WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

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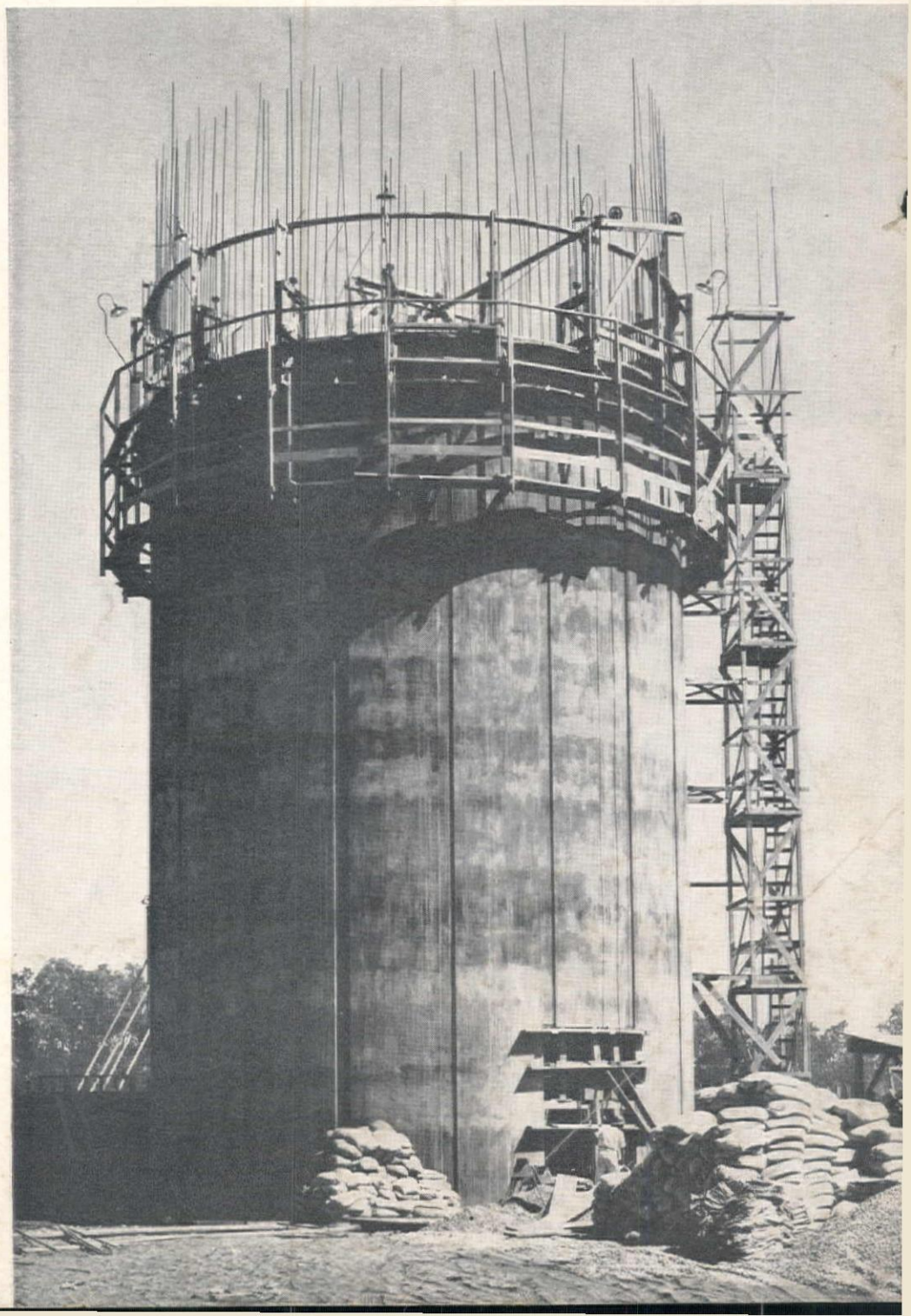
IN THIS ISSUE



CONSTRUCTION VIEW of an elevated concrete water tank at the Kaiser Company's iron and steel mill at Fontana, Calif. The use of slip forms enabled continuous pour from start to finish.

ENGINES "LIKE NEW" at Each Oil Change!

When Old Man River gets out of his course, these "Cats" are used to put him in his place, with the help of LeTourneau Dozers.

YOU will get thousands of extra miles of service between overhauls when you lubricate your heavy-duty engines with *Texaco Ursa Oil X★★*.

Texaco Ursa Oil X★★ possesses not only detergency, but *dispersion* properties. Detergency means cleaning engines of old deposits. Dispersion means that carbon and other deposit-forming materials do *not* settle out in the engine, but remain in suspension, draining away when the oil is changed, thus keeping screens and oil-ways clear.

Texaco Ursa Oil X★★ also possesses high film-strength, assuring protection against scuffing of rings and cylinders . . . also protects modern precision-type alloy bearings. Its use assures full power and substantial fuel economy.

For quieter-running longer-lasting transmission and differential gears, use *Texaco Thuban.*

So effective have Texaco Lubricants proved that they are definitely preferred in many important fields, a few of which are listed in the panel.

These Texaco users enjoy many benefits that can be yours. A Texaco Automotive Engineer will gladly cooperate in the selection of the most suitable lubricants for your equipment. Just phone the nearest of more than 2300 Texaco distributing points in the 48 States, or write:

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

THEY PREFER TEXACO

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

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

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

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

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

TEXACO

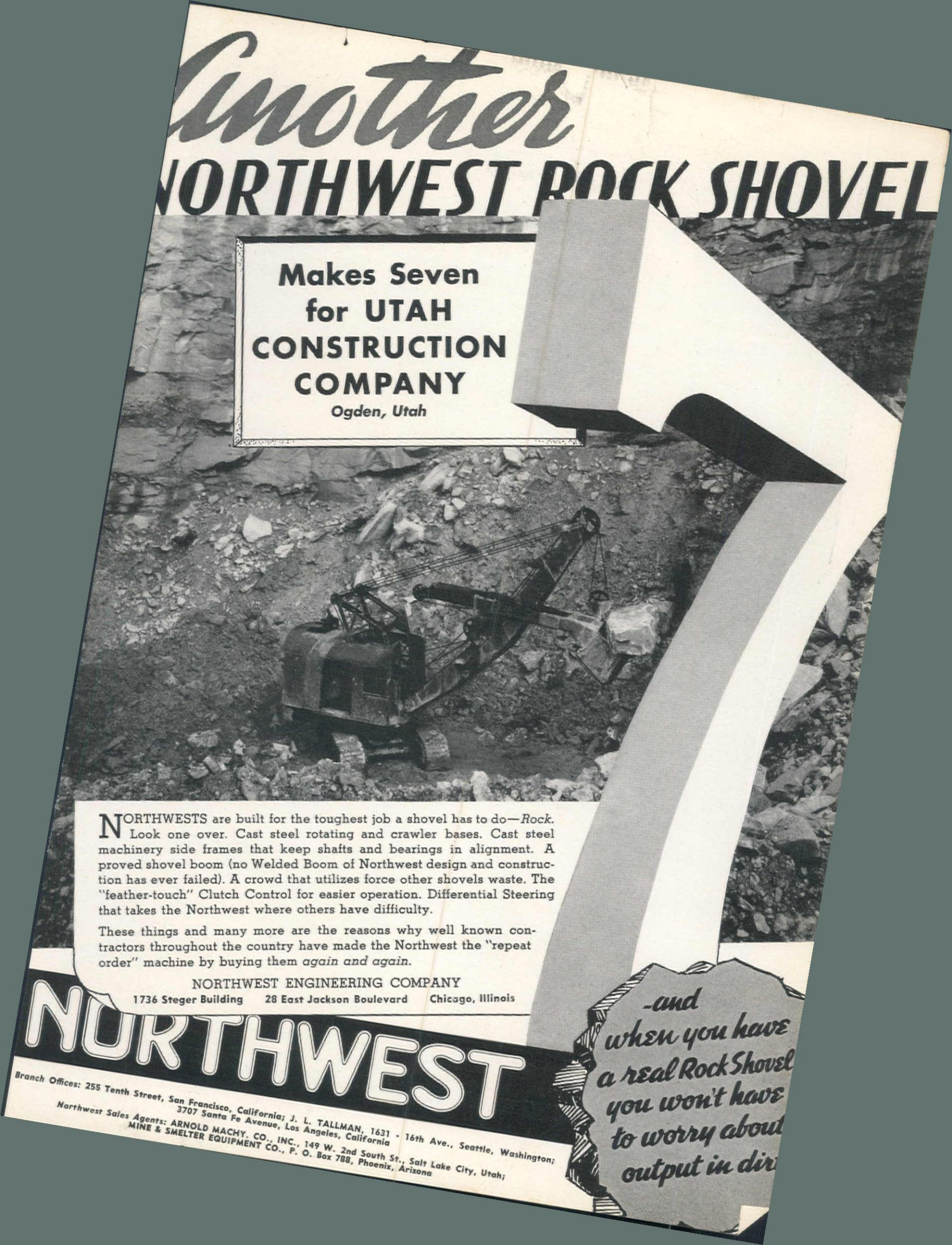
REG. T.M.

TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

TUNE IN FRED ALLEN EVERY SUNDAY NIGHT—CBS ★ HELP WIN THE WAR BY RETURNING EMPTY DRUMS PROMPTLY

Another NORTHWEST ROCK SHOVEL



Makes Seven for UTAH CONSTRUCTION COMPANY

Ogden, Utah

NORTHWESTS are built for the toughest job a shovel has to do—*Rock.* Look one over. Cast steel rotating and crawler bases. Cast steel machinery side frames that keep shafts and bearings in alignment. A proved shovel boom (no Welded Boom of Northwest design and construction has ever failed). A crowd that utilizes force other shovels waste. The "feather-touch" Clutch Control for easier operation. Differential Steering that takes the Northwest where others have difficulty.

These things and many more are the reasons why well known contractors throughout the country have made the Northwest the "repeat order" machine by buying them *again and again.*

NORTHWEST ENGINEERING COMPANY

1736 Steger Building 28 East Jackson Boulevard Chicago, Illinois

NORTHWEST

—and when you have a real Rock Shovel you won't have to worry about output in dir

Branch Offices: 255 Tenth Street, San Francisco, California; J. L. TALLMAN, 1631 - 16th Ave., Seattle, Washington; 3707 Santa Fe Avenue, Los Angeles, California

Northwest Sales Agents: ARNOLD MACHY. CO., INC., 149 W. 2nd South St., Salt Lake City, Utah; MINE & SMELTER EQUIPMENT CO., P. O. Box 788, Phoenix, Arizona

ON Victory's STARTING Line

● Rear-Dump and Bottom-Dump EUCLIDS may not capture any enemy positions or win any battles, but the jobs they are doing here and overseas help provide our armed forces with the raw materials for victory.

It's on victory's starting line — the open pit mines, quarries, power dams, army and navy bases, airports, cantonments, armament plants, ordnance depots, etc. — that Euclid speed, capacity and dependable performance have been called upon to complete tough jobs in record time and at lower cost per ton or cubic yard. Present deliveries are confined to high priority orders, but we're ready to help with your plans for after victory requirements.

The EUCLID ROAD MACHINERY Co., Cleveland, O.

THE EUCLID ROAD MACHINERY CO.

3710 SAN PABLO AVENUE — PIEDMONT 8046 — EMERYVILLE, CALIFORNIA

CONTRACTORS' EQUIPMENT & SUPPLY CO., Albuquerque; INTERMOUNTAIN EQUIPMENT COMPANY, Boise; HALL-PERRY MACHINERY COMPANY, Butte; F. W. McCOY COMPANY, Denver; LOGGERS AND CONTRACTORS' MACHINERY CO., Portland; A. H. COX & CO., Seattle

WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED WESTERN HIGHWAYS BUILDER

The National Magazine of the Construction West

Contents for March, 1943

J. M. SERVER, JR.
Editor

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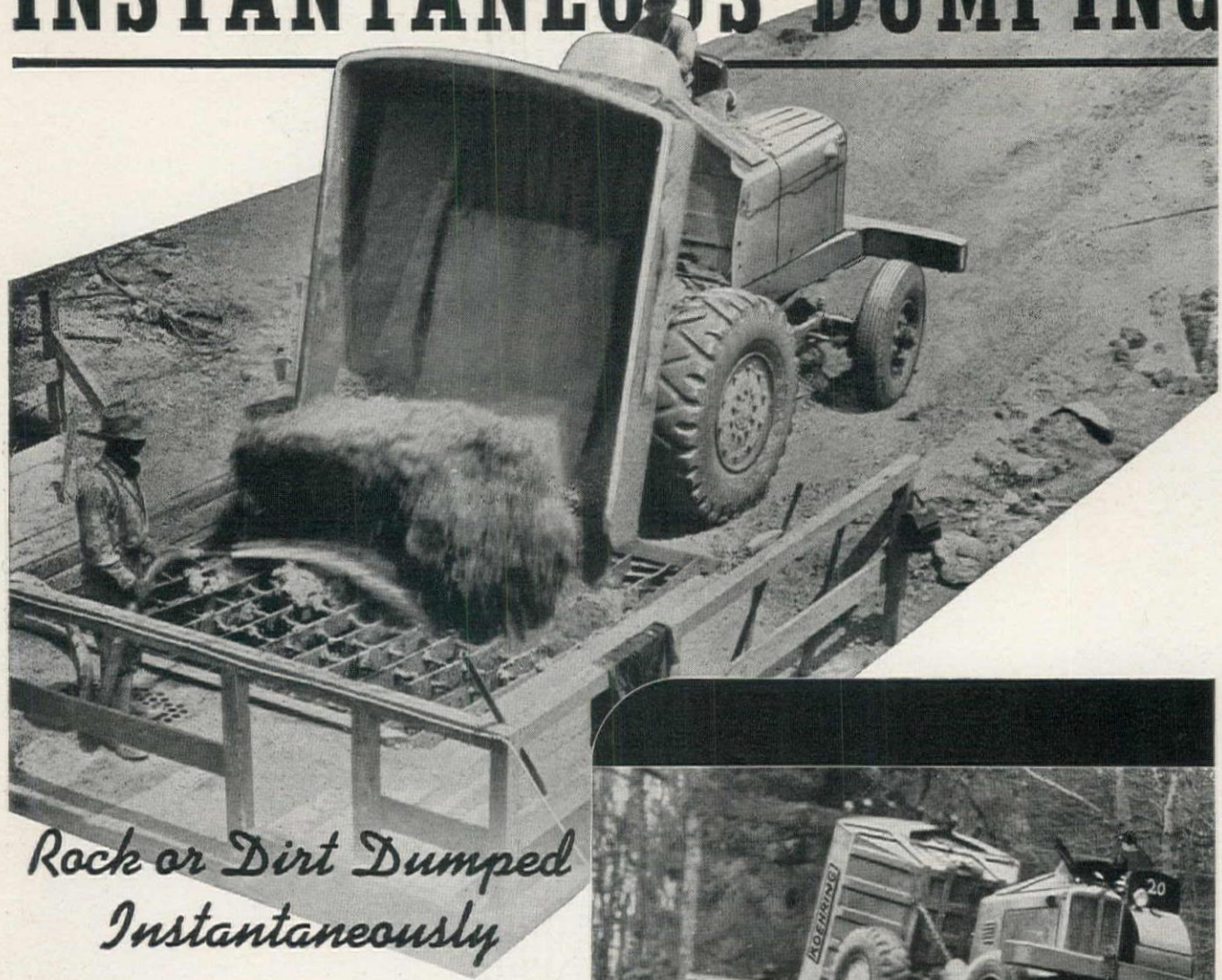
SPEED PRODUCTION *with* INSTANTANEOUS DUMPING



Rock or Dirt Dumped Instantaneously

Moving rock or dirt at high speed requires speed in all operations. Koehring Dumptors save seconds every time the load is dumped... instantaneously. Seconds saved speed production. Rock or dirt is dumped equally fast and the load is dumped clean every time . . . ready for a full load every trip. KOEHRING DUMPTORS HAUL ROCK OR DIRT FASTER THAN ANY OTHER METHOD.

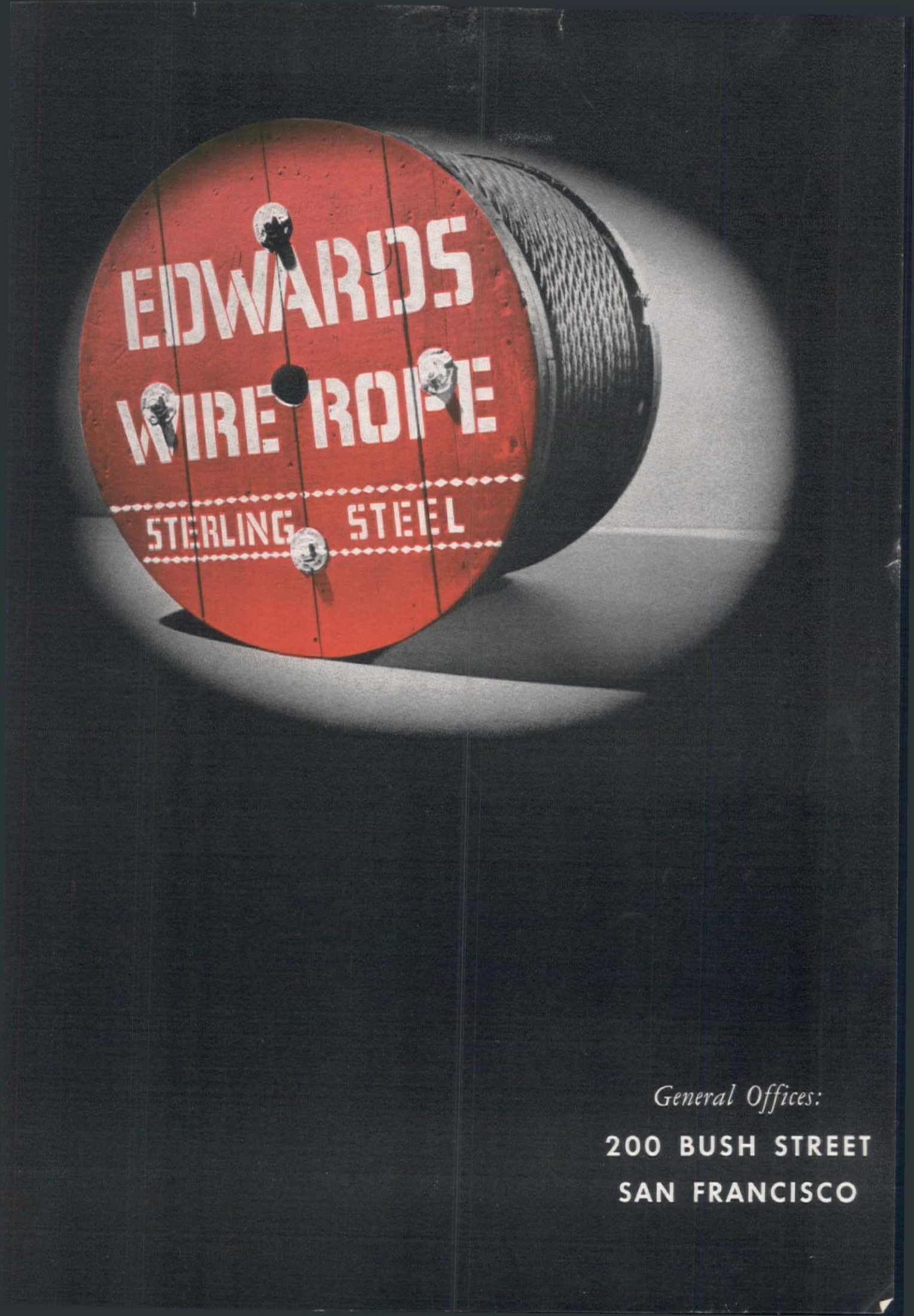
KOEHRING COMPANY
MILWAUKEE • WISCONSIN

Care for your equipment... to keep it working. Your construction equipment must give longer service . . . until new equipment is again available. Keep it in repair... lubricate it regularly... handle it carefully.

KOEHRING HEAVY DUTY

HEAVY-DUTY CONSTRUCTION EQUIPMENT

HARRON, RICKARD & McCONE CO., San Francisco-Los Angeles • PACIFIC HOIST & DERRICK CO., Seattle, Wash. • WESTERN CONSTRUCTION EQUIPMENT CO., Billings • CONTRACTORS EQUIPMENT CORP., Portland • LU ND MACHINERY CO., Salt Lake City • NEIL B. McGINNIS CO., Phoenix, Ariz. HARRY CORNELIUS CO., Albuquerque, New Mexico.



General Offices:

200 BUSH STREET

SAN FRANCISCO

FOR WORK WELL DONE

From the burning sands of Africa to the steaming jungles of Guadalcanal, our fighting men on land and sea are in the thick of battle, clearing the way to Victory.

It is our responsibility here at home to keep vital war supplies rolling in ever increasing volume to these men who are doing such a magnificent job on the world's far-flung battle fronts.

War plants, shipyards, air fields, military highways must be built in record time. Cargo ships must be loaded and unloaded without delay. Such a tremendous task requires cranes, shovels and draglines in great numbers.

Since the bombing of Pearl Harbor, the men and women of the Shovel and Crane Division of Lima Locomotive Works, Incorporated, have been building cranes, shovels and draglines with determination to meet every specification and to exceed every schedule set for them.

As a reward for outstanding accomplishment in the production of war materials, the Army and Navy have conferred upon this division the Army-Navy "E" award. Labor and management are proud of the award and the part they are playing in the battle of production.

It will continue to be our pledge to build better cranes, shovels, and draglines faster until Victory is won.

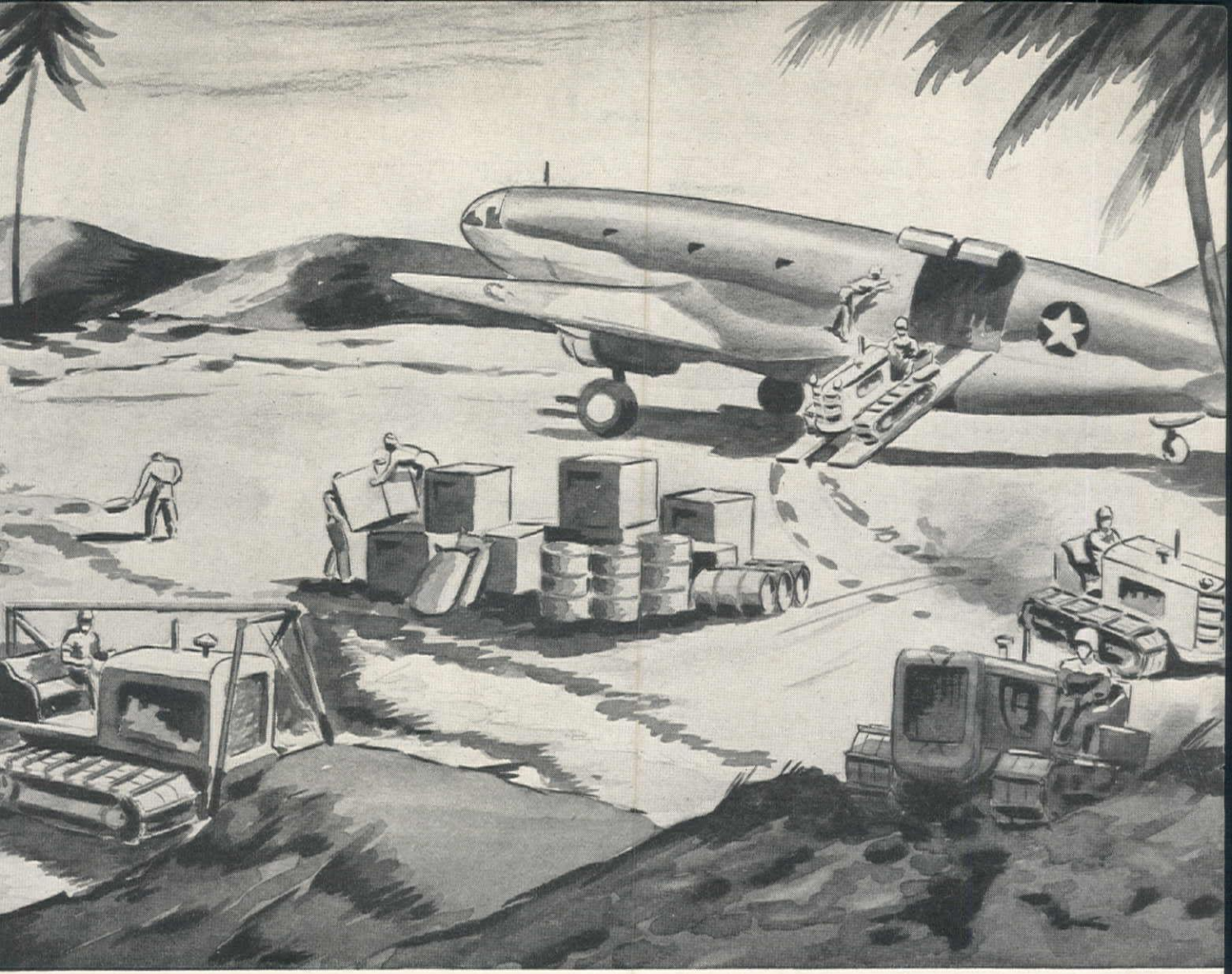
We are mindful of the fact that without the fine cooperation of our many suppliers who have furnished us with parts and materials, our award of the coveted Army-Navy "E" flag would not have been possible.

