	.015	.023	.015	.02
480,000 sq. roll earth fills and subgrade, Sheepsfoot	.066	.0075	.012	.015	.01
80,000 M. gal. water, subgrade and base course	1.39	1.20	1.50	2.50	1.50
23,000 sq. load test earth subgrades	.44	.10	.13	.20	.08
5,500 sq. roll runway areas	.24	.20	.25	.20	.30
900,000 cu. yd. cr. run fill	1.21	1.60	1.41	1.70	1.70
20,000 cu. yd. cr. run fill	1.43	1.85	2.04	1.90	2.00
40,000 cu. yd. cr. rock base	3.66	2.00	2.04	2.20	3.25
246,000 cu. yd. cr. run rock base	1.90	1.85	2.04	1.90	2.20
6,800,000 sq. roll grav. and rock base courses	.085	.015	.023	.015	.02
5,400,000 sq. roll grav. and rock base courses	.06	.0075	.014	.015	.01
43,000 sq. load test, complete rock and gravel base courses	.24	.10	.13	.20	.08
26,000 F.B.M. redwood expansion joint	.15	.20	.15	.20	.30
18,385 T. reinf. steel in conc. pave.	92.00	85.00	95.00	88.00	90.00
9,600 sq. ft. bitumastic enamel (1/16-in. thick)	.12	.30	.21	.20	.25
12 T. sealing compound	603.68	650.00	655.00	700.00	800.00
107,100 cu. yd. conc. airfield pave., reinf.	6.86	8.90	9.00	9.40	11.00
10,120 cu. yd. conc. airfield pave.	7.63	9.50	9.80	12.00	11.00
177,500 bbl. Portland cement	2.14	2.25	2.53	2.25	2.50
6,852 cu. yd. conc. beam under expan. joints	14.43	15.00	12.90	13.00	14.50
23,000 gal. membrane curing solution	.73	1.50	1.43	1.35	2.00
520 T. liq. asph.	19.94	18.00	18.85	18.00	20.00
180 T. cover aggr., pen. treat.	4.19	4.00	3.80	3.50	5.00
5,800 T. liq. asph., bitum. fieldmix pave.	20.75	16.00	18.75	17.00	17.00
914,500 sq. yd. bitum. fieldmix pave.	.066	.23	.075	.07	.10
1,700 T. 60-70 pen. paving asphalt	19.88	16.00	18.75	16.00	18.00
24,000 T. hot-mix asph. conc. 3-in. paved shoulders	4.20	4.00	4.68	4.00	4.25
235 T. liq. asph., tack and seal coats	22.24	18.00	17.25	22.00	23.00
1,570 T. cover aggr., seal coat	4.19	4.00	3.80	3.50	5.00
400 cu. yd. encasement of pipe	32.42	22.50	17.25	17.00	20.00
30 ea. conc. duct marker	5.07	3.75	5.18	3.00	4.00
1,037 lin. ft. 18-in. ex. str. reinf. conc. pipe drain	5.24	9.00	6.85	7.00	6.50
172 lin. ft. 21-in. ex. str. reinf. conc. pipe drain	6.18	12.00	8.10	7.50	7.80
1,800 lin. ft. 21-in. std. str. reinf. conc pipe drain	506	8.75	6.32	6.50	6.50
2,940 lin. ft. 30-in. ex. str. reinf. conc. pipe drain	9.99	12.00	11.40	11.00	12.00
2,980 lin. ft. 33-in. ex. str. reinf. conc pipe drain	11.33	14.00	12.75	12.50	14.00
1,800 lin. ft. 21-in. std. str. reinf. conc. pipe drain	5.06	8.75	6.32	6.50	6.50
2,136 lin. ft. 24-in. 10-gauge corr. metal pipe drain	7.02	11.25	8.25	8.00	9.00
640 lin. ft. 24-in. 14-gauge corr. metal pipe drain	5.20	9.50	6.90	6.00	8.00
150 cu. yd. conc. structs., reinf.	51.37	65.00	53.00	60.00	65.00
50 cu. yd. conc. structs, non-reinf.	45.33	50.00	44.50	50.00	65.00
20 ea. cast iron drainage grates	49.50	75.00	66.00	60.00	80.00
2 T. steel angle irons and I-beams	301.84	325.00	330.00	300.00	400.00
1 ea. paint black double numeral "30"	241.47	225.00	240.00	250.00	300.00
1 ea. paint black double numeral "12"	181.10	200.00	195.00	225.00	200.00
1,387 lin. yd. paint 6-in. reflective runway striping	.18	.20	.16	.15	.15
4,650 lin. yd. paint 6-in. reflective taxiway striping	.18	.25	.24	.25	.25
315 ea. inst. reflecting taxiway delineators	3.62	1.50	1.54	2.00	7.00
17,600 lin. ft. underground elect. duct	.76	.75	.73	.70	1.00
560,000 cu. yd. mile contingent haul	.12	.075	.10	.08	.12
ALTERNATE—NON-REINFORCED CONCRETE RUNWAY					
763,200 cu. yd. cr. run fill	1.21	1.60	1.43	1.70	1.70
84,800 cu. yd. cr. run fill	1.43	1.85	2.07	1.90	2.00
240,000 cu. yd. cr. run rock base	1.50	1.85	2.07	1.90	2.20

(Continued on next page)

DIGGING INTO A 3 BILLION DOLLAR MARKET



Cold facts about Blue Brutes will prove to you they're your best bet for post-war building . . . and cold facts on post-war buying intentions prove your market will be there:

A recent survey shows more than $3,000,000,000 has been budgeted for post-war construction plans, underway or completed today.

To back your bid check these features of Blue Brute Compressors against any other brand.

Feather Valves*, simplest and most efficient, soothe maintenance headaches, lessen repairs and delays.

*Reg. U. S. Pat. Off.

Full force feed lubrication throughout engine and compressor.

3-point Suspension "cradles" both engine and compressor in one integral housing, cushioning shocks and vibration.

Check all their strong points. Then take your choice of models . . . truck-mounted, two or four-wheel spring trailer and skid-mounted . . . Diesel, gasoline or electric driven . . . and team them up with Blue Brute air tools for best results.

Ask your nearest Worthington Representative listed on page 000 what models of compressors and air tools best fit your needs.

PC4-27A

Behind the Fighting Fronts with BLUE BRUTES

On jungle roads and airports 'round the world . . . on Pacific Islands . . . on bomb-blasted roads speeding U. S. Armies toward victory, Blue Brutes are hard at work today . . . and in hundreds of factories, Navy Yards, air bases . . . on vital supply lines behind the fighting fronts.**

**Blue Brute Compressors and Air Tools are painted olive drab for the Army, battleship gray for the Navy.

Get more WORTH from air with WORTHINGTON

BUY BLUE BRUTES

Compressors from 60 to 500 cu. ft. capacity in mountings to suit all jobs. Rock Drills and Air Tools that have always set the pace for easy operation — available in a wide range of weights and sizes.

WORTH BEHIND THE NAME WORTHINGTON

Worthington Pump and Machinery Corporation Construction Equipment Division
Holyoke, Massachusetts

37,700 F.B.M. redwood expansion joint	.15	.20	.15	.20	.30
1,875 T. reinf. steel in conc. pave.	109.88	90.00	102.00	110.00	130.00
167,300 cu. yd. conc. airfield pave. non-reinf.	7.46	9.25	9.50	8.95	10.00
279,250 bbl. Portland cement	2.35	2.25	2.53	2.25	2.50
4,550 cu. yd. conc. beam under expan. joints	14.40	15.00	9.10	13.00	14.50
ALTERNATE—ASPHALT CONCRETE RUNWAY					
925,000 cu. yd. cr. run fill	1.21	1.60	1.43	1.70	1.70
90,000 cu. yd. cr. rock base	3.32	2.00	2.07	2.20	3.25
180,000 cu. yd. cr. run rock base	1.91	1.85	2.07	1.90	2.20
18,000 F.B.M. redwood expan. joint	.151	.20	.15	.20	.30
13,575 T. reinf. steel in conc. pave	15.72	85.00	95.00	88.00	90.00
10 T. sealing compound	605.00	650.00	655.00	700.00	800.00
79,000 cu. yd. conc. airfield pave., reinf.	7.48	9.00	9.65	10.50	11.50
135,000 bbl. Portland cement	2.35	2.25	2.54	2.25	2.50
5,000 cu. yd. conc. beam under expan. joints	14.43	15.00	13.55	13.00	14.50
740 T. liq. asph.	19.99	18.00	18.90	18.00	20.00
4,000 T. 60-70 pen. pave. asphalt	19.92	16.00	18.80	16.00	18.00
15,900 T. hot-mix asph. conc., 4-in. base course	4.21	3.75	4.30	4.00	4.25
11,900 T. hot-mix asph. conc., 3-in. binder course	4.21	3.85	4.60	4.00	4.25
10,000 T. hot-mix asph. conc., 2½-in. wearing course	4.21	4.00	4.95	4.00	4.25
410 T. liq. asph., tack and seal coats	17.20	18.00	17.30	22.00	23.00
2,400 T. cover aggr., seal coat	4.20	4.00	3.80	3.50	5.00

Miscellaneous . . .

California—San Bernardino County—U.S.E.D.—Explosive Storage

Shannahan Bros., Huntington Park, was the low bidder at $266,095 to the U. S. District Engineer Office, Los Angeles, for the construction of an explosives holding yard at the Rialto Ammunition Storage Depot. The following bids were submitted:

(A) Shannahan Bros. $266,095.20
(B) Clifford C. Bond 269,472.14
(C) Morrison-Knudsen Co. 325,980.60
(D) J. A. Terteling & Sons 346,082.50
(E) Guerin Bros. $356,792.30
(F) Dimmitt & Taylor 379,595.00
(G) H. H. Nicholson Co. 400,957.10

(1) 96 ac. clearing.
(2) 9 ac. grubbing.
(3) 152,700 cu. yd. excavating and grading.
(4) 151,535 cu. yd. compacting earth-fill barricades and bumpers.
(5) 99,200 sq. yd. preparation of subgrade for ballast course.
(6) 27,000 sq. yd. preparation of subgrade for asphalt treatment.
(7) 100 bbl. Portland cement.
(8) lump sum, elect. serv. and elect. work.
(9) lump sum, reinf. concrete inspection pit.
(11) 6,400 lin. ft. removal and re-erection of existg. fence.
(12) 9,950 lin. ft. removal and re-erection of existg. fence.
(13) 6,400 lin. ft. erecting salvaged fence.
(14) 9,950 lin. ft. erecting salvaged fence.
(15) 9,600 lin. ft. new fence.
(16) 2,500 lin. ft. new fence.
(17) 1 ea. new 18-ft. double gate.
(18) 2 ea. new 18-ft. double gate.
(19) 20 lin. ft. 12-in. corrugated metal pipe.
(20) 160 lin. ft. pipe guardrailings.
(21) 24,085 cu. yd. ballast.
(22) 3,000 lin. ft. removg. and salvg. existg. track.
(23) 65,393 lin. ft. installing railroad track.
(24) 2 ea. removg. and salvg. existg. No. 8 turnout.
(25) 2 ea. removg. and salvg. existg. No. 10 turnout.
(26) 51 ea. installing No. 8 turn-out.
(27) 2 ea. installing No. 10 turn-out.
(28) 53 ea. lengthening switch rods.
(29) 34 T. liquid asph. for penetra. treamt. of road areas, applied.

ALTERNATE BIDS

(30) 152,700 cu. yd. excav. and grading, deleting requirements for screening out rods.
(31) 24,085 cu. yd. excavating material with rocks of 4-in. size and larger removed for railroad ballast, or equal material from outside source delivered to site.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)
(1)	165.00	90.00	62.00	40.00	75.00	35.00	45.00
(2)	165.00	105.00	200.00	20.00	100.00	50.00	55.00
(3)	.60	.52	.85	....	.65	1.00	1.25
(4)	....	....	....	....	....	....	....
(5)	.10	.11	.06	.10	.06	.10	.05
(6)	.10	.16	.13	.10	.06	.20	.15
(7)	2.60	2.10	3.00	2.50	3.50	2.00	2.50
(8)	$1,250	$1,000	$1,080	750.00	$1,250	$1,700	$1,100
(9)	$4,000	$6,516	$3,975	$5,500	$10,200	$6,200	$5,800
(10)	300.00	$1,020	227.00	300.00	600.00	350.00	400.00
(11)	.39	.28	.42	.30	.50	.33	.35
(12)	.28	.20	.30	.20	.18	.26	.25
(13)	....	....	....	....	....	....	....
(14)	....	....	....	....	....	....	....
(15)	.60	.58	.60	.60	.62	.48	.55
(16)	.33	.28	.32	.25	.18	.28	.29
(17)	100.00	75.00	100.00	65.00	105.00	90.60	90.00
(18)	100.00	75.00	100.00	60.00	85.00	80.00	85.00
(19)	4.00	3.00	3.00	5.00	3.00	3.00	5.00
(20)	3.00	1.25	2.00	3.00	3.10	3.00	3.00
(21)	.33	1.10	1.30	....	1.65	2.00	1.90
(22)	.45	....	.90	.60	1.25	1.25	1.00
(23)	1.55	1.48	1.70	2.00	2.35	1.80	1.70
(24)	130.00	365.00	150.00	100.00	150.00	275.00	300.00
(25)	160.00	365.00	150.00	110.00	150.00	275.00	300.00
(26)	250.00	365.00	250.00	260.00	350.00	300.00	275.00
(27)	275.00	365.00	250.00	275.00	400.00	300.00	300.00
(28)	14.00	10.00	10.00	5.00	1.50	10.00	10.00
(29)	21.00	40.00	27.00	17.00	22.00	40.00	25.00
(30)	.40	.52	.60	.90	.55	.45	.70
(31)	.33	1.10	1.30	1.10	2.10	1.60	1.60

Oregon—Deschutes County——Bureau of Reclamation—Power Devel.

C. J. Montag & Sons, Portland, Ore., bid low at $122,967 to the U. S. Bureau of Reclamation to construct Unit 3 of the Cove power plant of the Deschutes Project, Oregon. Bids were:

(1) C. J. Montag & Sons $122,967
(2) Morrison-Knudsen Co. 184,814
(3) Scheumann & Johnson 193,215
(4) Vernon Bros. Co. $193,775
(5) C. F. Davidson Co. 244,302

	(1)	(2)	(3)	(4)	(5)
Lump sum, coffer dam fdns.	$5,000	$1,000	$3,000	$10,000	$3,500
Lump sum, relocate flume and ditch	600.00	750.00	$1,000	500.00	350.00
Lump sum, reinf. bridge across canal	200.00	500.00	300.00	$1,500	$3,650
4,700 cu. yd. excav., power house, etc.	4.00	5.00	10.00	7.50	16.00
500 lin. ft. drill line holes	.50	2.00	2.00	1.00	1.00
1,900 cu. yd. excav. for road	2.00	2.50	2.00	1.50	8.00
100 cu. yd. road and turning area surf.	5.00	1.75	8.00	5.00	6.00

(Continued on next page)

SALERNO - NEW GUINEA - SAIPAN - FRANCE

--Now Germany!

...and on the job at home

ASKING NO QUARTER AND GIVING NONE!

IN the Army, Navy and Marines and here at home, with their tough buddies the hard slugging Internationals, Cletracs, Allis Chalmers and Caterpillar Tractors, Carco Winches are proving they can "take it" day in and day out, month after month.

No matter how hard the job, wherever it may be, in the woods, the oil fields, in construction work or on the battle field there is nothing but praise for Carco Hoists and Winches.

With strength far beyond that of their prime movers, Carco Winches are simple in design, have a minimum of parts, and are light in weight. They will handle your job with ease.

See your nearest tractor dealer.

YOUNGER BROTHERS OF THESE WINCHES

The Carco "General Sherman Tank" veteran of all battle fronts is another Carco Product.

"Dragon Wagons" M-26 Tank Retrievers are built by the men who build your winches.

CARCO

TRACTOR EQUIPMENT

PACIFIC CAR & FOUNDRY CO.

RENTON, WASHINGTON

Carco's "know-how" and production are going (in whole or part) into: bridges, hoists, winches, cargo ships, cranes, aircraft carriers, yarders, aircraft, structural steel, logging equipment, steel castings.

100	lin. ft. stone barrier, etc.	3.00	3.00	2.00	2.00	2.00
150	cu. yd. excav., for switch yard	6.00	5.00	5.00	10.00	10.00
160	cu. yd. excav. concrete	6.00	12.00	30.00	20.00	20.00
900	cu. yd. backfill	.75	.75	2.00	3.00	2.00
200	cu. yd. compact backfill	.75	2.50	2.00	.50	3.00
30	cu. yd. tamped gravel fills	7.00	5.00	8.00	6.00	7.00
3,000	cu. yd. overhaul	.10	.10	.10	.05	.05
400	cu. yd. rock fills	1.00	1.50	4.00	4.00	4.00
250	cu. yd. riprap	2.00	2.50	4.00	5.00	3.00
400	sq. yd. dry-rock pave.	5.00	7.00	5.00	7.00	4.00
540	cu. yd. conc., power house substruct.	25.00	50.00	50.00	40.00	50.00
200	cu. yd. conc., power house superstruct.	31.00	85.00	45.00	42.00	35.00
330	cu. yd. conc., power house	25.00	50.00	50.00	50.00	40.00
600	cu. yd. conc., penstock	35.00	65.00	50.00	43.00	50.00
35	cu. yd. conc., structs. for switchyard	35.00	70.00	40.00	50.00	35.00
210,000	lb. reinf. steel	.065	.105	.07	.10	.10
25	sq. yd. roughen conc. surface	2.00	2.00	5.00	4.00	2.00
50	lin. ft. holes for anchor bars	1.00	1.00	3.00	1.50	2.00
800	lin. ft. galv. metal seals	.75	1.25	2.00	1.25	2.00
Lump sum,	metal deflector for wasteway	50.00	35.00	100.00	300.00	300.00
60	lin. ft. control joints	.50	1.20	2.00	1.00	.50
120	lin. ft. calk grooves in control joints	.50	1.00	2.00	1.00	2.00
Lump sum,	power house roof	$1,500	$2,000	$1,500	$4,500	580.00
4,000	lbs. struct. steel roof beams	.75	.10	.30	.20	.10
600	lb. embed. anchors for turbine	.25	.30	.50	.30	.15
350	lb. pier nosing	.25	.30	.50	.30	.20
4,000	lb. embed. metal pipe	.50	.20	.50	.30	.30
1,500	lb. exposed metal pipe	1.00	.15	.60	.25	.40
500	lb. pipe handrails	.50	.50	.40	.30	.40
2,000	lb. misc. metalwork	.30	.50	.50	.30	.40
12,000	lb. trash racks, etc.	.10	.15	.10	.10	.04
12,000	lb. install radial gate	.06	.15	.10	.10	.04
4,000	lb. install radial gate hoists	.10	.10	.10	.10	.06
Lump sum,	two 8 T. hosts and trolleys	200.00	200.00	250.00	500.00	100.00
Lump sum,	turbine parts embed. in conc.	$3,600	$1,500	$3,000	$1,000	150.00
400	lb. generator and anchor bolts	.10	.30	.50	.20	.05
Lump sum,	exhaust fan, louvre and damper's	$1,000	500.00	400.00	400.00	250.00
Lump sum,	doors, windows and hardware	700.00	750.00	600.00	$2,000	400.00
1,100	lin. ft. embed. elec. metal conduit	.25	.60	.50	2.00	.30
750	lin. ft. embed. electric. metal conduit	.75	1.50	1.00	2.50	1.00
1,250	lin. ft. embed. elec. non-met. conduit	.50	1.00	1.00	2.00	.45
750	lin. ft. exposed elec. metal conduit	.25	.60	.70	2.00	.25
700	lin. ft. exposed elec. metal conduit	.75	1.50	1.00	3.00	.90
450	lin. ft. exposed elec. non-met. conduit	.50	1.00	1.00	2.50	.35
200	lb. ground system	.50	2.75	1.50	.30	100.00
600	T. transp. frgt. from Culver	5.00	2.50	5.00	10.00	5.00
15	T. transp. frgt. from Terrebonne	6.00	3.00	5.00	5.00	7.00
55	T. transp. frgt. from Redmond	4.00	1.50	3.00	3.00	3.00

California—Contra Costa County—Navy—Magazine

Barrett & Hilp of San Francisco, bid low at $5,296,848 to the Mare Island Public Works Office of the Navy for the construction of magazine storage bldgs. and facilities at Port Chicago. This magazine will replace a former one that was recently destroyed by an ammunition ship explosion. The following bids were submitted:

(A) Barrett & Hilp, San Francisco.....$5,296,848
(B) Twaits, Morrison-Knudsen 5,337,505
(C) MacDonald & Kahn, Inc., S. F..... 5,915,159
(D) Al. Johnson, Western Contr. Corp. & Peter Kiewit Sons 5,929,015
(E) Macco Const., Puget Sound Const., & Bevands & Bressi, Oakland.....$5,934,921
(F) J. A. Terteling & Sons, S. F..... 6,414,549
(G) J. I. Barnes Const. Co., S. F..... 6,582,437
(H) Guy F. Atkinson, S. F..... 6,718,327
(I) Piombo Bros. & C. L. Harney, S.F. 7,320,496