★
★
★

LIMA

LIMA LOCOMOTIVE WORKS, INCORPORATED
SHOVEL AND CRANE DIVISION
LIMA, OHIO

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



"The Engineers Have Landed"

HYDRAULICS Rodgers KEEP THE WORLD MOVING

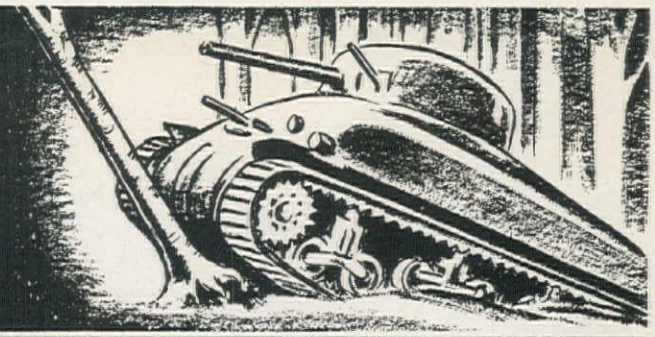
Manufacturers of:

UNIVERSAL HYDRAULIC PRESSES
TRACK PRESS EQUIPMENT
HYDRAULIC KEEL BENDERS
HYDROSTATIC TEST UNITS
POWER TRACK WRENCHES
HYDRAULIC PLASTIC PRESSES
PORTABLE STRAIGHTENER
FOR PIPE AND KELLYS

ONCE AGAIN the military engineers of the United States Army have accomplished an outstanding achievement in construction-breaking records. Huge cargo planes transporting engineers and heavy road building equipment have landed on the African coast. Advanced air bases have been constructed almost over night, overcoming unparalleled obstacles in engineering, making it possible for the armies of the United Nations to meet the enemy in the battle of Tunisia. ★ Rodgers Hydraulic Track Presses are furnishing speedy repair of vital track equipment, on all battle fronts. This equipment is recommended and approved by the engineering and servicing departments of every crawler tractor manufacturing company. ★ For many years Rodgers Hydraulic Track Press and Track Servicing Equipment have played an important part in the maintaining and servicing of crawler type tractors everywhere. ★ ***If it's a Rodgers, it's the best in Hydraulics.*** ★ Rodgers Hydraulic Inc., St. Louis Park, Minneapolis, Minn.

Rodgers HYDRAULIC Inc.

STRENGTH



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
Lowry Equipment Company, Redding
Butte Tractor & Equipment Company, Sacramento
COLORADO—McKelvy Machinery Co., Denver
IDAHO—Intermountain Equip. Co., Boise, Pocatello
MONTANA—Industrial Equipment Co., Billings
NEVADA—Allied Equipment, Inc., Reno
NEW MEXICO
McChesney-Rand Equip. Co., Inc., Albuquerque
OREGON
Howard-Cooper Corp., Portland, Eugene, Klamath Falls
UTAH—The Lang Company, Salt Lake City
WASHINGTON
Howard-Cooper Corp., Seattle, Spokane, Walla Walla

*Company Operated Branches

★★ STRENGTH, backed by power, enables our gigantic tanks to ride rough-shod over the toughest obstacles and clear the way for advancing troops . . . STRENGTH, backed by power, also enables Adams Motor Graders to clear and grade roadways quickly and efficiently through difficult natural obstacles on every continent to pave the way for vital war-time transport. STRENGTH is but one of the many features you'll like in Adams Motor Graders when once again you are permitted to buy equipment for use on peace-time projects!

J. D. ADAMS COMPANY • INDIANAPOLIS, INDIANA

Adams motor graders, leaning wheel graders, elevating graders, hauling scrapers, tamping rollers, bulldozers and road maintainers are used by allied forces throughout the world.

Adams
ROAD-BUILDING AND EARTH-MOVING EQUIPMENT

"DON'T RUN A GOOD THING INTO THE GROUND" TOO FAR . . .

When a Timken Bit begins to dull—remove it—put on another . . .

If you are using bits forged integral with the steel and if transportation or nipping costs are excessive it may pay to drill to a point where the bit is completely dull. Because Timken Removable Rock Bits so greatly reduce transportation and nipping costs this practice is no longer necessary, not even desirable.

Running a Timken Bit to a point of almost complete dullness does not result in the minimum drilling cost per foot for a dull bit means lower drilling speed, increased air consumption, increased reconditioning costs, fewer uses per bit and greater drill maintenance costs.

Because a sufficient supply of Timken Bits can be conveniently carried by the drill operator to give him sharp bits for eight hours' drilling there is no excuse to obtain the last possible inch in every Timken Bit use. But the habits formed by drillers in pre-Timken Bit years may carry over into Timken Bit use. Be sure this practice is not keeping you from getting the maximum footage for every drilling dollar you spend. The Timken Roller Bearing Company, Canton, Ohio.

The One Test For Every Decision—Will It Help To Win The War?

TIMKEN

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

ROCK BITS

TELSMITH PLANT

turning out 1,500,000 yds. of aggregate for NORFORK DAM

Quarry Plant Equipment by TELSMITH

One 48″ x 12′ Telsmith Heavy-Duty Apron Feeder
One 72″ x 25′ Telsmith Hercules Scalping Screen
One 16-B Telsmith Primary Breaker
One 5′ x 12′ Telsmith Double Deck Pulsator Screen
Two 30″ x 18″ Telsmith Double Roll Crushers

Sand and Gravel Plant Equipment by TELSMITH

Two 60″ x 22′ Telsmith Hercules Washing Screens
Two 5′ x 12′ Telsmith Double Deck Pulsator Screens
Two 3′ x 8′ Telsmith Single Deck Pulsator Screens.
One 57″ x 12′ Telsmith Screw Rewasher
Four No. 10 Telsmith Sand Tanks
Four 66″ x 16′ Telsmith Twin Screw Sand Classifiers
Five 30″x 5′6″ Telsmith Plate Feeders
Three 24″ x 5′ Telsmith Plate Feeders

Total power requirements for both quarry, and sand and gravel plants..... 1250 hp.

● Down in Arkansas, near Mountain Home, the Utah Construction Co. and Morrison-Knudsen Co. are building the huge Norfork Dam. A flood control project, it is also a future source of power. The expected completion date is July, 1944.

About 1,500,000 cu. yds. of aggregate will be needed. To produce it, this combination quarry and sand-gravel plant was designed by Telsmith engineers. And all its machinery, except some conveyors and electrical equipment, is Telsmith-built.

Six 10-yd. trucks haul the limestone rock from quarry to plant. The plant's rock-crushing section turns out 140 cu. yds. per hr. Three sizes of product are made: 6″-3″, 3″-1½″, and stone dust.

35 bottom-dump cars, each of 140,000 lb. capacity, haul the material from the White River gravel bars to the plant. Its sand-gravel section has a capacity of 260 cu. yds. per hr. and makes 4 sizes—3″-1½″, 1½″-¾″, ¾″-4 mesh, and minus 4 mesh sand.

The plant's combined aggregate capacity is 3000 cu. yds. per 20-hr. day. Exceptionally efficient design, combined with automatic inter-coupled controls, make it possible to operate this large and complete aggregate plant with only about six men. Uninterrupted performance of Telsmith equipment has made it possible to exceed the planned concreting schedule.

Today's Telsmith Plants are producing under pressure, to win the war. Tomorrow's Telsmith Plants will do an even better job for you, at still lower over-all costs. Get Bulletin EP-30. Q-8

SMITH ENGINEERING WORKS, 4010 NORTH HOLTON STREET, MILWAUKEE, WISCONSIN

MINES ENGINEERING & EQUIPMENT COMPANY, SAN FRANCISCO—LOS ANGELES

Clyde Equipment Co. Seattle, Wash.
Clyde Equipment Co. Portland, Ore.
General Machinery Co. Spokane, Wash.
Gordon Russell, Ltd. Vancouver, B. C.

Drive up and unload an *Airport!*

ROEBLING *"Blue Center"* helps them set the pace!

They start with a cow pasture and in a few hours have it ready for fighter planes taking off to battle . . . with the aid of "swiss cheese" steel strips woven into an all-weather emergency landing field! That's the kind of problem the Corps of Engineers thrive on.

We know, because "Blue Center" goes along on so many of their assignments . . . from tractor cranes to mobile cableways, from river dredges to motorized winches. And whether it's lifting the face of Mother Earth for the Army or passing the ammunition for war plants, you'll find Roebling "Blue Center" Steel Wire Rope on the job wherever the going is tough.

Roebling is learning every day the ways to make "Blue Center" better than ever before. Roebling development engineering, facilities and experience give it the extra stamina to meet unusual as well as routine jobs . . . to give extra service wherever extra service is called for . . . toward Victory.

ROEBLING
"Blue Center"
STEEL WIRE ROPE
PREFORMED OR NON-PREFORMED

It's your wartime duty to use wire ropes EFFICIENTLY!

Whatever your big job is, you've got a small but important job to see that wire rope is properly cared for on your *equipment*. To help you, Roebling has assembled a wealth of conservation data on convenient tags that operating men can fasten right on to reels and equipment. It's a simple, handy way to remind and instruct them about such vital precautions as:

1—PROPER INSTALLATION
2—CORRECT SPOOLING
3—PROPER USE OF CLIPS
4—REGULAR LUBRICATION
5—FREQUENT INSPECTION
6—CAREFUL OPERATION

Our nearest office will gladly furnish as many copies of this tag as you need. Ask for Tag "A".

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

AGGREGATE BITUMEN

INTERLOCKED PROPORTIONING

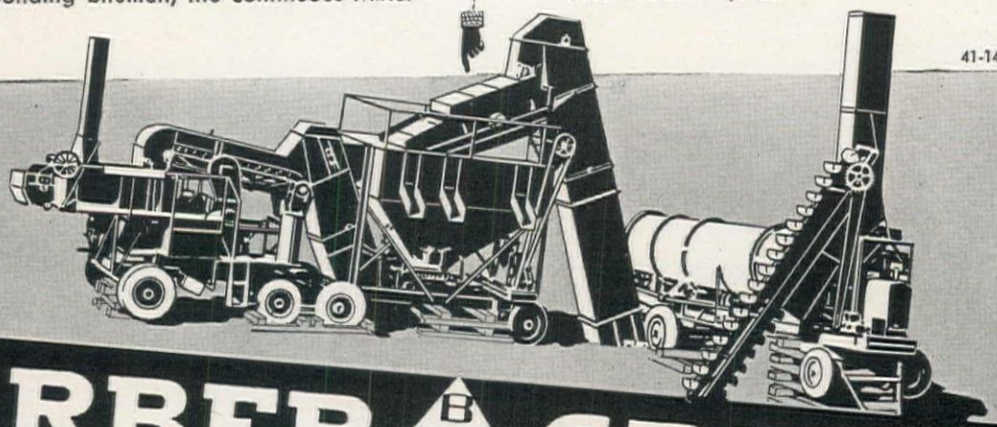
ONLY in the Continuous Mixer is the ratio of aggregate to bitumen mechanically interlocked. The volumetric proportioning is calibrated by weight, the ratio set and locked, and the entire job run with interlocked proportioning.

Even the most skillful mixer operators cannot maintain, hour after hour, the untiring precision of interlocked proportioning.

In addition to accurately measuring each size of aggregate and the corresponding bitumen, the continuous Mixer constantly feeds the aggregate and bitumen into the pugmill in a small continuous stream—in practically a homogeneous distribution *at the start of the mixing.*

These advantages plus the unequalled economy of the Continuous Mixer make it truly tomorrow's Mixer today. Regardless of your present equipment, you should at least have a complete understanding of the basic principles of the Continuous Bituminous Mixer. Complete literature on request.

41-14



BARBER GREENE

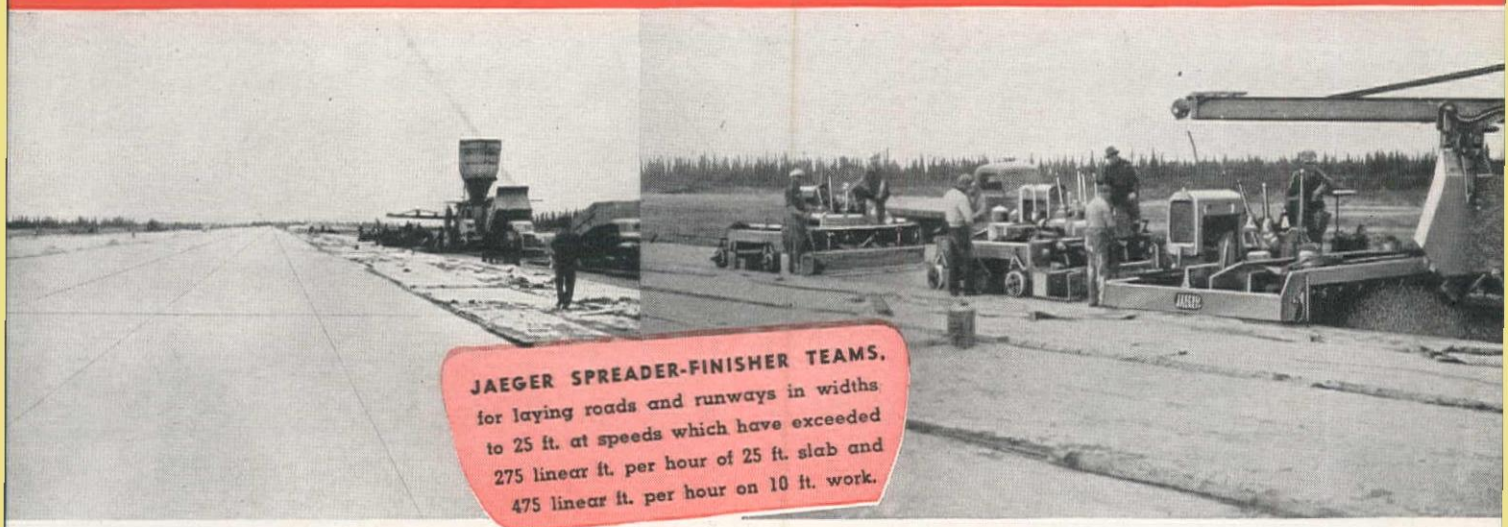
STANDARDIZED MATERIAL HANDLING MACHINES

AURORA ILLINOIS

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

On America's Greatest Northern Air Base

TWO JAEGER PAVING TEAMS Lay 11,500 Linear Ft. of 10 Ft. Slab in 12-Hour Shift!

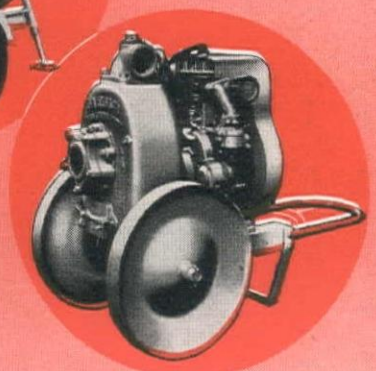


JAEGER SPREADER-FINISHER TEAMS, for laying roads and runways in widths to 25 ft. at speeds which have exceeded 275 linear ft. per hour of 25 ft. slab and 475 linear ft. per hour on 10 ft. work.

To build the latest stepping-stone to Europe, in a remote land without roads, McNamara Construction Co., Ltd., chose Jaeger Concrete Screw Spreaders and Jaeger Type "H" Finishers to team with two 34E pavers—worked 24 hours a day to complete 623,000 sq. yds. of 6" concrete runway in 10x100 ft. slabs—reached production rate as high as 13,000 sq. yds. (11,500 linear ft.) per 12-hour shift. Runways, which measure 200x6000 ft., already equal 53 miles of 20 ft. roadway—will constitute one of world's largest fields when extensions are completed.

All equipment, including complete machine shop and gravel plant, workmen, materials and supplies (except local aggregate) had to be brought in by ship thru submarine-endangered waters open to navigation less than half of the year—a testimonial to the difficulties of the operation, the efficiency of its organization and the dependability of the equipment selected.

JAEGER SPEEDLINE TRAILER MIXERS up to 14S size, are fastest to load and discharge—run smoother, quieter, longer because of machined steel drum tracks and enclosed, automotive-type transmission. Timken bearings, shock absorbers and balanced design for easy trailing and moving.



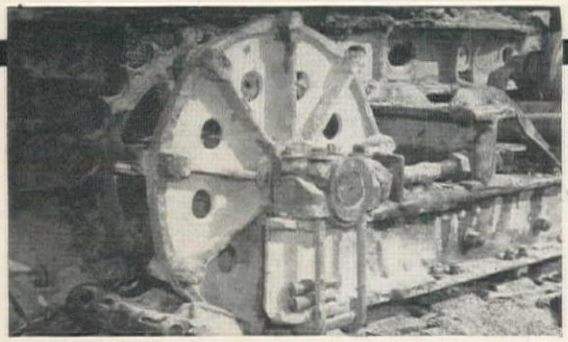
FOR HELP ON YOUR OWN PAVING, MIXING AND PUMPING PROBLEMS, CONSULT YOUR JAEGER DISTRIBUTOR: He offers you proved machines and methods, experience in job layout and equipment, knowledge of local conditions, complete stock of repair parts and service to keep your equipment rolling at today's fastest pace.

JAEGER "SURE-PRIME"—THE PUMPS THAT EXCEED THEIR PROMISES: The only pumps that, for years, have been individually tested and certified for vacuum, capacity and pressure and regularly exceed this guaranteed performance—with up to 5 times faster automatic priming, with high air and water capacity under adverse conditions, with thousands of extra hours of trouble-free service. Finest engineered pumps on the market—high pressure shell construction, replaceable liners, longest life seal (the only seal accessible for quick inspection) hi-head, hi-capacity impeller on oversize shaft that is direct driven and mounted in permanent alignment. Types for every job condition, 3000 to over 200,000 g. p. h.

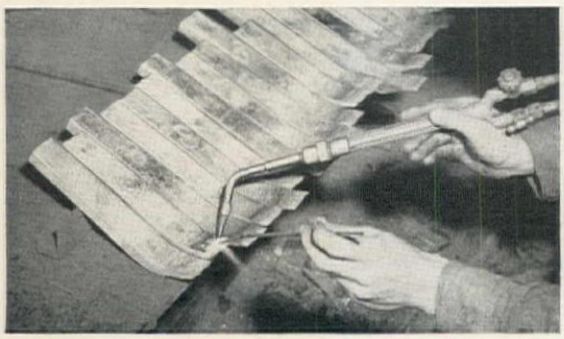
JAEGER EQUIPMENT DISTRIBUTED BY: Edward R. Bacon Co., San Francisco; Smith Booth Usher Co., Los Angeles; C. H. Jones Co., Salt Lake City; H. W. Moore Equip. Co., Denver; Smith Booth Usher Co., Phoenix, Ariz.; R. L. Harrison Co., Albuquerque, N. M.; A. H. Cox & Co., Seattle, Wash.; Wilson Equipment & Supply Co., Cheyenne, Wyo.; Nelson Equipment Co., Portland, Ore., Twin Falls, Idaho, Spokane, Wash.; Montana Powder & Equipment Co., Helena, Montana.

How to get *More Working Hours* from Construction Equipment

Stoody Hard-Facing Alloys Retard Wear, Prolong Equipment Life, Eliminate Replacement Delays



1 Driving tumblers from a 2½ yard shovel rebuilt with high carbon electrodes ordinarily last four months. The tumbler illustrated above which was rebuilt with high carbon electrodes then hard-faced with 3/16" Coated Stoody Self-Hardening has been in service more than a year.



3 To maintain one ordinary ditcher tooth for 30 days cost one construction company an average of 58c. The cost of maintaining a tooth hard-faced with 20-30 Acetylene Tube Borium for the same period is 19c.

2 The useful life of tractor rollers in one logging company was 90 days. Rebuilding rollers to their original size and shape with 3/16" Coated Stoody Self-Hardening as shown extended life to one year.

4 These hard-faced sheepsfoot tampers maintained regulation tamping area four times longer than those not protected. Cost of applying 3/16" Coated Stoody Self-Hardening was 60% of new tamp cost.

Stoody Alloys make similar savings on all types of wearing equipment. Free wall chart for welding departments describes and illustrates recommended procedures for prolonging equipment life. Send for your copy now.

STOODY COMPANY, 1136 W. SLAUSON AVE., WHITTIER, CALIFORNIA

STOODY COMPANY *Hard Facing Alloys*

How to dig V-ditches with LeTourneau ANGLEDOZERS

Another Time-Saving LeTourneau Method for Making Tractor Power Go Further

Sure, you can build V-ditches quickly and easily with LeTourneau Angledozers, just as so many other successful operators do when regular ditching machinery isn't handy or available. Here's how:

With Angledozer blade angled, make a short pass to get a windrow about 2 track lengths long. Then back-up and place one track on the windrow—this tilts the whole machine toward the bottom of the proposed V. Next tilt the blade corner to the low side, the extra tilt thus set up gives a deep digging action at the proposed V center and windrows the excavated material to form one side of the ditch.

Now place the track in the bottom of the cut and make a pass in the opposite direction. This shapes the second side of the V-ditch. To finish, clean up the loose material with a final pass. To widen and deepen, make additional passes.

Try this job-proved time and money-saving method with your LeTourneau Angledozer. Watch it make tractor power go further.

LeTourneau-"Caterpillar" Dealer Service Saves Tractor Power, Too

Your LeTourneau-"Caterpillar" dealer is completely equipped to rebuild tractors and engines and make repairs on all LeTourneau rigs. Well equipped machine shops and especially designed equipment and tools assure you better, faster repair work, thus less lost tractor time. Call him NOW. Ask him about Tournaweld R-W (Roller Weld) for repairing worn track rollers, rails, etc.

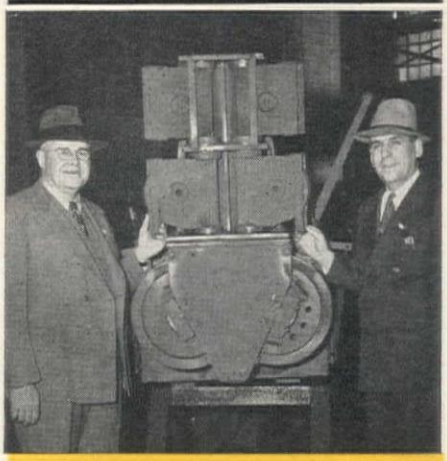
1. *Cutting first side of V-ditch. Note how material excavated by lower point of Angledozer blade rolls out under upper track, thus holds machine and blade to a constant cutting angle.*

2. *Cutting second side of V-ditch. Operator has turned around, leaves Angledozer blade tilted and angled, keeps tractor track in bottom of ditch.*

ARMY NAVY LETOURNEAU

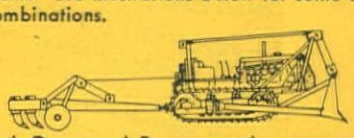
PEORIA, ILLINOIS • STOCKTON, CALIFORNIA

(Below) E. R. Galvin, general sales manager, congratulates Elmer Isgren, plant manager, on 30,000th LeTourneau Power Control Unit. That's more than any 4 other makes put together—proof by customer preference that successful earthmovers find LeTourneau PCU's keep men and tractors working profitably. They'll do the same for you.

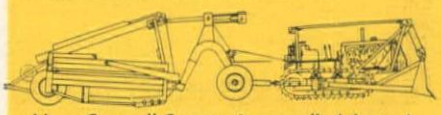


LeTourneau Power Control Units Enable You To Get Greater Use From Your Tractor Power

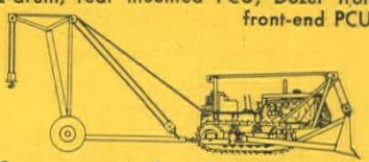
LeTourneau Dozers, like all LeTourneau Tools, are controlled by fast-acting cable operating through a Power Control Unit mounted on the tractor. Le Tourneau Power Control Units enable one man to operate both tractor and equipment from the tractor seat. They make it possible, too, for you to change your tractor from one tool to another to meet changing job requirements—see illustrations below for some of combinations.



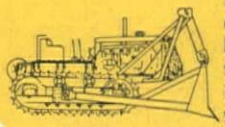
Both Dozer and Rooter can be operated from 2-drum, rear-mounted PCU.



Here Carryall Scraper is controlled through 2-drum, rear mounted PCU, Dozer from front-end PCU.



Crane operates from 2-drum; rear PCU Dozer from front-end unit in this combination.



Here front-end PCU operates Dozer, thus leaves rear of tractor free for mounting heavy-duty winch or for drawbar work.

WARTIME SERVICE FROM YOUR ALLIS-CHALMERS DEALER

1 PARTS ASSISTANCE — Information on availability of parts and how to obtain them.

2 PRIORITY ASSISTANCE — Who can get new equipment and how! Up-to-date information on latest regulations.

3 LIMITATION ORDERS — Interpretation of latest government limitation orders affecting construction equipment.

4 SUBCONTRACT INFORMATION — Frequently dealers possess information on subcontract opportunities.

5 REBUILDING FACILITIES—Enlarged, modern shop facilities to handle rebuilding with speed and efficiency.

6 SERVICE EDUCATION — Instructions on how to operate and service equipment correctly. Provides service school instructors.

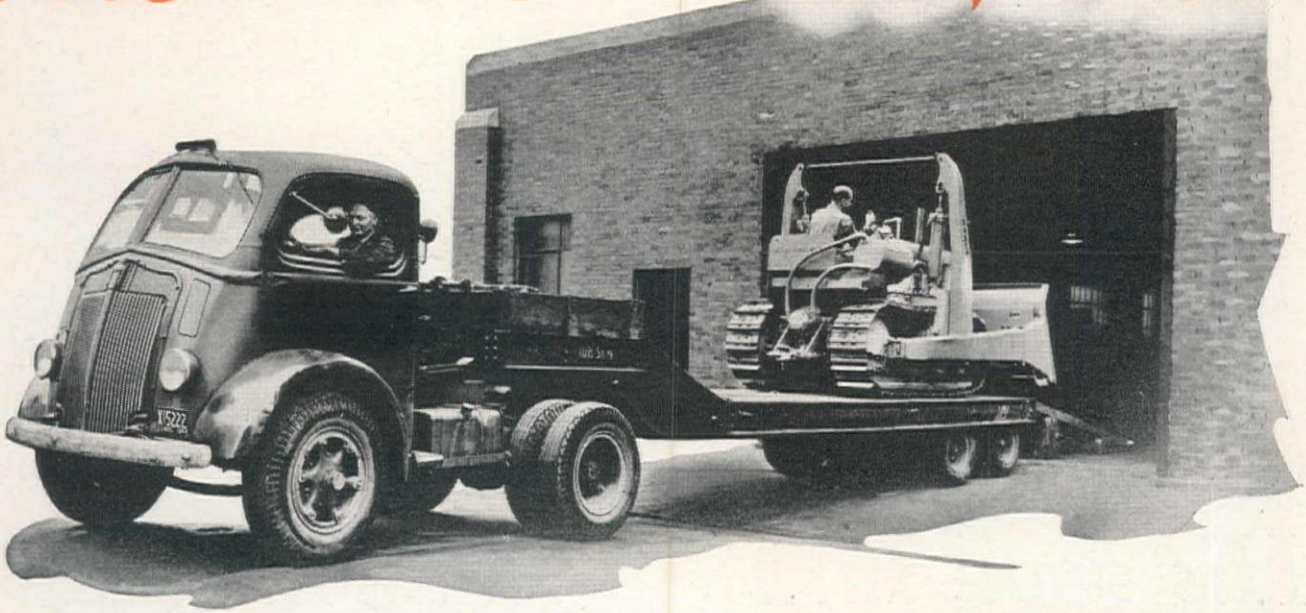
7 REPAIRS AND MAINTENANCE — Quick, efficient repairing by skilled, factory-trained mechanics, using the right tools and genuine parts.