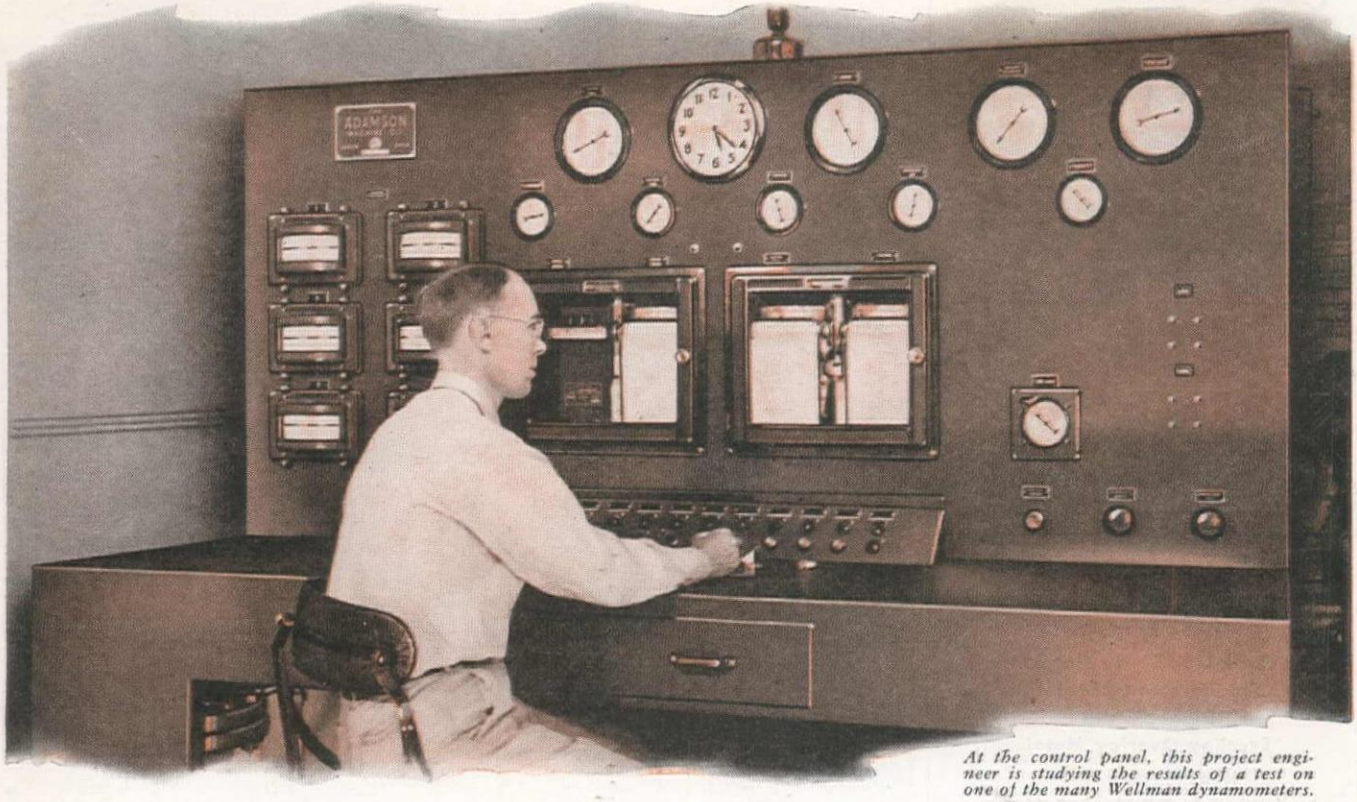
(1) Lump sum, prepare site.
(2) 1,300,000 cu. yd. excav.
(3) 8,000 hr. roll.
(4) 5,000 hr. shpft. roll.
(5) 5,000 hr. handroll.
(6) 3,000 hr. tamp.
(7) 400,000 cu. yd. subbase.
(8) 2,400,000 sq. ft. fill.
(9) 1,000 T. riprap.
(10) 85,000 T. cem. tr. base.
(11) 21,000 bbl. cement.
(12) 200 T. emuls. asph. cure seal.
(13) 54,000 T. asph. conc. pave.
(14) 2,700 T. asph. cement.
(15) 12,000 lin. ft. traffic stripe.
(16) 108 lin. ft. guardrail.
(17) 60 T. liq. asph.
(18) 5,430 lin. ft. 12-in. conc. pipe.
(19) 3,360 lin. ft. 18-in. reinf. conc. pipe.
(20) 90 lin. ft. 24-in. reinf. conc. pipe.
(21) 520 lin. ft. 30-in. reinf. conc. pipe.
(22) 240 lin. ft. 36-in. reinf. conc. pipe.
(23) 52 ea. single walls, 18-in. pipe.
(24) 2 ea. single walls, 24-in. pipe.
(25) 2 ea. single walls, 30-in. pipe.
(26) 2 ea. single walls, 36-in. pipe.
(27) 12 ea. double walls, 18-in. pipe.
(28) 2 ea. double walls, 24-in. pipe.
(29) 4 ea. double walls, 30-in. pipe.
(30) 6 ea. double walls, 36-in. pipe.
(31) 7 ea. "A" box culverts (50 ft.).
(32) 72 lin. ft. ea. addl. foot.
(33) 2 ea. "B" box culv. (20 ft.).
(34) 2 lin. ft. ea. addl. ft.
(35) Lump sum, conc. reservoir.
(36) Lump sum, pumping plant.
(37) Lump sum, electric power.
(38) 10,970 lin. ft. 6-in. C.I. pipe.
(39) 16,700 lin. ft. 8-in. C.I. pipe.
(40) 10,200 lin. ft. 12-in. C.I. pipe.
(41) 58 ea. 6-in. hub end valve.
(42) 13 ea. 8-in. hub end valve.
(43) 5 ea. 12-in. hub end valve.
(44) 56 ea. fire hydrant.
(45) 16 ea. hose cart shelter.
(46) 1 ea. auto. air vent.
(47) 31,414 lin. ft. recondition Bay Pt. and Clayton R.R.
(48) 7,000 ea. new ties.
(49) 14 ea. new turnout.
(50) 108,219 lin. ft. new R.R. track.
(51) 156 ea. turnout, new track.
(52) 32 ea. fouling point signs.
(53) 133 ea. tie stop bumpers.
(54) 9 ea. signs.
(55) 8 ea. sand bumpers.
(56) 13 ea. derails.
(57) 11 ea. derail signs.
(58) 13 ea. whistling signs.
(59) 20 ea. H. E. mag., Area 1.
(60) 20 ea. H. E. mag., Area 4.
(61) 5 ea. B. P. magazines.
(62) 10 ea. fuse and detonator magazines.
(63) 93 ea. gun ammunition mag.
(64) 19 ea. inert storehouses.

ALTERNATE ITEMS

(65) 8A (ice plant).
(66) 59A (omit expan. joints).
(67) 60A (omit expan. joints).
(68) 63A (omit expan. joints).

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
(1)	$18,382	$66,089	$7,500	$60,000	$90,000	$80,000	$30,000	$50,000	$44,150
(2)	.30	.3325	.33	.50	.54	.37	.60	.52	.44
(3)	6.10	6.66	6.75	5.30	5.80	6.00	5.25	6.80	5.30
(4)	8.50	8.70	8.00	7.50	9.40	6.50	8.50	11.00	8.29
(5)	2.75	3.20	4.00	5.57	3.50	4.00	3.00	5.20	4.08
(6)	6.60	14.00	8.00	10.62	6.00	7.00	8.50	9.10	7.88
(7)	.30	.433	.90	.717	.54	.86	.70	.52	.44
(8)	.07	.0505	.07	.06	.06	.07	.065	.07	.07
(9)	10.00	1.90	9.25	9.24	6.00	5.00	7.00	6.50	3.00
(10)	2.90	2.07	1.80	2.31	2.20	2.60	3.00	2.70	2.45
(11)	2.00	2.01	2.40	2.64	2.20	2.75	2.20	2.70	2.47
(12)	18.00	30.00	25.00	28.05	25.00	28.00	35.00	30.00	22.00
(13)	3.90	3.45	4.20	4.04	3.80	4.00	4.30	4.20	4.16
(14)	18.00	17.00	15.25	16.16	16.00	19.00	16.00	18.00	17.77

(Continued on next page)



At the control panel, this project engineer is studying the results of a test on one of the many Wellman dynamometers.

Solving your problems of RUBBING SURFACES

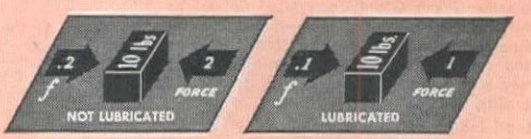
FRICTION is developed when two surfaces are rubbed together. Friction lights a match . . . and it's friction that operates your clutches and brakes. In the great S. K. Wellman laboratories we are engaged in continuous study of powder metallurgy, to improve friction qualities of Velvetouch *all-metal* clutch facings and brake linings . . . to bring you dependable friction materials *engineered to your exact specifications.*

Specify Velvetouch replacement clutch facings and brake linings for your tractors, graders, scrapers, shovels and other earthmoving equipment.

THE S. K. WELLMAN COMPANY
1374 EAST 51st STREET • CLEVELAND 3, OHIO

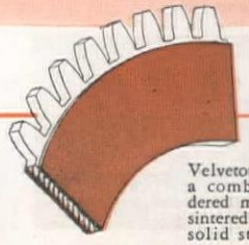
Interesting Facts About FRICTION

If two rubbing surfaces are separated by a film of oil, the friction is almost independent of the nature of the surfaces.



As shown in the illustration, a 10 lb. block sliding on a non-lubricated surface, requiring 2 lbs. of force, has a .2 coefficient of friction. When the surface is lubricated, however, the force required is only 1 lb. and the coefficient of friction drops correspondingly to 1 As lubrication decreases, the coefficient of friction becomes more dependent upon the material of the surfaces.

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.

(15)	.10	.024	.05	.081	.003	.005	.15	.006	.06
(16)	3.00	3.50	3.00	1.43	3.00	5.00	4.00	6.00	2.20
(17)	25.00	30.00	25.00	23.43	25.00	28.00	27.00	30.00	25.12
(18)	3.00	1.90	2.10	3.88	4.00	2.00	2.25	2.60	4.00
(19)	3.50	3.70	3.90	6.63	4.50	3.90	4.00	4.40	4.70
(20)	5.00	7.00	5.60	6.87	5.50	5.40	5.00	6.20	5.95
(21)	10.00	6.30	7.40	8.52	8.00	7.00	7.50	9.10	8.95
(22)	11.00	9.25	10.60	10.72	9.00	10.00	9.00	11.70	11.05
(23)	50.00	26.00	52.00	35.55	60.00	85.00	40.00	54.60	37.30
(24)	70.00	47.00	82.00	52.80	80.00	120.00	45.00	67.60	54.70
(25)	80.00	58.00	110.00	62.18	110.00	280.00	50.00	80.60	59.60
(26)	100.00	73.00	150.00	77.85	130.00	350.00	55.00	93.60	70.60
(27)	70.00	47.00	77.00	50.29	80.00	120.00	53.00	93.60	61.20
(28)	80.00	67.00	115.00	72.99	100.00	155.00	61.00	100.00	88.20
(29)	100.00	75.00	155.00	88.12	130.00	200.00	69.00	119.60	89.50
(30)	120.00	95.00	210.00	113.54	170.00	270.00	77.00	132.60	151.80
(31)	$7,000	$5,150	$9,900	$9,362.69	$7,000	$6,000	$8,000	$8,750	$7,938
(32)	100.00	98.00	150.00	106.78	110.00	110.00	150.00	110.00	109.50
(33)	$1,800	$1,170	$1,500	$1,168.20	$1,500	$1,500	$1,500	$1,982	$1,420
(34)	60.00	58.50	60.00	58.52	60.00	80.00	100.00	65.00	48.25
(35)	$42,000	$43,400	$42,250	$37,874.38	$42,000	$30,000	$30,000	$51,805	$32,167
(36)	$10,000	$10,200	$17,000	$7,743.38	$12,000	$20,000	$8,500	$10,084	$8,560
(37)	$3,500	$3,020	$2,800	$1,850.00	$2,000	500.00	$2,000	$1,362	$2,474
(38)	2.00	1.80	1.75	1.92	2.00	1.80	2.00	1.80	2.20
(39)	2.70	2.40	2.35	2.59	3.00	2.40	2.70	2.40	2.90
(40)	4.00	4.00	3.95	4.38	4.50	3.50	4.00	4.10	4.40
(41)	55.00	60.00	58.00	50.50	60.00	60.00	53.00	60.00	59.00
(42)	80.00	85.00	82.00	72.18	80.00	80.00	77.00	86.00	84.75
(43)	135.00	155.00	155.00	133.43	140.00	150.00	132.00	159.00	146.00
(44)	130.00	136.00	150.00	131.30	150.00	180.00	130.00	135.00	142.40
(45)	400.00	250.00	315.00	215.00	400.00	400.00	400.00	263.00	353.00
(46)	150.00	150.00	150.00	131.30	80.00	300.00	75.00	156.00	65.00
(47)	3.00	2.25	2.60	2.36	3.50	2.90	3.05	2.93	2.75
(48)	1.70	.85	1.13	1.01	2.00	2.00	1.70	1.17	1.18
(49)	700.00	720.00	585.00	515.00	900.00	580.00	800.00	390.00	539.00
(50)	5.00	4.20	5.40	4.63	4.90	4.76	4.70	5.26	5.39
(51)	600.00	720.00	345.00	318.15	800.00	580.00	700.00	358.00	571.00
(52)	20.00	16.50	23.00	22.22	25.00	15.00	22.00	13.00	25.90
(53)	20.00	42.50	23.00	22.22	25.00	15.00	22.00	19.50	25.90
(54)	30.00	16.00	23.00	22.22	20.00	30.00	22.00	20.80	25.90
(55)	100.00	97.00	145.00	131.30	.....	150.00	.....	104.00	.....
(56)	150.00	110.00	145.00	131.30	130.00	100.00	130.00	162.50	153.00
(57)	20.00	46.00	23.00	22.22	15.00	30.00	14.00	32.50	25.90
(58)	20.00	17.00	23.00	22.22	20.00	15.00	16.00	19.50	25.90
(59)	$10,500	$10,900	$11,400	$10,489.38	$10,000	$13,750	$12,000	$11,908	$18,290
(59)	$10,500	$10,900	$11,400	$10,489.38	$10,000	$13,750	$12,000	$11,908	$18,290
(60)	$12,000	$10,900	$11,400	$10,489.38	$10,000	$13,750	$12,000	$11,778	$18,290
(61)	$9,000	$8,500	$9,050	$6,342.81	$7,000	$11,150	$9,500	$9,100	$12,885
(62)	$6,000	$6,300	$6,170	$4,567.56	$6,000	$9,100	$6,700	$6,500	$8,560
(63)	$21,670	$22,945	$25,220	$25,142.88	$24,000	$27,500	$29,000	$31,162	$35,634
(64)	$30,000	$33,900	$30,900	$33,354.73	$33,000	$40,000	$31,000	$35,815	$44,950
(65)	.055	.042	.052	.032	.045	.003	.035	.002	.04
(66)	$10,460	$10,889	$11,390	$10,239.38	$10,000	$13,250	200.00	$11,878	$18,240
(67)	$11,960	$10,899	$11,390	$10,239.38	$10,000	$13,250	200.00	$11,748	$18,240
(68)	$21,530	$22,903	$25,140	$24,604.88	$24,000	$25,000	300.00	$30,962	$35,584

Irrigation . . .

Colorado—Grand County—Bureau of Reclamation—Channel, Earthwork & Bridges

Larson Construction Co. of Denver, Colorado, submitted the lowest bid at $62,601 to the U. S. Bureau of Reclamation to construct channel, earthwork and bridges between Grand Lake and Shadow Mountain Lake on the Big Thompson Project. Bids were:

(1) Larson Construction Co. $62,601
(2) Frank M. Kenney 63,435
(3) Brown Construction Co. $71,460
(4) J. F. Shea Co., Inc. 95,035

	(1)	(2)	(3)	(4)
14,000 cu. yd. excav., for channel	2.20	2.60	2.00	2.10
1,700 cu. yd. excav., common, for road	.50	1.00	1.00	1.55
100 cu. yd. excav., rock, for road	2.00	2.00	2.00	6.00
120,000 sta. cu. yd. overhaul	.03	.03	.05	.02
700 cu. yd. county road surf.	3.00	1.50	3.00	5.00
350 cu. yd. excav., common, for structs.	5.00	7.50	10.00	6.00
20 cu. yd. excav., rock, for structs.	10.00	8.50	14.00	6.00
300 cu. yd. conc. in sill, piers and abuts.	40.00	30.00	40.00	50.00
15 cu. yd. conc. in counterweight	40.00	35.00	40.00	30.00
36,000 lb. place reinf. bars	.04	.025	.05	.08
800 cu. yd. backfill	1.00	.70	1.00	3.00
600 cu. yd. compact. backfill	2.00	.20	2.00	6.00
54,000 lb. erect. struct. steel in bridges	.05	.03	.10	.20
22 M.F.B.M. erect. timber in bridges	70.00	80.00	100.00	200.00
9,000 lb. install. bridge operating equip.	.10	.10	.20	.50
8,000 lb. install. misc. metalwork	.10	.10	.20	.50
Lump sum, const. operator's house for rolling bridge	300.00	400.00	500.00	$1,500
Lump sum, construct. operator's house for bascule bridge	400.00	600.00	500.00	$2,000
150 lin. ft. install. elect. metal conduit	.10	.25	1.00	5.00
30 lb. install elect. conductors and ground wires	.20	.60	1.00	10.00
Lump sum, remove exist. foot bridge	100.00	150.00	100.00	200.00
Lump sum, remove. exist. county bridge	300.00	300.00	$1,000	$1,500

Oklahoma—Jackson County—Bureau of Reclamation—Canal

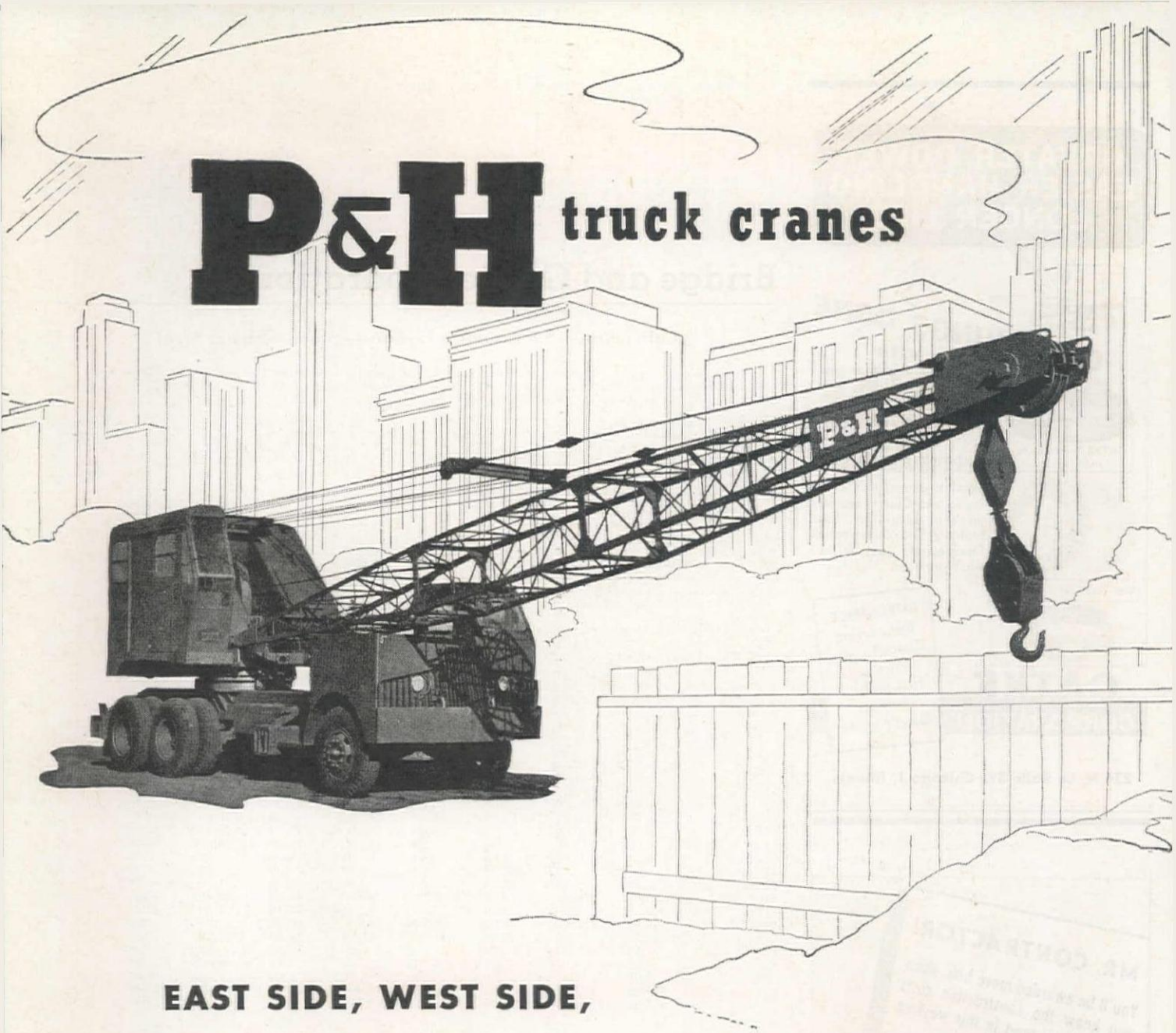
Morrison-Knudsen Co., Inc., Boise, Idaho, submitted the lowest bid on earthwork operations and erection of structures on the main canal of the Altus project in Okla. A bid of $459,103 was submitted to the U. S. Bureau of Reclamation. The work involves the laying of a sewer pipe and the construction of flumes and a siphon between sta. 85+73.5 and 125+60. The following bids were submitted:

(1) Morrison-Knudsen Co., Inc. $459,103
(2) Ottinger Bros. 468,369
(3) C. F. Lytle Co. 633,108
(4) Leo C. Sanders ..... $ 802,125
(5) Brown & Root, Inc. 986,772
(6) Stiers Bros. Const. Co. 1,085,715

	(1)	(2)	(3)	(4)	(5)	(6)
13,500 cu. yd. excav., for inlet bench flume	2.50	2.00	2.50	4.00	7.00	5.00
35,000 cu. yd. excav., for outlet bench flume	2.25	1.90	2.35	4.00	7.00	5.00
66,000 cu. yd. excav., for siphon	1.30	2.00	2.50	4.00	2.00	7.75
60,000 cu. yd. backfill	.30	.38	.60	.75	.45	1.00

(Continued on next page)

P&H truck cranes



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Warehouses Service Stations: Seattle, Los Angeles, San Francisco
Portland, Oregon: Loggers & Contractors Machinery Co., 240 S.E. Clay St.; Willows, Calif.: Willow Motor Sales Co.; Napa, California: Berglund Tractor & Equipment Co., 1224 Third Street; Salt Lake City, Utah: National Equipment Co., 101 West Second Street, So.; Spokane, Washington: F. M. Viles & Co., 1007 Second Avenue, West; Sacramento, Calif.: Capital Tractor & Equip. Co., 235 W. 16th Street.

1,700 cu. yd. compacting backfill	1.40	1.00	6.50	2.00	3.00	3.00
1,943 cu. yd. concrete in bench flumes	27.50	26.50	49.50	45.00	50.00	35.00
3,327 cu. yd. concrete in siphon	36.50	30.90	39.50	45.00	81.00	40.00
1,287,000 lb. placing reinforce. bars	.03	.035	.035	.03	.045	.03
100 sq. yd. dry-rock paving	3.50	6.00	6.00	5.00	11.00	6.00
600 cu. yd. riprap	4.00	3.50	7.00	5.00	7.00	6.00
0.25 M.F.B.M. erecting timber in structs.	200.00	400.00	250.00	200.00	800.00	300.00
3,100 lin. ft. constr. 6-in. diam. underdrains	1.75	3.45	3.00	4.00	12.00	3.00
100 lin. ft. laying 6-in. diam. sewer pipe	2.00	3.00	5.00	4.00	15.00	3.25
24,300 lbs. place metal water stops	.65	.15	.60	.05	.40	.40
8,000 lbs. install. blow-off valve	.20	.08	.25	.05	.15	.10

Bridge and Grade Separation . . .

California—Sacramento County—State—Struc. Steel

Lord & Bishop and A. Teichert & Son, Inc., of Sacramento, submitted the low bid at $727,858 to the California Division of Highways, Sacramento, to reconstruct a portion of the existing bridge across the Sacramento River at Rio Vista. Bids were as follows:

(A) Lord & Bishop & A. Teichert & Son..$727,858
(B) C. W. Caletti Co. 733,481
(C) J. H. Pomeroy & Co., Inc. 745,773
(D) Earl W. Heple 746,680
(E) United Concrete Pipe Corp. & Ralph A. Bell 747,375
(F) W. A. Bechtel Co. $755,127
(G) A. Soda & Son 764,985
(H) George Pollock Co. 772,472
(I) Morrison-Knudsen Co., Inc. 812,963

(1) 2,500 cu. yd. struct. excav.
(2) 4,400 cu. yd. imported borrow.
(3) 200 M. gal. applying water.
(4) 575 T. crusher run base.
(5) 600 T. mineral aggreg. (P.M.S.)
(6) 32 T. liquid asph. MC-3 (P.M.S.)
(7) 4 T. liquid asph. MC-3 (Prime Ct.).
(8) 60 T. rock and screenings.
(9) 5 T. pav. asph.
(10) 74 M.F.B.M. Douglas fir timber.
(11) 1,015 cu. yd. Cl. "A" P.C.C. (footing blocks).
(12) 2,090 cu. yd. Class "A" P.C.C. (struct.)
(13) 3,285,000 lb. structural steel.
(14) 3,285,000 lb. erect. struct. steel.
(15) 6,000 lin. ft. treated Douglas fir piles.
(16) 75 ea. driv. timber piles.
(17) 19,040 lin. ft. steel piles.
(18) 406 ea. driv. steel piles.
(19) 350 ea. friction fins.
(20) 320,000 lb. bar reinf. steel.
(21) 320,000 lb. placing bar reinf. steel.
(22) 2,722 lin. ft. steel rail.
(23) Lump sum, elect. equipt.
(24) Lump sum, misc. items of work.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
(1)	10.00	25.00	30.00	30.00	10.00	15.00	20.00	25.00	15.00
(2)	1.25	2.00	2.25	2.00	2.00	1.50	2.00	2.00	1.00
(3)	2.00	4.00	2.00	2.00	3.00	2.00	3.00	3.00	3.50
(4)	4.00	4.00	4.00	4.00	3.00	5.00	4.00	4.00	4.60
(5)	5.00	6.00	6.00	6.00	5.00	8.00	7.00	7.00	6.50
(6)	20.00	40.00	30.00	20.00	25.00	27.00	15.00	30.00	25.00
(7)	40.00	40.00	55.00	40.00	50.00	45.00	35.00	40.00	27.50
(8)	7.00	10.00	8.00	8.00	7.00	6.00	7.00	9.00	6.00
(9)	30.00	40.00	25.00	40.00	20.00	35.00	35.00	25.00	30.00
(10)	200.00	200.00	170.00	150.00	150.00	160.00	130.00	160.00	150.00
(11)	30.00	30.00	22.00	25.00	22.00	20.00	20.00	50.00	50.00
(12)	40.00	42.00	32.00	40.00	55.00	35.00	50.00	50.00	35.00
(13)	.08	.075	.08	.08	.085	.094	.08	.08	.09
(14)	.05	.037	.042	.04	.04	.04	.04	.04	.04
(15)	1.50	1.50	1.50	1.70	1.50	1.75	1.50	1.50	2.00
(16)	50.00	100.00	70.00	90.00	60.00	40.00	200.00	50.00	40.00
(17)	2.50	2.00	2.50	3.00	2.50	3.10	3.00	2.50	3.00
(18)	40.00	100.00	80.00	40.00	85.00	60.00	80.00	35.00	150.00
(19)	10.00	10.00	12.00	10.00	10.00	14.00	10.00	10.00	25.00
(20)	.04	.04	.045	.04	.04	.05	.04	.045	.044
(21)	.025	.02	.02	.015	.02	.02	.02	.02	.025
(22)	9.00	8.00	9.00	7.50	7.50	8.00	7.00	8.50	9.00
(23)	$4,000	$2,500	$4,200	$4,000	$4,000	$6,233	$3,000	$4,000	$4,500
(24)	$5,000	$10,135	$2,200	$5,000	$5,000	$3,700	$10,896	$5,000	$7,500

California—Kern County—State—Bridge & Surf.

Clyde W. Wood, Inc., Los Angeles, submitted the low bid of $108,070 to the State Division of Highways, Sacramento, to grade, blanket with imported borrow and surface material, and apply bituminous surface treatment on a total of 5.4 mi. of highway in Kern County between San Bernardino Co. line and 1.5 mi. north of Inyokern. Work also includes the construction of 2 reinforced concrete slab bridges on treated timber pile bents. Bids were as follows:

(1) Clyde W. Wood, Inc. $108,070
(2) Griffith Co. 143,020
(3) Phoenix Construction Co. 145,483
(4) D. A. Williams & Frontier Const. Co. 152,202
(5) Vinnell Co. $153,386
(6) Mittry Bros. Constr. Co. 160,369
(7) Robert A. Farish 171,872

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
6 cu. yd. remove concrete	5.00	12.00	12.00	10.00	13.00	6.00	10.00
28,435 cu. yd. roadway excav.	.39	.54	.72	.86	.51	.75	.71
510 cu. yd. struct. excav.	2.00	3.00	2.00	3.25	2.60	2.50	4.00
45 cu. yd. ditch and channel excav.	2.00	3.00	2.00	3.00	2.60	.75	4.00
2,850 cu. yd. imported borrow (Sec. A)	.65	.90	1.15	.70	1.00	1.25	1.15
23,500 cu. yd. imported borrow (Sec. C)	.85	.90	.85	.91	1.00	1.25	1.15
10,200 cu. yd. imp. surf. mat'l (Sec. A)	.70	1.10	1.25	1.00	1.35	1.25	1.55
21,400 cu. yd. imp. surf. mat'l (Sec. C)	.90	1.20	1.15	1.12	1.35	1.25	1.55
22,000 sta. yd. overhaul	.015	.015	.01	.005	.01	.02	.02
Lump sum, develop water and furnish equip.	500.00	$9,000	$2,000	$6,000	$3,000	$5,000	$1,000
2,525 M. gal. apply water	3.00	2.20	3.50	3.60	4.00	3.00	3.55
284 sta. finish. roadway	10.00	6.00	15.00	8.00	20.00	12.00	10.00
47 T. liquid asph. MC-2	17.75	52.00	20.00	23.00	22.00	22.00	30.00
770 T. liq. asph. MC-2 or MC-3	17.75	24.50	19.00	23.00	20.00	22.00	25.00
75,370 sq. yd. prepare, mix and shape surf.	.06	.09	.08	.115	.11	.12	.15
16 T. asph. emulsion (seal)	25.00	55.00	32.00	25.00	30.00	26.00	70.00
184 lin. ft. timber bridge rail.	1.50	4.00	4.00	3.00	2.60	5.00	2.80
188 cu. yd. Class "A" P.C.C. (struct.)	40.00	48.00	62.00	60.00	50.00	45.00	60.00
33,300 lb. furnish. bar reinf. steel	.04	.05	.05	.05	.06	.05	.06
33,300 lb. place bar reinf. steel	.04	.03	.05	.025	.06	.05	.035
1,290 lin. ft. tr. Douglas fir piles	1.50	1.50	2.00	1.34	1.50	1.20	1.20
43 ea. driv. timber piles	30.00	48.00	75.00	74.00	100.00	80.00	60.00
53 ea. monuments	4.00	5.00	11.00	4.00	7.00	5.00	4.00
76 ea. culv. mkrs. and guide posts	3.00	4.00	8.00	4.00	7.00	5.00	5.00
112 lin. ft. 18-in. un R.C.P. (2000-D)	4.50	4.30	4.00	4.50	6.00	3.80	6.00
86 lin. ft. 24-in. un R.C.P. (2000-D)	6.90	7.20	6.00	7.00	7.00	6.35	8.00
76 lin. ft. 36-in. un R.C.P. (2000-D)	10.50	12.00	8.00	11.00	10.00	9.80	14.00
345 lin. ft. salve pipe culverts	1.00	1.00	2.00	2.00	1.30	2.00	3.00
252 lin. ft. relay salv. C.M.P. culverts	1.50	1.00	3.00	2.00	1.80	2.00	2.00
500 lb. misc. iron and steel	.40	.30	.10	.25	.40	.30	.30

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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...

Guy F. Atkinson Co., San Francisco, Calif., was awarded a $404,695 contract to construct railroad and highway overhead over the Southern Pacific Co. and the Atchison, Topeka and Santa Fe Ry. Co. tracks at Inland Storage Area, Port Chicago, Calif., by Bureau of Yards and Docks, Washington, D. C.

Lord and Bishop, Sacramento, Calif., received a $727,858 contract to reconstruct portions of the existing bridge crossing the Sacramento River at Rio Vista, Calif., by the California State Division of Highways, Sacramento, Calif.

Haddock-Engineers, Ltd., Oceanside, Calif., received a $1,296,400 award to construct aviation storehouse facilities at the Marine Corps Air Station, El Toro, Calif., by the Federal Public Works Officer at San Diego, Calif.

Peter Kiewit Sons Co., Al. Johnson Construction Co. and **Hubert H. Everist,** San Francisco, Calif., were awarded a $769,007 contract to construct parking aprons and taxiways, extend runway and install utilities at the Fairfield-Suisun Airport, Calif., by the U. S. Engineer Office, Sacramento, Calif.

Shannahan Bros., Huntington Park, Calif., received a $1,347,000 contract to extend piers Nos. 2 and 3 at the U. S. Navy Dry Docks at Terminal Island, Calif., by the Bureau of Yards and Docks, Washington, D. C.

Morrison-Knudsen Co., Boise, Idaho, were awarded a $459,103 contract to construct earthwork and structures from station 85+73.5 to station 125+60 of the main canal of the Altus project, Oklahoma, by the Bureau of Reclamation, Altus, Okla.

Parker, Steffens and Pearce, San Francisco, Calif., have received a $762,675 contract to construct barracks, laundry, dry cleaning, subsistence and provision storage buildings, install mechanical services and sewers, build roads and site improvements at the Naval Magazine, Port Chicago, Calif., by the Bureau of Yards and Docks, Washington, D. C.

M. W. Kellogg Co., Torrance, Calif., was awarded a $4,000,000 contract to construct additions to the refinery at Torrance, Calif., by the General Petroleum Corporation of Los Angeles, Calif.

Shannahan Bros., Huntington Park, Calif., received a $1,191,582 contract to construct additional magazines at the Naval Ammunition Depot, Fallbrook, Calif., by the Bureau of Yards and Docks, Washington, D. C.

Nettleton and Baldwin, Seattle, Wash., were awarded a contract to construct overhaul and gunnery training buildings and storage facilities at the commanding officers' quarters at Quillayute, Wash., by the Bureau of Yards and Docks, Washington, D. C.

Lease and Leigland and **Kuney-Johnson Co.,** Seattle, Wash., have received a $2,681,122 contract to construct industrial and personnel buildings and facilities at Bangor, Wash., by the Bureau of Yards and Docks, Washington, D. C.

Hayward Lumber and Investment Co., Los Angeles, Calif., was

awarded a $4,026,255 contract to build 35,250 prefabricated, portable huts for the U. S. overseas troops by the Bureau of Yards and Docks, Washington, D. C.

Morrison-Knudsen Co., Los Angeles, Calif., received a contract award to reconstruct 14.0 miles of double track railroad in the Los Angeles Harbor area by the Harbor Belt Line Railroad of San Pedro, Calif.

Haddock-Engineers, Ltd., of Oceanside, Calif., received a negotiated contract approximating $1,000,000 to construct 300 steel arch-rib huts and to place asphaltic pavement at Camp Pendleton, Oceanside, Calif., by the Bureau of Yards and Docks, Washington, D. C.

McKenzie Construction Co., San Antonio, Texas, was awarded a contract, estimated between $4,000,000 and $5,000,000 to enlarge the ordnance plant at Amarillo, Texas, by building a new shell loading line and by increasing the capacity of the three existing lines by the U. S. Engineer Office, Denison, Texas.

Highway and Street . . .

California

ALAMEDA CO.—**Louis Biasotti & Son,** 40 Clay St., Stockton—$80,759 to construct 0.8 mi. access road on Main St. from Atlantic Ave. to Reservation boundary, Alameda Naval Air Sta.—by Pub. Roads Adm., San Francisco. 9-18

ALAMEDA CO.—**Lee J. Immel,** 3030 San Pablo Ave., San Pablo—$13,678 to widen 0.2 mi. truck lane with conc. pave. betw. S. F.-Oakland Bay Bridge and Toll Plaza—by Div. of Hwys., Sacramento. 9-12

ALAMEDA CO.—**Lowrie Paving Co.,** 1540 16th St., San Francisco—$21,554 to repair with asph. conc. surf. betw. S. F.-Oakland Bay Bridge and Toll Plaza—by Div. of Hwys., Sacramento. 9-11

ALAMEDA & CONTRA COSTA COS.—**Lee J. Immel,** 3030 San Pablo Ave., San Pablo—$22,368 to repair with plant mix surf. 1.0 mi. betw. El Cerrito Hill and Richmond—by Div. of Hwys., Sacramento. 8-31

CONTRA COSTA CO.—**Macco Construction Co.,** Ferry and Freight Sts., Oakland—$41,924 to grade, pave with asphaltic conc. on crushed rock base and apply shoulder treatment to 0.4 mi. of Richmond Blvd. in Richmond—by Div. of Hwys., Sacramento. 9-25

HUMBOLDT CO.—**Mercer-Frazer Co.,** 2nd and Commercial Sts., Eureka—$15,645 to place asph. road mix surf. in Dist. 5—by County Clerk, Eureka. 9-12

KERN CO.—**Griffith Co.,** 502 Los Angeles Railway Bldg., Los Angeles—$35,595 to repair with plant mix surf. and seal coat 3.8 mi. of hwy. betw. Wasco and Famoso—by Div. of Hwys., Sacramento. 9-22

KERN CO.—**Clyde W. Wood, Inc.,** 816 W. 5th St., Los Angeles—$108,069 to grade, blanket with imported borrow and surf. material and apply bitum. surf. treatment to portions, totaling 5.4 mi., of hwy. betw. San Bernardino line and Inyokern and to construct 2 reinf. conc. slab bridges on treated timber pile bents—by Div. of Hwys., Sacramento. 9-25

LOS ANGELES CO.—**Bonadiman-McCain,** 1709 W. 8th St., Los Angeles—$32,313 to place rail and wire bank prot. and sacked conc. riprap, and construct fences on 0.6 mi. of hwy. betw. Solamint and Dulce Canyon Road and betw. Newhall and Saugus—Div. of Hwys., Los Angeles. 8-31

LOS ANGELES CO.—**Vido Kovacevich,** 5400 Imperial Hwy., South Gate—$31,643 to construct and reinforce conc. culvert at Atlantic Ave. and 52nd St., Long Beach—by City Council, Long Beach. 9-21

LOS ANGELES CO.—**C. O. Sparks** and **Mundo Engineering Co.,** 2727 E. Washington Blvd., Los Angeles—$24,401 (est.) to place rock, oil and asphaltic concrete wearing surface under Sched. 4670—by City Council,Los Angeles. 9-21

LOS ANGELES CO.—**Sully-Miller Contracting Co.,** 1500 W. 7th St., Long Beach—$10,201 to surf. 3rd St. betw. Junipero and Redondo Ave., Long Beach—by City Council, Long Beach. 9-1

MONTEREY CO.—**Granite Construction Co.,** Box 900, Watsonville—$51,381 to construct 3.2 mi. access road to Dolomite Quarry, Natividad, from U. S. 101, near Salinas—by Pub. Roads Admin., San Francisco. 9-8

NAPA CO.—**A. E. Forde,** 640 Sir Francis Drake Blvd., San Anselmo—$18,881 to repair and surf. 2.5 mi. of hwy. betw. Napa and Yountville—by Div. of Hwys., Sacramento. 9-14

SAN BERNARDINO CO.—**George A. Herz & Assoc.,** 436 Court St., San Bernardino—$34,651 to grade and plantmix surf. 1.2 mi. of Tippecanoe Ave., San Bernardino—by Div. of Hwys., Sacramento. 9-28

SAN DIEGO CO.—**Basich Bros. Construction Co.,** 600 S. Fremont Ave., Alhambra—$158,310 to grade and place plant mix surf. on 3.6 mi. betw. "I" St. and South Harbor Dr., National City—by Div. of Hwys., Sacramento. 9-19

SAN DIEGO CO.—**Basich Bros. Construction Co.,** 600 S. Fremont Ave., Alhambra—$234,229 to grade and pave 4.7 mi. with asph. conc. and Port. cement conc. betw. Palm Ave. and Coronado—by Div. of Hwys., Sacramento. 9-11

SAN DIEGO CO.—**V. R. Dennis Construction Co.,** P. O. Box F, Hillcrest Sta., San Diego—$149,630 to grade and repair pave. at Naval Train. Center, San Diego—by Bureau of Yards and Docks, Washington, D. C. 9-6

SAN FRANCISCO CO.—**Fay Improvement Co.,** 760 Market St., San Francisco—$28,418 to surf. Evans Ave. betw. 3rd and Mendell Sts. and Newhall St. betw. Evans and Fairfax Aves., San Francisco—by Dept. of Pub. Works, San Francisco. 9-1

SAN FRANCISCO CO.—**Chas. L. Harney,** 625 Market St., San Francisco—$12,746 to pave areas of Sea Wall Lot 340 and El Dorado St., San Francisco—by State Harbor Comm., San Francisco. 9-21

SAN FRANCISCO CO.—**Chas. L. Harney,** 625 Market St., San Francisco—$147,186 to pave streets and yard area and construct sidewalks at Naval Dry Dock, Hunters Point—by Bur. of Yards and Docks, Washington, D. C. 9-19

SANTA CLARA CO.—**A. J. Raisch,** 900 W. San Carlos, San Jose—$40,828 to grade and pave Mt. View-Stevens Creek Road from Grant Road to San Jose-Stevens Creek Road—by County Clerk, San Jose. 9-11

SANTA CLARA CO.—**A. J. Raisch,** 900 W. San Carlos, San Jose—$79,564 to grade and pave portion of San Jose-Stevens Creek Road—by County Clerk, San Jose. 9-11

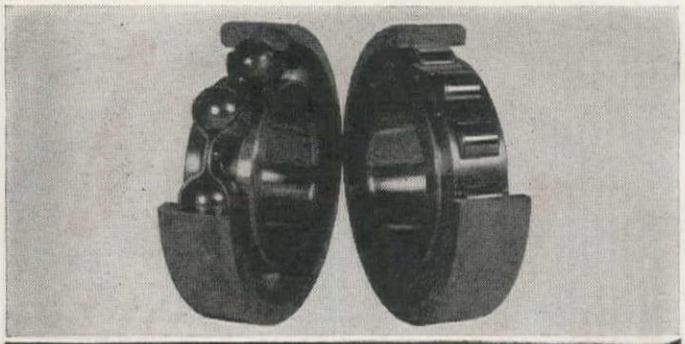
SISKIYOU CO.—**Phoenix Construction Co.,** P. O. Box 906, Bakersfield—$70,983 to construct 13.2 mi. access road to Ball Mountain logging unit—by Pub. Roads Adm., San Francisco. 8-30

SOLANO CO.—**W. C. Railing,** 27 Lowell St., Redwood City—$23,643 to construct 6.0 mi. access road to Fairfield-Suisun Army Airfield—by Public Roads Adm. 9-18

VENTURA CO.—**G. W. Ellis,** 8240 Lankershim Blvd., North Hollywood—$15,490 to resurf. Ojai Road in Santa Paula—by City Council, Santa Paula. 9-20

New Mexico

SOCORRO & CATRON COS.—**Armstrong & Armstrong,** Box 873, Roswell—$37,958 to grade, surf. and oil 37.9 mi. of U. S. Hwy. 60 betw. Magdalena and Datil—by State Hwy. Dept., Santa Fe. 9-6



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Brown-Bevis Equipment Co., 4900 Santa Fe Ave., Los Angeles 11, Calif.; Edward R. Bacon Company, Folsom at 17th Street, San Francisco 10, Calif.; Geo. B. Brose, The Marion Steam Shovel Company, 571 Howard St., San Francisco 5, Calif.; Joseph O. Reed, 603 Terminal Sales Bldg., Portland 5, Ore.; Star Machinery Co., 1741 First Ave., South, Seattle 4, Wash.

Oregon

MULTNOMAH CO.—**Cascade Construction Co.,** Portland—$17,255 to resurf. S. E. Ladd Ave., from Division St. to Hawthorne Blvd.—by City Council, Portland. 9-1

MULTNOMAH CO.—**Parker-Schram,** Couch Bldg., Portland—$29,621 to construct access road and to stabilize and surf. certain areas at Portland Sub-port of Embarkation, Portland—by U. S. Engr. Ofc. 9-11

MULTNOMAH CO.—**Porter W. Yett,** 6500 N. E. Ainsworth, Portland—$14,358 to resurf. streets betw. East Burnside and N. E. Glisan and 39th and 44th Aves., $11,788 to resurf. N. Denver Ave. from Portland Blvd. to Lombard St.—by City Council, Portland. 9-1

Washington

CLALLAM CO.—**Rush & Baird,** Seattle—$47,124 to grade, drain, surf. and seal coat 1.3 mi. State Hwy. 9 betw. Little Michigan and Jefferson Co. line—by Dir. of Hwys., Olympia. 9-6

KING CO.—**Fiorito Bros.,** 1100 Leary Way, Seattle—$29,924 to construct conc. pave. on Highland Park Way in Seattle—by Board of Pub. Works, Seattle. 9-27

PACIFIC CO.—**T. W. Thomas,** Portland, Ore.—$19,957 to grade, ballast and surf. 5 sections of State Hwy. 12 betw. Frances and Lilly Wheaton Bridge—by Dir. of Hwys. 8-30

SPOKANE CO.—**Diesel Oil Sales Co.,** 2155 Northlake, Seattle—$13,105 to construct 4.0 mi. of bitum. surf. treat. roadmix type road on Cheney-Spokane Hwy.—by Dir. of Hwys., Olympia. 8-30

Bridge . . .