8 USED EQUIPMENT — In some instances, good rebuilt construction equipment may be available.

9 RENTALS — Good used equipment may be available for temporary emergencies.

10 EQUIPMENT EXCHANGE — Information center on used equipment available in territory.

Better Service Plan



EQUIPMENT OWNERS FIND IT PAYS TO HAUL 'EM IN FOR REPAIRS

Here is a new service plan—of far more benefit to equipment owners. Instead of having dealer mechanics travel to the job to make repairs . . . it's proved to be much better, faster, more economical to haul your outfits to the dealer's shop. Working in comfort, with warm fingers, proper illumination and the right tools, dealer mechanics find they are able to do more justice to a job, and do it quicker. They have the supervision and expert help of the shop foreman — every problem is quickly solved. Parts go farther — worn out or broken sections are fixed up where possible... easily, quickly replaced where necessary. Special tools are available to speed the job — clean surroundings assure proper handling of delicate Diesel parts. In addition, the owner's operators who bring in the machines, work with the mechanics . . . thereby help cut the cost of the work and learn plenty about the care and maintenance of the outfits.

The cost of transporting the machines is surprisingly small . . . and usually they are back on the job sooner . . . ready to work longer. Find out for yourself how well you will like this shop plan. Next time your units need repairing . . . haul 'em into your Allis-Chalmers dealer. He's equipped to do your work right, fast and at bigger savings!

HOW THE SHOP PLAN IS WORKING OUT IN ONE TERRITORY!

"It is surprising how much better the customer has been satisfied and how little it costs to transport the tractor to and from our shop. We are turning out more tractors . . . do a better job . . . get better acquainted with the owners and operators," says Walling Tractor & Equipment Company, Allis-Chalmers dealer at Portland, Ore.

ARMY E NAVY

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE, U. S. A.

YOUR REX DISTRIBUTOR IS A GOOD MAN TO KNOW *these turbulent days—and any day. He specializes in finding tools and equipment for you—in getting you the right kind of help. And his shop is equipped to give you a first-class repair and rebuilding service.*

His good turn led to another job!

YOU know how it is on a paving job. You can lose your shirt in a hurry if your equipment isn't in shape to take advantage of every break in the weather.

And, man, I'd been having plenty of trouble on that big airport paving job at —— Field. Inexperienced help did the darndest things at the most unexpected times.

That's why my Rex Distributor came to the rescue. "Looks to me," he said, "that what you need is an experienced operator—a guy who has worked a job like this before. I think I know where I can find one for you."

He was as good as his word. Next day he drove up with a chap you could tell had been around a bit. With that new man on the job, things were different. He sure made things hum. In fact, we finished so far ahead of schedule we took on another job before frost. Seems to me as though these Rex Distributors are *always* going out of their way to help a fellow!

CHAIN BELT COMPANY OF MILWAUKEE

MIXERS • PUMPS • PAVERS • MOTO-MIXERS • PUMPCRETE

See your REX Distributor *first* for Rentals, Repairs, Rebuilding

Everywhere MARIONS Are Setting The Stage for Victory!

In open pit mines, digging raw materials for fighting tools . . . in quarries, gravel pits and on sand piles . . . on vast Army, Navy and Maritime construction projects . . . in shipbuilding yards . . . along cargo loading docks, MARIONS of every description are at work putting new confidence into the United Nations with every swing of the boom . . . bringing defeat ever closer to the enemy with every load it delivers. Yes, the powerful influence MARION machines are wielding in this war is helping to write a brilliant chapter of production and material handling accomplishments that will be recognized in history as one of the forerunners to Victory.

THE MARION STEAM SHOVEL CO., Marion, O., U.S.A.

MARION

SHOVELS · DRAGLINES · CLAMSHELLS

CRANES · PORTAL CRANES · WALKERS

WORKING FOR VICTORY: DIGGING — Coal • Magnesium Iron Ore • Copper Ore • Bauxite • Manganese • Nickel Molybdenum • Sand & Gravel • Clay

MATERIAL HANDLING — Shipbuilding and Cargo Loading

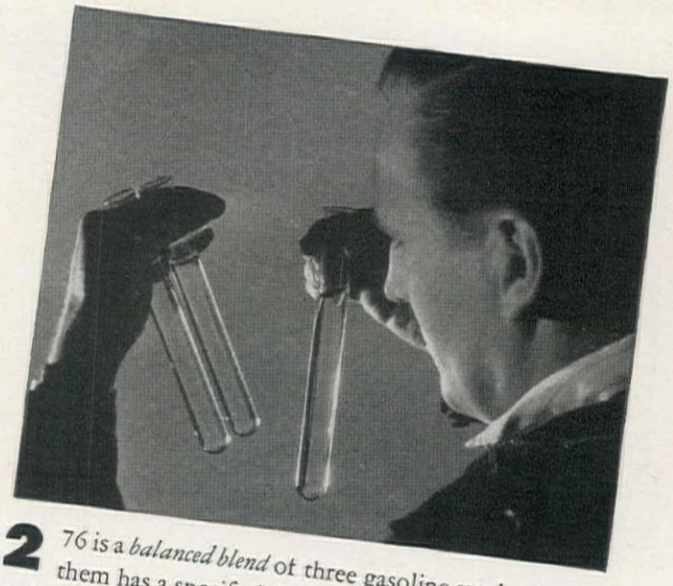
BUILDING — Airports, Ordnance Plants, Arsenals, Army Camps, Marine Bases, etc.

DISTRIBUTED BY: Brown-Bevis Equipment Co., 4900 Santa Fe Ave, Los Angeles, Calif.; The Marion Steam Shovel Co., 571 Howard St., San Francisco, Calif.; Edward R. Bacon Co., Folsom at 17th St., San Francisco, Calif.; Joseph O. Reed, Parklawn Apts., 2504 N. E. Hoyt St., Portland, Ore.; Walling Tractor and Equipment Corporation, 1033 S. E. Main St., Portland, Ore.

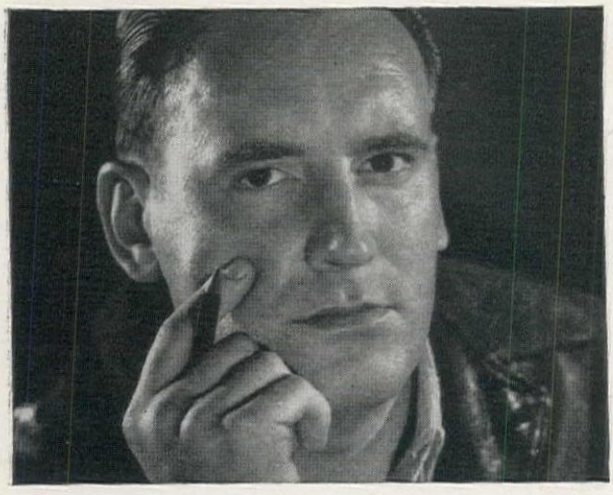
IN GASOLINE

BALANCE IS WHAT COUNTS!

1 The real secret of good gasoline is balance. Unless the stocks that go into gasolines are perfectly balanced and blended, some quality suffers. You get quick starting but a lot of knocks. You get smooth travel on the highway but hard starting. Or you get long mileage but no power.



2 76 is a *balanced blend* of three gasoline stocks. Each of them has a specific job to do. One gives easy starting and smooth acceleration. Another gives even, powerful performance on the road. The third gives high efficiency and long mileage. *And all these stocks are blended in exactly the right amounts so every quality is brought out to its fullest extent.*



3 In other words, when you sign on the dotted line for a supply of 76, you're getting a gasoline with a million dollars worth of research behind it. You're getting a motor fuel that has been tested in all kinds of equipment, in all kinds of climates, under all kinds of conditions. And in these days, a product like that is well worth looking into.

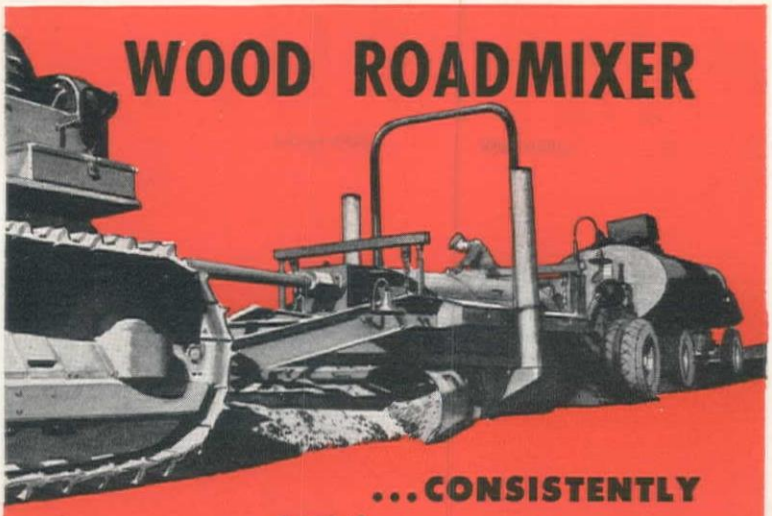
4 So before you get busy on something else, give your Union Oil Resident Manager a ring. Have him deliver a supply of 76 tomorrow. It's a mighty good way to get rid of those gasoline worries.

OIL IS AMMUNITION
—USE IT WISELY

UNION OIL COMPANY

76

WOOD ROADMIXER



...CONSISTENTLY DELIVERS *250* TONS PER HOUR OF HIGHEST QUALITY MIXED AGGREGATES

——At less than blade-mix costs!

Here is speed and *quality* in pavement construction at lowest cost! Wood Roadmixer, by employing the traveling plant method of pavement construction, eliminates excessive, costly and complicated equipment.

Two men can operate the Roadmixer, tractor and binder supply truck. This streamlined operation produces 250 tons per hour, or 2,000 tons per 8-hour day of top quality paving. And the cost is far less than time-consuming, inaccurate blading—and other ordinary methods of pavement construction.

Choose your own paving job, under the toughest possible conditions, and use a Wood Roadmixer. You'll get a better job, faster and at less cost than by any other method of pavement construction you have ever used.

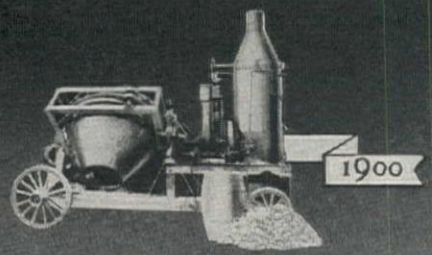
Write for detailed and illustrated Wood Roadmixer bulletin, "The Fastest Method of Low-Cost Paving."

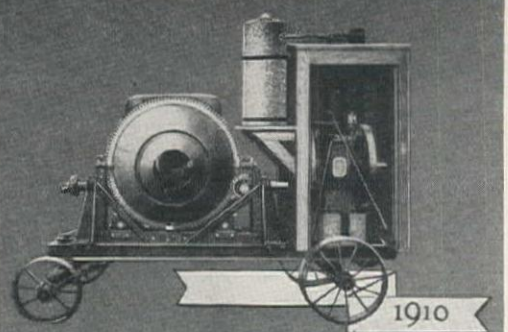
WOOD ROADMIXER

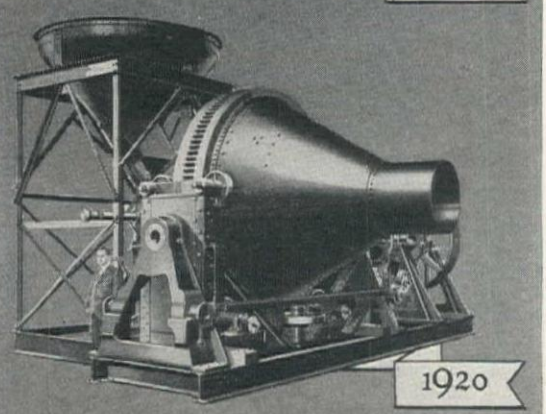
Wood Manufacturing Co. • 816 West 5th St., Los Angeles, California

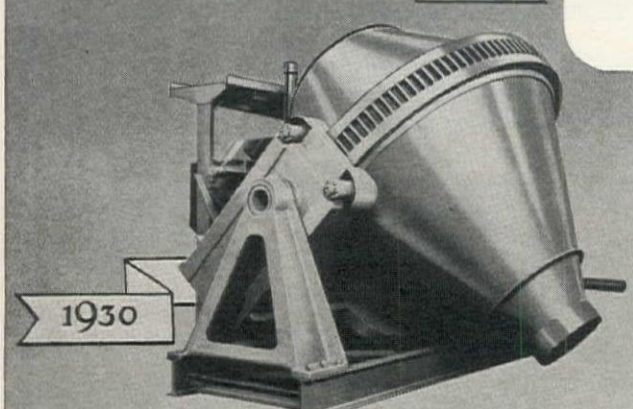
CONCRETE MIXERS by SMITH

THE T. L. SMITH CO. MILWAUKEE, U.S.A.









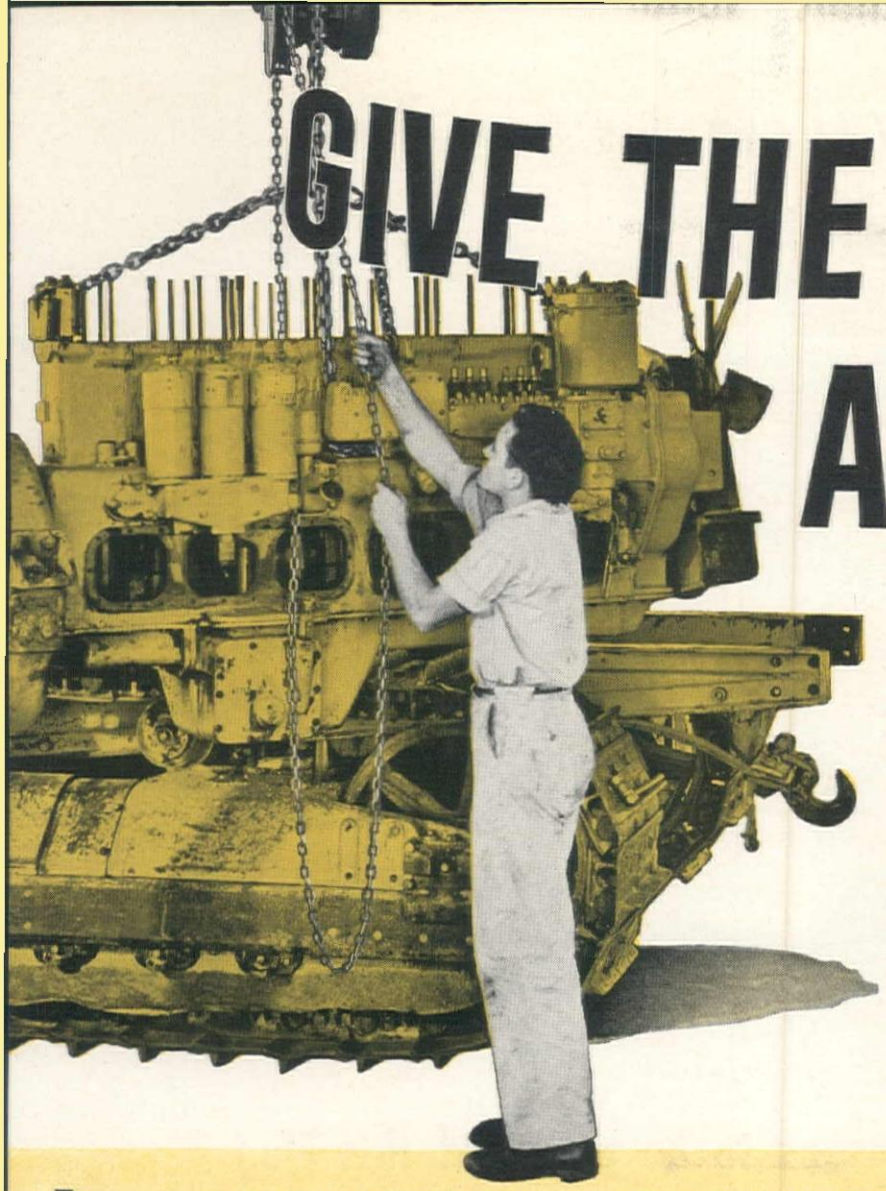
Every Year they become BETTER and BETTER

43 years ago, the late Mr. Thomas L. Smith designed the first duo-cone drum, tilting type, concrete mixer. Judged by today's standards it was a crude machine, nevertheless, the forerunner of the famous Smith line of concrete mixers that has made history in the construction industry. Every year, improvements and refinements were added that resulted in greater convenience, speed and efficiency. Today, Smith is the acknowledged leader in the industry. Smith Mixers have definitely proven their worth, over and over again, on the world's greatest concrete projects: *Boulder Dam, Marshall-Ford Dam, Cherokee Dam, Watts Bar Dam, San Francisco-Oakland Bridge, Norris Dam, Muscle Shoals, Panama Canal* and many other world-famous projects. All sizes available, up to 4-yards per batch.

The T. L. SMITH COMPANY
2871 North 32nd Street, Milwaukee, Wis., U. S. A.

Famous for Performance on the WORLD'S GREATEST PROJECTS

Distributed by: Garfield & Co., San Francisco; Le Roi-Rix Machinery Co., Los Angeles; The Lang Company, Salt Lake City; The Sawtooth Company, Boise; Clyde Equipment Co., Portland & Seattle; The O. S. Stapley Co., Phoenix; F. W. McCoy Co., Denver; Francis Wagner Co., El Paso.



GIVE THE ENGINE A BREAK!

WHATEVER type of "Caterpillar" Diesel equipment you operate, it's powered by a great engine. Thousands of veteran "Caterpillar" units are doing a heroic job in these trying times—carrying on with sturdy efficiency long after their ordinary life span.

It's the many *extra* qualities built into all "Caterpillar" Diesel Engines that are proving their worth today. They're simple, dependable, as nearly free from operating adjustments on the job as possible. But if you expect to get the utmost out of your engine, it's up to you to do *your* part.

FIRST OF ALL, YOU SHOULD READ THE INSTRUCTION BOOK AND RE-READ IT

Lubrication is important to engine life. Use the correct grade of oil, and be sure to change the oil and filters at proper intervals, as indicated by the hour-meter.

Don't forget to keep the fan belt properly adjusted.

See that the cooling system is tight, and put in enough anti-freeze to give positive protection in winter.

Keep the air-cleaner clean, and remember it needs more attention if dust conditions are bad.

Keep the clutch properly adjusted to avoid slippage, and don't overload the machine oftener than is absolutely necessary.

When repairs or special adjustments are needed, your "Caterpillar" dealer is ready day or night to help keep your engine working. He is equipped for every type of service.

He'll install new rings or recut piston ring grooves and put in wider rings if grooves are badly worn.

He'll etch cylinder liners, removing gum and glaze.

He'll replace bearings when they are worn, and he is equipped to recondition a worn crankshaft and fit it with new bearings, saving many pounds of war-needed metal.

Have him test your fuel injection system to see if it is functioning properly.

The "Caterpillar" dealer is the best friend your "Caterpillar" equipment has. Wartime conservation of power and materials is his job and he's doing it well. You can count on his sound advice and reliable service, now and at all times.

CATERPILLAR DIESEL

REG. U.S. PAT. OFF.

CATERPILLAR TRACTOR CO. • SAN LEANDRO, CALIF. • PEORIA, ILL.

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

We have <u>two</u> reasons to be proud of this Flag

First, of course, we are proud of the Army-Navy "E" flag because it is an award to the 3,000 employees of our Richmond refinery. We have long known that their energy, devotion and skill merit the highest praise.

The other reason is that this flag is a harbinger of better days to come, when we will take pride in offering to industry the fruits of Richmond's tremendous war effort.

Today we can only hint at the giant strides our petroleum research and production have made. We cannot publish the specifications of a host of new products, nor the story of how old products have been sensationally improved. We cannot describe the system by which these products are distributed on a world-wide scale.

But we can promise you that, when these facts become known, they will open new horizons for American businessmen and technicians in many fields. They will prove once again that "know-how" can turn yesterday's impossibilities into tomorrow's accomplishments.

In the meantime, the Richmond refinery and all of Standard of California are living up to the "E" flag, helping bring the inevitable victory nearer.

STANDARD OIL COMPANY OF CALIFORNIA

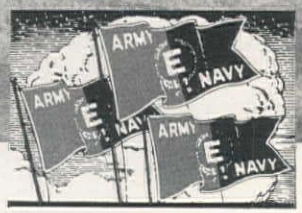
RPM DELO IS USED IN U. S. NAVY DIESELS First used in submarines, RPM DELO performed so well that it is now also used to lubricate high-speed Diesels in the Navy's mine sweepers, sub chasers, landing barges, patrol boats and ocean-going tugs. In all these vessels it is licking some of the toughest lubricating problems in the world. RPM DELO is typical of Standard's development of petroleum products for war.

Get extra performance with Standard Diesel Fuel

100% distilled! Power-packed Standard Diesel Fuel is "vapor-cleaned" for long injector and fuel pump life. Carefully controlled ignition qualities and other characteristics provide more complete combustion. Use it — get extra performance for your money.

A ROUND TRIP TO TOKYO *Every Week!*

FLYING FORTRESS



TH THE FUEL SAVED BY DRILL-MORE REGULATORS ON Ingersoll-Rand MOBIL-AIR COMPRESSORS

The patented DRILL-MORE Multi-Speed Regulator automatically selects the slowest and most efficient of three working speeds that will maintain the required air pressure. It alone saves up to 30% in fuel, depending upon the load factor. This is so because it eliminates most of the usual idling periods which waste gasoline, and because the average working speed of the compressor and engine is slower and more efficient. Wear-and-tear is reduced . . . the machine lasts longer.

Because of this regulator, MOBIL-AIR Compressors maintain more uniform and higher average air pressures. As a result, air tools operate as much as 15% faster than the same tools used with conventional portables.

★ ★ ★

Here are our figures . . . To be ultra-conservative, assume that only ⅓ of all MOBIL-AIR units now in service are being used during any one day . . . at an average of ¾ load . . . about 6 hours a day, even though many units operate 24 hr daily. Although sizes range from 105 to 500 cfm, assume 160 cfm as an average size, which consumes about 2¼ gal of gasoline per hr at ¾ load.

With a 15% *average saving* in fuel attributable to the Drill-More Regulator alone, the weekly fuel saving of MOBIL-AIR units actually operating would be 22,000 gallons.

If someone donated enough gasoline to send a Flying Fortress from Seattle to Tokyo and back every week, he would be heralded as a great patriot. Yet every week, that same amount of fuel, roughly speaking, is actually being saved by a small mechanism—we call it the DRILL-MORE Regulator—on MOBIL-AIR compressors now operating throughout the United States.

The DRILL-MORE Regulator is *not essential* on a portable compressor. Tens of thousands of old machines never had it . . . hundreds of other portables being built today don't have it. There never was such a device until Ingersoll-Rand developed and patented it a short time ago. Yet the DRILL-MORE Multi-Speed Regulator is *just one* of the many refinements included in the line of MOBIL-AIR compressors which Ingersoll-Rand introduced in 1941 . . . all at no increase in selling price. Since the first I-R portable compressors in 1902, Ingersoll-Rand has always been first with new trends, and has always insisted on producing the best portable on the market.

2-222

Ingersoll-Rand

11 BROADWAY, NEW YORK, N.Y.

Just What You Need for PAVING BREAKING

C7 in action

WHATEVER your requirements, there is a Cleveland Paving Breaker exactly suited to the job. The 80 lb. C7 is the right tool for average work—two C7's run from a No. 85 compressor. For heavier work, use the C9; it is 2 lbs. heavier, but uses no more air. C9 is a slugger that licks the toughest, reinforced concrete. For light work, trimming, etc., try the C10, the little fellow with the big wallop. Three C10's run from a No. 85 compressor. Model C11 is the 58-pound machine with the long stroke and the heavy "slugging" blow—a favorite wherever used. Extremely economical as to air consumption.

Among accessories you can't beat "Clevaloy' chisels, moils and miscellaneous paving breaker tools. Try the 14" narrow chisels, they cost no more than moils, but cut faster. Then specify tough, durable Cleveland "Veribest" air hose. Finally, connect it with Cleveland quick-acting Type "A" hose couplings, and you are all set for the toughest paving breaker job.

Ask for Bulletin 128 on Cleveland Paving Breakers

WESTERN BRANCHES

BERKELEY, CALIFORNIA
572 Santa Barbara Road

SALT LAKE CITY, UTAH
65 West Fourth South St.

WALLACE, IDAHO
515 Bank Street

EL PASO, TEXAS
1225 Texas Street

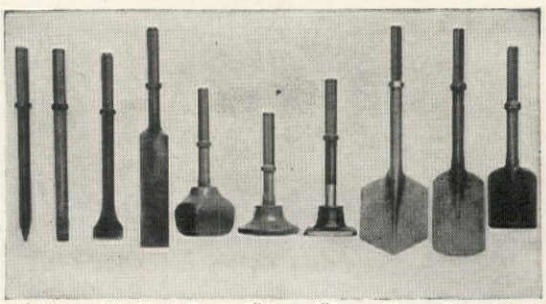
BUTTE, MONTANA
41 East Broadway

CALIFORNIA DISTRIBUTORS

LE ROI-RIX MACHINERY COMPANY
3817 Santa Fe Avenue, Los Angeles

THE RIX COMPANY, INCORPORATED
582 - 6th Street, San Francisco

BUY U. S. WAR BONDS AND STAMPS



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

THE CLEVELAND ROCK DRILL COMPANY

Subsidiary of The Cleveland Pneumatic Tool Company

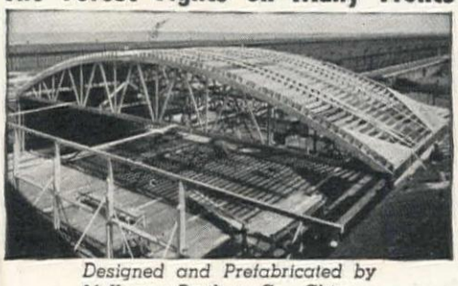
CABLE ADDRESS: "ROCKDRILL" • CLEVELAND, OHIO

LEADERS IN DRILLING EQUIPMENT

BIG HAUL
FOR UNCLE SAM

Selectively cut under scientific woods management, this forest harvest goes to war — leaving the vigorous younger growth for continuous harvests to come. Harvesting matured trees accelerates healthy forest growth.