California

CONTRA COSTA CO.—**Guy F. Atkinson Co.,** Russ Bldg., San Francisco—$404,695 to construct railroad and highway overhead over S. P. Co. and A. T. & S. F. railroad tracks at Inland Storage Area, Port Chicago—by Bur. of Yards & Docks, Washington, D. C. 8-30

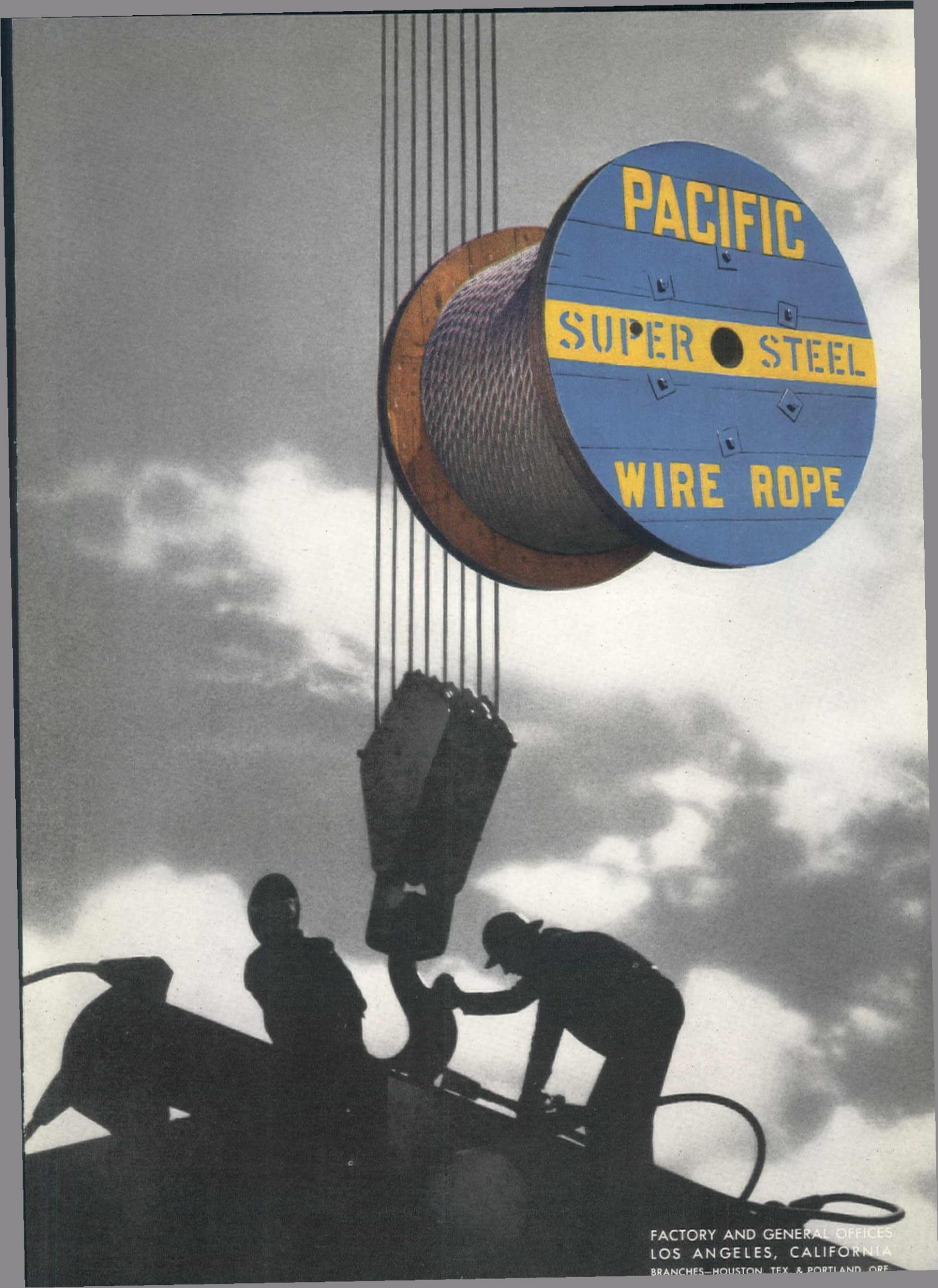
LOS ANGELES & VENTURA COS.—**F. Fredenburg,** P. O. Box 328, South San Francisco—$18,603 to repair two bridges across Arroyo Simi at Simi and across Castaic Creek near Castaic Junction, and to construct a culvert at Sta. 225+06 in Ventura Co.—by Div. of Hwys., Sacramento. 9-14

SACRAMENTO CO.—**Lord & Bishop,** Box 812, Sacramento and **A. Teichert & Co.,** 1846 37th St., Sacramento—$727,858 to reconstruct portions of exist. bridge crossing the Sacramento River at Rio Vista—by Div. of Hwys., Sacramento. 9-25

SAN DIEGO CO.—**E. G. Perham,** 1128 Stearns Dr., Los Angeles—$12,927 to repair Cottonwood Creek bridge, 35 mi. east of San Diego—by Div. of Hwys., Sacramento. 8-31

SAN FRANCISCO CO.—**Columbia Steel Co.,** Russ Bldg., San Francisco—$17,977 to repair struts on Oakland-San Francisco Bay Bridge—by Div. of Hwys., Sacramento. 9-27

SAN JOAQUIN CO.—**Dan Caputo,** 985



FACTORY AND GENERAL OFFICES
LOS ANGELES, CALIFORNIA
BRANCHES—HOUSTON, TEX. & PORTLAND, ORE.

Delmas Ave., San Jose—$26,319 to repair four timber trestle bridges betw. Stockton and Lodi—by Div. of Hwys., Sacramento. 9-20

Oregon

DOUGLAS CO.—**Harry I. Hamilton Co.,** Rt. 5, Box 34, Eugene—$13,871 to construct timber log bridge on conc. piers over Deer Creek, Roseburg — by Hwy. Comm., Salem. 9-15

Airport . . .

California

ALAMEDA CO.—**N. M. Ball Sons,** P. O. Box 404, Berkeley — $37,538 to roughly grade 30 ac. at Naval Air Sta., Alameda—by Bur. of Yards & Docks, Washington, D. C. 9-11

ALAMEDA CO.—**Piazza & Huntley,** P. O. Box 708, San Jose—$140,497 to construct taxiways at Oakland Municipal Airport, Oakland—by U. S. Engr. Ofc., San Francisco. 9-21

MARIN CO. — **Fredrickson & Watson,** 873 81st Ave., Oakland and **Chas. L. Harney,** 625 Market St., San Francisco—$477,378 to construct Air Transport Command aprons at Hamilton Field—by U. S. Engr. Ofc., San Francisco. 9-18

MONTEREY CO. — **Granite Construction Co.,** P. O. Box 900, Watsonville—$62,581 to construct additional drainage facilities at Monterey Airport—by U. S. Engineer Ofc., San Francisco. 9-5

ORANGE CO. — **Haddock - Engineers, Ltd.,** P. O. Box 569, Oceanside—$1,296,400 to construct aviation storehouse facilities at Marine Corps Air Sta., El Toro—by Pub. Works Officer, San Diego. 9-11

SAN DIEGO CO.—**R. E. Hazard Contracting Co.,** Box 1951, San Diego—$208,400 to construct asph. conc. pave. with asph. stabil. base, drainage ditches, storm drains, and grade at Naval Air Sta., San Diego—by Bur. of Yards & Docks, Washington, D. C. 9-6

SAN MATEO CO.—**Union Paving Co.,** 310 California St., San Francisco—$12,256 to repair taxiway pavement at San Francisco Airport—by Pub. Util. Comm., San Francisco. 9-27

SOLANO CO.—**Peter Kiewit Sons Co., Al Johnson Construction Co.** and **Hubert H. Everist,** San Francisco — $769,007 to construct parking aprons and taxiways, extend runway and install utilities at Fairfield - Suisun Airport — by U. S. Engr. Ofc., Sacramento. 9-28

SOLANO CO.—**Morrison-Knudsen Co.,** 111 Sutter St., San Francisco—$171,471 to excav. and place sub-base material for parking apron, Suisun-Fairfield Airfield—by U. S. Engr. Ofc., Sacramento. 9-11

Oregon

CLATSOP CO.—**A. Rudd,** Railway Exchange Bldg., Portland—$358,511 to construct warm-up apron, gunnery training bldg. and class "C" bldg., Naval Air Sta., Astoria—by Bureau of Yards & Docks, Washington, D. C. 9-8

Texas

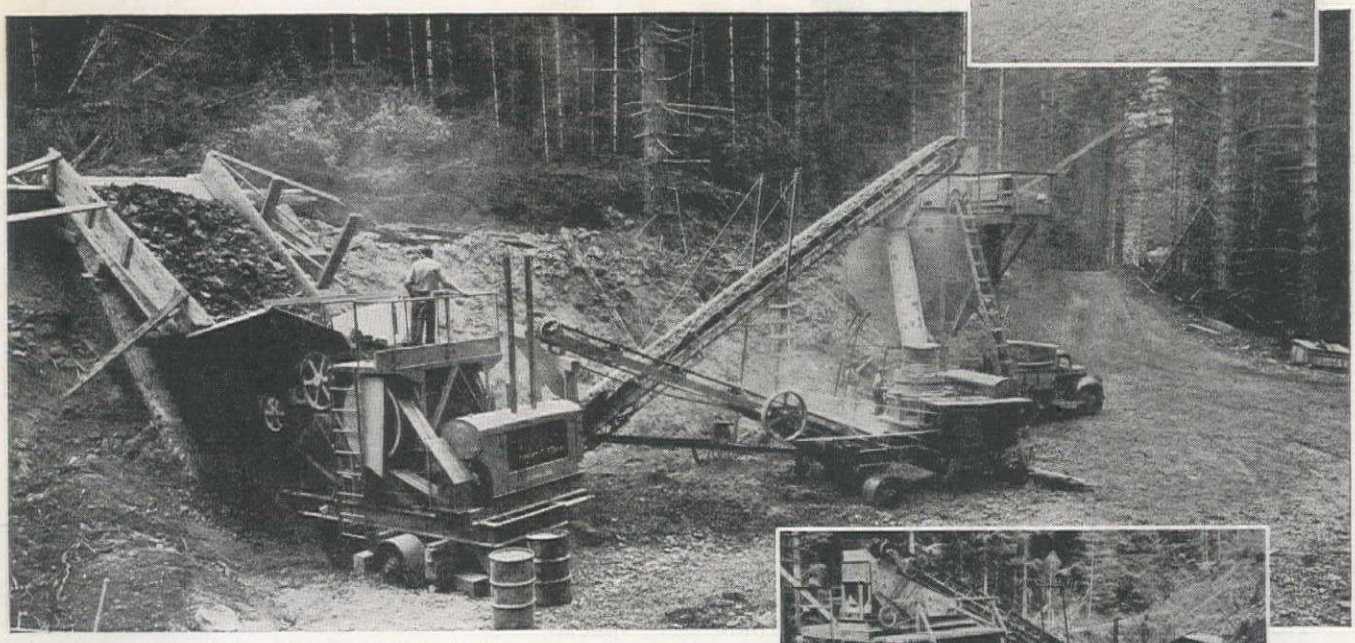
DALLAS CO. — **Texas Bitulithic Co.,** Dallas — $41,982 (est.) to pave parking area and access road, Aircraft Plant 4,

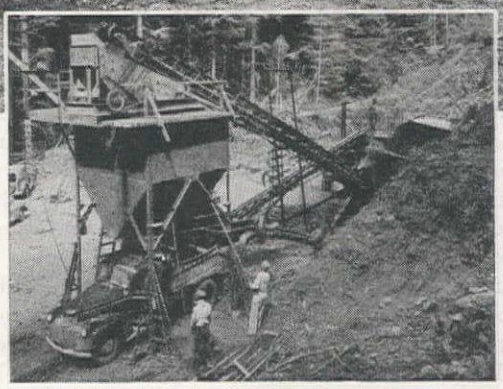
Crushing Hard Rock for Oregon Logging Roads..

TELSMITH

PORTABLE CRUSHING PLANTS

far exceed expected capacity!





• To provide faster, more economical timber transportation, Weyerhaeuser Timber Co. is building its own roads and super-truck highways.

To turn out the required aggregate *fast* and *economically* they're using two Telsmith Portable Crushing Plants—one at Longview, Wash.—the other at their Molalla, Oregon operation pictured here.

Each is a Telsmith Two-Unit Portable Crushing-Screening Plant with an 18″ x 32″ Primary Jaw Crusher with feeder, a 28″ Intercone Secondary Crusher, conveyors, vibrating screen, power units, and steel bin.

These logging roads are being built to highway specifications. When producing a minus 4″ plus 1″ aggregate for base course and a minus 1″ for top course, with the Primary Jaw Crusher set at 3″, and 100 per cent of the material being crushed, these Telsmith Portable Plants average 75 cu. yds. per hr. When producing a straight minus 1″ aggregate for top course, they average 40 to 50 cu. yds. per hr. The rock is very hard and tough, but plant capacity has more than met expectations.

For private logging roads — or any highway anywhere—Telsmith Portable Crushing-Screening Plants will produce the aggregate more economically. *Get Bulletin P-30.*

P-9

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

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

Clyde Equipment Co. Seattle 4, Wash.

Clyde Equipment Co. Portland 9, Ore.

General Machinery Co. Spokane 1, Wash.

Gordon Russell, Ltd. Vancouver, B.C.

Benbrook—by U. S. Engr. Ofc., Denison. 9-8

TAYLOR CO.—**L. H. Lacy & Co.,** 3009 N. Henderson St., Dallas—$66,433 to extend parking apron at Abilene Army Airfield—by U. S. Engr. Ofc. 9-6

WARD CO.—**Uvalde Construction Co.,** P. O. Box 3027, Dallas—$220,685 (est.) to construct additional parking apron at Pyote Aux. Air Field—by U. S. Engr. Ofc., Albuquerque, New Mexico. 9-8

Water Supply . . .

California

KERN CO.—**Harry Austin,** 17344 Van Owen St., Van Nuys—$6,111 to drill water well and construct appurtenant facilities at Muroc Army Air Base, Muroc—by U. S. Engr. Ofc., Los Angeles. 9-6

SOLANO CO.—**McGuire & Hester,** 796 66th Ave., Oakland—$19,944 to construct water supply pipe lines to the Yuba Manuf. Co., Benicia—by U. S. Engr. Ofc., San Francisco. 9-11

Texas

DENTON CO.—**J. L. Meyers & Sons,** Denton—$12,495 to drill water well for City of Denton—by City Council, Denton. 9-13

Utah

UTAH CO.—**Wheeler & Tempest,** 22½ E. 1st S., Salt Lake City—$55,514 to construct water facilities in Orem—by City Council, Orem. 9-5

Sewerage . . .

California

LOS ANGELES CO.—**Mike Miller,** 877 N. Bunker Hill, Los Angeles—$148,269 to construct sewer in vicinity of Northside Drive, Los Angeles—by County Board of Supervisors. 9-21

LOS ANGELES CO.—**Oberg Bros.,** Box 640, Inglewood—$63,074 to construct reinforced conc. drainage structures along Sec. 6, N. Outfall Sewer, betw. Centinela Blvd. and Sinaloa Road—by Board of Pub. Works, Los Angeles. 9-19

MONTEREY CO.—**Granite Construction Co.,** Box 900, Watsonville—$62,580 to construct additional drainage facilities at Monterey Airport, Monterey—by U. S. Engr. Ofc., San Francisco. 9-5

SAN JOAQUIN CO.—**F. R. Zinck,** 1940 N. Center St., Stockton—$23,444 to construct additional pump. unit at south disposal plant—by City Council, Stockton. 9-6

SOLANO CO.—**M. J. Lynch,** Barneveld and Oakdale Sts., San Francisco—$51,300 to construct 9,000 lin. ft. 15-in. sewer line from Basic Veg. Prods. Co. to Vacaville—by City Council, Vacaville. 9-13

SOLANO CO.—**Oakland Sewer Construction Co.,** P. O. Box 282, Walnut Creek—$21,620 to construct vitrified sewer in Benicia—by City Council, Benicia. 9-20

Idaho

BEAR LAKE CO.—**Reynolds Construction Co.,** Springville, Utah—$11,827 to construct drainage facilities at Bear Lake

Airport, near Paris—by U. S. Engr. Ofc., Sacramento. 9-25

Montana

SILVER BOW CO.—**Kisley & Shannon,** Butte—$79,765 to construct sewer system in Walkerville—by City Council, Walkerville. 9-12

Nevada

PERSHING CO.—**W. E. Shumes,** P. O. Box 227, Reno—$11,082 to improve sewer at Mill City—by Pub. Housing Auth., San Francisco. 9-7

Oregon

LINN CO. — **Henry Denherder,** Lebanon —$9,029 to construct 4,000 gpm sewage pumping plant in Lebanon — by City Council, Lebanon. 9-18

Utah

UTAH CO.—**Newman Construction Co.,** Salt Lake City — $163,017 to construct sewer facilities in Orem—by City Council Orem. 9-5

Washington

GRANT CO.—**Chisholm & Eiford,** Box 54, Bellingham—$63,900 to construct lift sta. and treatment plant (Sched. II and III) at Moses Lake — by Federal Works Agency, Seattle. 9-20

GRANT CO.—**Matt Malaspina,** 1803 30th So., Seattle — $53,910 to construct pipe lines at Moses Lake (Sched. I)—by Fed. Works Agency, Seattle. 9-20

KING CO. — **L. Coluccio Co.,** 512 21st Ave. So., Seattle — $46,741 to construct sewers on 5th Ave. N. E. and others, Seattle—by Board of Public Works, Seattle. 9-11

Waterway . . .

California

ALAMEDA CO. — **Duncanson - Harrelson,** 1404 deYoung Bldg., San Francisco — $298,750 to construct marginal wharf and elec. and mech. services at United Engineering Co., Ltd., Alameda — by Civil Works, U. S. Navy, San Francisco. 9-8

CONTRA COSTA CO. — **H. F. Lauritzen,** P. O. Box 470, Pittsburg—$28,788 to drive piles, construct new floats and reinforce existing dock at Yacht Harbor and Municipal Wharf, Martinez — by City Council, Martinez. 9-21

GLENN & COLUSA COS.—**Bessi-Bevanda Constructors, Inc.,** 208 W. 8th St., Los Angeles — $273,238 to enlarge levee from Moulton Weir to Princeton - Butte City Road, on Sacramento River—by U. S. Engr. Ofc., Sacramento. 9-12

HUMBOLDT CO.—**Scheumann & Johnson,** 1001 Lloyd Bldg., Seattle—$30,745 to construct bank protection on Eel River at Founders Grove, Dyerville — by Div. of Water Resources, Sacramento. 9-8

LOS ANGELES CO. — **Case Construction Co.,** San Pedro—negotiated award to dredge 875,000 cu. yd. from West Basin and deposit near Bixby Slough—by Bur. of Yards & Docks, Washington, D. C. 9-28

LOS ANGELES CO.—**Shannahan Bros.,** 6193 Maywood Ave., Huntington Park—$1,347,000 to extend piers 2 and 3, U. S. Navy Dry Docks, Terminal Island — by

Bur. of Yards & Docks, Washington, D. C. 9-26

SAN FRANCISCO CO.—**J. D. Proctor, Inc.,** 451 Monadnock Bldg., San Francisco—$23,933 to reconstruct fender line on Pier 40, San Francisco—by State Harbor Comm., San Francisco. 9-1

SOLANO CO.—**Freethy - Kimball Co.,** 1432 Kearney St., El Cerrito—$58,922 to construct conc. bulkhead on wood pile foundation from Mare Island Ferry Bldg. to Virginia St. Wharf, Vallejo—by City Council, Vallejo. 9-7

SOLANO CO.—**Red Rock Quarries,** Box 671, Vallejo—$18,150 to place riprap at California Maritime Academy, Carquinez Straits, Vallejo—by Div. of Arch., Sacramento. 9-5

SONOMA CO.—**American Dredging Co.,** 1419 Broadway, Oakland—$30,250 to dredge Petaluma Creek—by U. S. Engr. Ofc., San Francisco. 9-20

YUBA & SUTTER COS.—**H. Earl Parker,** 12th and F Sts., Marysville—$268,486 to enlarge levee on Bear River, West. Pac. R. R. intercepting channel and N. & S. Dry Creek—by U. S. Engr. Ofc., Sacramento. 9-12

Oregon

LANE & LINN COS.—**Oscar Butler & Son,** 4910 N. E. 42nd Ave., Portland—$63,130 to repair revetment and related work on Willamette and McKenzie rivers, near Eugene and Harrisburg—by U. S. Engr. Ofc., Portland 9-11

MARION, LINN & BENTON COS.—**Eldon & Dennis,** 3101 N. Columbia Blvd., Portland—$46,000 to repair revetments and other work on Willamette River and tributaries—by U. S. Engr. Ofc., Portland. 9-25

Dam . . .

Oregon

LANE CO.—**Lynch Bros.,** 3425 Stoneway Ave., Seattle, Wash.—$29,700 to core drill & pressure test 34 holes on Meridian Dam site, Eugene—by U. S. Engr. Ofc., Portland. 9-1

Irrigation . . .

Oklahoma

JACKSON CO.—**Morrison-Knudsen Co.,** Box 450, Boise, Idaho—$459,103 to construct earthwork and structures, Sta. 85+73.5 to Sta. 125+60 of the main canal, Altus project—by Bur. of Reclam., Washington, D. C. 9-5

Texas

DALLAS & ELLIS COS.—**Morse Bros. & Associates, Inc.,** 323 Ardis Building, Shreveport, La.—$29,800 to construct levees in Dist. 2, Dallas Co. and $13,237 to construct levees in Dist. 4, Ellis Co. 9-7

Building . . .

Arizona

WASHINGTON CO.—**Robert E. McKee,** Box 350, Glendale, Calif.—$50,000 (est.) to repair round house at Winslow

STABILITY FOR HEAVY LIFTS

Truck-like mobility has been an important feature of MICHIGAN convertible cranes and shovels, both in civilian and military use. But STABILITY is an equally important factor. Balanced design provides low center of gravity and low unit ground pressures for working on soft or muddy areas.

Optional outriggers give added stability for extra heavy lifts — contributing further to the broad working range of the MICHIGAN. Write for New Bulletin W-104.