The Forest Fights on Many Fronts



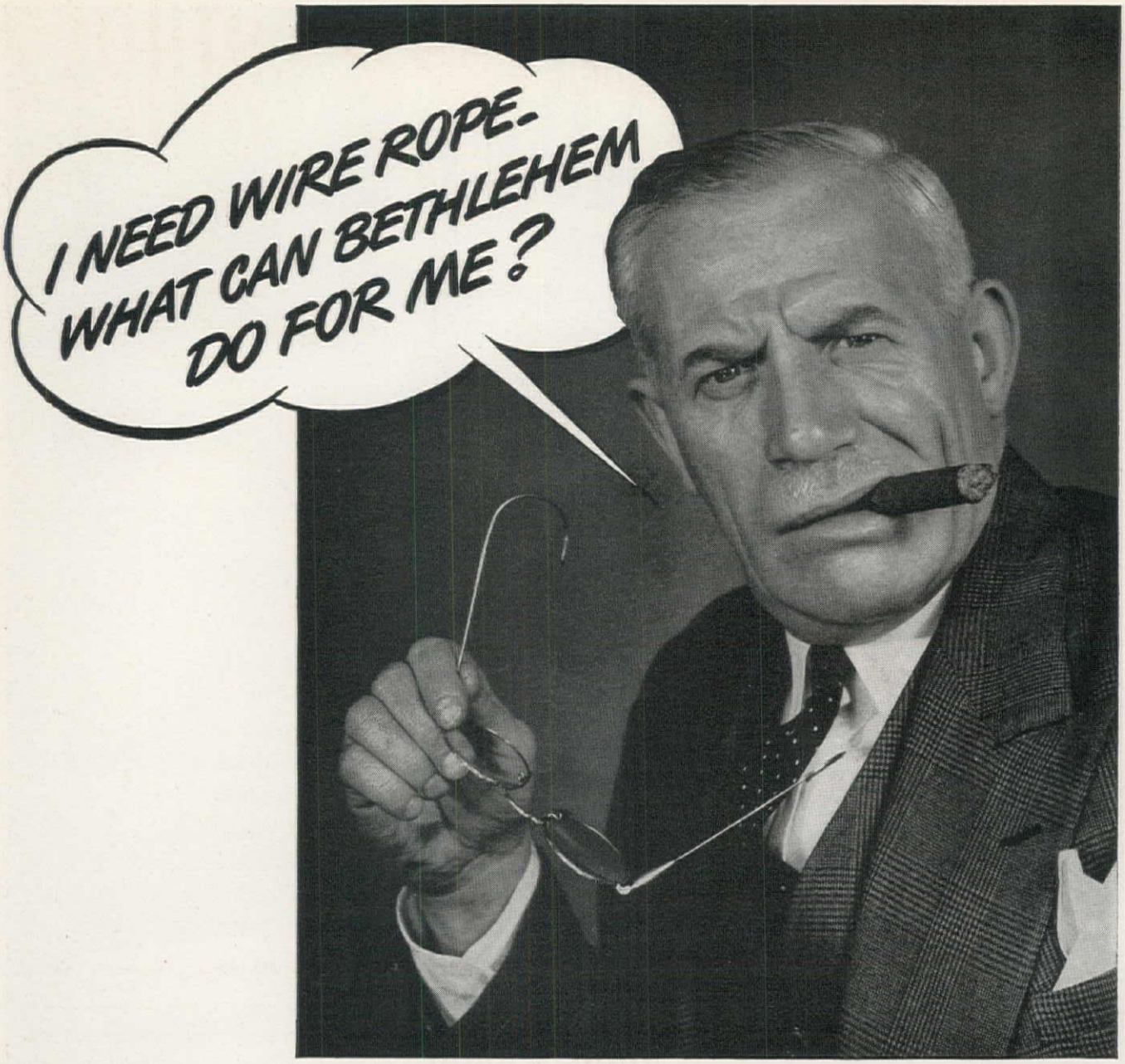
Designed and Prefabricated by McKeown Brothers Co., Chicago

And on the home front, wood has taken over metal's peacetime tasks in thousands of heavy timber structures. This 111-foot-span municipal pier in Chicago is a typical example of how the TECO-RING Connector System has made it possible to employ timber as a heavy engineering material . . . and to meet fully all requirements of speed, strength and economy. *Write for our literature today.*

The TECO Ring Connector spreads the load on a timber joint over practically the entire cross-section of the wood . . . brings the full structural strength of lumber into play.

TIMBER ENGINEERING CO. OF CALIF.
85 Second Street, San Francisco, Calif.

TIMBER ENGINEERING COMPANY
Washington, D. C. Portland, Oregon



Bethlehem Wire-Rope distributors can supply you with a full range of wire rope, either from stock, or on prompt mill order. Bethlehem's mills are making rope at top speed, night and day. We produce a size, grade of steel, construction and type of center to handle every job in the contracting field.

Due to war emergencies—unexpected red-rush orders for military wire ropes—we can't promise ahead of time just how fast we can deliver. We *can* say, however, that we'll do our level best on every order. If you're working on a war contract or some war-related job, you can expect to get your rope within your normal time requirements.

There are more than 260 Bethlehem Wire-Rope distributors in key locations throughout the United States. They know wire rope thoroughly, and are always willing and able to help contractors. Why not give your local Bethlehem Wire-Rope distributor a ring? He'll be glad to hear from you . . . to help you in any way he can.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY

Anybody Worried about the FUTURE?

WITH THE WAR'S DEMAND for speed in construction and production, every vestige of formality in design, every adherence to doing the job in the same old way, has disappeared. Large scale projects have eliminated tradition and have opened the eyes of engineers, designers and industrialists to new and better products and methods of production, *en masse*. From here on out, Americans will not be satisfied to return to old, stereotyped procedures of building or of manufacture.

With our own eyes we can see what titanic projects will do for the future of America. In building heavy, power transmission lines for Basic Magnesium, Bonneville, Grand Coulee, Fort Peck, and Boulder Dam, we can visualize the new cities and industries that will be created through plentiful hydro-electric power, and the hundreds of thousands of new families who will farm the fertile, irrigated desert. In helping to construct overnight, new cities and military camps, we can see the necessity for building future roads, utilities and housing. Construction of complete airport lighting systems has given us the definite vision of a future air-borne, highly commercial America.

This is a BIG war and in fighting it, we have been building a large industrial backlog for the future—an assurance that American construction and production genius will make this country the most pleasantly livable place on the globe. No, we aren't worried about America's future.

Today, the 1700 men and women of the Ziebarth organization are putting in every bit of their energy and time into the winning of the war. They are doing it in the same manner that they have always applied themselves to Ziebarth Construction jobs—"Get the job done—ahead of schedule!"

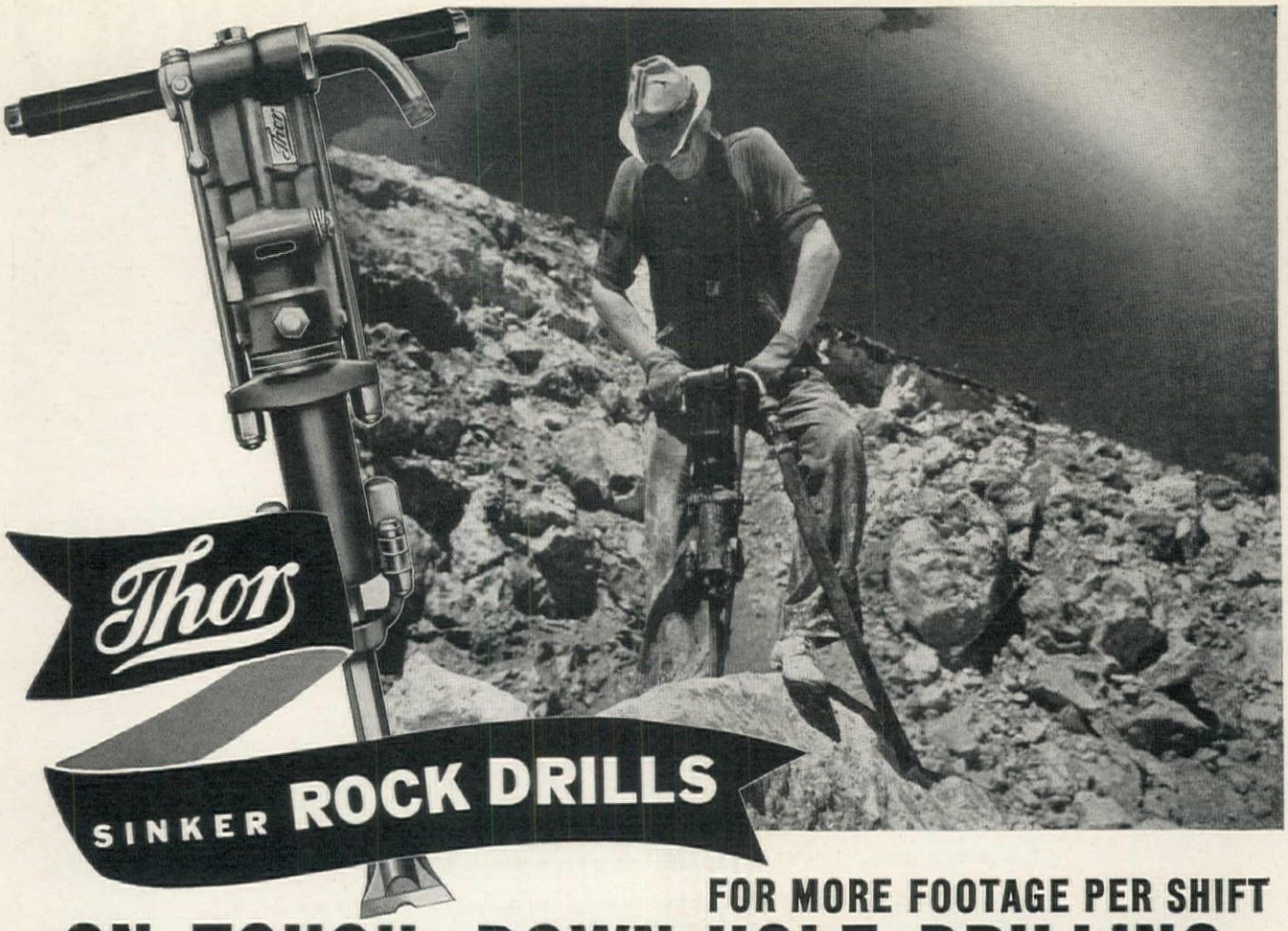
For *your* heavy construction, now or in the future, contact Ziebarth Construction.

"The Story of Ziebarth Construction" tells executives how this leading contractor can help them. Gratis.

ZIEBARTH

CONSTRUCTION

FRITZ ZIEBARTH · 818 WEST ESTHER STREET, LONG BEACH, CALIFORNIA
RENO, NEVADA



FOR MORE FOOTAGE PER SHIFT

ON TOUGH, DOWN-HOLE DRILLING

Thor Sinker Rock Drills in every weight class have an *extra* margin of power that means the difference between ordinary and *outstanding* footage on down-hole rock drilling. They hit hard and fast because they actually use most effectively ALL of the air that enters the machines. Basic reason for this is the patented Thor short-travel, tubular valve (with a controlled tolerance of .00025") that measures and admits exactly the right amount of air for peak operating efficiency.

Positive Control — High Average Drilling Speed

Thor's precision valve action, *plus* a quick-acting throttle valve, gives drill runners positive control for all operating conditions. This means powerful rotation for hole starting with quick acceleration to top speed for drilling and plenty of air for clean hole blowing. Results — high average drilling speed and *more* holes per shift.

Easy Holding — Sturdy Construction

Just as Thor's principle of "Measured Air" assures full efficiency and control, so also does it provide easy handling. With every stroke powered by the same amount of air, operation is smooth and uniform. Naturally, minimum vibration contributes to longer life, as do the air-cushioned retainer, automatic lubrication and drop-forged steel construction. Today, on scores of road building, shaft-sinking, tunnelling and other projects Thor Rock Drills are delivering more footage per shift.

For All Your Portable Tool Needs — **ROCK DRILLS, PAVING BREAKERS, SHEETING DRIVERS, CLAY DIGGERS, BACK FILL TAMPERS, SPIKE DRIVERS, CONCRETE SURFACERS, SAWS, HAMMERS, DRILL STEELS, DETACHABLE BITS, HOSE AND HOSE FITTINGS**

Thor *Portable Pneumatic and Electric Tools*

INDEPENDENT PNEUMATIC TOOL COMPANY

600 W. JACKSON BOULEVARD, CHICAGO, ILL.

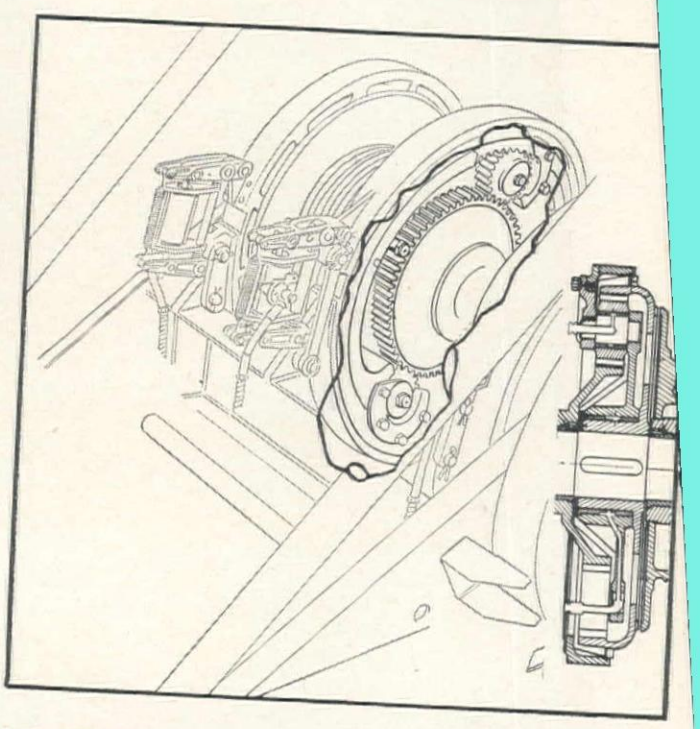
Branches in Principal Cities

A THOR SINKER ROCK DRILL FOR EVERY DRILLING JOB

7 standard models for light, medium or heavy duty work in the most popular weight classes. Other types available for special applications.

MODEL NO.	TYPE OF SERVICE	WEIGHT CLASS
38	Light Duty	45 Lb.
39	Auger Drill	45 Lb.
70 Series	Medium Duty	55 Lb.
85-B	Heavy Duty	80 Lb.

P&H



HOW TO LUBRICATE *your main drum planetary*

Keep your machines at peak efficiency. Avoid the need for hard-to-get replacement parts! Start *now* to observe a few simple precautions.

To help you, we've prepared a new Wartime Service Bulletin. This one shows how to properly lubricate the main drum planetary on your P&H Shovel, Crane or Dragline. There's a chart that's easy to follow. Instructions are simple and clear. Use it to insure proper and thorough lubrication of this vital mechanism at all times. This Bulletin will be sent free to any P&H owner or operator.

WRITE FOR FOLDER, FORM NO. D-49

Wartime maintenance is cut to a minimum with these P&H advantages:

ROLLED ALLOY STEEL CONSTRUCTION—all welded, combines toughness with greater rigidity.

TRUE TRACTOR TYPE CRAWLERS put an end to old traction troubles.

P&H HYDRAULIC CONTROL—easier on both machine and operator; more positive.

ARMY E NAVY

A new star has been added to P&H's award for excellence in war production.

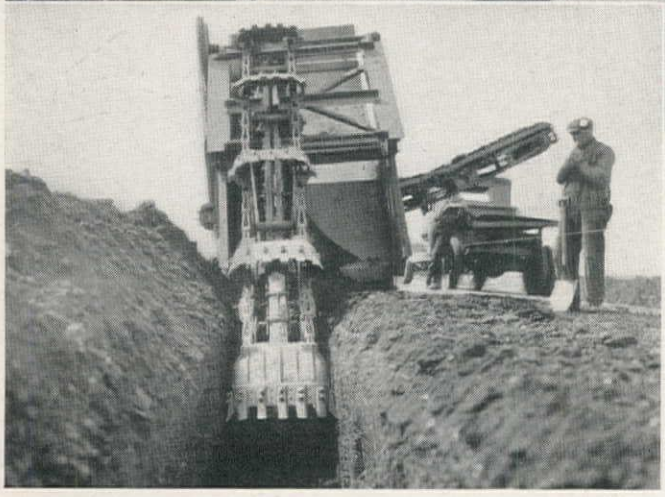
Make War on Wear With Proper Care

General Offices:
4490 West National Avenue, Milwaukee, Wisconsin

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

HARNISCHFEGER CORPORATION
82 Beale Street, San Francisco, Calif.
Portland, Oregon: Loggers & Contractors Machinery Co. Reno, Nevada: R. D. Jenkins & Son. Willows, Calif.: Willow Motor Sales Co. Albuquerque, New Mexico: Mr. Floyd Ames. Great Falls, Montana: Midland Implement Co. Prescott, Arizona: Arizona Mining Supply Co. Napa, California: Berglund Tractor & Equipment Co. Salt Lake City, Utah: National Equipment Co., Seattle, Washington: Glenn Carrington & Co. Spokane, Washington: F. M. Viles & Co. Redding, California: Lowry Tractor & Equipment Co.

PARSONS



● *The offset boom feature makes operations between bank and pavement elementary. The heavy section alloy steel buckets with drop forge alloy steel teeth stand up remarkably well.*

TRENCHERS Quickly House Productioneers

With a Parsons Trencher, one machine covers the entire project...yes, lateral and service lines alike. That's why Parsons gets the important housing jobs. Trenches must be dug faster, because our vast army of laborers to industry need their defense homes. Furthermore, these trenches for drainage and other service facilities must be completed prior to building the homes. With the speed and rigidness for which Parsons is known, their trenchers can accept these assignments throughout the world, in any climate ... hot or cold, in any soils from .... clay or shale ... to loam or gumbo. With a speed variation unequalled, Parsons Trenchers deliver greater output plus quality work. Parsons' speed can do more work, and Parsons' quality equipment lasts longer. See your Parsons' dealer today or write him now for detailed information.

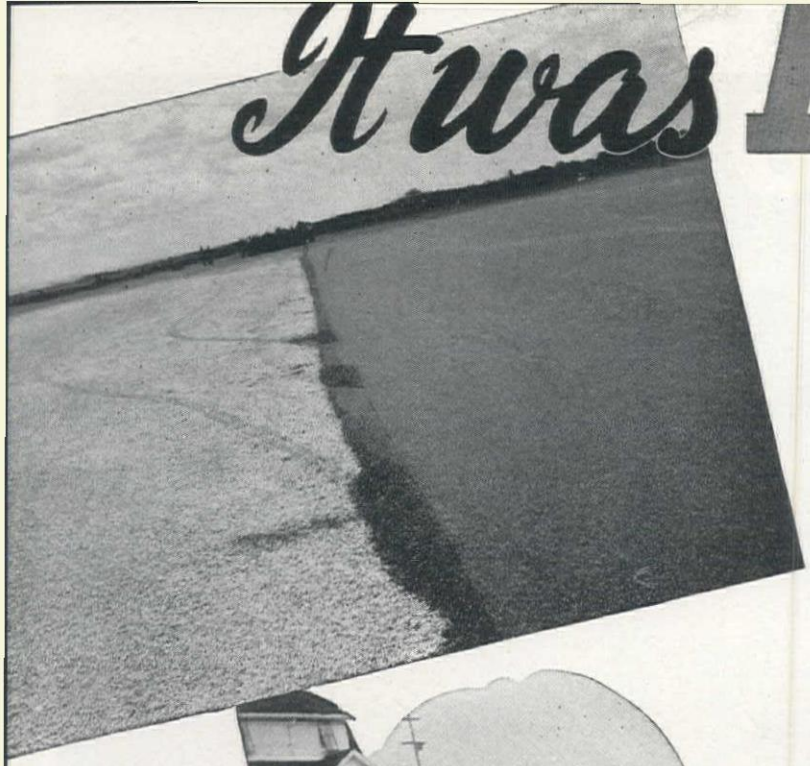
THE PARSONS COMPANY · NEWTON, IOWA

TRENCHING EQUIPMENT

PARSONS

It was ADNUN

. . . that introduced LEVELING WITHOUT FORMS



Always rolls out smooth as Silk

Built by the Builders of MULTIFOOTE CONCRETE PAVERS

WELL over ten years ago and six years before any other black top paver had been put on the market, the Foote Company developed "Continuous Course Correction" and "leveling without forms." To date no one has improved on this method of correcting inequalities from the standpoint of smoothness of surface, or simplicity and ruggedness of machine design.

Adnun "Continuous Course Correction" corrects the inequalities and irregularities with a minimum of rough grade preparation and without the bringing up of excessive fats.

In planning for the future remember this Adnun advantage. We'll be glad to give you further details.

THE FOOTE COMPANY, INC., Nunda, N.Y.

The World's Largest Exclusive Manufacturers of Concrete and Black Top Pavers

ADNUN

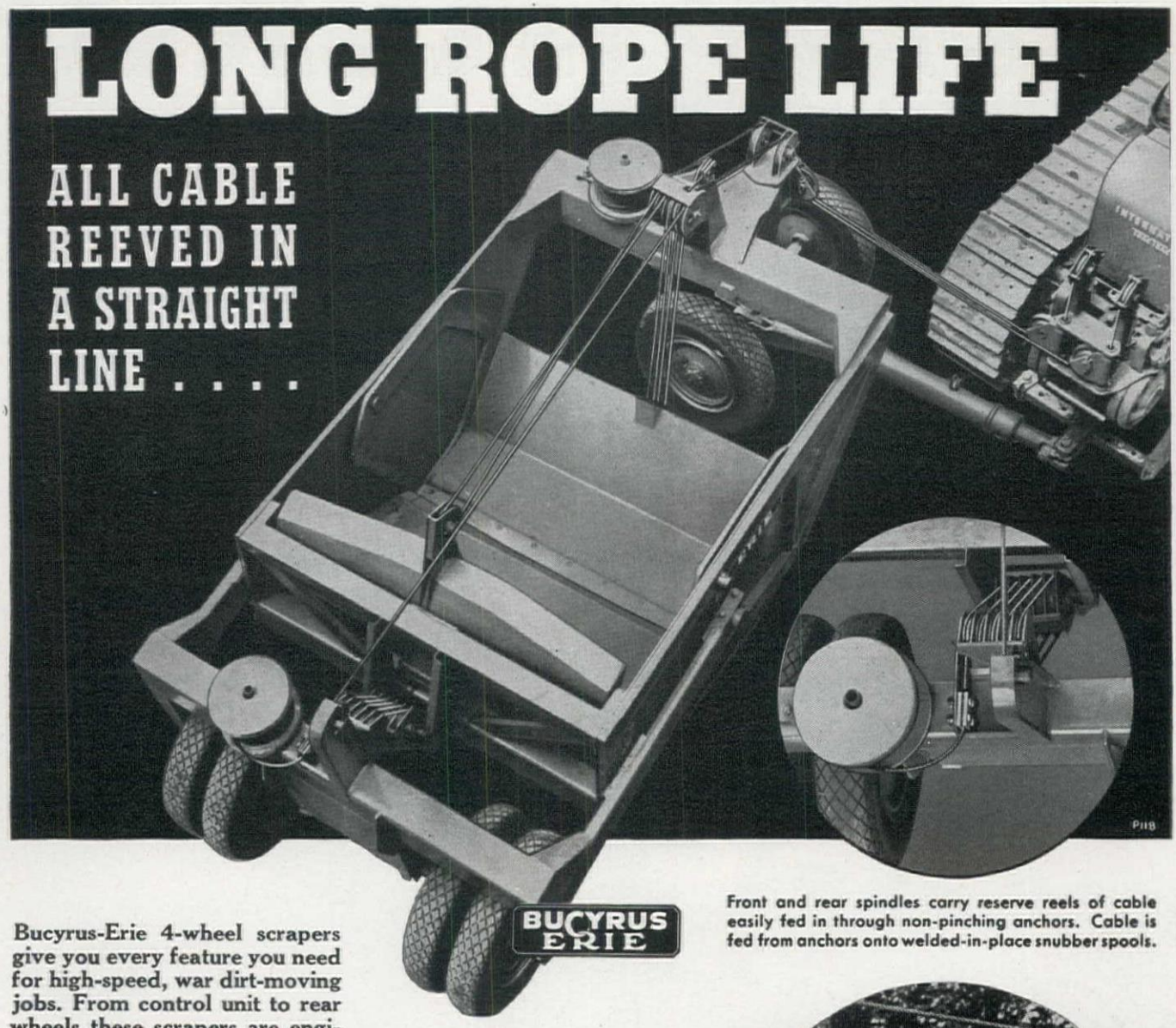
TRADE MARK REGISTERED

BLACK TOP PAVER

WITH CONTINUOUS COURSE CORRECTION

LONG ROPE LIFE

ALL CABLE REEVED IN A STRAIGHT LINE . . . .



Front and rear spindles carry reserve reels of cable easily fed in through non-pinching anchors. Cable is fed from anchors onto welded-in-place snubber spools.

Bucyrus-Erie 4-wheel scrapers give you every feature you need for high-speed, war dirt-moving jobs. From control unit to rear wheels these scrapers are engineered to keep operating efficiently over the longest possible period. There is rope life for instance:

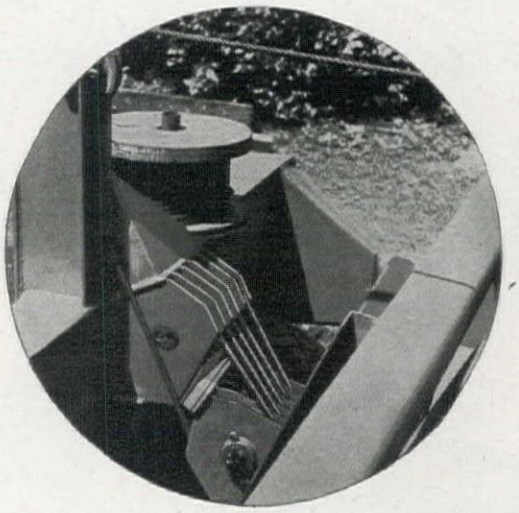
All cable is reeved so that there are no side bends, no damaging twists, and only a minimum number of reverse bends.

The sheaves are big; they're all vertical with horizontal axes; they're mounted on easy-rolling anti-friction bearings; on each model they're all the same size and interchangeable.

Self-aligning fairleads on scrapers and control unit prevent fouling between the unit and scraper and eliminate lateral or vertical cable distortion.

Wear occurs within a few feet of the control unit, where the cable is easy to watch, and where worn cable can easily and economically be removed.

Bucyrus-Erie 4-wheel scrapers are easy on cable and keep rope maintenance at a minimum. This is one of the many ways in which they will increase output to meet today's demands. Bucyrus-Erie Company, South Milwaukee, Wisconsin, U. S. A.



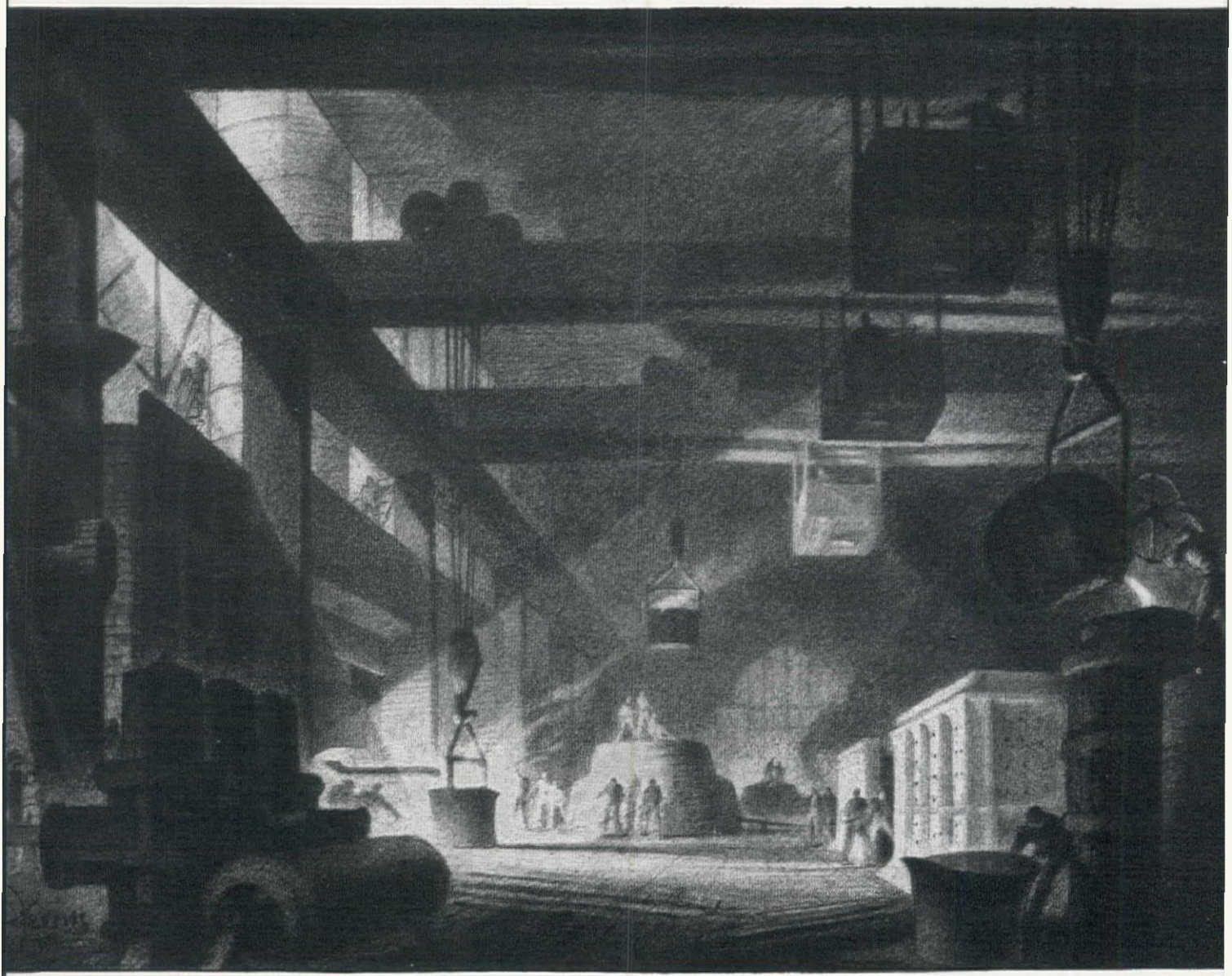
A friction cushion between the rear tackle blocks provides for a slight overrun of the cable after the blocks are in contact, eliminating shock strains in the cable resulting from block to block contact.

BUCYRUS ERIE TRACTOR EQUIPMENT

SEE YOUR INTERNATIONAL TRACTRACTOR DISTRIBUTOR

Pipe founders plus

You may know us as America's largest producer of cast iron pipe but not be aware that we have exceptional facilities to cast and completely machine special castings in accordance with engineers' designs and specifications. Many of them, now — machine tool, marine engine and dry dock castings—are being made for the furtherance of the war effort. Our special castings foundries, and a specialized plant for the manufacture of fittings, are equipped to meet unusual industrial requirements, particularly in the process industries, as well as in the water supply, gas and sewerage fields. Our technical and laboratory staffs are experienced and resourceful. We invite you to take up with us any problems you may have in connection with the design of pipe, fittings or special castings for present or post-war requirements.

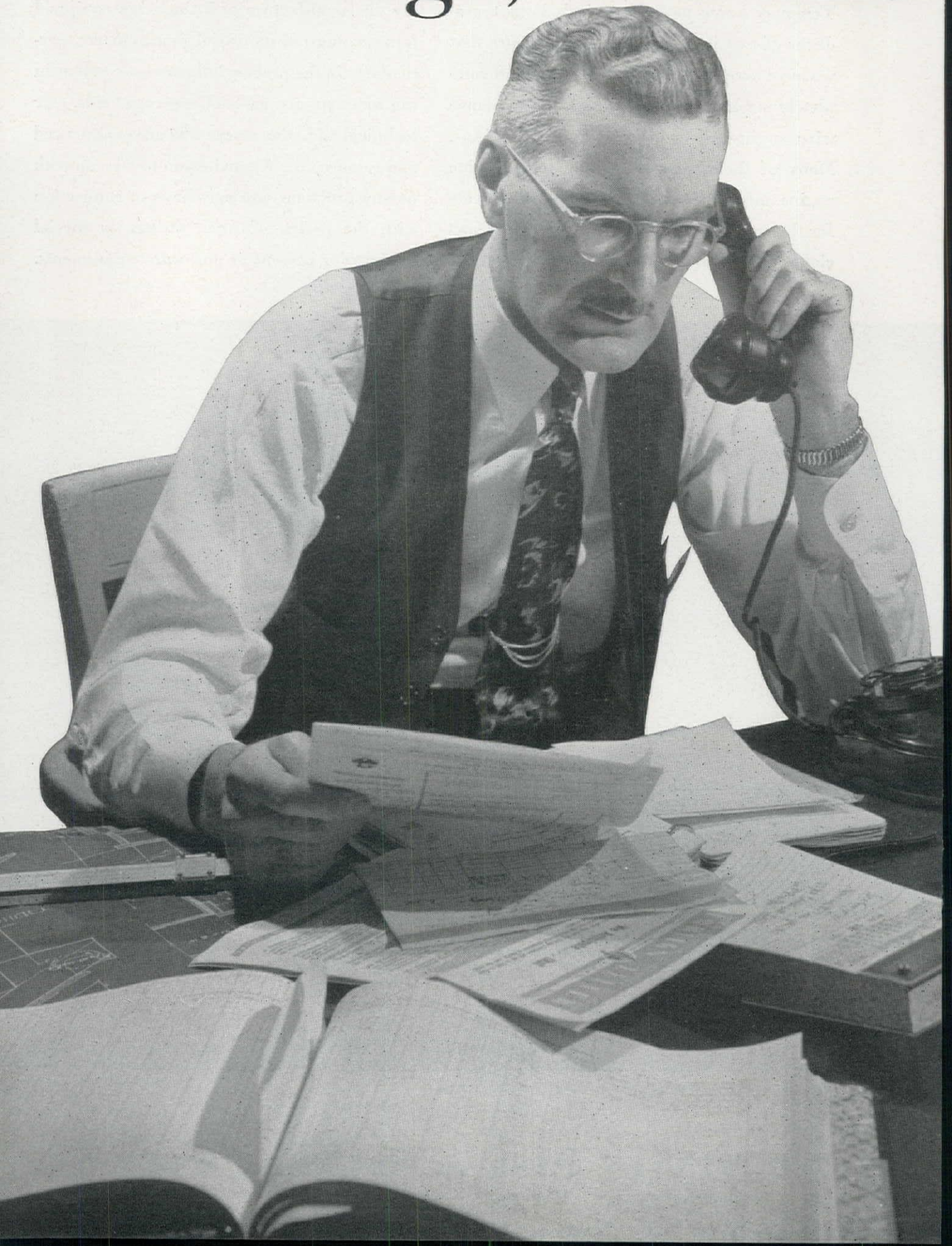


A special castings foundry at one of our plants, drawn by Hugh Ferriss.

UNITED STATES PIPE & FOUNDRY CO.

General Offices: Burlington, New Jersey. *Plants and Sales Offices throughout the U. S. A.*

George*, we'd like



to shake your hand

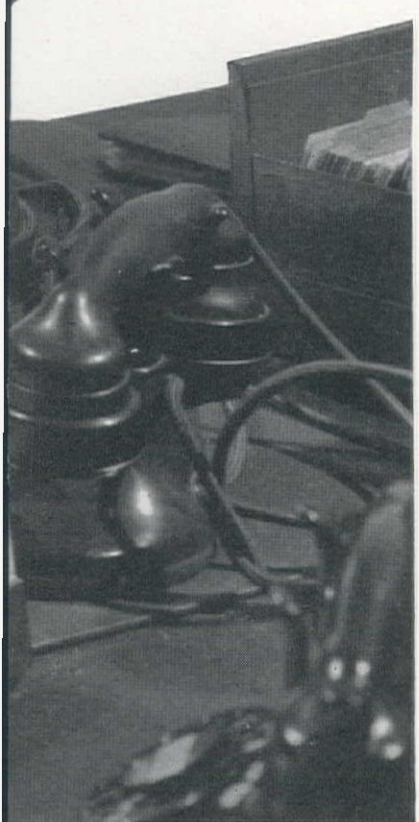
YOU'RE such a matter-of-fact fellow, George, that maybe it never occurred to you that you've done anything out of the ordinary since that fateful Sunday when America found itself at war.

Sure—you've just done your job as you saw it. But listen, George. Planning and engineering our war effort—keeping the wheels turning and supplies and materials moving—figuring out the million minor details . . . that took brains of a special sort. The vast load of paper work that had to be done before a single machine could function, before a single bomber could lay its eggs, didn't just do itself. You did it.

When bad news came over the wires, you set your jaw and worked just that much harder. And when the news was good, you took it with a quiet smile and kept right on plugging away. No, George, not all the heroes in this war are making the headlines.

The late hours you spent at your desk when the others had left . . . the way you've planned and sweated to meet one emergency after another . . . the extra work you've taken on your patient shoulders when younger men were called away for more spectacular, more exciting duties, wasn't exactly a snap, either.

Maybe you don't wear a uniform, George, but remember this. You're on the all-important staff of the home-front army. If it weren't for you, and the thousands of Georges like you, our job of war production would be in an awful mess right now.



**Who is George?* *Surely you know dozens of Georges. He stands beside you on a crowded bus early in the morning. You've watched him coming wearily home from work long after the rest of the neighbors have finished supper. He may even be the fellow who makes those funny faces at you as you shave before your mirror in the morning. More power to you!*

COLUMBIA STEEL COMPANY, *San Francisco*
CARNEGIE-ILLINOIS STEEL CORPORATION
Pittsburgh and Chicago
United States Steel Export Company, New York

USS

UNITED STATES STEEL

Wanted— More Synergism!

"What is Synergism?" you well may ask. To put it succinctly, you might say that synergism is the force that can make 2 + 2 = 5.

Synergism is not a new word. It has its roots in the classic Greek (Συν—together; Εργον—work) and has long had its connotations for the chemist, the doctor and the theologian. Basically, it always has meant forces working together to produce a whole greater than the sum of the parts.

Now, "Synergism" emerges, in its larger sense, with a meaning for industry, bred of war accomplishment.

For the miracles of war production are in no small part due to the meeting of minds, working together as a creative stimulus—minds that "click," as we call it on the street—so that the net result is always greater than the sum total of the individual ideas. From synergistic thinking, evolve the great mechanisms, the new synthetics, the magnificent product creations which comprise materiel for Victory.

Synergism may apply to individuals working together, to groups, to companies—across a table, in the laboratory, in the field. It is the newer concept for industrial mentality. Now, as never before, it is evident that industrial progress revolves about the stimulus created by minds working together to "click" creatively. Synergism is a much needed component for post-war development—not as an abstract philosophy, but as a practical working force.

Here at Atlas, we are "Synergism-minded." In our own fields of chemical endeavor, we have acquired a degree of expertness which can be applied synergistically to products now to create results far beyond present design expectations. Add synergism to cooperation and miracles become commonplace.

We would like to talk with you.

ATLAS POWDER COMPANY

WILMINGTON, DELAWARE

San Francisco, Cal. ***Offices in Principal Cities*** **Seattle, Wash.**

CHEMICALS ATLAS EXPLOSIVES

Industrial Explosives • Industrial Finishes • Coated Fabrics • Acids
Activated Carbons • Industrial Chemicals • Ordnance Materiel

Copyright 1943, Atlas Powder Company

4 Simple Maintenance steps keep Pneumatic Wrenches on the job

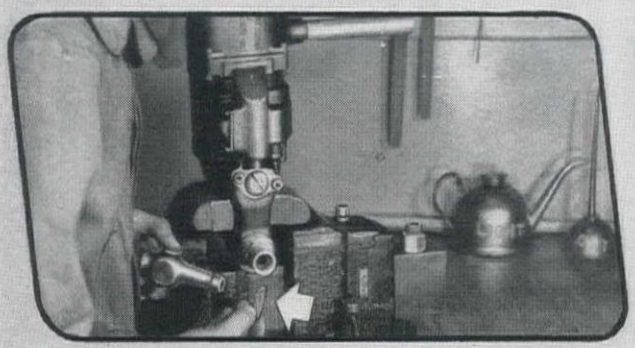
PERIODIC LUBRICATION PROPER ALIGNMENT BIG FACTORS IN IMPACT WRENCH PERFORMANCE

Because of their sturdy construction, slow motor speed and fewer parts (no springs or gears), CP Pneumatic Wrenches (impact type) give long service under severe conditions with a minimum of repairs. But, they will give even better service if they are given a little precautionary care.

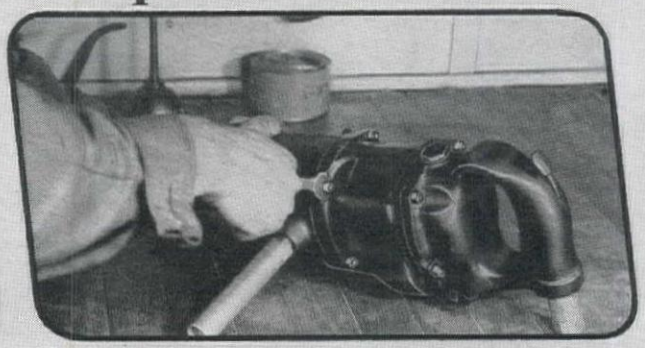
Here are four simple maintenance steps for your CP 365-R Pneumatic Wrenches. Do these things regularly and you will keep your wrenches on the job, cut repair time to the minimum and conserve strategic materials.

While these points apply particularly to the CP 365-R, they are applicable generally to other CP wrenches of the impact type. Detailed suggestions for the care of other models will appear in future advertisements.

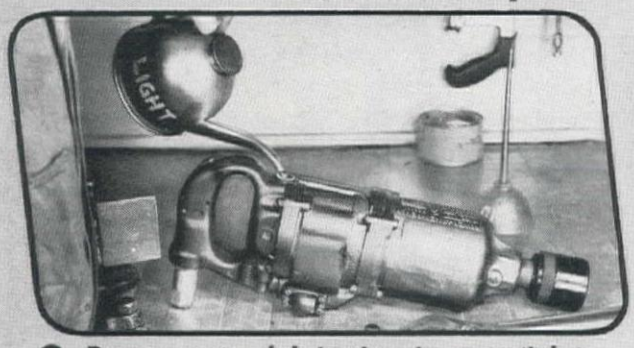
HOW TO GET MAXIMUM SERVICE FROM YOUR CP 365-R PNEUMATIC WRENCH



1 Check the air screen at least once a week. Clean it with an air hose. A dusty, dirty air screen will rob your wrench of power.



2 At the beginning of every shift, check the through bolts and nuts on tool housing and motor housing. Be sure all nuts are tight.



3 Proper motor lubrication is essential to good wrench performance. Fill reservoir every day with a good grade of light oil.

4 Once each week, lubricate the 365-RP wrench with a grease gun. For the best results, use the CP Impact Wrench Grease.

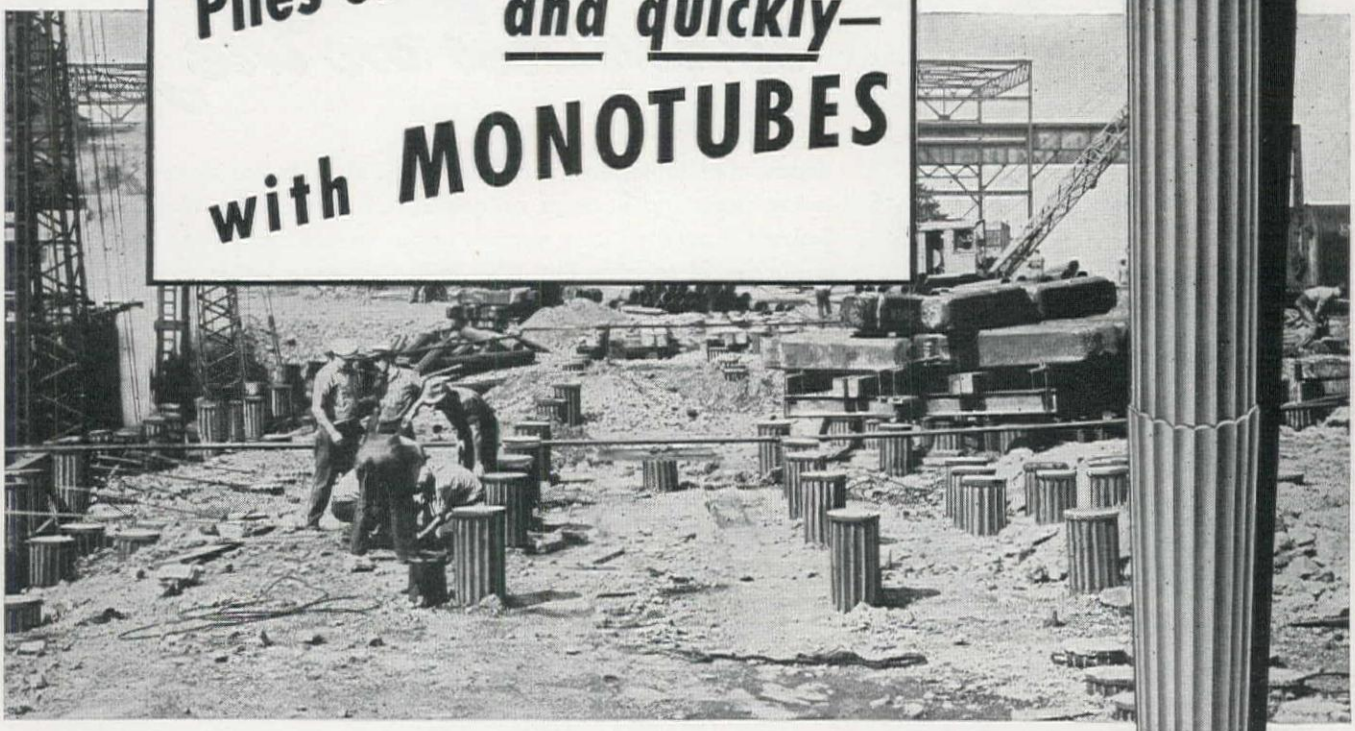
★★★★★★★★★
PNEUMATIC TOOLS
ELECTRIC TOOLS
(Hicycle...Universal)
ROCK DRILLS

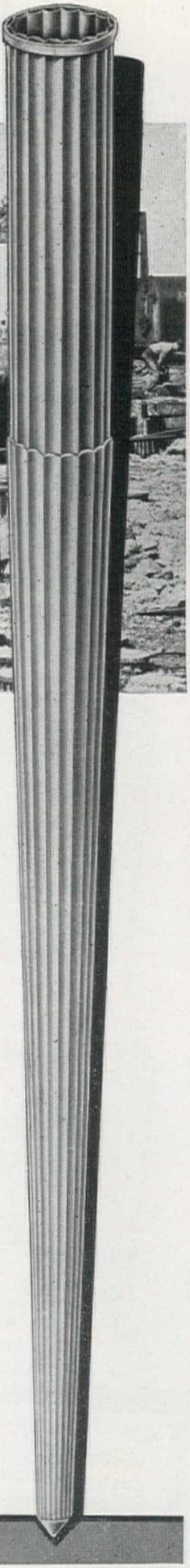
CHICAGO PNEUMATIC TOOL COMPANY

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

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

"Piles" of Work Well Done— and quickly— with MONOTUBES





Today, when speed plus sound construction is a must on every job, you'll find more all-steel tapered Monotubes preferred —for the installation of cast-in-place concrete piling.

And here are four sound reasons why:

FIRST—Monotube steel casings are light in weight, permit FAST and ECONOMICAL HANDLING.

SECOND—Monotubes are so strong and rigid they require no heavy core or mandrel and can be SPEEDILY DRIVEN with average job equipment (crawler crane equipped with standard leads and hammer).

THIRD—The use of extendible Monotubes permits SPEEDY INSTALLATION of VARYING PILE LENGTHS without delay or waste even in low headroom.

FOURTH—The hollow tubular design of Monotubes enables you to INSPECT CASINGS QUICKLY and thoroughly from top to toe before concreting.

Monotubes are available in gauges, tapers, and lengths to meet varying soil conditions, and Union Metal engineers stand ready to give you constructive help with your piling problems. Write for your copy of the Monotube Catalog 68A containing additional valuable information.

THE UNION METAL MANUFACTURING COMPANY
CANTON, OHIO

UNION METAL

Down to river's edge from the northwest, land of the tall timber, come giant Mack trucks bearing thirty-ton loads of logs . . . cut from centuries-old trees for the war needs of today.

TIME DOES TELL . . . PLENTY!

The Mack trucks you see on the road today are of all capacities. But there's one thing they have in common. *Being Macks, they're built to last!* That's a basic Mack advantage, doubly important in wartime when replacements are hard to get. Seven of every ten Macks built ten years ago are still on the job. For forty-three years Mack trucks have established a record for long life that is still gaining on home front and battle front alike. The expression "Built like a Mack truck" was not coined by us, but by those who watch Mack trucks at work.

Mack International Motor Truck Corporation, Los Angeles . . Sacramento . . Fresno . . San Francisco . . Seattle . . Portland. Factories at Allentown, Pa.; New Brunswick, N. J.; Plainfield, N. J. Factory branches and dealers in all principal cities for service and parts.

Mack

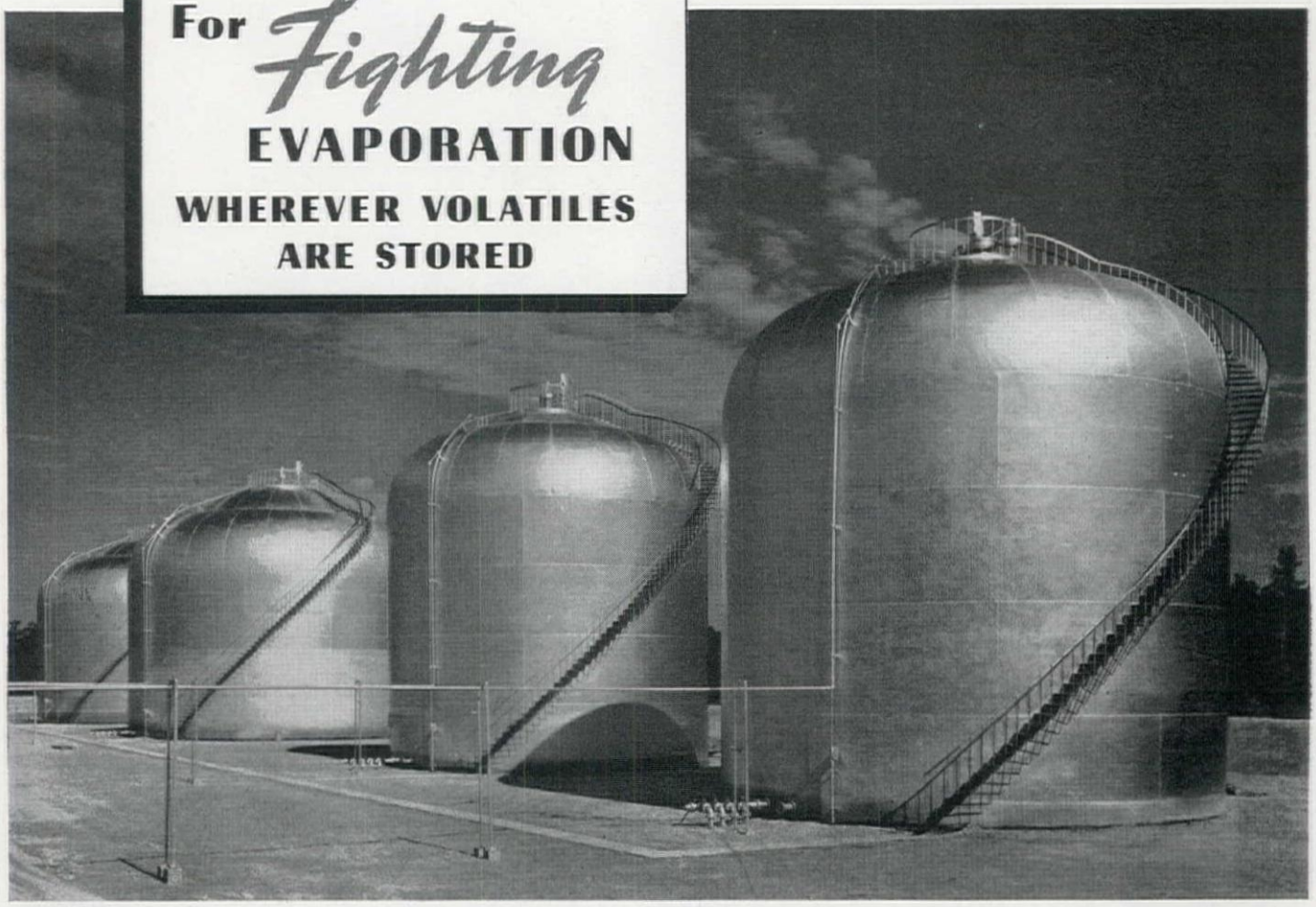
TRUCKS
FOR EVERY PURPOSE
ONE TON TO FORTY-FIVE TONS

BUY U. S. WAR BONDS

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

HEMISPHEROIDS

For *Fighting* EVAPORATION WHEREVER VOLATILES ARE STORED



LIKE faithful watchdogs, pressure storage tanks, such as those illustrated, are protecting volatile liquids against vapor loss and deterioration. This protection is *vital* today as volatile petroleum products play an ever-increasing role in the war effort.