Rugged I-beam Outriggers (optional) slide out for instant use. Obtainable for center, for rear, or for both positions.

MICHIGAN T-6-K CRANE SHOVEL

MICHIGAN TLDT-20 CRANE SHOVEL

MICHIGAN

POWER SHOVEL COMPANY

BENTON HARBOR, MICHIGAN

by replacing wooden platforms with reinforced concrete—by A. T. & S. F. Railway. 9-21

California

ALAMEDA CO.—**Christensen & Lyons,** 3454 Harlan St., Oakland—$119,700 to construct dispensary recreation bldg. and alterations and facilities for scrub bldg. and incinerator at Aux. Air Sta., Oakland—by Bureau of Yards & Docks, Washington, D. C. 9-13

CONTRA COSTA CO.—**Parker, Steffens & Pearce,** 135 S. Park, San Francisco—$762,675 to construct barracks, laundry, dry cleaning, subsistence and provision storage bldgs., mechanical services, sewers, roads and site improvements at the Naval Magazine, Port Chicago—by Bur. of Yards & Docks, Washington, D. C. 9-22

IMPERIAL CO.—**Smith & Manchester,** P. O. Box 262, Holtville—awarded contract to build 200 x 60-ft. reinf. conc. warehouse with wooden roof trusses and a framed office bldg. at El Centro—plans were prepared by W. M. Bostock, 2534 Live Oak Ave., Huntington Park. 9-14

LOS ANGELES CO.—**C. W. Driver,** 111 W. 7th St., Los Angeles—$132,578 to convert bldg. into sheet metal shop at Naval Dry Docks, Terminal Island—by Bur. of Yards & Docks, Washington, D. C. 9-26

LOS ANGELES CO.—**Ray Gerhart,** 334 S. Greenwood Ave., Pasadena—$132,178 to construct 5-story reinf. conc. mech. engr. lab. bldg., Calif. Inst. of Tech., Pasadena—by California Institute of Technology, Pasadena. 9-8

LOS ANGELES CO.—**M. W. Kellogg Co.,** P. O. Box 359, Torrance—$4,000,000 to construct additions to refinery, Torrance—by General Petroleum Corp., Los Angeles. 9-5

LOS ANGELES CO.—**Lindgren and Swinerton, Inc.,** 615 Standard Oil Bldg., San Francisco—negotiated contract to restore Santa Anita Racetrack by rebuilding portion of grandstand and removing temporary structures constructed by government—by Los Angeles Turf Club, 2550 Huntington Drive, San Marino. 9-18

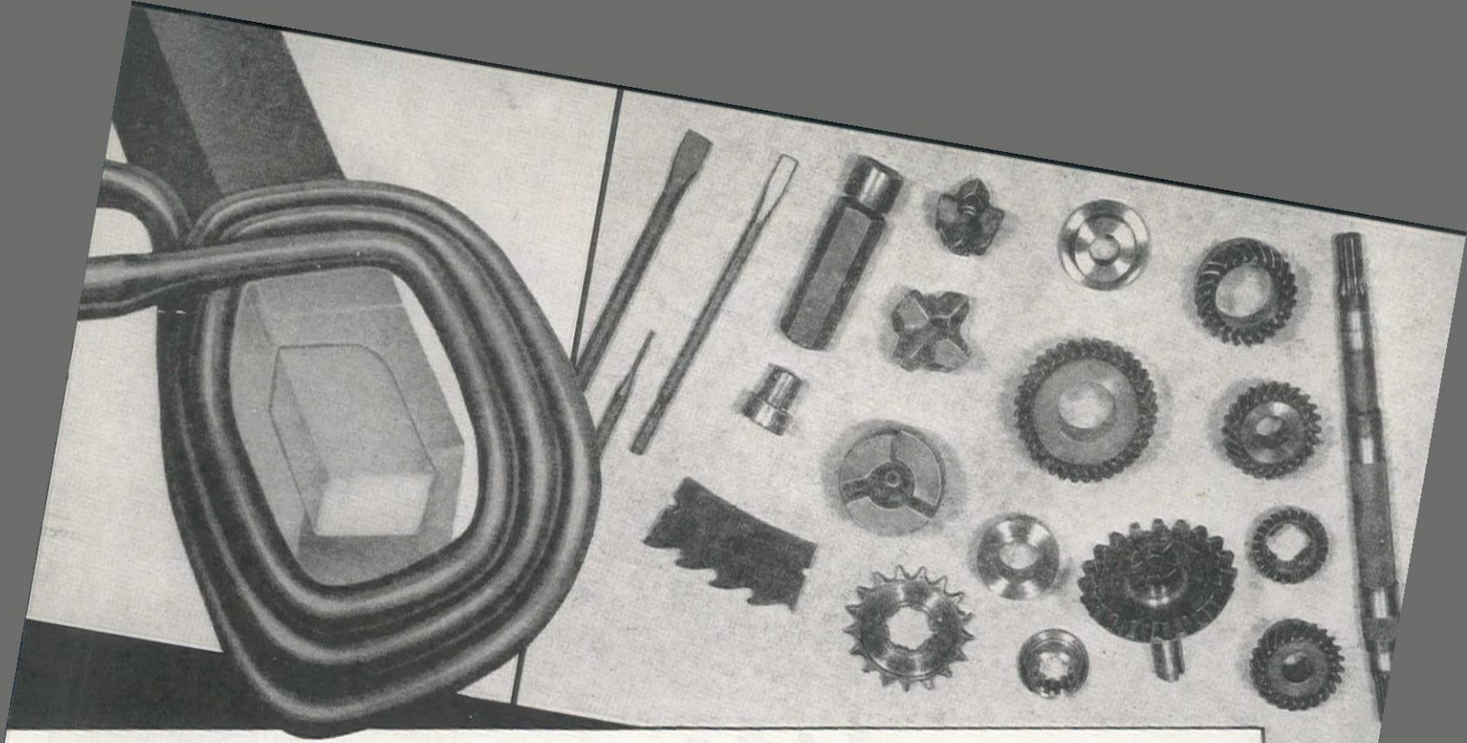
LOS ANGELES CO.—**Pozzo Construction Co., Ltd.,** 2403 Riverside Drive, Los Angeles—$174,987 to construct paint and storage bldgs. at Terminal Island—by Bur. of Yards & Docks, Washington, D. C. 9-26

LOS ANGELES CO.—**Royal Building Corp.,** 11201 Long Beach Blvd., Lynwood—$80,335 to construct six 60-unit nursery school bldgs. on FPHA sites, near San Pedro and Watts—by Federal Works Agency, Los Angeles. 9-20

LOS ANGELES CO.—**W. C. Smith, Inc.,** 411 W. 5th, Los Angeles—$529,443 to construct Waves barracks and facilities at U. S. Naval Hospital, Long Beach—by Bur. of Yards & Docks, Washington, D. C. 9-22

SACRAMENTO CO.—**Moore & Roberts,** 693 Mission St., San Francisco—$71,073 to relocate wooden bldgs. at Mather Field—by U. S. Engr. Ofc., Sacramento. 9-19

SAN DIEGO CO.—**L. C. Anderson,** 414 Broadway Bldg., San Diego—$111,500 to construct 175 x 200-ft. bus garage in San Diego. Building will have wood roof trusses, composition roofing, concrete floor and brick and frame walls and partitions—by



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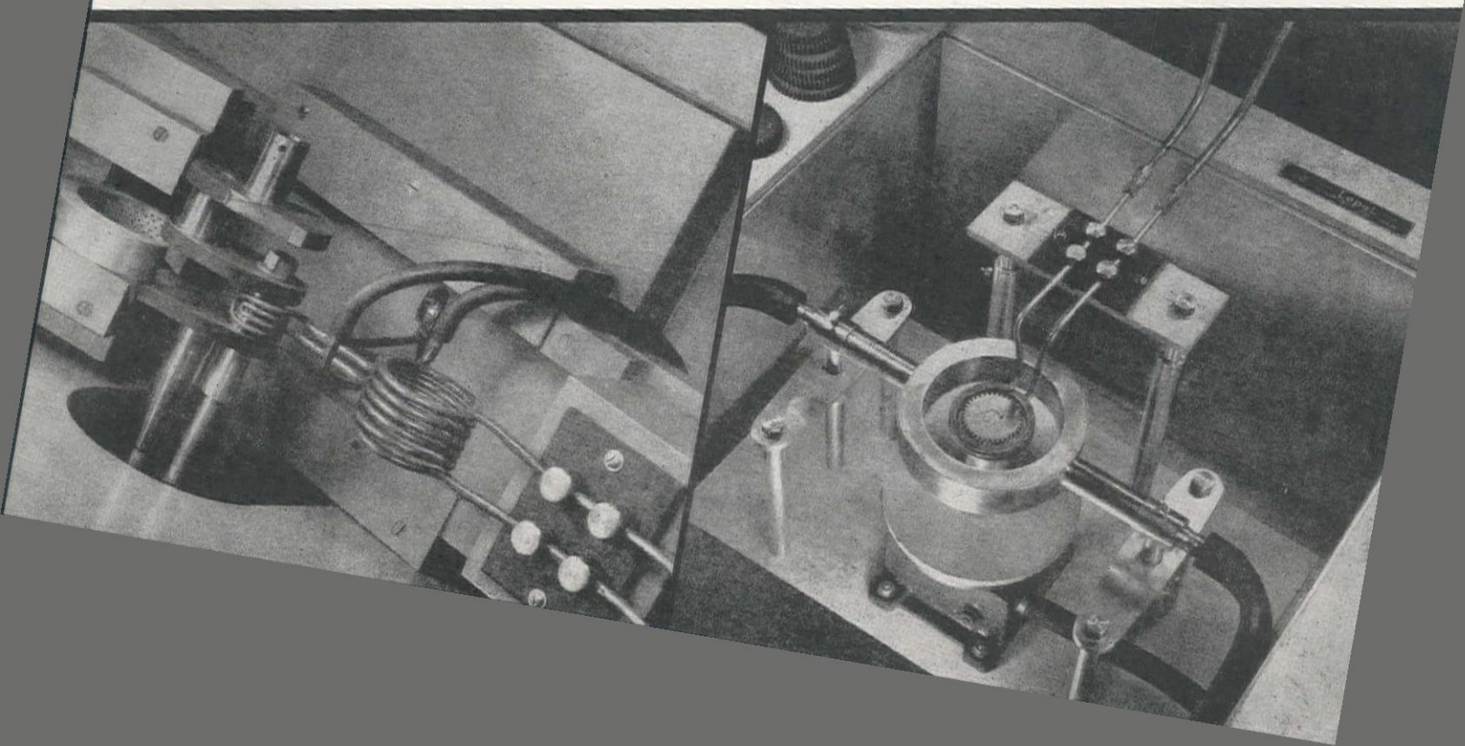

San Diego Electric Railway Co., San Diego. 9-18

SAN DIEGO CO.—**Baruch Corp.,** 625 S. Olive St., Los Angeles—$935,000 to complete overhaul shop for Navy at San Diego —by Bur. of Yards & Docks, Washington, D. C. 9-28

SAN DIEGO CO.—**Griffith Co.,** 502 Los Angeles Railway Bldg., Los Angeles—$701,900 to construct 17 temporary wood-frame bldgs. at Naval Receiving Barracks, San Diego—by Bur. of Yards & Docks, Washington, D. C. 9-27

SAN DIEGO CO. — **Shannahan Bros.,** 6193 Maywood Ave., Huntington Park—$1,191,582 to construct additional magazines at Naval Ammunition Depot, Fallbrook—by Bur. of Yards & Docks, Washington, D. C. 9-5

SAN FRANCISCO CO.—**S. J. Amoroso Construction Co.,** 2136 Alemany Blvd., San Francisco—$54,838 to construct cafeteria at Marine Corps Depot of Supplies, Islais Creek, San Francisco—by Bur. of Yards & Docks, Washington, D. C. 9-27

SAN FRANCISCO CO.—**Carl N. Swenson,** 355 Stockton St., San Jose—$52,333 to construct torpedo storage bldg. at Hunters Point—by Bur. of Yards & Docks, Washington, D. C. 9-19

SAN LUIS OBISPO CO. — **Howson Bros.,** Gilroy—$55,759 to construct additional facilities and bachelor officers' quarters, Morro Bay—by Bur. of Yards & Docks, Washington, D. C. 9-19

SOLANO CO.—**J. H. Pomeroy & Co.,** 333 Montgomery St., San Francisco—negotiated award to construct Homoja housing for transient naval personnel, Mare Island—by Bur. of Yards & Docks, Washington, D. C. 9-18

SOLANO CO.—**James I. Barnes Construction Co.,** Russ Bldg., San Francisco —$666,000 to construct joiner and machine shops at Naval Ammunition Depot, Mare Island—by Bur. of Yards & Docks, Washington, D. C. 9-25

SONOMA CO.—**Seward J. Pearson,** 1057 Arlington Ave., El Cerrito—$125,817 to construct 40 room nurses' home for Sonoma County Hospital, Santa Rosa—by County Clerk, Santa Rosa. 9-11

Colorado

DENVER CO.—**Brown-Schrepferman & Co.,** 240 Washington St., Denver—$65,000 to remodel and construct additions to Denver University bldgs., Denver—by Denver University, Denver. 9-20

DENVER CO.—**Short & Bundgaard,** 11 E. 4th Ave., Denver—Estimated cost $65,000 to construct one-story bus depot 100 x 84 ft.—by Rio Grande Motorway, Inc., Denver. 9-12

LAS ANIMAS CO.—**Frank M. Kenney,** Box 898, Denver — $67,560 to convert present barracks into officers' quarters at Trinidad—by U. S. Engr. Ofc. 9-21

Nevada

MINERAL CO. — **Byrne Organization,** 1309 First National Bank Bldg., Dallas, Texas—negotiated award to construct two barracks bldgs. at Naval Air Depot, Hawthorne — by Bur. of Yards & Docks, Washington, D. C. 9-27

Oregon

CLACKAMAS CO.—**Austin Co.,** Dexter Horton Bldg., Seattle, Wash.—$70,500 to begin preliminary construction of a log barking plant at Oregon City — by the Hawley Pulp & Paper Co., Oregon City. 9-18

DESCHUTES CO.—**Julius Johnson,** 4804 N. Kerby, Portland—$81,390 to construct gymnasium at Union High School, Redmond—by Union High School Dist. Clerk, Redmond. 9-11

Utah

SALT LAKE CO. — **Ellis W. Barker,** Ness Bldg., Salt Lake City — $66,300 to construct 3-story addition to nurses' home at County General Hospital — County Comm., Salt Lake City. 9-12

Washington

CLALLAM CO. — **Nettleton & Baldwin,** 1109 N. 36th St., Seattle—awarded contract to construct overhaul and gunnery training bldgs. and storage facilities at officers' quarters, Quillayute—by Bur. of Yards & Docks, Washington, D. C. 9-28

CLARK CO. — **Reimers & Jolivette,** 435 Railway Exchange Bldg., Portland, Ore. —$57,151 to construct four additions to Northern Permanente Hospital, Vancouver—by Dr. J. W. Neighbor, Vancouver. 9-1

CLARK CO.—**C. M. Corkum Co.,** Portland, Ore. — $129,987 to construct the Fourth Plain school at Vancouver for defense workers' children — by Clark Co. School Dist., Vancouver. 9-30

FRANKLIN CO.—**J. C. Boespflug Construction Co.,** Securities Bldg., Seattle—

WIDE, EASY LOADING BODY . . .

If you have idle construction equipment, make it available for home front use, where it is urgently needed. Register all your idle equipment with the local office of the War Production Board.

Wide body top opening permits full, heaping loads, assures easy and quick spotting of shovel dipper. Heaping loads every trip increase production. Short wheel base and three shuttle speeds make it easy to maneuver in tight spots, close to the loading unit. That, combined with the wide body top opening, cuts shovel swing time for more dipper passes per hour. Seconds are saved with every move . . . you get more loads per hour with Koehring Dumptors.

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$72,380 to construct airplane parts warehouse at Naval Air Sta., Pasco—by Bur. of Yards & Docks, Washington, D. C. 9-14

KITSAP CO.—**Lease & Leigland,** 515 Joseph Vance Bldg., Seattle, and **Kuney-Johnson Co.,** 235 9th Ave. N., Seattle—$2,681,122 to construct industrial and personnel bldgs. and facilities at Bangor—by Bur. of Yards & Docks, Washington, D. C. 9-8

KITSAP CO.—**Northern Construction Co.,** 2384 N. W. Savier, Seattle—$323,213 to construct two one-story school bldgs., with masonry exteriors at Port Orchard—by Fed. Works Agency, Seattle. 9-11

MASON CO.—**J. B. Warrack Co.,** Securities Bldg., Seattle—$91,780 to construct officers' quarters and overhaul shop at Aux. Air Sta., Shelton—by Bur. of Yards & Docks, Washington, D. C. 9-21

SNOHOMISH CO.—**Gassland Construction Co.,** 1161 Ellis, Bellingham, Wash.—$207,881 to construct bldg. at Naval Aux. Air Sta., Arlington—by Bur. of Yards & Docks, Washington, D. C. 9-19

Miscellaneous . . .

California

ALAMEDA CO.—**Christensen & Lyons,** 3454 Harlan St., Oakland—$103,565 to construct additional mess and galley facilities at Naval Supply Depot, Oakland—by Bur. of Yards & Docks, Washington, D. C. 9-13

ALAMEDA CO.—**M. J. King,** 231 Franklin St., San Francisco—$274,356 to construct additional facilities at Naval Receiving Barracks, Shoemaker—by Bur. of Yards & Docks, Washington, D. C. 9-28

CONTRA COSTA CO.—**Fredrickson & Watson Construction Co.,** 873 81st Ave., Oakland—$743,544 to construct ammunition classification yard and lumber storage at Naval Magazine, Port Chicago—by Bur. of Yards & Docks, Washington, D. C. 9-11

CONTRA COSTA CO.—**Parker, Steffens & Pearce,** 135 South Park, San Francisco—$353,035 to construct segregation bldgs., roads, tracks and services at Naval Magazine, Port Chicago—by Bur. of Yards & Docks, Washington, D. C. 9-29

HUMBOLDT CO.—**Mercer Fraser Co.,** 2nd and Commercial Sts., Eureka—$79,112 to clear and excavate 2.9 mi. access road to Ah Pah Creek timber area—by Pub. Roads Adm., San Francisco. 9-19

HUMBOLDT, SONOMA, SAN JOAQUIN, STANISLAUS, SANTA CRUZ, SAN BENITO & MONTEREY COS.—**Central California Construction Co.,** 230 California St., San Francisco—$122,250 to construct additional gasoline facilities at Aux. Air Stas. at Arcata, Santa Rosa, Vernalis, Crows Landing, Watsonville, Hollister and Monterey—by Bur. of Yards & Docks, Washington, D. C. 9-14

IMPERIAL CO.—**M. M. Sundt Construction Co.,** P. O. Box 2592, Tucson, Ariz.—$264,155 to construct gunnery training facilities at Marine Corps Air Sta., El Centro—by Bur. of Yards & Docks, Washington, D. C. 9-5

KERN CO.—**Barrett & Hilp,** 918 Harrison St., San Francisco—negotiated contract in excess of $50,000 to grade site and move 25 bldgs. from Santa Anita to Tupman and repair—by Bur. of Yards & Docks, Washington, D. C. 9-5

KERN CO.—**Macco-Robertson Co.,** 811 Paramount Blvd., Clearwater—awarded contract to trench, weld, backfill and place 60 mi. of 10-in. steel pipe line betw. Elk Hills and Cottonwood Pass—by the Texas Co., Los Angeles. 9-22

LASSEN CO.—**L. F. Dow Co.,** 8465 Melrose Ave., Los Angeles—$270,599 to construct firewalls, floors and railroad crossover at Sierra Ordnance Depot near Herlong—by U. S. Engr. Ofc., Sacramento. 9-8

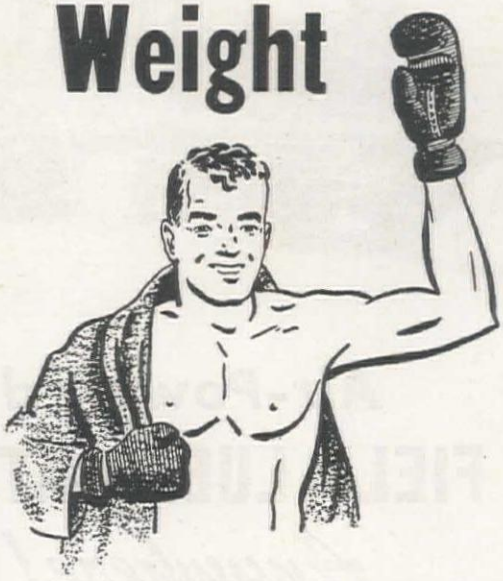
RIVERSIDE CO.—**Baruch Corp.,** 625 S. Olive St., Los Angeles—$199,255 to construct addtl. facilities at U. S. Naval Hospital, Corona—by Bur. of Yards & Docks, Washington, D. C. 9-29

SAN BERNARDINO CO.—**John A. Klarquist,** 618 S. Western Ave., Los Angeles—$39,904 to construct shooting-in target butt and facilities at Army Airfield, Daggett—by U. S. Engr. Ofc., Los Angeles. 9-29

SAN DIEGO CO.—**Midland Construction Co.,** 8677 Otis St., South Gate—awarded contract to install 88,000 lin. ft. of 6-in. to 14-in. gas pipeline in San Diego Co.—by San Diego Gas & Electric Co., San Diego. 10-5

SAN FRANCISCO CO.—**Alliance Machine Co.,** Alliance, Ohio—$608,650 to furn. two 225-T. bridge cranes at Hunters Point—by Bur. of Yards & Docks, Washington, D. C. 10-4

Not One Ounce of EXTRA Weight



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LOS ANGELES CO.—**Hayward Lumber & Investment Co.,** Box 1551, Los Angeles—$4,026,255 to build 35,250 prefabricated portable huts for U. S. overseas troops—by Bur. of Yards & Docks, Washington, D. C. 9-21

LOS ANGELES CO.—**Morrison-Knudsen Co.,** 411 W. 5th St., Los Angeles — awarded contract to reconstruct 14.0 mi. of double track railroad in Los Angeles Harbor area—by Harbor Belt Line R. R., San Pedro. 9-5

LOS ANGELES CO.—**Wesco Construction Co.,** 2000 Hyperion Ave., Los Angeles—$407,240 to improve sites for 1,000 temporary dwelling units and construct community bldg. at Western Terrace-Wilmington, San Pedro—by Fed. Housing Agency, Los Angeles. 9-26