The Hemispheroid, as well as the Hortonsphere and Hortonspheroid, successfully combat evaporation because they operate on the principle that no loss will occur as long as vapor does not escape from the tank. Instead of venting as the temperature rises, pressure builds up in these tanks until it is equal to the vapor pressure of the liquid. As long as this is below the operating pressure of the tank, no vapor will be vented out of the tank and no loss will take place.

The four Hemispheroids shown are located at a well known recycling plant and used for the storage of gasoline at a working pressure of 5 lbs. per sq. in. Two of them have a capacity of 20,000 bbls. each and the others hold 10,000 bbls. each. Hemispheroids are built in capacities of 5,000 to 20,000 bbls.

CHICAGO BRIDGE & IRON COMPANY

San Francisco.....1013 Rialto Bldg.	Houston.....5621 Clinton Drive	New York.....165 Broadway Bldg.
Birmingham.....1598 N. Fiftieth Street	Tulsa.....Hunt Bldg.	Philadelphia....1700 Walnut St. Bldg.
Chicago.....McCormick Bldg.	Cleveland.....Guildhall Bldg.	Washington.....330 Bowen Bldg.

Plants at BIRMINGHAM, CHICAGO, and GREENVILLE, PA. *In Canada:* HORTON STEEL WORKS, LIMITED, FORT ERIE, ONT.

WESTERN CONSTRUCTION NEWS
WITH WHICH IS CONSOLIDATED WESTERN HIGHWAYS BUILDER

March, 1943 Vol. 18, No. 3

J. M. SERVER, JR. . . . . Editor
A. H. GRAHAM . . . . . Field Editor
A. G. LOMAX . . . . . Northwest Editor
ARNOLD KRUCKMAN . . . . Washington Editor

ODT Order Worth Extending

WHEN VISITING in a small Pennsylvania town a few years ago, the editor noticed a traffic signal in 24-hour operation at the intersection of the main State highway through the town with a cross street which extended about two blocks in each direction. Rarely did more than one car cross the highway when the green light favored the side street, while from ten to fifty automobiles and trucks were held up on the through artery.

Seeing this obvious inequality, a resident of the town was asked the reason for the installation. "Well," he said, "the big towns all have 'em, don't they?"

Indeed they do! The automatic traffic signal is a well-known sight in every city of any importance in the United States. It has proved its usefulness as a safety factor, and in releasing uniformed policemen for other and more vital activities. At busy mid-city intersections it is an invaluable device for accelerating traffic safely. Old-time "traffic snarls" are now almost unknown at important intersections protected with signals.

However, in some cities it has become a policy to install traffic signals at many intersections in outlying or purely residential sections. In some instances this has been done because a serious accident, perhaps occasioned by a careless driver who might pay little attention to a signal anyway, has occurred at the crossing, and nearby residents have felt that an automatic signal would prevent a recurrence of the unfortunate incident.

In other cases, owners of markets and other businesses at intersections have seen a steady stream of traffic passing their place of business and have petitioned governing bodies for signals, pointing to some safety hazard, of course, but in reality taking the action because they hoped the autoists would see their advertising and window displays while stopped by the signal. In other regrettable instances, politicians have used installations of this kind to pay political obligations of one kind or another.

With the advent of war and its accompanying shortages of rubber and gasoline, Chairman Joseph D. Eastman of the Office of Defense Transportation has issued an order directing cities to cease operating all "stop-and-go" and boulevard stop signals not absolutely essential to safety, in order to save critical materials consumed in stopping and starting, and to speed the passage of important traffic. It is pointed out that since the advent of gas-rationing an increasingly high percentage of traffic on the streets is on essential or emergency business, delay to which is an impairment of the war effort, and a continually decreasing percentage of the traffic is of the amusement or non-essential sort.

It is cause for commendation that western cities are resurveying their streets and intersections with a view to conforming with this order. It is cause for concern that the same cities shall not blindly restore to service in the post-war period all signals now discontinued or dismantled under the war necessity, without a careful traffic check. Although gasoline and rubber and time may be more abundant after the war, it is utterly senseless to waste them simply because more can be gotten. In reviewing existing signals in an important western city in conformity with the ODT order, the city's chief electrician made this revealing statement: "With the exception of some stop-and-go signals in the outlying districts, all these signals were found necessary by past traffic surveys." *Western Construction News* feels that NO signals should be installed either in war or peace unless justified by ample traffic surveys and studies.

The mechanical traffic signal is a most useful device. It has many advantages over the old-time "traffic cop." At busy downtown intersections, it is invaluable. But, like all blessings, it can be and has been abused. It is to be hoped that the purposes of the present emergency order of the ODT will be considered and applied in the post-war period.

B & H Builder

CONGRATULATIONS are due to Barrett & Hilp, general contractors of San Francisco, Calif., upon the issuance of the *B & H Builder*, Vol. I, No. 1, a house organ dedicated to the employees of the coast to coast construction organization. Many industrial organizations have discovered that the publication of a house organ is of considerable value in creating and maintaining employees' interest in the organization and thereby increasing the efficiency of the organization as a whole.

Construction firms have not been quick to accept this idea as being applicable to the peculiar conditions under which the industry has operated in the past, but if the experience of Morrison-Knudsen Co., who began publication of a house organ last year, and Barrett & Hilp proves to be successful, perhaps other contracting firms will follow the precedent now being established.

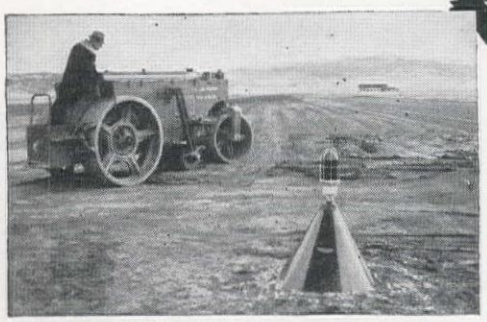
Publication of a house organ may be accepted as a sign of a stabilized organization, a characteristic which has not been common among construction firms. With the possibility of future demands for industrial stability looming ahead, it is encouraging to see signs that promise a greater stability in the construction industry.

Change in Staff

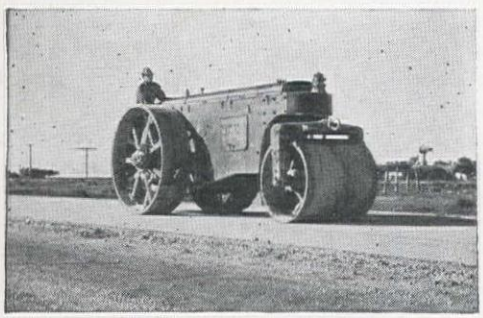
DUDLEY F. STEVENS, editor of *Western Construction News* since Jan. 1, 1941, has resigned that position to accept a commission as a First Lieutenant in the Coast Artillery of the U. S. Army. John M. Server, Jr., who has been Mr. Stevens' assistant since last June, has been appointed editor. There will be no change in the editorial policy which has found such favor among engineers and construction men throughout the West.

This busy Austin-Western Tandem, at a Naval Supply Depot, is compacting a lot of surface, where things have to move fast. A single lever mounted on steering post controls both reversing clutches.

PAVING THE WAY TO VICTORY



So big war birds can take off and land safely, large areas must be kept smooth and level—the year around. This is a Cadet size Roll-A-Plane.



Well compacted, smooth surfaced and properly crowned roads make for efficient lines of communication. The machine is an A-W Autocrat.

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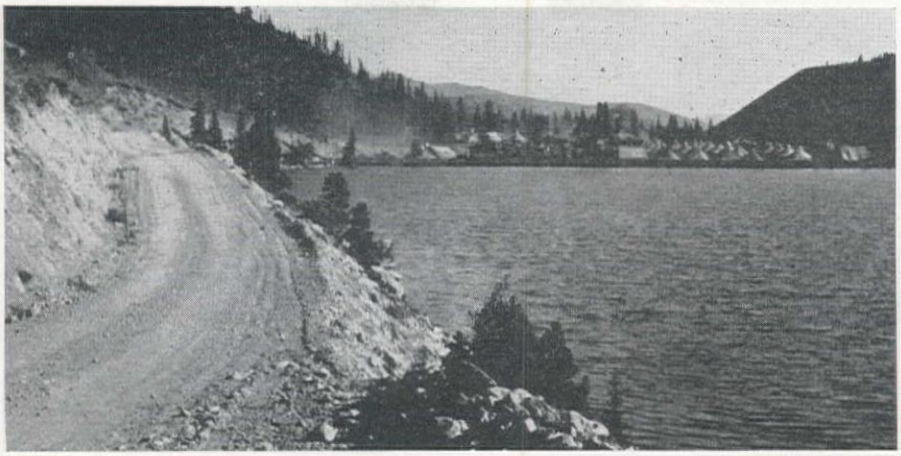


A SECTION of pioneer highway looking east toward the outlet of Summit Lake. Here at the divide between the Tetsa and McDonald drainage systems the highway reaches its highest elevation, 4,350 feet above the sea.

Alaska Highway—Problems in Roadway Design

Extremes of temperature and variable soil conditions presented engineers with almost unprecedented problems in designing the permanent 36-ft. roadbed which will replace the Army's pioneer road. Frost heave, sudden severe floods add to difficulties

By A. C. CLARK
Principal Highway Engineer
U. S. Public Roads Administration

DESIGN PROBLEMS encountered on a project of the magnitude of the Alaska highway are naturally quite extensive and varied and range from those ordinarily found in the States to those arising from conditions peculiar to the "bush country" of the far north.

Line topography

The project lies between latitudes 55 and 65 deg. north and the latitude and general topographical conditions of the area traversed and adjacent areas exert a marked influence upon the climate. The new highway begins at Dawson Creek, British Columbia and extends northerly through the upper reaches of the Great Plains east of the Rocky Mountains; thence along the rolling foothills of the mountains to Fort Nelson. From there the road ascends to the summit of a range of the Rockies, 102 mi. distant, at an elevation of 4,350 ft.—the highest point on the route.

The line then descends to a crossing of the Liard River, and then traverses a high plateau area on ascending grades to a crossing of the Stikine Mountains or Continental Divide at an elevation of 3,300 ft. This crossing is approximately 190 mi. southeast of Whitehorse. From the divide, the area traversed to the northern terminus is a high plateau at an average elevation in the neighborhood of 2,000 ft., broken by drainage channels of varying sizes. The entire route lies east of the Coast Range, the highest and most scenic mountains of this northern region.

These mountain ranges are so located as to effect marked differences in climatological conditions, and division of the region into two general classifications, marine and continental, is possible. The marine climate along the coast is characterized by moderate temperatures and heavy precipitation. The continental climate of the Western Great Plains and interior valleys is characterized by a wide temperature range, with extremely low temperatures common during the winter months, and light precipitation.

Climatic conditions

Temperatures and snowfall vary considerably from place to place and are strongly influenced by local topography, distance from the coast, and elevation. In general, it can be said that, in the interior, the temperature regime is purely continental with long extremely cold winters, especially in northern Alberta and British Columbia, Yukon Territory and the Yukon and Tanana River valleys. Extreme low temperatures of —57 deg. F. at Edmonton and —66 deg. F. at Fairbanks have been recorded. Average minimum temperatures are freezing or lower from September to April in the Tanana and Yukon River valleys, and generally from October to April or May over most of the Great Plains and interior valley areas for which data are available.

The precipitation in the interior valleys and over the western Great Plains is light, with the maximum fall occurring in the summer season. Annual amounts usually range between 10 and 20 in.

Snowfall over southeastern Alaska, the Yukon Territory and British Columbia, is highly variable and it is quite difficult to generalize concerning any large section in regard to amounts. The following summary, obtained from the best available sources, is indicative of

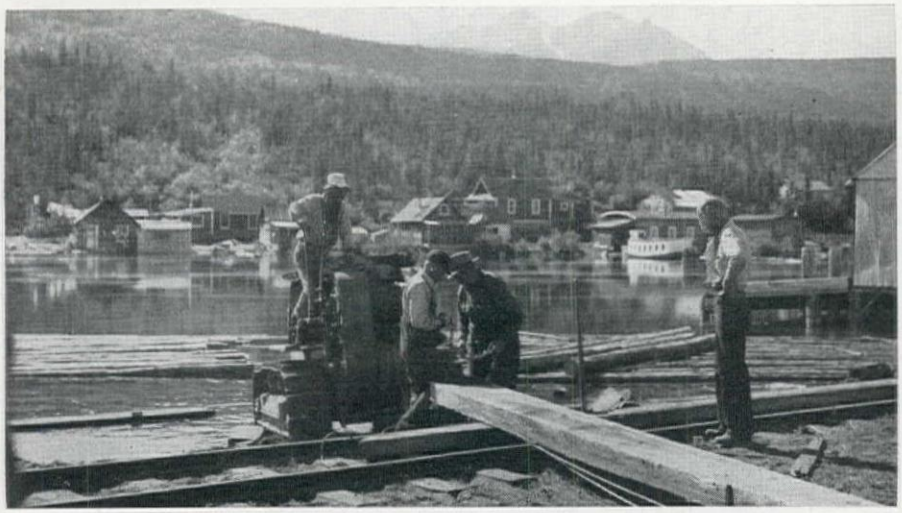


PHOTO shows a tractor dragging timber to water's edge preparatory to building a dock at an important supply base. Note workmen's mosquito protection.

conditions generally encountered: Great Plains route—Dawson Creek to Watson Lake—snowfall rather evenly distributed with annual averages of from 3 to 5 ft.; Watson Lake to Fairbanks via Whitehorse—annual average, 2 to 4 ft. of snow.

It is obvious that climatic conditions, although quite severe, are not entirely dissimilar from those in some sections of our northern states except possibly for the longer duration of winter.

Classification of soils

Soils run the gamut from solid rock to muskeg, but relatively the amount of these two materials is small. Discussions of construction of the Alaska highway in the public press, before detailed field studies had been made, laid great emphasis on the difficulties anticipated in crossing the muskeg swamps of Canada. This material is classified in A-8 group of soils in conformity with the method of soil grouping and classification originally devised by the Public Roads Administration. Group A-8 material is described as follows: "The soils in this group are composed of very soft peat and muck. They contain excessive quantities of organic matter and moisture. They are obviously unsuitable for use in subgrade or embankments."

The muskeg swamps do exist but it was a simple matter to swing the location between Fort St. John and Fort Nelson over to the foothills that lie slightly west of a direct line, thereby avoiding all such areas except those formed by the cross drainage. Of the 300 mi. between Dawson Creek and Fort Nelson, swampy conditions were encountered over a distance of 33 mi. On sections totalling 30 mi., the unstable material varied in depth from 1 to 5 ft.; on 1.3 mi., from 5 to 10 ft.; on 0.7 mi., from 10 to 20 ft.; and on a 1-mi. section, over 20 ft. with a maximum depth of 26 ft.

The best procedure to insure a stable embankment across these areas, and one that has been practiced by Canadian engineers in the construction of the Trans-Canada highway, north of Lake Superior, is to excavate all of the unstable soil and backfill with selected material. On account of the large yardage involved in the deeper swamps, it is probable that some modification of this plan, such as underfill blasting, may be adopted.

Soft rock encountered

From Dawson Creek to Fort St. John, Fort Nelson, and to a point 88 mi. west of the latter point, the line traverses cretaceous St. John shales and Dunvegan sandstones. The St. John shales are very soft, and, in many places, have decomposed into heavy clays. The Dunvegan sandstones are soft (94 per cent wear in L. A. Rattler at 500 rev.) and extremely fine grained. The topography of the region is gently rolling, having been modified by glacial action which has left deep deposits of silty clay, shallow pockets of fine sand, and small deposits of gravel.

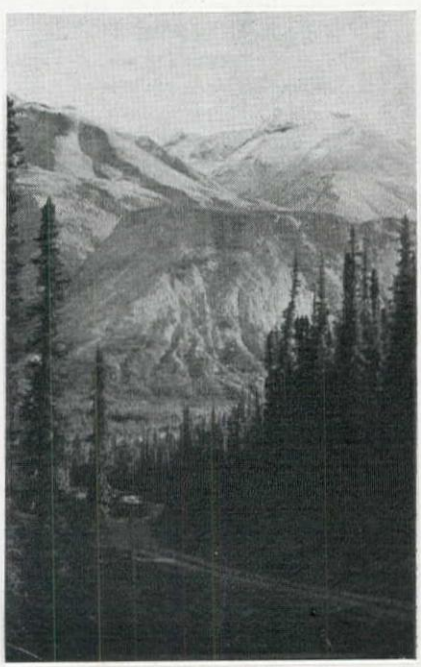
Between Mi. 88 and 210 west of Ft. Nelson, the highway crosses the Rocky Mountain formations which consist, primarily, of limestone, although some shales are encountered. The topography is rugged with many fast flowing streams.

Between Mi. 210 and 360 (Watson Lake) of Section D, the topography is less rugged than the mountain section and has been modified by glacial action. Limestones, shales, glacial silts, sands and gravel are found. The glacial deposits become deeper and more extensive as Watson Lake is approached.

Soils surveys were made over the entire route to classify the soils for the purpose of determining the economical thicknesses of selected borrow, base and surfacing to form a stable road. The soil types are definitely correlated with the geological formations. Where the soils have been formed from cretaceous shales and fine grained sandstones, the soil type is preponderately silty clay of the A-7 group with some heavy clays of the A-6 group and silts of the A-4 group. The silts are shallow in depth and overlie the clays.

Through the mountain sections where limestone predominates, the soils are sands and gravels of the A-2 group. A few silts of the A-4 group and clays of the A-7 group are also found. In the vicinity of Watson Lake, some of the glacial silts are classified as A-5.

THE ALASKA Highway passes through an evergreen forest of the Canadian Northwest toward 4,350-ft. Wheeler Summit. This pioneer truck trail will be soon replaced by a more modern highway.



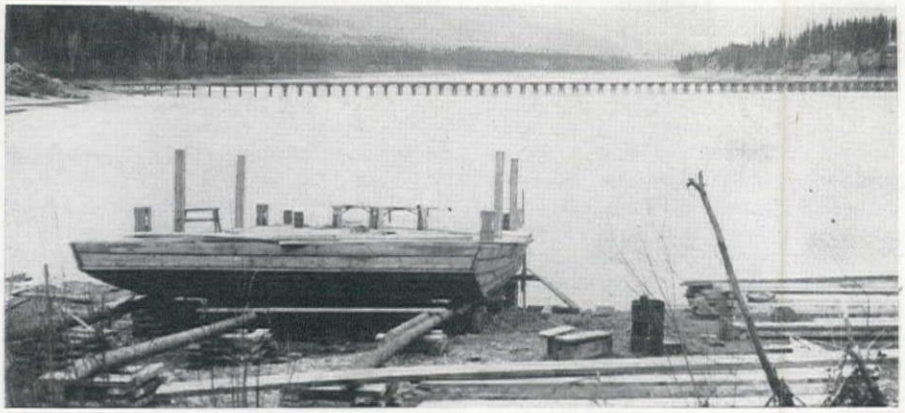
Fill and surfacing material

The subgrade design follows standard practice. Three layers of material above the natural soil are provided—selected borrow, base course, and surface course. The surface and base courses are each 4 in. thick, while the thickness of selected borrow is varied between 6 and 16 in., depending on the classification of the subgrade soil. Where A-6 and A-7 soils are encountered, a total thickness of 24 in. of selected borrow, base and surfacing, is placed. Where A-2 and A-3 soils are found, 14 in. of material is placed. Where A-4 and A-5 soils are found, they are entirely removed or mixed with heavier clays and treated as A-7 soils. Fortunately, the A-4 and A-5 silts are not of great depth and trouble from frost boils because of them can be prevented.

Selected borrow is being obtained from deposits of fine sand, sandy gravel, or from sandstone ledges. Borrow is generally of A-2 classification, although some fine grained A-2-4 sands are being used. Because of the scarcity of sand and gravel deposits on certain sections of the route, it is necessary to use sandstone ledges for selected borrow. Most ledges require drilling and blasting, but although the rock comes out quite blocky, it is not necessary to resort to crushing, as the material readily breaks down during normal subgrade shaping operations.

Base course material is being obtained from gravel deposits and sandstone ledges. The material is crushed to a 2-in. maximum size with the gradation controlled to give a dense stable base. Where sandstone is used, the harder ledges are selected, but it is necessary to place the surface course immediately to prevent detrimental abrasion of the base.

Surface course material is being obtained from sandy gravel deposits. The



LOOKING UP the Liard River toward the Colonel Ingalls Bridge, 1,200 feet long. This bridge was completed in only eight days. The scow in the foreground is used in case the bridge is swept away by the spring break-up.

material is crushed to 1-in. maximum size and the gradation and quality are carefully controlled. Only hard durable aggregates are used in this course.

Compaction and drainage

A troublesome problem of great importance is the compaction of the heavy clay soils. These soils are difficult to excavate and are of massive, rubbery form when placed on the grade, with a moisture content above the plastic limit even during the driest season. This necessitates considerable manipulation to lower the moisture content and obtain proper compaction. Sheepsfoot rollers are used for compaction and it has been noted they speed the drying process by reducing the aggregations to smaller size, in addition to compacting the soil.

Through the mountain sections, considerable water is encountered under all varieties of conditions. Many drainage ditches and subdrains will be required. Serious problems develop where the road crosses large alluvial fans at the mouths of box canyons. During the summer, very little water flows from these canyons, but during the spring break-up, or during heavy storms, enormous quantities of water and debris are poured onto the fan. Many of the streams flood practically the entire floor of the valleys through which they flow. Some of these streams freeze from the bottom during the winter and build up large deposits of ice which block all ordinary drainage structures. These problems are now being studied to determine the best solution, whether by placing grade lines high and channel control by jetties, or avoidance by routing the highway around the section.

With the exception of a section near the Alaskan border, it appears that sufficient sand and gravel for subgrade stabilization and surfacing are available. On this section, it may be necessary to use sand for subgrade stabilization and ledge rock for surfacing.

The advance and retreat of the glaciers made many changes in the established drainage systems. Streams were dammed, forming long lakes, such as Lake Teslin; the channels and valleys of others were filled, necessitating the development of new water courses; new divides were created and the direction of flow of parts of some streams were reversed and the drainage systems of many broad, low areas were destroyed. That these changes were comparatively recent is indicated by the fact that good drainage has not been satisfactorily reestablished in many areas. As a result of these changes, the streams meander considerably, although their velocities are not low and there are numerous swamps and marshes. In general, the swamps and marshes are not over 3 or 4 ft. deep, and they are underlain by material suitable for use as foundations for embankments. The percentage of located line crossing swamps is small.

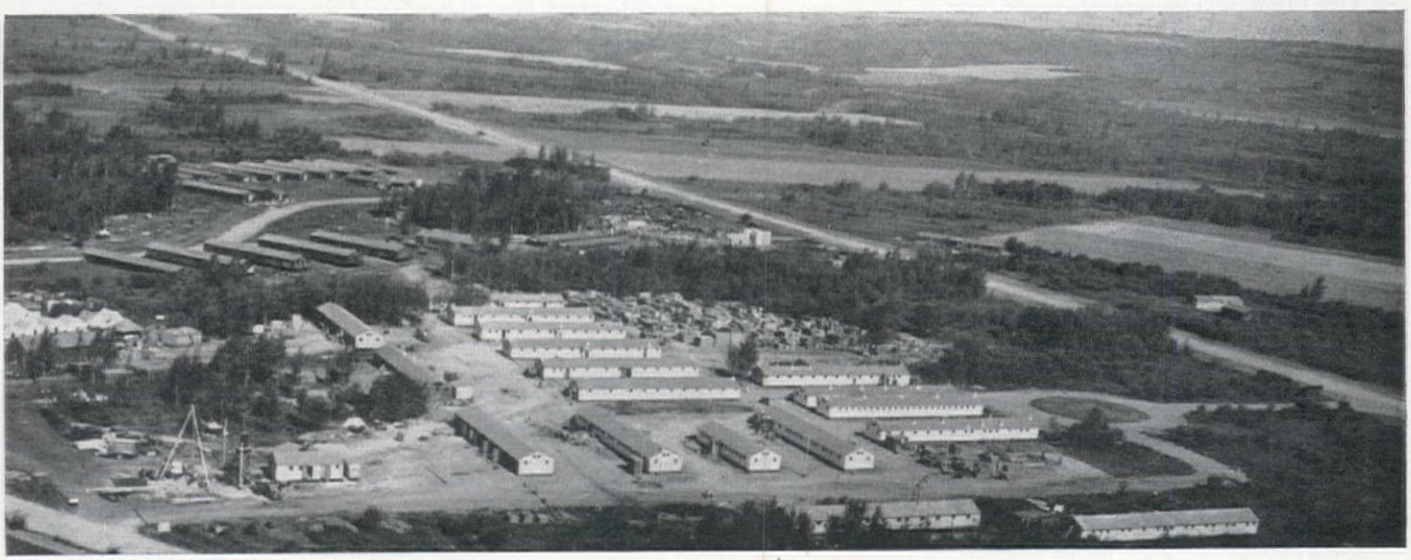
A PUBLIC ROADS Administration camp, looking northwest. In the foreground is the old Fort Nelson road; beyond the camp is the Alaska Highway. The camp of one of the contractors may be seen in the upper left of this photograph.

Frozen ground creates problems

The lack of well-developed drainage systems contributes to the formation of areas of frozen ground protected from thawing by an insulating blanket of moss. It is estimated that 100 mi. of frozen ground may be encountered in the Yukon Territory and a somewhat less amount in Alaska. The existence of this perpetually frozen ground at varied depths below the surface is one of the most unusual features of this area.

A thickness of as little as 3 in. of moss seems to be sufficient to prevent thawing in many cases and, except for this one fact, the problems of actual construction in this area would be relatively simple, since much of the soil is of the A-2-4 or A-4 type fine silty sand. To offset these complications, there is an abundance of good gravel, sand and rock suitable for selected borrow or surfacing, and generally within short hauling distances.

Permanently frozen ground or ice may occur at almost any depth. Most commonly, the frozen material is close to the surface in relatively flat areas and immediately under a heavy insulating layer of moss or grasses. Formations of this character are called arctic tundra. In addition to moss, the covering consists of low-growing bushes and "niggerheads", the latter being a local term used to describe the hummocky grass that grows in relatively flat areas where the drainage is too poor to permit the growth of other vegetation. Occasionally, however, scattered scrub black spruce trees grow in the "niggerhead" areas and are frequently found in the areas covered by the heavy moss or ground vegetation.



Corduroy not a solution

Since the ice or frozen ground occurring immediately under heavy vegetation will generally be found in low areas, the problem faced by the highway engineer is that of constructing a stable embankment over these areas. Good material will be available for the embankment itself, but the foundation will often be of doubtful supporting value. In the construction of a truck road during the past season, the time factor was of the greatest importance, and embankments were constructed across these areas by the quickest feasible method, generally by corduroying with brush and poles, and following with a light fill of good granular material.

However, for the permanent highway, this method is not recommended wherever it can possibly be avoided. Wherever a more solid foundation can be reached by stripping the vegetation, this should, of course, be done. If this vegetation is underlain by a frozen silty-sand, stripping greatly increases the construction difficulties and results in a foundation which, for some time at least, is anything but stable. As soon as the clearing, if any, is done, the underlying frozen ground begins to thaw (if the weather is warm), and since the water thus released cannot drain downward, it further saturates and softens the surface, and thawing, with the resultant release of water, proceeds at a greatly accelerated rate. If the soil is a fine silt-sand, as is so common, it quickly becomes a quagmire incapable of supporting equipment for further construction operations or of adequately supporting an embankment. Until the excess water is removed by drainage or by evaporation, a stable embankment cannot be expected.

Stripping and filling

Experience indicates that if time is available, the most satisfactory method (from a permanent construction standpoint) of handling a condition of this kind is to clear the right of way, strip the vegetation with bulldozers, shape the surface thus exposed so that surface water will drain, and then leave that part of the work alone until it has had time to become relatively stable by thawing, drainage, and evaporation. This method has been extensively used by the Alaska Road Commission on many miles of highway constructed by them.

Sections of the new highway where frozen ground originally occurred at the grass roots were treated in this manner and, after a two-months' period, they thawed to a depth of 7 ft. or more, and were relatively dry and stable. While this method involves extending the work over considerable distances, it need not delay operations if they are planned with this procedure in mind, and the clearing and stripping done far enough in advance of the actual grading. Clearing and stripping to a considerable width is essential to provide the exposure necessary for thawing and drying.

There are certain areas so flat or so low that drainage is impracticable. At such places it is not considered advisable to strip the vegetation unless the underlying material is of a type naturally stable even when saturated, such as a coarse sand or gravel. If the vegetation is not stripped, a fill of 3 ft. or more should in all cases be constructed. The lower part of this fill should be a porous, granular material that will permit the escape of water released by thawing and forced out by the weight of the fill. While the moss will lose some of its insulating value when compressed, it appears that this would be compensated by the insulating value of the fill so that no thawing would take place under it. As a factor of safety against unforeseen developments, fills should have broad bases and flat side slopes. When temperatures and other conditions permit, consideration may be given to stripping the moss and placing the fill directly on the frozen ground before thaw occurs.

Lower ice lenses

Layers of ice and frozen soil occurring at depths of 3 ft. or more present a problem much more difficult than those near the surface. Such layers vary in thickness from a foot or two up to perhaps hundreds of feet. Such a condition in a cut may make construction operations so difficult that it will be advisable to change the location or to raise the grade line above the frozen layers. These frozen layers are almost as difficult to remove as solid rock. They present the additional complication that they start to melt as soon as the surface is exposed. This quickly produces "soupy" material in which it is almost impossible to operate equipment.

The thawed material contains such a high percentage of water that it cannot be safely placed in embankments. In such locations it is desirable to excavate one or more feet below grade and backfill with sandy material before thawing occurs. As would be expected, the material in the side slopes in such cuts has a tendency to flow as it thaws.

Another ice condition which causes a great amount of trouble is that known as "glaciering" or the building up of ice formations during the winter. Water may seep from the side slopes and cause a continuous build-up of ice across the road. This ice must be removed periodically. The "glaciering" may develop in stream channels due to the continual freezing and subsequent overflowing by the stream water. Such action may eventually cause the stream to overflow nearby road sections, and ice may build up to a height that endangers bridges. Local aviators have reported that at some locations on present highways in Alaska which were not in use during the winter, the streams have "glaciered" high enough to completely encase small truss bridges. Others have reported as much as 50 ft. of ice in stream channels by spring.

At some locations, seepage from cut banks may be intercepted by porous drains. However, extreme precautions will be necessary to keep these drains open during the winter. No doubt thick layers of arctic moss so common in Alaska can be used to good advantage in insulating drains, particularly near the outlets. Installations of this kind have not been tried on the road so far constructed.

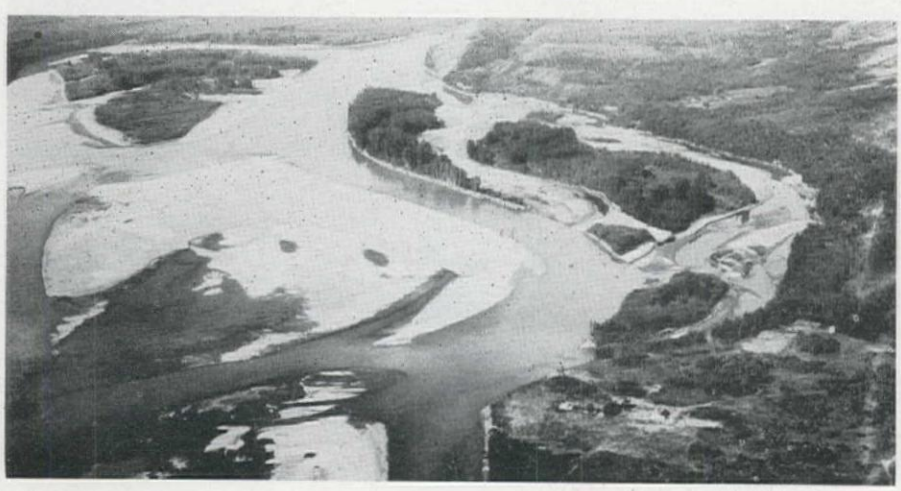
Wherever possible the road has been located away from areas where sidehill or through cut seepage is likely to occur. It may be preferable to build fills across swampy ground rather than on wet hillsides. Generally, seepage conditions and wet areas are at their worst at the toe of hillside slopes, and these locations are avoided as much as possible.

Where "glaciering" occurs in stream channels near road crossings, the problem is more difficult. These streams are generally of the smaller, swifter-flowing types, and the condition will probably be helped by building dikes on either side of the channel, and by extending them upstream for a considerable distance. Confining and straightening the channel will speed up the flow of water, and thus reduce not only the deposition of stream-carried debris, but also retard the formation of ice.

Avoiding frost heave

Frost heave and the spring thaw are

AN AIR VIEW looking upstream and west at the Peace River, four miles west of Fort St. John, B. C. This river will require the only steel bridge on the Highway. It is being built by Morrison-Knudsen Co., Inc., Boise, Idaho.



the controlling factors in providing a surface having adequate bearing value. Frost heave occurs most frequently in silty, micaceous and diatomaceous soils where a supply of water is available at low temperatures. During a thaw the receding frost line forms an impervious stratum through which water cannot escape. The soils immediately above will become saturated and lose all stability if the water is not removed promptly after the ice melts. Reduction of bearing values is due to increase in the moisture content of the subgrade, either by direct saturation from melting ice, capillary action or manipulation under traffic when water is present.

Solution of the problem lies in the provision of a course of granular material to prevent capillary rise and distribute traffic loads and impacts, and an adequate drainage system to assure the removal of water from the immediate vicinity of the roadway. As the portion of clay and silt subgrades immediately above the frost line during a period of thawing may become quite plastic, a layer course of sand 4 to 6 in. thick should be provided to avoid fouling of the subgrade reinforcement.

On the Alaska highway we have the problem of designing an all-weather highway for heavy traffic that can be constructed readily and maintained under severe climatic conditions. We must provide a satisfactory roadbed across shallow marshes, and through cuts and over fills on frozen soil, and the surface must have an adequate bearing value at all times.

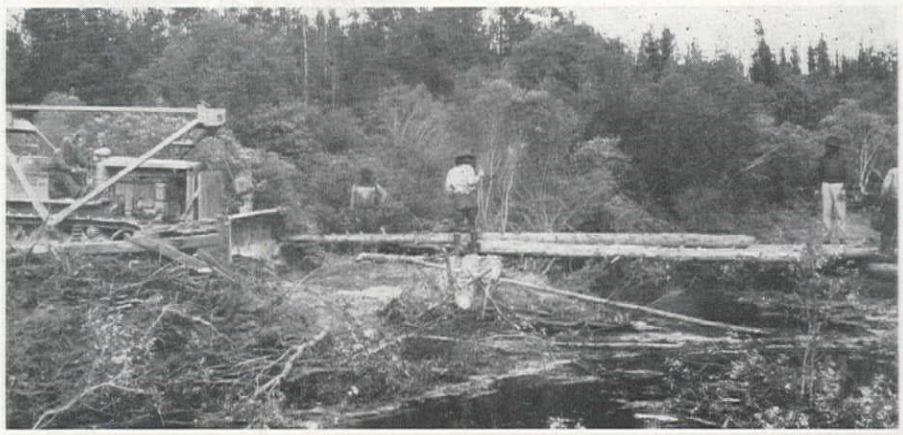
All of the problems involve controlling the effect of water on the stability of soil. Therefore, it is of the utmost importance to design a well-drained roadway. The provision of wide ditches of ample depth together with maintenance to remove ice and snow during the periods of alternate freezing and thawing will go a long way towards promptly draining all water away from the roadway.

Provisions for high water

Throughout the section of Alaska in which the new highway is located, the average annual precipitation is light and snow removal will not be a serious problem. Neither is there much wind except in certain small areas. The winters are extremely cold so that very little snow or ice melts and runs off until spring. As most of the country is covered with timber and low-growing vegetation, the spring run-off is retarded. In spite of this, considerable trouble from high water and floating ice may be expected.

To successfully withstand the high water and ice flows, bridges will have to be built with long spans and ample clearance. Piers and abutments must be protected against the damaging effects of the ice. Generally speaking, pile trestles will not be satisfactory for permanent bridges since they offer too much obstruction to ice and driftwood.

In the foregoing discussion, an effort has been made to present the outstanding design problems as they occur progressively along the project. Many of these problems present major difficulties on only a limited mileage but they cause troubles of a lesser degree over the remainder of the route. The corrective measures as well as the type of design indicated will be utilized throughout, subject to such modifications as are necessary to meet the situation without unnecessary work.



A TRACTOR is used in assembling piles for construction of one of the temporary bridges along the Highway. Mosquitoes present a great problem here.

Design standards

It was recently agreed in conference with the Chief of Engineer's staff that the standard section originally adopted for this highway, namely a 24-ft. surface with 6-ft. shoulders, will be built. This standard is to be followed throughout except in heavy cuts and in rock.

In laying the grade line, the object will be to provide drainage and protection from capillary moisture. To accomplish this, much of the completed road bed will be at a higher level relative to the surrounding ground than the existing pioneer road. The grade line will be rolled with the contour of the country as far as practicable, and no attempt will be made to produce long grade tangents. Vertical curves will be flattened to provide safe sight distances with a thousand-foot sight distance as the ruling minimum except where excessive yardage would be involved.

On fills less than 2 ft. in depth, slopes will be flattened to 2 ft. horizontal to 1-ft. vertical, further depth of fill to take the natural slope. In frozen ground, consideration will be given to using 4:1 fill slopes on shallow fills, and if present winter observations indicate the necessity, these slopes may be further flattened even on higher fills.

Standards of alignment and grade will be governed largely by those used in constructing the existing Army pioneer road. The following standards were originally agreed upon and may be approached where deviations from the pioneer road are desirable, and are approved by the Division Engineer of the U. S. Engineers:

Ruling grades not to exceed 5 per cent, the maximum grades 7 per cent; curvature on prairie terrain not to exceed 3 deg. in mountainous sections, 19 deg. on open sight distance, and 16 deg. where the sight distance is obscured or blind; all curves to have standard spirals and widening of road bed for curvature above 3 deg.

Surfacing to be deferred

It will be necessary to put forth every effort to complete the highway this year to a crushed stone or crushed gravel surfacing standard. Construction will be in progress over practically the entire length of the project and final hard surfacing operations cannot be undertaken until the grading is stabilized.

It is desirable to defer the placing of a high-type surfacing until after the road has been subjected to a season's traffic during which time necessary corrective measures can be undertaken to insure an adequate subbase. Meanwhile, consideration must be given to the use of a bituminous surface treatment.

The field engineers of the Public Roads Administration have made a careful study of all factors influencing highway design on this project. The data assembled by the materials and soils engineers will be particularly valuable in effecting economy and permanency of design. Credit is hereby given to Messrs. L. A. Deklotz, Worth D. Ross, William L. Eager, and W. J. Liddle, material engineers on the project who furnished the data included in this report relative to soil and general topographic conditions.

NOTE: The foregoing article discussing design problems presented by soil and climatic conditions on the Canadian-Alaskan Military Highway was presented before members of the American Society of Civil Engineers attending the Ninetieth Annual Meeting of the Society in New York. All photos in this article are from the Federal Works Agency.—Editor.

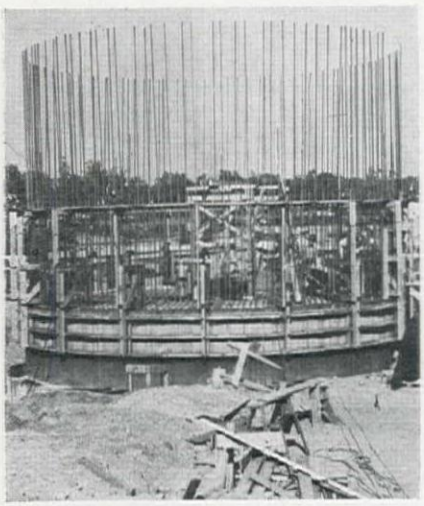
Dredging Trestle Built

STANDARD Dredging Corp., Los Angeles, Calif., has constructed a 10,000-ft. trestle for use in connection with its contract to dredge 3,900,000 cu. yd. from San Diego Bay. The contract calls for dredging a channel 21 ft. deep at a cost of $1,350,000.

Elevated Tanks of Concrete

Water storage tanks of pre-stressed concrete occupy upper 37 ft. of 145-ft. towers built by continuous-pour, sliding-form method at Kaiser Co. iron and steel mill at Fontana, California

TO MAINTAIN an adequate water supply, both domestic and industrial, at the Kaiser Company's $84,000,000 steel plant now under construction at Fontana, Calif., two elevated concrete water tanks of unusual design were constructed on the site. One is for the storage of domestic water, the other for water to be used in industrial purposes. The total height of the towers is 145 ft. above foundation level, and they have a 35-ft. inside diameter. The upper 37 ft. of the structure is used for water storage, but the 9-in. shell is continuous for the entire height. Storage capacity is 250,000 gal.



Earthquake design

Since the Fontana plant is located within 10 mi. of the main San Andreas fault as it runs through Cajon Pass, care was required in the design of the tanks to provide adequate earthquake resistance. An added factor in this design was the fact that the entire load was at the top of the structure. No interior cross-bracing was included, all of the stress being carried in the shell which was designed with an earthquake factor of 0.2 gravity.

Another influencing factor in this particular was the extremely severe wind pressures caused by the frequent storms known locally as the "Santa Ana." Twenty-five pounds per sq. in. was the load factor used in the design for wind resistance.

The foundations of the towers are circular rings of spread footings, 7 ft. below the surface of the ground.

To insure water-tightness in the tank, the hydrostatic pressure is carried by pre-stressed bands encircling the tank, thus preventing tension in the tank walls. These bands maintain a compression in the concrete when the tank is empty equal to and offsetting the tension produced in the shell when the tank is filled. Pre-stressing of tanks is a new development in engineering design, and has been previously used in only a few installations. An article on this type of tank construction will appear in an early issue of *Western Construction News*. In the Fontana water supply tanks, the stressing bands are concealed by a layer of gunite, which preserves the architectural design and protects the steel from the elements.

Concrete placement

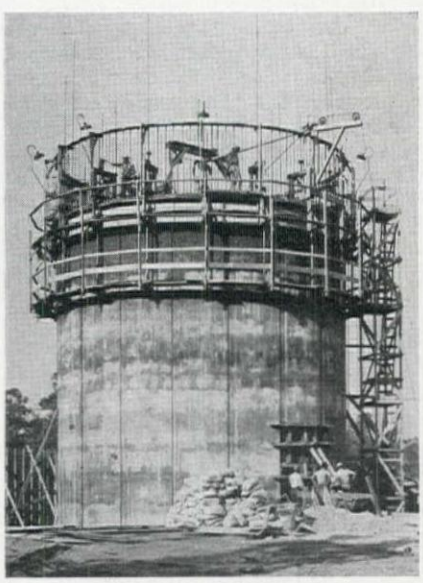
Concrete was placed in a continuous pour from start to finish of the tanks, at a rate of about 1½ cu. yd. per hour. The mix was designed for 3,000 lb. per sq. in. of compressive strength, which corresponds roughly to the old style nomenclature of "6-sack concrete." This continuous pouring was made possible by the use of 4-ft. slip forms which were first set immediately after the foundation pour and raised continuously at an average rate of 5 in. per hr.

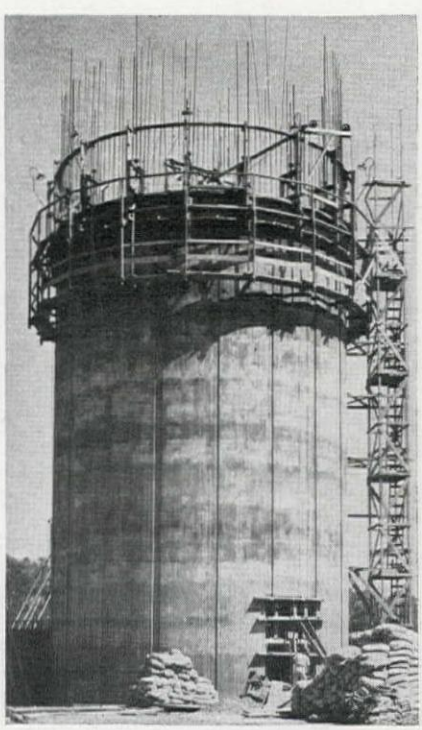
The working platform, which extended from wall to wall at the top of the inner ring of forms, served as a diaphragm to stiffen those forms, and also incorporated the concrete tower and an outrigger for raising reinforcing steel.

An automatic trapdoor in the center of the working platform closed as the bucket came through. This was designed as a safety measure. The buggies of concrete were then wheeled from the hoist opening to the forms about the perimeter. This pouring platform was eventually used for the roof slab when the wall pouring was completed.

Since the continuous operation of pouring and raising of the forms depended upon utilizing the initial set of the cement it was too hazardous to use vibrators on the concrete.

One of the interesting features of the form lifting was the water leveling device which was developed to insure uniform raising. A continuous circular pipe was laid around the perimeter of the pouring platform, and at 10-ft. intervals, vertical pipes terminating in glass water tubes were installed. At the first setting of the forms, the markings of these glass tubes were calibrated by precise level-





THREE early stages in construction of one of the tanks. The first view shows the original placing of the slip forms. The water leveling device was calibrated by precise leveling at this time. In the second view can be seen the lifting hoist and outrigger for raising steel and tools. The guide for reinforcing steel can be seen in the third view. The lower platform on the form assembly was for the use of cement finishers, inspection, and application of the Hunt curing compound, used throughout.

ing, and at all subsequent positions of the pouring platform, observations of these glasses permitted absolutely accurate leveling of the platform and forms. This was essential, since even a slightly unequal raising of the forms would put a kink in the structure and result in both architectural and structural inequalities.

Slip forms

The forms were constructed of good-grade edged grain flooring, free of knots or other defects. They were placed vertically with the bottom of the forms ⅛ in. wider than the top, in order to facilitate the slipping of the forms. A circular wooden guard was attached to the slip forms about 10 ft. above the level of the pouring platform, to serve as a guide for reinforcing rods protruding above the elevation of the work.

Reinforcing steel

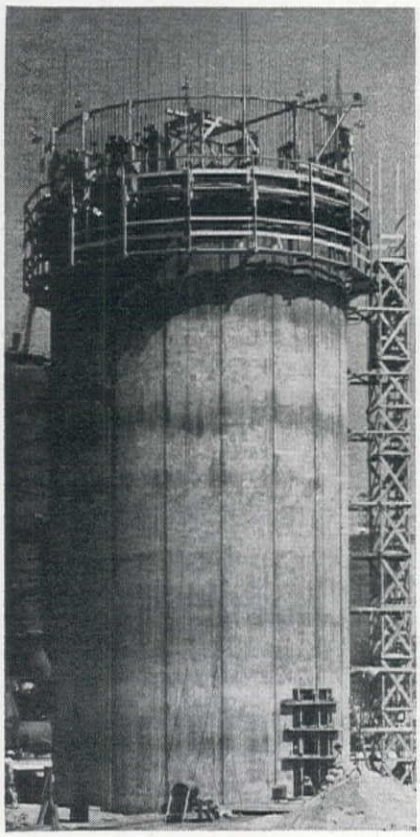
The vertical steel varied from 1¼ in. square at the base of the shell to ⅝ in. round in the tank section. In the first tier at the foundation, alternate 10 and 20-ft. lengths were used; thereafter, all rods used were of the same length. By starting out in uneven positions, the situation of having all rod breaks at the same level was avoided. Horizontal bars were ⅝ in. round on 12 in. centers.

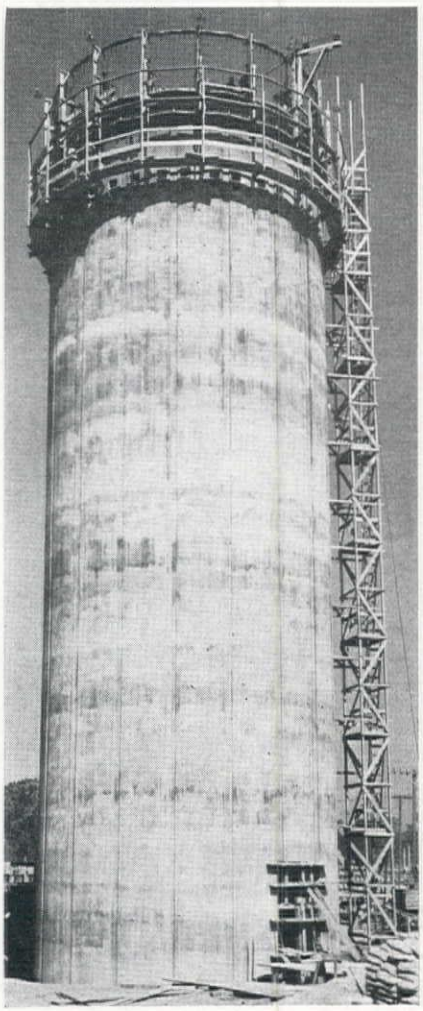
The slip forms were raised by screw jacks fastened in timber yokes. The entire load of the working platform was carried on 1-in. jack rods which were imbedded in the center of the wall and passed through the form jacks.

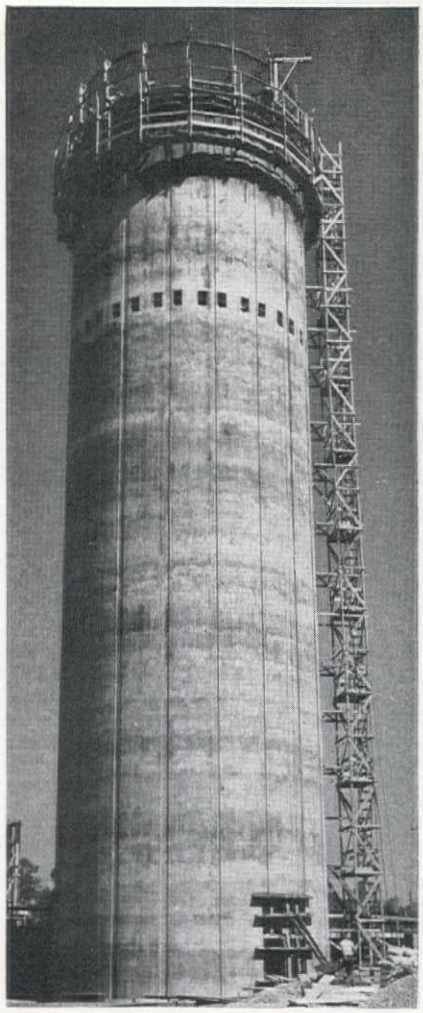
The floor slab of the water compartment is 3 ft. thick, and rests on a continuous 5 x 5-ft. bracket. A plastic filler was inserted between the floor and walls to compensate for interior flexure, and the walls and tank floor were painted with a bitumastic compound to insure watertightness.

Floor slab

The height of the interior falsework required to support the heavy concrete slab for the bottom of the tank was over 100 ft. Care had to be taken to adjust this falsework as the pour progressed, because as the weight of the slab resting on the comparatively fragile timbering increased, differential deformation between the concrete shell and the timber posts would have a tendency to produce cracks around the periphery of the slab.