SAN DIEGO CO.—**Haddock-Engineers, Ltd.,** P. O. Box 569, Oceanside—negotiated award, approximately $1,000,000, to construct 300 steel arch-rib huts and to place asph. pave. at Camp Pendleton, Oceanside—by Bur. of Yards & Docks, Washington, D. C. 9-14

SAN FRANCISCO CO.—**Dinwiddie Construction Co.,** Crocker Bldg., San Francisco—$280,400 to install elec. and mech. services and locker facilities for four maintenance piers, Frontier Base, Treasure Island—by Bur. of Yards & Docks, Washington, D. C. 9-11

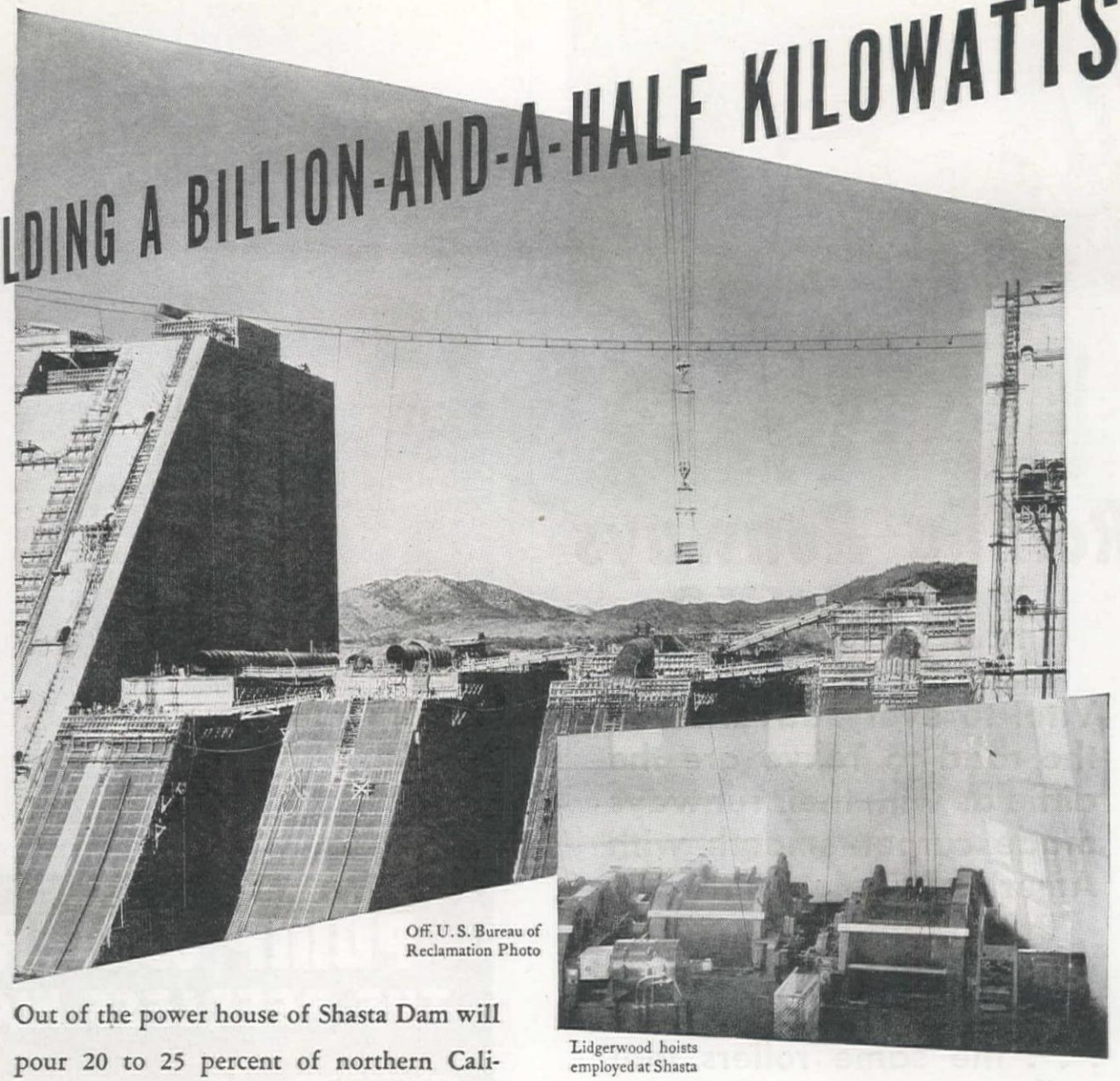
SAN FRANCISCO CO.—**Chas. A. Langlais,** 488 Bryant St., San Francisco — $96,893 to install general yard lighting at Hunters Point Naval Drydocks, San Francisco — by Bur. of Yards & Docks, Washington, D. C. 9-5

SAN FRANCISCO CO.—**Walter S. Leland,** 55 New Montgomery St., San Francisco—$85,283 to construct boiler plant additions at Treasure Island—by Bur. of Yards & Docks, Washington, D. C. 9-11

SANTA BARBARA CO.—**Jos. G. Moore Co.,** Santa Maria—$65,000 to recond. constr. equip.—by U. S. Engr. Ofc., Los Angeles. 9-6

SOLANO CO.—**Close & Lewis,** 721 C St., Hayward—$139,939 to install fire prevention equip. and alarm systems at Vallejo—by Fed. Housing Authority. 9-14

BUILDING A BILLION-AND-A-HALF KILOWATTS



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Represented in California by Industrial Equipment Co., Emeryville, California; in Washington and Oregon by Balzer Machinery Co., Portland, Oregon

SOLANO CO.—**George M. Robinson Co.,** 451 Folsom St., San Francisco—$153,352 to install interior sprinkler system and automatic fire alarm system at Benicia Arsenal—by U. S. Engr. Ofc., San Francisco. 9-22

Colorado

PUEBLO CO.—**Johns Engineering Co.,** 3708 Ames St., Denver—$60,000 to construct docks, sheds and bumper blocks at Pueblo Air Base—by U. S. Engr. Ofc., Pueblo. 9-21

Montana

VALLEY, McCONE, DAWSON & ROOSEVELT COS.—**Rue Contracting Co.,** Fargo, N. Dakota—$112,741 to construct 115-KV transmission line from Fort Peck Power Plant to Glendive and 34.5-KV line from Frazer to Wolf Point—by Bur. of Reclamation, Fort Peck. 9-27

Oregon

CLATSOP CO.—**Bumstead & Woolford,** 1411 4th Ave. Bldg., Seattle, Wash.—$161,722 to install heat. plant at Naval Hosp., Astoria—by Bur. of Yards & Docks, Washington, D. C. 9-5

DESCHUTES CO.—**C. J. Montag & Sons,** 429 S. W. 4th Ave., Portland—$122,967 to construct unit 3 of the Cove power plant —by Bur. of Reclam., Bend. 9-29

MULTNOMAH CO.—**Porter W. Yett,** 3525 N. E. 7th St., Portland—$2,177 for improving Tolman St. betw. S. E. 72nd and 74th Aves., Portland—by City Council, Portland. 10-4

MULTNOMAH CO.—**Ross B. Hammond Co.,** 1241 N. Williams St., Portland—$228,893 to convert a Defense Plant Corp. project bldg. at N. W. Everett and Davis, betw. 13th and 14th Sts., into an ice and cold storage bldg.—by Northwestern Ice & Cold Storage Co., Portland. 9-5

Texas

NUECES CO.—**Thomas Bate & Sons,** 1107 Girard St., Houston —$206,686 to construct additional boiler and power plant im-

provements at U. S. Naval Air Sta., Corpus Christi—by Bur. of Yards & Docks, Washington, D. C. 9-12

POTTER CO. — **McKenzie Construction Co.**, Smith-Young Tower Bldg., San Antonio—betw. $4,000,000 and $5,000,000 to enlarge ordnance plant at Amarillo by building a new shell loading line and increasing capacity of three existing lines—by U. S. Engr. Ofc., Denison. 8-31

Utah

DAVIS CO.—**Young & Smith Construction Co.**, 1678 Browning Ave., Salt Lake City—awarded negotiated contract to place and cover 3,500 lin. ft. of underdrain on State Road 206 from Clearfield south—by State Road Comm., Salt Lake City. 9-12

Washington

ISLAND CO.—**Western Construction Co.**, 605 Arctic Bldg., Seattle—$77,675 to construct marine railway and extension to

boathouse at Whidby Island — by Bur. of Yards & Docks, Washington, D. C. 9-22

KING CO.—**A. G. Rushlight Automatic Sprinkler Co.**, 55 N.E. Farragut St., Portland, Ore.—$84,444 to install an automatic sprinkler system at Auburn Army Airforce warehouse, Auburn —by U. S. Engr. Ofc., Seattle. 9-29

PROPOSED PROJECTS

Airport...

California

MARIN CO.—War Department has authorized construction of additional hangar, service apron, wash rack, loading mat, bldgs. and essential utilities at Hamilton Field. Expenditure of $1,000,000 has been approved.

SOLANO CO.—War Department has authorized the expenditure of $2,465,000 for additional airfield and housing facilities at Fairfield-Suisun Army Airfield. 9-8

Texas

WILLIAMSON CO.—City of Taylor voted $60,000 bonds to construct airport. 8-30

Water Supply...

California

CONTRA COSTA CO.—Fed. Works Agency has approved half of funds necessary to construct $725,000 pumping plant at Brentwood. Plant will pump 95 million gal. per day. 9-12

Sewerage . . .

California

SAN MATEO CO.—Engineers Charles Broughton of South San Francisco and C. L. White of San Bruno are preparing plans for an outfall sewer from Lomita Park to Tanforan Ave. to the bay, to be built at an estimated cost of $150,000. 9-1

SOLANO CO.—Fed. Works Agency has appropriated $339,500 for the construction of sewers in South Vallejo. 9-6

Texas

BEXAR CO.—Bexar Co. Water Control & Improvement Dist. 3 voted $25,000 bonds to acquire a site and construct a sewage disposal plant. 8-28

Irrigation . . .

Idaho

ADA, BOISE & ELMORE COS.—U. S. Engr. Dept. has allotted an additional $200,000 to construct work on Boise River emergency flood control project. Wm. E. Welsh, watermaster for the Boise River, stated that plans will be prepared shortly. 9-14

Building . . .

California

CONTRA COSTA CO.—Fed. Works Agency has appropriated $360,000 to cover half the cost of enlarging Bixler Pumping Plant near Brentwood. 9-6

FRESNO CO.—Bisceglia Brothers Wine Co., Fresno, plans to build a $300,000 concrete winery and distillery at California and

Cedar Aves., Fresno. Construction will probably begin in December. 8-31

KERN CO.—Architect Robert V. Derrah, 9470 Santa Monica Blvd., Beverly Hills, is preparing plans for a 75 x 92-ft. garage bldg. to be built in Bakersfield. Hollow conc. block construction, wood roof trusses, composition roofing, cement floors and steel sash will be employed in construction. 9-5

LOS ANGELES CO.—Architect G. Stanley Wilson, 3681 6th St., Riverside, is preparing plans for several new bldgs. for Westmont College, 231 S. Westmoreland Ave., Los Angeles, to be constructed at a cost of $400,000. 9-5

SAN FRANCISCO CO.—Federal funds have been approved for the construction of 260 temporary family dwelling units for evictees of so-called Japtown, San Francisco. New housing is estimated to cost betw. $300,000 and $500,000. 9-8

SAN JOAQUIN CO.—H. J. Heinz Co. has purchased a 73-ac. site at Tracy. An architect is being engaged to prepare plans and specifications for a plant that will be built as soon as materials are available. 9-7

YOLO CO.—California Fruit Exchange has prepared plans for the erection of a new $50,000 plant at Winters. 9-6

Idaho

ADA CO.—Salt Lake Hardware Co. purchased land betw. 7th and 8th Sts. and betw. Battery and Idaho forest office, Boise, for a $200,000 reinf. conc. bldg. Work will begin as soon as approval is received from W. P. B. 9-12

Oregon

MULTNOMAH CO.—Plans are now complete for the conversion of the Old Multnomah Nurses' Home at S. W. Second and Woods Sts. into a clinic. The $119,108 project will be open for bids as soon as F. W. A. gives final approval. 9-9

Utah

IRON CO.—W. P. B. granted priorities to construct $300,000 steam generating plant, mouth of Coal Creek canyon near Cedar City plant, for the Southern Utah Power Co. 9-7

TRADE WINDS

News of Men Who Sell to the Construction West

CALIFORNIA

Employees of the UNITED STATES SPRING & BUMPER COMPANY, Los Angeles, Calif., have been awarded the second Army-Navy "E" production award. The company produces armor plate for the M-5 tank, for Navy gun mounts and for the Tank Recovery Unit. It manufactures springs for Army jeeps and for the Tank Recovery Unit. Recently the company has made track links and grousers for the "water buffalo."

☆ ☆ ☆

J. A. Justeson is the new assistant western sales manager of the CATERPILLAR TRACTOR CO. He succeeds **B. L. Hagglund** who was promoted to the position of western sales manager. **Justeson** joined "Caterpillar" in 1935 and has served as agricultural representative, district sales representative, engine representative, district representative and materials expediter.

☆ ☆ ☆

Ted Corbett, past general sales manager for the FIBRE & METAL PRODUCTS, INC., Downey, Calif., was recently appointed to the position of factory manager. **Ray Wright** succeeds **Corbett** as sales manager. **Corbett** has been in the service of the company for more than 18 years and is particularly well qualified to fill his new position. **Wright** joined the company in 1939 with a background of years of experience in sales and sales executive work.

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VICTOR EQUIPMENT COMPANY, with plant and executive offices at 844 Folsom St., San Francisco, has opened a sales and service store at 312 Twelfth St., Oakland. **E. L. Russell**, new branch manager and veteran Victor service engineer, offers convenient shipping and repair services to the East Bay area.

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THE GENERAL ELECTRIC COMPANY is opening a service shop at 2045 Kettner Boulevard, San Diego, Calif. Currently, the entire activity of the shop will be devoted to repairing battle-damaged equipment and to handling general maintenance requirements for the Navy. **Ralph Meyers**, former superintending engineer for G. E. at MARINSHIP CORPORATION, will manage the service store. He anticipates a vast field for operations after the war in fishing and refrigeration services. At present G. E. has nearly 2,000 employees in California alone, with manufacturing plants in Oakland and Ontario and service shops in San Francisco and Los Angeles.

ILG ELECTRIC VENTILATING CO. has moved its San Francisco branch office to 826 Sharon Bldg., 55 New Montgomery St., San Francisco 5, Calif. Ilg operates branches in Seattle, Salt Lake City, Phoenix, El Paso, San Diego and San Francisco under the management of **C. E. Parks** of Los Angeles. The company supplies fans and blowing equipment for figting and transport ships of the Navy and Maritime Commission, for Army and Navy barracks and for shipbuilding plants. **James S. Rose**, a graduate civil engineer and former supervisory methods engineer in charge of heating and ventilation for CURTISS-WRIGHT COMPANY, will manage the new branch office.

JAMES S. ROSE

☆ ☆ ☆

FAIRBANKS, MORSE & COMPANY has purchased the POMONA PUMP COMPANY, a division of JOSHUA HENDY IRON WORKS. The transaction included the sale of all physical assets, patents and trade-marks of the Pomona and Westco pump lines. No changes in personnel are contemplated and **Arnold G. Brown**, general sales manager of the Pomona company, becomes assistant manager of the Fairbanks-Morse Pump division in charge of Pomona and Westco products. The Pomona open impeller turbine pumps of the water-lubricated type and the Westco industrial and home water system lines will be known, respectively, as the Fairbanks-Morse-Pomona and the Fairbanks-Morse-Westco lines.

☆ ☆ ☆

Two hundred forty employees of CATERPILLAR TRACTOR COMPANY in San Leandro were recently awarded service pins based on their lengths of service with the company. Silver pins were awarded for 10 to 20 years of service, gold pins for 20 to 25 years, a gold pin with a diamond setting for 25 years and an additional diamond for each 5 years of service thereafter. **C. L. Best**, having been with the company for 50 years, received a gold pin with a large diamond. The circular service pins are crowned by a "Caterpillar" track-type tractor.

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The G. W. VAN KEPPEL COMPANY, 2440 Pennway, Kansas City, Missouri, and the HERMAN M. BROWN COMPANY, First and Sheridan Sts., Des Moines, Iowa, have been appointed state distributors for the Wood Roadmixer in their respective states. The machine is a traveling asphalt paving mixer, manufactured by the WOOD MANUFACTURING CO., Los Angeles, Calif.

PACIFIC NORTHWEST

M. H. (Hayes) Johnson is the northwestern district representative covering Utah, Idaho, Oregon, Washington, British Columbia and Alberta for THE EUCLID ROAD MACHINERY COMPANY, Cleveland, Ohio. He has had wide experience in the heavy construction equipment field. **Johnson** is a past superintendent of construction for MORRISON-KNUDSEN COMPANY and has until recently specialized in the sale of heavy machinery for the INTERMOUNTAIN EQUIPMENT COMPANY of Boise, Idaho.

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P. L. CROOKS & COMPANY, 2145 N. W. Pettygrove St., Portland 10, Oregon, has been appointed exclusive distributor for GOODALL RUBBER COMPANY'S industrial and construction rubber products for the State of Oregon and for southern Washington.

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INTERMOUNTAIN

The INDUSTRIAL EQUIPMENT COMPANY of Billings, Montana, recently appointed distributor for P&H excavators in east Montana, is now representing the HARNISCHFEGER CORPORATION in the territory formerly covered by the MOUNTAIN TRACTOR COMPANY. **Frank Ruppel**, with offices at Kalispell, is the industrial representative in the new area. The agency carries all P&H gasoline and diesel machines of ⅜ to 2½ cu. yd. capacity and maintains complete service facilities for equipment operators. **W. (Bill) Hardie** is vice president and general manager of Industrial Equipment. The company also handles INTERNATIONAL HARVESTER construction equipment and BUCYRUS-ERIE bulldozers and scrapers.

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Karl W. Freeman has been appointed southern district manager for the motor truck division of the INTERNATIONAL HARVESTER COMPANY. **Freeman** joined Harvester at Des Moines, Iowa, in 1925 and since that time he has represented the company at Council Bluffs, Amarillo, San Antonio and Atlanta.

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FRUEHAUF TRAILER CO. has opened a new factory branch in El Paso at 1706 Texas St. The new branch is designed to assist motor transport operators in western Texas and southern New Mexico in keeping their equipment in operation. Manager **A. V. Tice** is a transportation expert and has had extensive experience with Fruehauf. He states that the factory service station is equipped to maintain and repair all makes of trailers, has a new modern paint spray booth, welding equipment and brake relining machines.

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J. S. McMahon was appointed superintendent of blast furnaces for the GENEVA STEEL COMPANY, subsidiary of UNITED STATES STEEL CORPORATION. **McMahon** was formerly blast furnace superintendent for the REPUBLIC STEEL CORPORATION of Warren, Ohio, and succeeds **J. M. Stapleton**, who has been transferred to the CARNEGIE-ILLINOIS STEEL CORPORATION, another U. S. subsidiary, to become assistant division superintendent of blast furnaces at South Works in Chicago, Ill.

☆ ☆ ☆

SIERRA MACHINERY COMPANY, of Reno, Nevada, is the exclusive sales and service distributor

Construction Plant and Equipment From Shasta Dam, California

Available For Sale **Immediate Delivery**

Listed below are a few of the items of plant and equipment used in the construction of this dam. Most of the equipment purchased new for this project. Most items available for immediate shipment, F.O.B. Shasta Dam, California, subject to prior sale.

AIR COMPRESSORS

4—Sullivan Model WN4, size 22—13 x 14 twin angle compound. Complete with all regular equipment, after cooler, syn. motor 500 h.p. direct connected, motor generator set, auto starter panel, air receiver. 2—Available Now. 2—In Dec.
1—Sullivan Model WN31 with G.E. synch. motor, 250 h.p. auto starting panel, after cooler, air receiver.
1—C-200 Fuller single stage rotary compressor Westinghouse motor 100 h.p.

CABLEWAYS

3—Lidgerwood, 3-drum electric hoists with 500 H.P. G.E. Motors. Ward Leonard control, complete with controls and all electrical equipment.
3—Lidgerwood, 3-drum electric hoists with 500 H.P. Westinghouse motors complete with controls and all electrical apparatus.
5—Cableway towers, structural steel, 3—125 ft.; 1—75 ft. and 1—45 ft., complete with travel mechanism.
6—Complete sets of carriages, main and auxiliary, fall and dump blocks, fall rope carriers, buttons, takeup bars and takeup sheaves.
1—1790 ft. pcs. of 3" dia. locked coil cable, new.
12,000 lin. ft. of used 3" dia. locked coil cable in length from 500 to 2600 lin. ft.
50,000 lin. ft. of used 7/8" and 1 1/8" wire rope.
20,000 lin. ft. of new 7/8" and 1 1/8" wire rope.
Misc. lot of sheaves, jewels, blocks, etc.

CEMENT PLANT

1—Dual #265 Fuller Fluxo cement pump, duplex type complete with gravity feed and automatic control equipment. 400 bbls. per hr. capacity. Pumping distance 3300 ft. (Available in December).
2—Fuller-Kinyon Pumps—type "D" 125 h.p. complete with air hose power control cable, control cabinets.
1—Sly Dust Filter—#51 Type "D" 360.
6—8" Valves, 2—two-way, 4—three-way.
360 lin. ft. 8" Fuller Kinyon Conveying System license.

CONVEYORS

1,000 troughing rolls for 36" belt.
300 return idlers for 36" belt.
2—Complete sets, including 42" tandem drive pulleys, 42" head pulleys, 36" tail pulleys.
6—150 h.p. Westinghouse gear motors, 144 r.p.m., 2300 volts, 3-phase, 60-cycle.
3—75 h.p. Westinghouse gear motor, 194 r.p.m., 2300 volt, 60-cycle.
1—Airplane tripper for 36" belt with two 17' wing belts, capacity 1,000 T per hour, complete with pulleys, drives and gear motors.
200 lin. ft. 18" dia. screw conveyor with 25 & 40 h.p. gear unit drives.

2—120B Bucyrus-Erie shovel and dragline combinations, good working condition. Can be inspected at Shasta Dam.

DRILLING EQUIPMENT

10—I-R drifters DA35.
5—I-R Wagondrills—pneu. tires, hoists, X71 drifters mounted.
2—I-R-54 Drill Sharpeners.
1—I-R-50 Drill Sharpener.
10—I-R Jackhammers.

HEATERS, WATER

5—Pacific Gas water heaters — Catalog #8110W7, 30 gal. capacity, complete with thermostatic control.
4—Pacific Duct unit heaters, Catalog #262A76, complete with regulator and thermostat.
4—Pacific unit heaters, Catalog #200A5, complete with propeller fan and regulating valve.
3—Hot water storage tanks, two at 3'6" x 10' and one at 3' 6" x 12'.

PUMPS

2—Byron-Jackson 400 h.p. 12 in. deepwell.
3—Bingham type SVD submersible pumps.
1—Bingham 100 h.p. 18 in. deepwell.
1—Byron-Jackson 150 h.p. 10 in. deepwell.
1—Gardner-Denver grout pump model FD-FS, 10" x 2 1/2" x 10", with case-hardened liners and Calmex pistons and rods, 1,000 lb. pressure at 90 lb. air.
2—Gardner-Denver grout pumps model FG-AG, 6" x 2 1/2" x 6", with case-hardened liners and Calmex pistons and rods, 500 lb. pressure at 90 lb. air.
Other pumps complete with motors from 1 1/2 h.p. to 200 h.p., also several I-R #25 sump pumps.

MIXING PLANTS

1—3000 cy. bin with 5 compartments for aggregates, 2 compartments cement, incl. turnhead, gates.
1—Complete set C. S. Johnson fully automatic batching equipment for 5 aggregates, cement and water for 4 cy. batchers.
5—4 cy. Koehring Concentric zone mixers, incl. batchmeters, timers, consistency meters. 3—Available Now.
1—Rex 160 Pumpcrete, gas or electric.

MISCELLANEOUS

1—Broderick 86 h.p. horizontal locomotive type fire box boiler with #5 Ray burner.
1—Gardner-Denver #9 mine car loader, 24" gauge.
4 ea. #6671 Mattison mine cars, body size 29" x 47" x 32".
2—Special built sheepsfoot rollers with floating frames, extra heavy duty.
1—Bodinson 60" x 16' trommel screen complete with motor drive, feed chutes.
Pipe—used, 3, 4, 6, 8, 10, 12, 16-inch.
Valves—1, 2, 3, 4, 6, 8, 10, 12, 16-inch.
10,000 ft. Type S rubber covered cord cable.
Pole line hardware.
Floodlites—500 to 1500 w.
Structural Steel—all shapes and sizes—girders 48 and 72 inch—28 to 50 ft.
1—LeTourneau Heavy Duty 3-Point Rooter.
1—1 1/4 cu. yd. Heavy Duty Clam-shell Bucket.
12—Muck Skips, 7—14 cu. yds.

THE GREATER PORTION OF THE FOLLOWING EQUIPMENT TO BE RELEASED IN THE NEXT 60 DAYS

2—48B Bucyrus-Erie shovel and dragline combinations—Diesel Power.
1—Model 18 Northwest shovel and dragline combination—Gas Power.
5—D8 Caterpillar Diesel Tractors with LeTourneau Angle Dozers.
1—Model 22 Caterpillar Tractor with Kay-Brunner hydraulic bull dozer.
1—RD-6 Caterpillar Diesel Tractor with LeTourneau bulldozer.
1—Model 12 Caterpillar road grader.
16—White Dump Trucks—Model 1580 (691) 24 cu. yd. capacity.
5—B.F. Mack 7 cu. yd. Dump Trucks—(3 Available now).
2—International Flat racks, capacity 10 tons.
6—B.F. Mack Flat racks, capacity 10 tons (3 Available Now).
20—Ford V-8 1 1/2 ton flat racks 1938 to 1942 models.
15—Ford V-8 Pickups, '38 to '42 models.
1—Ford V-8 Fire Truck with fire equipment.
2—Callahan trailers—one 35 ton capacity; one 40 ft. semi.
Complete line of Machine Shop and Garage Equipment including lathes, presses, shapers, bolt and pipe threaders, ironworker, welders, drills, vulcanizers, wrenches and tools.
Complete stock of Warehouse supplies.
Complete stock of Mess hall and Dormitory equipment and furnishings.
Complete line of transformers and electric motors.

Commitments for future delivery will be accepted on any of the above items not immediately available.

PACIFIC CONSTRUCTORS, INC.

GENERAL CONTRACTORS—SHASTA DAM, CALIFORNIA **PHONE 512 REDDING**

for R. G. LE TOURNEAU, INC., of Peoria, Illinois, in the state of Nevada, exclusive of Clark county, and in Lassen, Plumas, Sierra, Alpine, Mono and parts of Placer and Nevada counties in California. The partners **Jack D. Burgess**, sales and service manager, and **Ed. Kinzel**, office manager, are former "Caterpillar" distributors in Reno. The machinery company has an experienced staff and excellent facilities to handle the Le Tourneau line along with other construction, mining and logging equipment.

ED KINZEL, left, and JACK D. BURGESS

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H. S. Chase and **Drew L. Hines** were appointed vice presidents of TIDE WATER ASSOCIATED OIL COMPANY and **Richmond K. Kelly** was recently appointed assistant vice president. **Chase**, past general superintendent of the refinery at Bayonne, New Jersey, joined the company 22 years ago and will continue in charge of manufacturing in the eastern division. **Hines**, past assistant manager of transportation of the western division, has been employed by the company for 21 years and will continue in charge of transportation and supplies in the eastern division. **Kelly**, with 15 years' experience in marine transportation operations of the eastern division, will continue to have charge of the marine department.

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AMONG THE MANUFACTURERS

The BARNES MANUFACTURING COMPANY of Mansfield, Ohio, has completed a five-year program of modernizing its office space. Designed by ALDEN DOW & ASSOCIATES, industrial architects, the new home for office personnel introduces extremes in color and design for industrial use. Bright and alert mood conditioning is achieved by a color treatment of light yellow, Chinese red and light green, in a variety of combinations for ceilings, walls and floor. The company manufactures self-priming centrifugal pumps and is developing a line of plumbing fixtures for postwar markets.

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R. G. Wingerter, past industrial engineer for THE TIMKEN ROLLER BEARING COMPANY, Canton, Ohio, was appointed assistant chief engineer for the industrial division. **Wingerter** is a graduate mechanical engineer, is a member of the Society of Automotive Engineers and the Detroit Engineering Society, and a board member of the Canton Junior Chamber of Commerce and the Jay-Teen Association.

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M. G. Werme is now chief development engineer for the WICKWIRE SPENCER STEEL COMPANY of Buffalo, New York. **Gordon Lloyd** succeeds **Werme** as superintendent of the Clinton, Massachusetts, plant and **Victor Chartner** was appointed chief mechanical engineer. **Werme** has been associated with the company for the past 25 years and has an outstanding record as an operating engineer. **Lloyd** is a former power and fuel engineer for the CARNEGIE-ILLINOIS STEEL CORPORATION and was chief engineer for LOFTUS ENGINEERING CORPORATION of Pittsburgh. **Chartner** is a past chief engineer for the PITTSBURGH STEEL COMPANY and has been associated with the OTIS STEEL COMPANY of Cleveland, PITTSBURGH CRUCIBLE STEEL COMPANY of Midland, Pennsylvania, the BENSON MINES COMPANY of New York and the JONES & LAUGHLIN STEEL COMPANY.

Roy E. Choate, president of the LA PLANT-CHOATE MANUFACTURING CO., INC., Cedar Rapids, Iowa, was recently re-elected to the board of directors of this company. **S. E. Coquilletts**, president of the MERCHANTS NATIONAL BANK, Cedar Rapids, was also re-elected to the board. The new directors include **Archie D. Dennis**, secretary-treasurer of the company, **Alfred Kauffmann**, director of LINK-BELT COMPANY, **Roy Fruehauf**, executive vice president of FRUEHAUF TRAILER COMPANY, **Howard Hall**, president of IOWA MANUFACTURING COMPANY and IOWA STEEL AND IRON WORKS, and **Owen N. Elliott**, senior partner in the law firm of ELLIOTT, SHUTTLEWORTH AND INGERSOLL.

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Edward B. Yancey, general manager of E. I. DU PONT DE NEMOURS & COMPANY, Wilmington, Delaware, was recently elected a vice president with membership on the executive committee of the company. **W. H. Ward** succeeds **Yancey** as general manager, **H. F. Brown** becomes assistant general manager, **P. J. Kimball** is the new general superintendent and **F. R. Wilson** moves up to be manager of the explosive division. **J. H. Wellford** will be associated with **Yancey. Brown** started with the company as a chemist in 1917, **Kimball** started as a salesman in 1919, **Wilson** joined the company as a chemist in 1924 and **Wellford** has been associated with the company for 32 years.

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The men and women employees of the LA PLANT-CHOATE MANUFACTURING COMPANY of Cedar Rapids, Iowa, have been awarded the Army-Navy "E" production award for the third time. This high honor was achieved through cooperation beyond the line of duty in the development and production of earthmoving equipment essential to the maximum war effort.

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The employees of the LA PLANT-CHOATE COMPANY, Cedar Rapids, Iowa, have purchased and presented a dozer to the Seabees in appreciation of the work by **Aurellio Tassone** in charging and uprooting a Jap pillbox during the invasion of Treasury Island. The company matched the efforts of its employees by giving a dozer to the United States Engineers. This equipment, accepted by **Col. Richard L. Smith** of the U. S. Engineers and **Lt. Commander Hugh A. Dunlap** of the U. S. N. R., was dedicated to **Lt. Harold Goodwin**, the first casualty among La Plant-Choate employees.

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Howard C. Sauer is the general manager of the newly-created foreign division of the TIMKEN ROLLER BEARING COMPANY of Canton, Ohio. He will be in charge of sales and service of the company's products, bearings, steel and detachable rock bits in the world market. Up to recently **Sauer** was chief of the anti-friction bearing section of the tools division of the War Production Board. He joined Timken as a salesman in the Cleveland office in 1923.

☆ ☆ ☆

JOHN A. JOHNSON & SONS, INC., Brooklyn, New York, was awarded a general contract to construct a new subsidiary plant of THE GOODYEAR TIRE & RUBBER COMPANY at Topeka, Kansas. The new factory, a Defense Plant Corporation unit, is scheduled for completion by Jan. 1, 1945, and will build tires of large dimension for military use.

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Harry Scott Wherrett, chairman of the board of directors of the PITTSBURGH PLATE GLASS COMPANY, died on August 13 at the age of 68. His service record of 53 years with the company is the longest of any employee. For many years he had been active in business, civic and philanthropic affairs of the city of Pittsburgh.

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S. W. Antoville, past vice president at Chicago in charge of mid-western operations, is the new director of sales for the UNITED STATES PLYWOOD CORPORATION of New York. **R. W. Tompkins** succeeds **Antoville** as manager of the Chicago branch. **Tompkins** has had years of experience in building materials sales and distribution. **Antoville** joined Plywood in 1921 as an office boy, expecting to return to law school that autumn. He changed his mind and has remained with the company. He is also vice president of ALGOMA PLYWOOD & VENEER COMPANY, a subsidiary of U. S. Plywood.

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Capt. E. D. Almy, assistant general manager of the JOSHUA HENDY IRON WORKS, Sunnyvale, Calif., has been promoted to manager of the Crocker-Wheeler division at Ampere, New Jersey, succeeding **A. J. M. Baker**, who has resigned to become executive vice president and general manager of the E. W. BLISS COMPANY of New York. **Harry C. Gunetti** is now assistant general manager in Sunnyvale. **Robert Mann** is general superintendent and **Clifford Sayre** is the new assistant general superintendent.

LIDGERWOOD MANUFACTURING COMPANY, Elizabeth, New Jersey, has acquired manufacturing and sales rights and all interests in the Whiting and Butler stokers, Whiting horizontal compression feed stokers and Continental stokers which are manufactured by WHITING STOKER COMPANY of Chicago, Ill. A new company will be formed to be known as the WHITING STOKER COMPANY, with head offices in Chicago and to operate as an affiliate of Lidgerwood. Officials will be **L. D. Tenerell**, chairman of the board; **W. G. Schalscha**, president; **A. E. Bottenfield**, executive vice president and general manager; and **G. L. Reech**, treasurer. The Lidgerwood plants in Elizabeth, Newark and Superior, Wisconsin, manufacture heavy marine equipment. The acquisition of the Whiting line is a move to expand and diversify the company's activities in preparation for the post-war period.

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H. C. Allington has been named sales research engineer for WICKWIRE SPENCER STEEL CO. He will be in charge of the development and expansion of markets for the company's products. Prior to joining Wickwire Spencer, Allington was district manager of the Logan-Allington Company, Inc., for 12 years. His new headquarters will be in the company's executive offices in New York.

☆ ☆ ☆

Gale H. Fegley resigned as sales manager of the SHUNK MANUFACTURING CO. of Bucyrus, Ohio, after serving the company for the past 26 years. Because of his wide experience in the construction equipment blade industry, he was appointed to the advisory committee of the War Production Board in Washington, D. C. Fegley will witness his daughter, **Marine Sgt. Eleanor A. Fegley**, sponsor the christening of the Victory ship Bucyrus which will be launched on the Pacific Coast. He has no immediate plans for the future.

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LIDGERWOOD MANUFACTURING CO., Elizabeth, New Jersey, was awarded the U. S. Maritime Commission "M" pennant and Victory Fleet flag for its excellent production. The company manufactures electro-hydraulic steering gears, electric boat winches and other types of special purpose hoisting machinery. The employees are very proud of the Maritime Commission award as well as the 4th star in their Army-Navy "E" flag.

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THE CLEVELAND TRACTOR CO. of Cleveland, Ohio, is merging with the OLIVER FARM EQUIPMENT CO., Chicago, Ill. Cleveland Tractor's peacetime production consists of a line of crawler tractors for agricultural and industrial use. Military demand for its special tractors has reduced substantially and the company can now expand into a larger enterprise having a larger scope of operation. Oliver produces a wide range of farm equipment and a limited amount of industrial equipment, maintaining plants in Battle Creek, Michigan; Charles City, Iowa; Shelbyville, Illinois; South Bend, Indiana; and Springfield, Ohio. The new unit will be a well rounded organization whose unified management and administration should attain economies in manufacture and distribution.

☆ ☆ ☆

F. E. Schaumburg is the new railroad representative of the sales development division of the CATERPILLAR TRACTOR CO. of Peoria, Ill. Since 1932, he has been roadmaster for the Chicago and Northwestern Railroad Co. Schaumburg will analyze and promote the use and application of "Caterpillar" equipment for general off-track railroad construction and maintenance. His practical railroad experience and acquaintance gives a valuable background for his work. The company will soon be in favorable position to satisfy the many railroad needs for diesel tractors, engines, motor graders and earthmoving machines.

☆ ☆ ☆

James B. Black of San Francisco, Calif., has been elected a director of the UNITED STATES STEEL CORPORATION, New York. He fills the vacancy created by the death recently of **William J. Filbert**. Black is the first Pacific Coast director of the steel corporation. He is president of the PACIFIC GAS & ELECTRIC CO. of San Francisco and is prominent in Pacific Coast civic, philanthropic and industrial affairs. The steel company recognized the necessity of a western representative in order to better serve the rapidly expanding western industrial area. COLUMBIA STEEL CO., the west coast subsidiary, has steel producing plants at Pittsburg and Torrance, Calif. U. S. Steel's operations in the west also include the Boyle manufacturing division of the U. S. STEEL PRODUCTS CO. with plants at Alameda and Los Angeles, Calif., and the government's new $200,000,000 Geneva, Utah, plant built and now being operated for the Federal Government by U. S. Steel without profit for the duration of the war emergency. Black is a director of the SOUTHERN PACIFIC CO., the EQUITABLE LIFE ASSURANCE SOCIETY, FIREMAN'S FUND INSURANCE CO., DEL MONTE PROPERTIES CO., and CALIFORNIA PACIFIC TITLE INSURANCE CO.

NEW EQUIPMENT

Welding Ground Clamp

Manufacturer: Lincoln Electric Co., Cleveland, Ohio.

Equipment: Ground clamp for welding.

Featured claimed: Clamp is designed so that each jaw connects independently to the ground cable. If scale or paint prevents one jaw from making a good electrical contact, the other jaw will carry the current. The ground clamp has a heavy-duty processed steel frame with durable copper conductors and contacts. Unit weighs 1½ lb., has a maximum jaw spread of 2½ in. and a rating of 300 amperes.

Slide Rule

Manufacturer: Kotal Co., New York.

Equipment: Slide rule computor.

Features claimed: The slide rule computor for bituminous mixes enables paving engineers and contractors to calculate the tonnage needed for any job. It is designed to compute tonnage with any density of mix and any length, width and thickness desired. The celluloid face rule is obtainable at the present time.

Drill Press

Manufacturer: Mechanical Research Co., Portland, Ore.

Equipment: Portable magnetic drill press.

Features claimed: The press has simplified the precision drilling of holes. It can be clamped into position anywhere, on any ferrous metal, providing a tension of from 800 to 1,200 lbs. by turning on the switch. It will drill ¾ to 1 in. holes in any position, overhead, vertical or flat, and is adjustable for use over uneven spots. It is designed to use either AC or DC

circuits and holds either electric or air drills as well as various sized drills so that it can be used for reaming, tapping and spot facing. Three models of portable magnetic drill posts are manufactured for use in every type of construction work.

Single Drum Winch

Manufacturer: Pacific Car and Foundry Co., Renton, Wash.

Equipment: Single drum free-spooling winch.

Features claimed: The model E Carowinch is designed for installation on Allis-Chalmers, Caterpillar Cletrac and International Crawler tractors. Although designed for the logging industry, its strength, compact simple design and universal adaptability to other types of work, have extended its use into many other fields.

Wood Preserver

Manufacturer: Quigley Co., Inc., New York.

Equipment: Triple-A copper naphthenate wood preserver.

Features claimed: An application of this wood preserver, applied by brush, spray or dipping, will penetrate and impregnate wood, thereby sealing it against the destructive influences of dry rot, fungi and mold. It provides permanent treatment at low cost, is non-poisonous to humans and will not bleed through light-colored paints. It dries in less than 48 hrs., is green in color, is shipped in 1, 5, 30 and 55 gal. containers and covers 200 sq. ft. per gallon.

Water Analysis

Manufacturer: Chief Chemical Corp., New York.

Equipment: Aero-titrater for rapid water analysis.

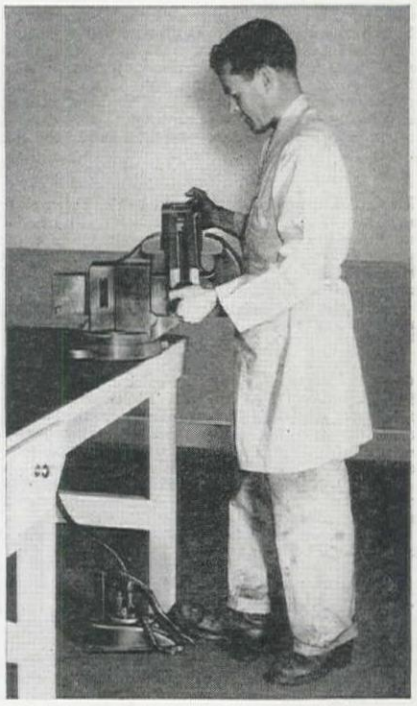
Features claimed: This water analysis apparatus provides a quick and accurate method to determine the hardness (calcium and magnesium content) of waters. False endpoints are absent and air agitation eliminates tedious shaking by hand. The instrument is supplied calibrated and ready for assembly and use, has no moving parts to wear out and can be used in the field as well as in the plant. All vital parts are constructed of durable plastic construction. Substances ordinarily in water do not interfere with direct titration.

Hydraulic Vise

Manufacturer: Brucon Co., San Francisco, Calif.

Equipment: Hydraulic vise.

Features claimed: Simple two-pedal foot control allows operator complete freedom of hands for gripping or releasing his work. Accurately controlled



gripping permits gripping of delicate parts without crushing and heavy work without slipping. Ease of operation reduces chances of injury and fatigue. Any standard-make, hand-operated vise can be converted to Brucon hydraulic action without purchasing complete new vise equipment.

Beam Compass

Manufacturer: Charles Bruning Co., Inc., San Francisco, Calif.

Equipment: Beam compass with micrometer adjustment.

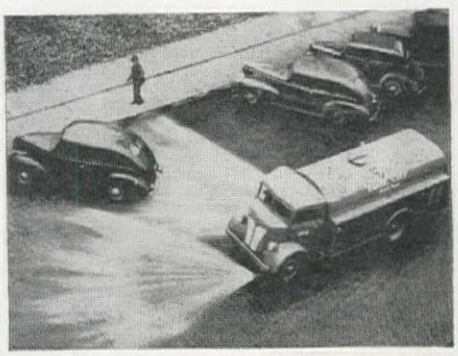
Featured claimed: The compass makes circles from 1 to 48 in. in diam. Micrometer adjustment assures rigid and accurate setting. It is nickel plated and has two hexagonal beams, measuring 8 and 16 in. in length, with coupling unit for securely joining together. The free-moving holding unit for a divider, pencil or pen can be locked firmly in any desired position. The set includes a needle point pivot with micrometer adjustment for accurate setting, a spare needle and a container of leads.

Street Flushers

Manufacturer: E. D. Etnyre & Co., Oregon, Ill.

Equipment: Sanitary street flushers.

Featured claimed: Available now for urgent civilian use, the Etnyre sanitizing street flusher can be used for sewer cleaning, street flushing, surface sprinkling,



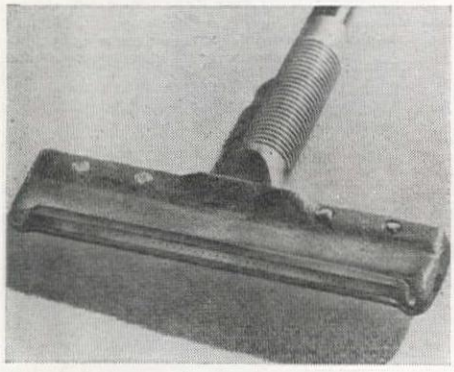
pumping out basements, tree spraying, fire fighting, flushing away snow and slush and watering shrubbery. Parked cars do not interfere with the work of the street flusher which can spray streets up to 42 ft. in width and wash the central traffic zone dirt and all other waste to the gutter and on into the sewer.

Descaling Attachment

Manufacturer: Victor Equipment Co., San Francisco, Calif.

Equipment: Descaling attachment.

Features claimed: Descaler is attachable to any standard Victor welding torch butt and is furnished with torch butt for other makes of equipment. A well-designed spiral mixer and gas proportioner handles efficiently the large gas volumes required for this type of work. Mixing device eliminates back-fire and flash-back. An airadiator aluminum cooling section in the nozzle head keeps the pre-mixed gases below the ignition temperatures. Replaceable Meehanite skid shoes with properly shaped lugs prolong the wearing life of the nozzle and facilitate the dragging of the nozzle at any angle over the metal surfaces to be cleaned. The standard nozzle is made in 4 in. (model 361) and 6 in. (model 362) ribbon flame widths. Special circular multi-flame nozzles are available for inaccessible areas or rivet heads.



Shear Plates

Manufacturer: Iowa Manufacturing Co., Cedar Rapids, Iowa.

Equipment: Emergency shear plates.

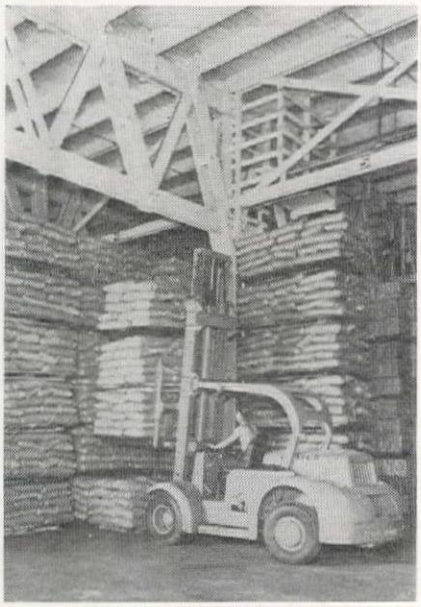
Features claimed: The shear plates, quickly replaceable, are a safety improvement against roll breakage on aggregate crushers. Under ideal working conditions, heavy helical springs of chrome vanadium steel maintain proper tension on the floating roll and keep the opening for material constant. When uncrushable foreign material is introduced, the springs protect the roll by relieving the undue stress and thus prevent breakage. Each shear plate consists of 11-gauge sheet iron and is located in the slot of the adjustable plate that holds the spring in position. Any large piece of uncrushable material would cause the nut, holding the shear plate, to shear the plate and allow the unrestrained bolt to pass through the spring and release the tension on the floating roll. Operations are resumed after the shear plate is replaced.

Lift Truck

Manufacturer: Hyster Co., Portland, Oregon.

Equipment: Model "150" fork-type lift truck.

Features claimed: Truck has high rating of work capacity because it can operate over any type of smooth or rough ground surfaces, climb 34 per cent grades, carry loads up to 7½ tons and stack and tier 20 ft. in 32 sec. Equipped with pneumatic tires, the Hyster has excellent maneuverability because of its power steering mechanism.



Cable Insulation

Manufacturer: United States Rubber Co., New York, N. Y.

Equipment: Nubun—synthetic rubber latex insulation.

Features claimed: This insulation for power, lighting and communication cable is flexible, impervious to water, of laminated construction, homogeneous and low in specific conductive capacity. Because of the presence of special anti-oxidants, the insulation has good aging qualities and because of the nature of the latex process, it will resist severe wear. It is made from a special modification of buna S synthetic rubber.

Cement Floor Treatment

Manufacturer: Synthex Products Co., New York.

Equipment: Treatment for cement floors.

Features claimed: The material, known as Synkrete Concentrate, covers 1,000 sq. ft. of cement floor per gallon, is easily applied by mop, brush, long-handled broom or sprinkler and soaks deep into the pores of the concrete where it hardens to form a rocklike mass. The treatment increases the resistance of the concrete to wear, water infiltration, oils, greases and chemicals. The liquid is almost colorless and does not affect the appearance of floors.

Drawing Instruments

Manufacturer: Chas. W. Downs and Son Co., Detroit, Michigan.

Equipment: True perspective drawing instruments.

Features claimed: The instruments reduce perspective art to its simplest terms and permit the artist or draftsman to present his subject as it appears to the eye. In this "Truper" line are a wide variety of perspective graphs which permit the showing of subjects at any angle. True perspective circles avoid the distortion resulting from the use of ellipses and freehand circles. Perspective scales have diminishing units of measurement as they recede toward the vanishing point. All instruments are accurate at any scale, angle or visual distance.

Heating Torch

Manufacturer: Air Reduction Sales Co., New York, N. Y.

Equipment: Medium-weight heating torch.

Features claimed: New torch (style 9802) is designed for concentrated localized heating such as is

required for bending, straightening and shrinking steel plate and for silver-brazing of heavy copper plate in the process of manufacturing copper pipe. Torch is light in weight and has adequate gas capacity. The 7 tips that are available will meet the requirements of every heavy heating job. Mixers are manufactured for positive pressure acetylene, for low pressure acetylene and for propane. Standard extensions include a 12 in. straight extension and 18 in., 24 in. and 42 in. angular extensions.

Hydraulic Dredge

Manufacturer: American Steel Dredge Co., Inc., Fort Wayne, Indiana.

Equipment: 12-in. hydraulic dredge.

Features claimed: New diesel-powered dredge is a complete, compact unit which is fully equipped to operate in isolated locations for long periods of time. It is designed to handle sand, clay and silt to a depth of 16 ft. and deliver the material through 1,000 ft. of discharge line at water level or through 500 ft. of discharge line at 30-ft. elevation. The main dredging pump, powered by an 8-cylinder, 320 h.p. diesel engine, is equipped with a 14-in. suction and a 12-in. discharge pipe. The main power plant consists of an 85-kw diesel electric generator set and a 6-kw auxiliary diesel power plant. The bolted 104x29x6-ft. prefabricated steel hull may be dismantled and shipped on standard railroad cars or in the hold of a ship for overseas destinations. The wooden 72x20x10⅔-ft. deck house, enclosing all machinery, is also prefabricated to facilitate shipment. The 36-ft. digging ladder has an adequate margin of overload capacity and is fitted with interchangeable cutter heads to handle different materials. Special compound gearing on the 5-drum hoist permits high rope pull at low speeds and cone friction clutches and drum switch controls add flexibility to its operation.

Snow Tractor and Trailer

Manufacturer: Allis-Chalmers Manufacturing Co., Milwaukee, Wis.

Equipment: Snow tractor and snow trailer.

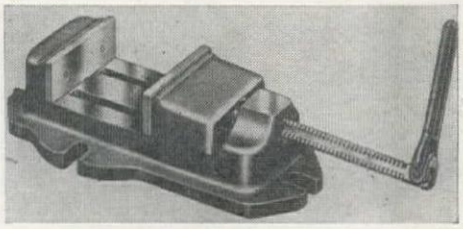
Features claimed: The snow tractor (model M-7), equipped with either wheels or skis, and the 1-ton snow trailer (model M-19) are suitable and practical for either snow travel or highways. Long wide tracks with rubber faced shoes spread the tractor's weight and prevent it from sinking into the snow and assure maximum traction. The tractor, powered by a 4-cylinder, 4-cycle gasoline engine, develops 63 h.p. at 3900 r.p.m., has 6 forward speeds ranging from 4 to 41 mi. per hr. and has 2 reverse speeds ranging from 3 to 11 mi. per hr. Because of its low center of gravity, the tractor can climb 45 deg. slopes. The 640-lb. trailer has a load capacity of 1 ton. The snow tractor and trailer unit was originally designed for the use of rescue squads in aiding downed pilots and their crews.

Heavy Duty Vise

Manufacturer: Mechanics Engineering Co., Jackson, Mich.

Equipment: Fast locking heavy-duty vise.

Features claimed: The vise, known as the Jenkins



Bar-Lok, is set and released by means of a Bar-Lok push-pull pressure unit. It has a positive locking contact at 4 points and develops pressure to 20,000 lb. Only a quarter turn of the handle is needed to lock and to release. It is precision built for heavy duty where severe vibration might affect holding. The vise is built in one size with a 4-in. opening, 3½-in. height and 1⅝x4¼-in. jaws.

Weld Test Machine

Manufacturer: Air Reduction Sales Co., New York, N. Y.

Equipment: Portable weld testing machine.

Features claimed: Moderately priced, this unit performs three weld tests: (1) reduced section transverse tension test, (2) guided bend test—a complete 180-deg. face or root bend, (3) longitudinal all-weld metal tension test—.505 in. The machine provides accurate data on tensile strength and ductility of weld specimens and because of its light weight, weld tests can be performed on the job. The unit operates on the principle of the hydraulic jack. A hand operated pump transmits pressure through a hose to the plunger. While the maximum direct load is 40,000 lbs., the use of reduced sections of specimens permits the testing of metals of higher strength.

Outdoor A-C Welder

Manufacturer: General Electric Co., Schenectady, N. Y.

Equipment: Outdoor alternating-current welders.

Features claimed: The 500-amp. welder has a current range from 100 to 625 amps. and the 300-amp. welder has a range from 60 to 375 amps. Welders are designed for use in outdoor weather exposed locations. They are equipped with "idlematic" control which automatically reduces the voltage to 30 volts

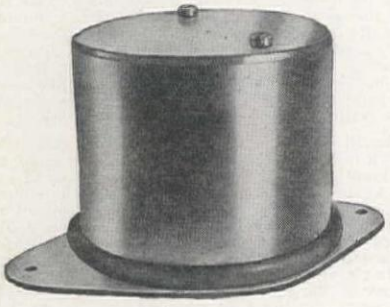
when the arc is not in operation, and which provides full power for welding when the arc is struck. A convenient switch permits the welder to be shut off when not in use. Dripproof construction of all openings in the top and a sealed window over the current indicator protect against the entrance of rain, snow and sleet. Ventilating openings shed water and keep the air velocity low and a special finish on all internal parts protects them from corrosion. These welders are designed with the built-in power-factor improvement, fingertip adjustment, stepless current control and fan-forced ventilation.

Time Delay Relay

Manufacturer: R. W. Cramer Co., Inc., Centerbrook, Conn.

Equipment: Model TD 6 time-delay relay.

Features claimed: The relay has a cam-operated switch mechanism and is mounted in a dust- and moisture-proof bakelite case for panel mounting. It



has a visible index showing open and closed position by means of a graduated indicating dial, 4 screw-type terminals for motor and switch circuits, and an enclosed switch which has definite snap action and positive lock in both operating positions.

Tinning Flux

Manufacturer: Air Reduction Sales Co., New York, N. Y.

Equipment: Cast iron tinning flux.

Features claimed: Not to be confused with a brazing flux, this material is designed particularly for tinning cast iron prior to brazing. May be applied as a water-mixed paste or as a powder on heated surface. Packed in 1-lb. glass containers.

Plywood Form Calculator

Manufacturer: National Plywood Distributors Association, Inc., Chicago, Ill.

Equipment: Plyform calculator.

Features claimed: A slide rule device made of heavy cardboard is designed to save much time in speeding up estimating on amount and size of plywood, studs and wales needed for any plywood concrete form. It is only necessary to know the rate of pour, whether vibrated or unvibrated, and the height, length and thickness of wall. With these items of information, any estimator engineer, contractor, or construction supervisor can with one setting of the slide rule arrive at an accurate estimate of the material needed to construct the forms.

Floor Crane

Manufacturer: Rogers Equipment Co., Portland, Ore.

Equipment: Floor lift crane.

Features claimed: Having a lifting capacity of three tons, the floor crane can be operated either by hand or by power, and has a lifting range of 9 ft. 4 in. on the standard model. The lifting beam has hydraulic power application. The power model is operated by two 6-volt storage batteries in series, operating a heavy-duty, 6-pole, 12-volt motor. Flexibility of cantilever and adjustable sheave permit practical, convenient operation in foundries, machine shops, garages, or factories. The multi-cylinder pump on the hand unit has manual control for power and speed.

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, etc., required by the Acts of Congress of August 24, 1912, and March 3, 1933, of Western Construction News, published monthly at San Francisco, California, for October 1, 1944.

State of California, County of San Francisco, ss.: Before me, a Notary Public in and for the state and county aforesaid, personally appeared Charles White who, having been duly sworn according to law, deposes and says that he is the Business Manager of the Western Construction News and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business manager are:

Editor—John M. Server, Jr., 503 Market Street, San Francisco, Calif.

Publisher—Arthur F. King, 503 Market Street, San Francisco, Calif.

Managing Editor—Maurice A. Buckley, 503 Market Street, San Francisco, Calif.

Business Manager—Charles White, 503 Market Street, San Francisco, Calif.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

KING PUBLICATIONS, 503 MARKET STREET, SAN FRANCISCO, CALIFORNIA; Arthur F. King, 503 Market Street, San Francisco, California, Louise B. King, 503 Market Street, San Francisco, California.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.)

None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is: (This information is required from daily publications only.)

Charles White, Business Manager.

Sworn to and subscribed before me this 29th day of September, 1944.

(SEAL) ELEANOR J. SMITH,

Notary Public in and for the City and County of San Francisco, State of California.

(My commission expires January 3, 1947.)

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LITERATURE FROM MANUFACTURERS . . .

B. F. Goodrich Co., Akron, Ohio—The company has recently issued a general booklet giving illustrative descriptions of its industrial rubber products that are now available. This descriptive literature tells of a line of vibro-insulators, devices of rubber and metal which reduce vibration, molded, extruded, lathe cut and sponge rubber products, rubber lined tanks and valves, products made with Koroseal, V-belts and cements. Koroseal is a flexible material that has been manufactured from plasticized plyvyinyl chloride. Photographs, cutaway diagrams and charts are used to clarify the discussion.

Chain Belt Co., Milwaukee, Wis.—A 10-page illustrated pamphlet, bulletin No. 446, describes the Rex concrete mixers. The mixers range in size from a 3½ to a 28 cu. ft. capacity. The booklet describes in detail operating features that have been incorporated in the design of the mixer as a result of 35 years of building experience. The company claims that the concrete mixer makes high quality concrete, has a shimmy skip which removes the necessity of pounding, has a long life with low maintenance, has a swingchute which is free-flowing, has a water system which measures accurately, has a chain belt drive which protects the engine, gears and shafts from harmful shocks, has a unit-type power take-off which provides smooth economical power and is simple to operate because of the convenient location of the controls.

Bucyrus-Erie Co., South Milwaukee, Wis.—The company has just issued a 24-page bulletin giving an illustrated description of their No. 8 and their No. 12 blast hole drill bit dressers. Photographs, drawings and diagrams of efficient shop layouts show the driller how to use No. 8 in dressing bits up to 6⅝ in. and No. 12 for bits up to 12 in. in diam. to save time, steel and the number of sharpenings that are required. The bit dressers dress the bits uniformly regardless of the operator's skill and shape the bits accurately so that sticking tools and fishing jobs are a rare occurrence. The bulletin also gives illustrated descriptions of bit furnaces, quenching tanks and bit handling cranes.

R. G. Le Tourneau, Inc., Peoria, Ill.—An 8-page pamphlet describing tournapulls has been issued recently by the company. Photographs and diagrams are used in describing the operation and design features of tournapulls. The two wheel design concentrates the heavier load on the front drive wheels where it increases traction. The large pneumatic tires give greater traction and add to compaction on the fill. This earthmoving equipment has rugged, lightweight construction, is designed for fast off-road service, has simple cable control and has a sturdy scraper that has displayed its quality on many jobs.

Air Reduction Co., New York, N. Y.—A 16-page booklet, "Underwater Cutting and Welding" describes the development of equipment and technique that enabled miracles of speed in submarine and ship repair work. The development of the oxy-hydrogen torch for underwater cutting and welding made possible the mammoth ship-raising operations conducted after the debacle at Pearl Harbor. Although official secrecy permits no detailed discussion of the work repairing submarines, vessels and harbor facilities that has been done in combat areas all over the world, the pamphlet lists recommended practices for efficient cutting and welding in submarine work.

The Ric-Wil Co., Cleveland, Ohio.—Catalog No. 44, "Ric-Wil conduit systems for underground and overhead steam, oil or hot water lines," is a 12-page booklet giving a comprehensive description of the company's products as well as a discussion of the problems of insulation. Included are capacity tables, trench dimensions and general specifications for prefabricated insulated pipe units and tile or cast iron conduit systems. Cutaway diagrams present a clear picture of the insulated pipe units and the welded lock seam pressure-tight conduits.

B. F. Goodrich Co., Akron, Ohio.—A wall poster, "Here's Important News About Truck Tires," has been published recently by the company. Produced especially for truck operators during this period of extreme heavy duty tire shortages, the chart pictures graphically 7 rules for tire care: don't overload, don't exceed victory speed, don't overinflate, don't underinflate, duals must be twins, drive carefully, and correct mechanical defects.

Atlas Foundry & Machine Co., Tacoma, Wash.—The company has issued recently a 182-page book, "Atlas Foundry Castings—Steel—Iron—Bronze," reviewing its history of 44 years of successful foundry service. Photographs and diagrams illustrate the laboratory testing room and equipment, the pattern shop, a large automatic oil burning annealing furnace and a full automatic steel melting furnace. The foundry can pour castings weighing from 1 lb. to 6 tons. Photographs and cutaway diagrams illustrate and extensive tables list standard sizes, weights and prices of Atlas cast iron pipe fittings, wood pipe fittings which are asphalt coated, cast steel and bronze flanged fittings, manhole covers and catch basins, meter boxes and plumbing supplies, boiler castings, sprockets and couplings. Many other products are listed such as bearings, rolls, dolly boxes, crane wheels, gears, sheaves, lathe chucks, marine castings

—cleats, anchors, bollards—clutches, wire rope sockets, brake shoes, air jacks, piston ring stock, bronze bushings, locomotive brasses, builders' supplies, bridge castings, car wheels, and hand wheels. The book contains useful information concerning the weights and properties of metals, weights and measures, contents of vessels of different shapes, water pressure at different heads and many worthwhile mechanical suggestions.

Reincke, Ellis, Younggreen & Finn, Chicago, Ill.—A booklet, "Wherein we Sleuth Out a fact or two about Preformed Wire Rope," points out the necessity of publicizing the good points of preformed wire rope in order that the public might become aware of the qualities of preformed wire rope and thus find the answer to many distressing problems arising from the use of an unsatisfactory rope. The pamphlet points out that preformed wire rope is woven so that the strands share the load equally, and the rope is flexible, spools easily, resists whipping, withstands jerking, protects men from broken outside wires, and it has a salvage value.

The Timken Roller Bearing Co., Canton, Ohio.—A 74-page booklet has been published by the company titled "Evaluating the Forgeability of Steels." The company has found by experimental testing that the results obtained from the hot twist tests are of great usefulness in evaluating the forgeability of steels. The tests reveal the temperature which must not be exceeded in the forging operation, the change in ductility of the steel with varying temperatures and the change with temperature of the force required to deform the steel. A number of torque and twist curve diagrams are given in order to present the hot working characteristics of many alloy steels.

Willamette Hyster Co., Peoria, Ill.—An 8-page pamphlet pictures in colors the Hyster lift truck at work. The truck can be used for transporting at 35 mi. per hr., hoisting at 45 ft. per min. and lowering at 60 ft. per min. It has a load capacity of 15,000 lb., 4 speeds forward, 4 speeds reverse and is fast in every operation. Its many valuable features include pneumatic tires, demountable wheels, finger tip hoist and tilt controls, hydraulic steering, adjustable load arms, 17½ ft. lift to underside of load and forced feed lubrication.

Robinson Air-Activated Conveyor Systems, New York, N. Y.—Bulletin 310, "Conveyor Systems" describes and shows photographs of the conveyor at work. When the conveyor tank is filled and the entrance port closed, compressed air is admitted in fine jets around the discharge port located at the base of the tank. As the pressure in the tank increases, the lightened mass flows from the tank and through the pipe line, just as any fluid flows under pressure. Pressure alone, without air activation, would not be adequate. Air-activation makes the difficult conveying jobs easy and economical. Cement and similar materials are handled in the standard size conveyor tank under automatic operation at the rate of 125 cu. ft. every 3 min.

Byron Jackson Co., Los Angeles, Calif.—The company has issued a bulletin No. 44-7035 describing the design and operation of the pneumatic sponge pump. The pump is designed to pump heads up to 150 ft. and can be used in mine shafts and winzes, coffer-dams, caissons, sumps, cisterns, pits, tanks, basements, manholes and bilges. It can be used on construction projects for salvage work where the pumped fluid contains a large percentage of solids.

General Electric Co., Schenectady, N. Y.—A 12-page pamphlet, "Gas Turbines and Turbosupercharges," describes the operation and construction of the gas turbine. The history and development of the present day turbosupercharger turbines in operation by the United States Army Air Forces, is given in full detail with a complete list of reference and source material.

The Euclid Road Machinery Co., Cleveland, Ohio.—An illustrated booklet depicts the "Bottom Dump Euclids on the Move." The bottom-dump Euclid, developed more than 10 years ago, has filled the need of the earthmoving industry for large capacity, high speed and economical hauling. The pamphlet pictures the equipment hauling material during the construction of an air strip in South Carolina, a railroad relocation in Georgia, a flood control project in California and many other large earthmoving projects.

Caterpillar Tractor Co., Peoria, Ill.—A 16-page booklet, Form 8588-D43, "The Caterpillar Diesel Way," illustrates the mechanical construction of the diesel engine. Photographs and cutaway diagrams picture the seals and filters which are designed to keep out dust, the operation of the fuel in producing power, the oil and water cooling system, the starter motor and the close-regulating flyball governor.

E. I. du Pont de Nemours & Co., Wilmington, Del.—A 32 page booklet, "Ditching with Dynamite," has been released by the explosives department of the company. The booklet explains and illustrates technique that is the product of years of experience in the field and in the laboratory. Two methods of blasting ditches, the propagation and the electric, are explained in considerable detail. In wet soils, the propagation method is generally the quickest and the most economical, while the electric method can be used successfully in either wet or dry soils. It takes an experienced operator to blast a satisfactory ditch under unfavorable conditions such as dry sand or soft clay.

Cleveland Worm and Gear Co., Cleveland, Ohio.—This company publishes a 4-page bulletin which describes and illustrates the new Speedaire fan cooled worm gear reduction units. The pamphlet, form 515, points out how the high horsepower capacity of the fan is possible because of the effective removal of heat by holding the high velocity air stream on a directed course through the use of a double wall housing and by dissipating the heat through the use of integrally cast fins on the outer wall of the housing.

Preferred Utilities Manufacturing Corp., New York, N. Y.—A bulletin, just issued, describes the uses and properties of 2 heat resistant coatings: "white hot" and "pyrochrome." These two coatings employ the principle of heat reflectance in protecting refractories, metals and ceramics against the effects of high temperatures. This bulletin No. 925 states that "white hot" derives its heat-resisting properties from titanium, a pure white mineral substance of high reflective qualities and the whitest substance known, and will withstand temperatures up to 2840° F. "Pyro-chrome" is grass green in color, resists heat up to 4000° F. and is for heavy duty use. Chrome, one of the most effective of all heat resistant substances, is the basic ingredient.

OPPORTUNITY SECTION

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