PROGRESSIVE views of construction on the concrete tanks. In the top view the structure is practically complete, only the pouring of the roof slab remaining. The openings are blockouts for construction of the water storage compartment floor slab. The architectural design of the towers was made to harmonize with other buildings of the steel plan. In conformity with this, the pre-stressing bands around the tank section were concealed by a layer of gunite, which also serves to protect the steel from the elements.

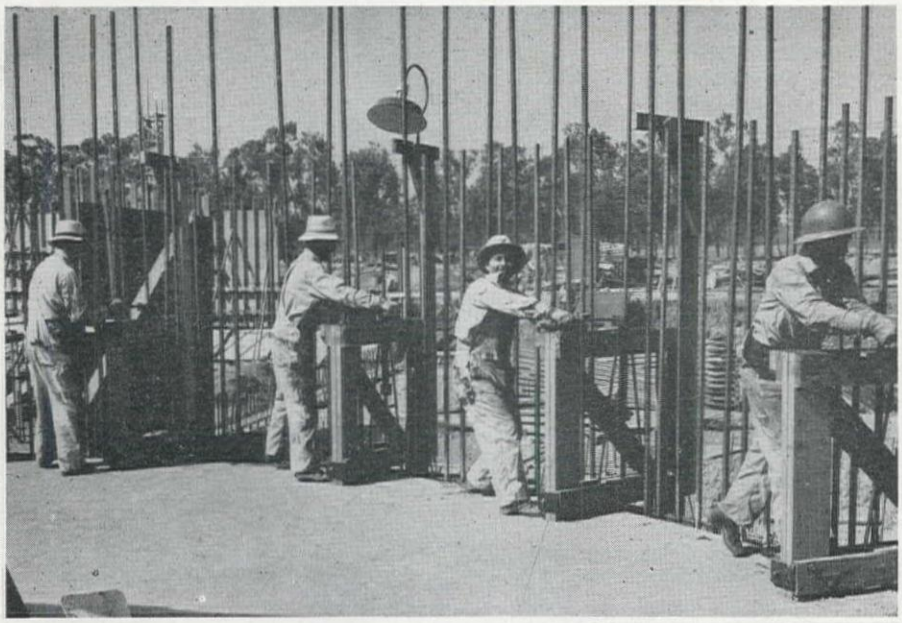
This unusual design of water storage facilities was necessitated by the shortage of steel plate. The preliminary investigations showed that the concrete tanks could be built in the allotted time and at a cost no greater than that of steel ones. It is believed that the life of the structures will be comparable to that of steel tanks.

The sources of water for the Fontana mill are two-fold — partly from wells drilled on the Kaiser Company's own land, and partly from the Fontana Lands Co., suppliers of domestic water to the town of Fontana.

Organization

The tanks were built by the Kaiser Company's own forces. The Donald R. Warren Co., of Los Angeles, were the consulting engineers on the project, and Mr. Warren was largely responsible for the new design features. A. S. Hartley was the concrete engineer in charge of construction in the field, and Henry (Jack) Holt was the carpenter superintendent. Both of these latter men were formerly with the Bureau of Reclamation at Shasta and Friant dams. Tom Price is construction manager at Fontana for the Kaiser Company, and Frank Backman is his assistant.

Construction of the Fontana steel mill was started in May, 1942, and the first pig iron was produced in January, 1943. Pig production is now averaging about 600 tons per day. It is anticipated that the mill will be rolling plates and shapes

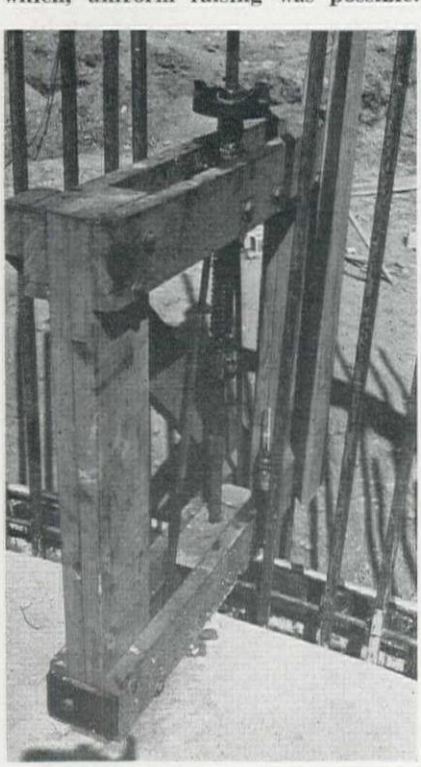


RAISING forms by turning screw jacks in timber yokes. In the photograph, all the jacks are being turned simultaneously, but the usual procedure was for one man to devote his entire time to the jacks, going continually around the platform, giving each jack one-quarter turn, and checking the water level tubes at frequent intervals. The continual turning raised the slip forms at the average rate of 5 in. per hour.

by the end of this year, in nearly full production.

Eventual total capacity of the Fontana mill will be 675,000 tons of iron and steel per year, by far the largest production of any mill in California. Beside the blast furnace put into operation by Mrs. H. J. Kaiser at special ceremonies this January, equipment of the plant includes 6 open hearth furnaces, 90 coking ovens, a plate mill, a bar mill, a structure mill and alloy finishing facilities. The primary reason for building the plant is to furnish steel for construction of Liberty ships in 3 Kaiser shipyards in California. When in full production, doubtless other yards will also receive shipments from Fontana.

CLOSEUP of the yoke and screw jack attached to the jack rod set in the concrete of the wall. In the lower outside corner of the yoke may be seen one of the water level tubes, by reference to which, uniform raising was possible.



HENRY HOLT, right, carpenter superintendent at Kaiser Co., Inc., Iron and Steel Division's plant now under construction at Fontana, Calif. With him is JAMES YEOMANS, his assistant.

Contractor Wins Honor

J. A. CASSON CO., contractor of Hayward, Calif., has been awarded the Treasury "T" flag. The recognition is due to the fact that all of the contractor's employees are investing 10 per cent or more of their salaries in war bonds.

Bureau Plants Produce Huge 1942 Power Output

POWER PLANTS on Bureau of Reclamation projects in all western states produced in the calendar year 1942 more than seven and a quarter billion kilowatt-hours of electric energy, largely for war purposes. The 1942 output, speeded to meet the demands of war industries, showed an increase of 75 per cent over the production in the calendar year 1941.

Substantial additions to capacity at the close of 1942 and early in 1943 now enable the plants on Bureau projects to operate at the rate of nine billion kilowatt-hours annually. The annual rate will be increased to ten billion kilowatt-hours by midsummer, which is more than the generation in the entire state of Illinois in 1940.

The major part of the Bureau's power output was from Boulder Dam in the Pacific Southwest, already the largest single source of electric energy in the world; and from Grand Coulee Dam whose three 108,000-kw. generators operated at an overload in order to meet the power demands from war activities in the Pacific Northwest. The capacity of both of these plants was increased during the year as were also the installations at dams constructed by the Bureau of Reclamation in Texas, Idaho and Utah.

The total capacity of power plants on Bureau of Reclamation projects was increased nearly 50 per cent, from 1,114,562 kw. at the time the Japanese struck at Pearl Harbor to 1,642,000 kw. early in January this year. The Parker Dam power plant on the Colorado River between Arizona and California—the 29th in the Reclamation family—and the installation of an additional generator at Boulder Dam, enabled the Bureau to start the New Year with a capacity gain of 172,500 kw. over the installations on Dec. 1, 1942.

During 1943 additional installations cleared by WPB at Reclamation plants will increase the total capacity to more than 2,000,000 kw. These include two 75,000-kw. generators originally constructed for Shasta Dam of the Central Valley project in California which are being rushed into place at Grand Coulee Dam in order to meet additional load requirements in that area. Two more 108,000-kw. generators are to go on the line at Grand Coulee during the year.

A new plant scheduled for operation in April is that of Green Mountain Dam of the Colorado-Big Thompson project in Colorado. Shasta Dam is to come in early in 1944 when there will be further increases in capacity at Boulder and Grand Coulee. When the present schedule of installations is completed in the spring of 1944, the capacity on Reclamation projects will increase to 2,500,000 kw.—a volume greater than the total installed capacity of all electric plants in the 11 western states at the close of the last war.

New Railway Utilizes Salvage

To provide emergency transportation for thousands of shipyard workers a 14-mi. electric railway was built from such material as timber from an old pier, girders from a railroad turntable, and cars from New York's dismantled elevated lines

PRESSING NEEDS for mass transportation facilities to serve three shipyards employing more than 85,000 men at Richmond, Calif., have brought forth one of the most unusual construction jobs ever undertaken in which practically all materials, from rail spikes to cars, are second-hand. Assembly of materials from all over the United States for construction of the 14-mi. interurban line at a cost of $1,890,000 was made possible by the assistance and cooperation of near a dozen organizations, including railroads and Federal, State and city governmental organizations.

A year ago, contemplated employment increases at the Richmond shipyards and congested motor vehicle traffic conditions between Oakland and Richmond on the east shore of San Francisco Bay indicated the need for additional transportation facilities. The California Division of Highways was engaged in constructing a new 4-lane highway from a junction with the East Shore Highway at Albany to Richmond, but it was apparent that a highway would not entirely solve the problem. Increasing rubber shortages also indicated the need for mass transportation facilities that would not depend on pneumatic tires. Following a conference attended by representatives of the U. S. Maritime Commission, the California Railroad Commission, the Key System, the Southern Pacific Co., the Interurban Electric Railway Co., the Atchison, Topeka & Santa Fe Railway Co., the Western Pacific Railroad Co., and the Richmond Shipyards, it was felt that the Key System had the existing facilities and equipment with which to construct a shipyard railway, and that it was the logical transportation agency through which extended service should properly be provided in the East Bay area. As a result, a contract was awarded to the Key System by the U. S. Maritime Commission for the construction of the Richmond Shipyard Railway at a cost of $1,890,000.

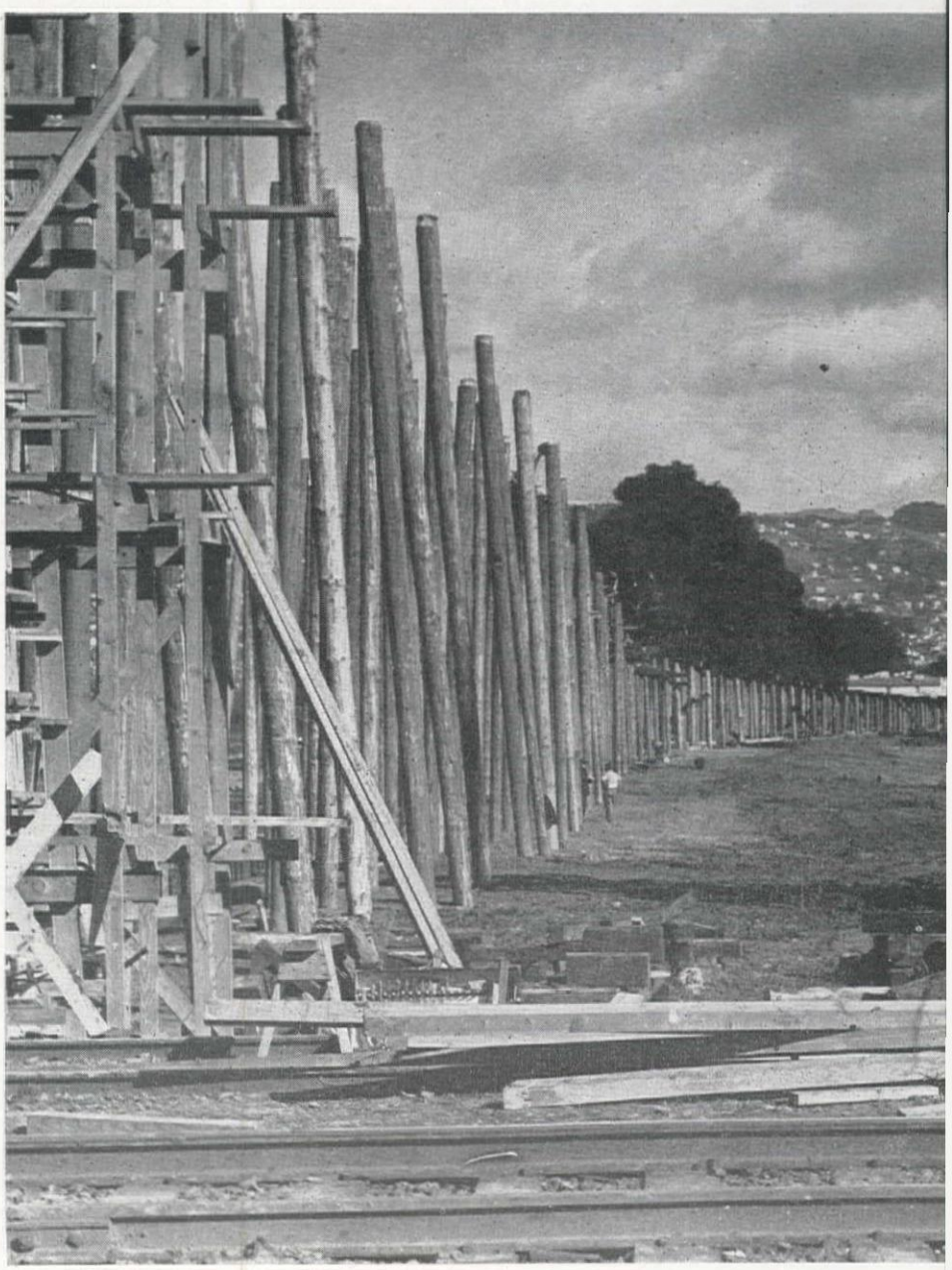
The Key System, at the time the contract was awarded, was the only transportation utility organization operating in the East Bay. It operates inter-city streetcars in Oakland, Piedmont, Berkeley, and Emeryville; motor busses in all of the metropolitan East Bay area from Hayward on the south to Richmond on the north; and interurban electric railways over the San Francisco-Oakland Bay Bridge from San Leandro, Oakland, Piedmont and Berkeley. The Interurban Electric Railway Co., a subsidiary of the Southern Pacific Co., had formerly operated an interurban service between San Francisco and East Bay points similar to the service provided by the Key System, but in July 1941, had abandoned this service, and its facilities were in the process of being dismantled. When the Interurban Electric Railway Co. abandoned its services, the Key System made extensive changes in its own services, taking over portions of the I.E.R. lines and abandoning other portions of its own lines to effect a consolidation of transportation facilities in the East Bay.

Railway route

The route of the Shipyard Railway starts at Yerba Buena and Hollis Streets, a block west of San Pablo, and about two blocks north of the middle approach to the San Francisco-Oakland Bay Bridge. The Key System interurban lines from San Francisco come through this point. The main vehicular route to Richmond, which was formerly used by motor coaches, is San Pablo Avenue. Facilities for storage and servicing of equipment were provided in the Yerba Buena yard of the Key System from which access is readily available to the main line interurban tracks of the Key System.

From this terminal the route extends over existing Key System facilities to San Pablo Avenue, where it connects to existing street car tracks running toward Berkeley. Near Ashby Ave., in Berkeley, the street car tracks terminate and new track was extended north to Grayson St.

THE ONLY important structure on the new shipyard railway is an overhead crossing above the tracks of the Southern Pacific at Albany, containing over 600,000 board feet of salvaged timber. Photo shows the piling in the east approach to the overhead.



and west to Ninth St. to a connection with the existing Ninth St. line of the Interurban Electric Railway. This old line, which had been abandoned nearly a year and a half ago, was utilized as far as Cordonices Creek, which is the boundary line between the cities of Albany and Berkeley. Here the route turns west over newly placed track, and crosses the main line of the Southern Pacific Co. on an elevated structure.

The route then swings north, passes under an existing elevated concrete structure which carries the East Shore Highway over the main line of the Southern Pacific Co. and connects with the new Richmond highway recently constructed by the California Division of Highways especially for shipyard traffic. The rail route immediately adjoins the new highway, paralleling it to Twenty-Sixth St. and Potrero Ave. in Richmond. From here, it follows Potrero Ave., Eighth St. and Cutting Blvd., passing two, and terminating at the third shipyard in Richmond.

Railway cars

At the time construction of the Shipyard Railway was contemplated, the elevated lines in New York City were being abandoned, which made it possible to purchase 90 cars which had been used on the elevated lines for years, and ship them to Oakland. The elevated cars had been used in connection with third rail operations in New York, so it was necessary to remove the third rail shoes and install pantographs in order to fit the cars to use the overhead catenary system which must be used in surface operations.

Fortunately, abandonment of the Interurban Electric Railway made available a large number of pantographs which were removed from the I.E.R. cars and placed on the cars from the elevated railway. It might be explained that the I.E.R. cars could not be utilized on the Shipyard Railway because their electrical equipment was intended for use at 1,300 volts, whereas all Key System lines are operated at 600 volts, and the necessary electrical changes would have been difficult to make under existing conditions.

In addition to the installation of pantographs, electrical and braking equipment on the eastern cars was completely overhauled, and all wheel flanges were turned down to permit their use on street car rails. To complete the overhaul of the cars, they were completely repainted.

Track

Rails for the new line were salvaged from all available sources throughout California. The Key System used rail which had been salvaged from the Sacramento St. interurban line in Berkeley, and street car rails from Eighth St., Twelfth St., Wood St., and Foothill Blvd. in Oakland. Interurban Electric used rails were salvaged in Alameda and Berkeley.

More than 20,000 ft. of rail were removed from the Glen Ellen line of the Napa and Calistoga railway in the northern counties of the San Francisco Bay area, and another 75,000 ft. were obtained from the Pacific Electric Railway, an interurban utility in Los Angeles. In addition to this, of course, a portion of the Shipyard line utilized existing tracks of the Key System which were already in use on San Pablo Ave., as well as several thousand feet of double track rail on Ninth St. in Berkeley which had been abandoned 18 mo. before by the Interurban Electric Railway Co. An unusually large number of compromise joints were necessary due to the many different rail sections used on the job.

Catenary

To supply overhead wire for the power feed, the Key System utilized all of its own stocks, and removed the catenary from the abandoned lines in the East Bay area. The catenary which had been used on the San Francisco-Oakland Bay Bridge for operation of the Interurban Electric Railway and the Sacramento Northern Railway was removed and used for the shipyard line. It might also be explained that during the operation of the three rail lines over the double track railway on the lower deck of the Bay Bridge, two power systems were used.

The Key System employing the lower voltage uses a third rail system throughout the length of the bridge, while the Interurban Electric and the Sacramento Northern, utilizing the higher voltage, operated from an overhead catenary. With the abandonment of the I.E.R. and the Sacramento Northern, it was possible to remove all of the catenary on the bridge proper, and a great deal from the I.E.R. storage yards at the east approach to the bridge. The only remaining catenary on the bridge system now extends from the San Francisco approach through the terminal and back to the bridge. Future plans contemplate the possible use of this catenary.

Some catenary, as well as rails and other miscellaneous items, were salvaged from the old Key System pier which is being dismantled and removed. More than 90 mi. of copper trolley and feeder wire were required in the construction of the Shipyard Railway line.

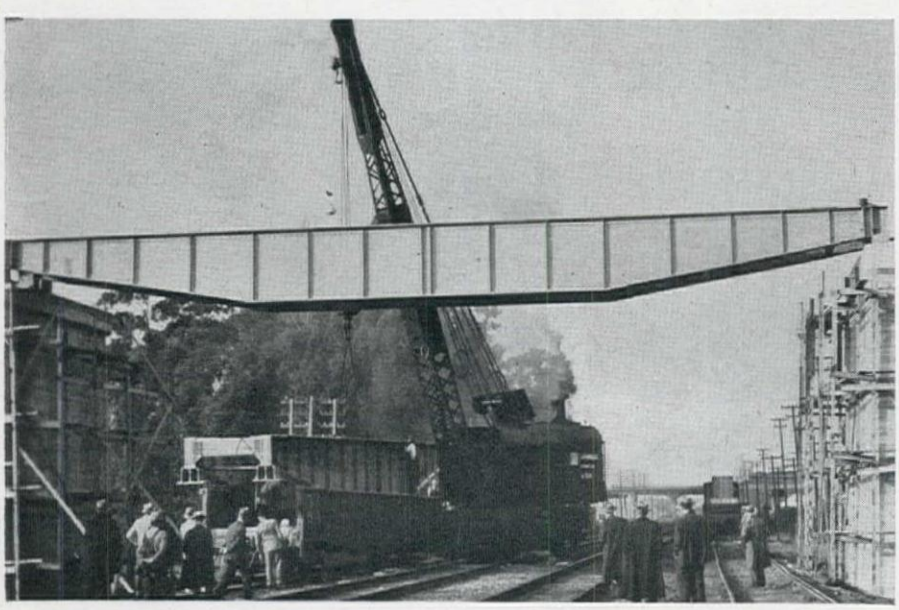
Accessories

Tie-plates, rail spikes and miscellaneous timbers were secured from a number of sources, the most important one being the old Key System pier which still remained in place immediately to the south of the Bay Bridge. The pier had been built originally to serve as a junction for the Interurban Railway operations and the Trans-Bay ferries of the Key System. Prior to the construction of the Bay Bridge and the operation of interurban trains on its lower deck, electric trains from the East Bay operated to the end of the pier, where passengers were transferred to steam turbine-driven ferries which plied between the pier and the Ferry Building at the foot of Market Street in San Francisco.

When construction of the Shipyard Line was begun, dismantling of the old pier was undertaken by the same contractors constructing the Shipyard Railway. Approximately 500,000 bd. ft. of timber from the old pier were utilized, principally in the construction of the timber pile trestle forming a part of the overhead crossing of the Shipyard Railway across the main lines of the Southern Pacific at Albany, for smaller timber pile trestles for the shipyard line, and for the construction of loading platforms to meet the requirements of the cars from the New York elevated. These cars were not equipped with steps since the elevated operations in New York had been from depressed rails directly to station platforms. In order to avoid the installation of steps on each car, it was decided to operate the old cars on through-trains with scheduled stops only at terminals where loading platforms could be constructed.

These platforms were simple timber structures 400 ft. long by 20 ft. wide. Several platforms at Richmond termi-

GIRDERS for the overhead structure at Albany were formerly part of a Southern Pacific turntable, which had been abandoned. Stiffeners were added before erection.



nals were constructed as earth fills with the timbers used as retaining walls, but these proved to be less practical from a cost standpoint than all-timber platforms although less critical material was used in their construction. In all, six loading platforms were constructed. Timbers from the old pier were also utilized extensively in the construction of small drainage structures. However, new ties were used for the most part on the rail lines.

Track crossings were built by a number of organizations capable of handling this type of work. Some of the crossings were constructed by the Moore Drydock Co. in Oakland, some were built by Ramapo-Ajax Co. in Seattle, Wash., and a few were secured from the Southern Pacific Railway which had previously removed crossings from the Fresno Street Railway System in Fresno, Calif.

Electric power substations

Four electric power substations were constructed to serve the Shipyard Railway. In place of the usual concrete buildings, the electrical equipment is housed in frame buildings with corrugated cement asbestos siding and composition roofs, making very presentable structures, and ones which are acceptable under existing conditions from the standpoint of fire resistance.

The majority of the electrical equipment installed in the four substations was removed from the San Francisco-Oakland Bay Bridge. Equipment was distributed as follows:

One 1000 kw. 625-volt Mercury Arc rectifier unit was removed from the San Francisco-Oakland Bay Bridge Mole Substation and installed in the Dwight Way Substation of the Richmond Shipyard Railway.

Two 2500 kw., 1350-volt recifier units were removed from the San Francisco-Oakland Bay Bridge Mole Substation and installed in the Buchanan and Canal Street Substations of the Richmond Shipyard Railway.

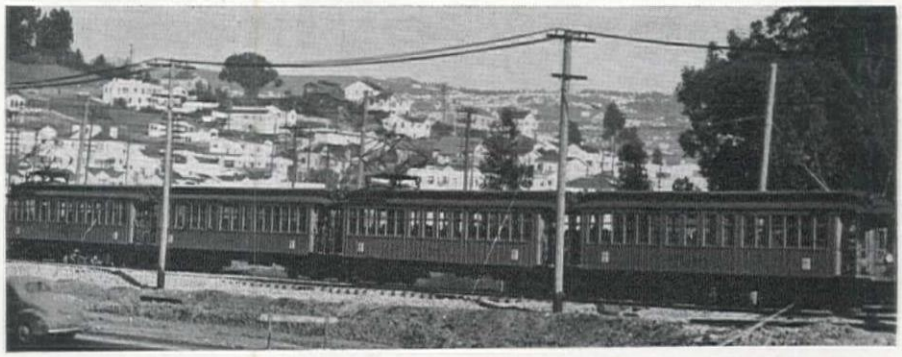
One 2000 kw., 625-volt rectifier unit was removed from the San Francisco-Oakland Bay Bridge Island Substation and installed in the Potrero Substation of the Richmond Shipyard Railway.

The capacities of the four substations are as follows:

Dwight Way	1000 kw.
Buchanan Street	2000 kw.
Potrero Avenue	2000 kw.
Canal Street	2000 kw.

or a total of 7000 kw. of new substation capacity plus approximately 2000 kw. from existing Key Substation Y for the complete railway. This provides enough capacity to continue operation of the road should any one of the stations have to be shut down due to failure of equipment.

Power is furnished to all stations at 1200 volts via overhead transmission lines. Transmission wires enter the building through high-voltage wall bushings and after passing through primary disconnect switches and metering equipment are connected to a high-voltage bus suspended from the ceiling of the station. Both the rectifier power transformer and the station auxiliary transformer are supplied from this bus.



CARS used on the Shipyard Railway were formerly used on the elevated lines in New York City. Addition of pantographs and other equipment was needed for present use.

Poles

Along the old Ninth St. line of the Interurban Electric Railway, the steel catenary poles were still in place and the Maritime Commission acquired these, using them at their existing locations. Where additional poles were required for support of the new catenary system, new materials were purchased and installed.

Overhead crossing

The principal structure on the 14-mi. line is the overhead crossing of the shipyard line across the main transcontinental route of the Southern Pacific. This was accomplished by a 1,692-ft. timber pile trestle with one 80-ft. double-track steel girder span supported on concrete piers. Because the Shipyard Railway line and the Southern Pacific line run approximately parallel at the point of crossing, it was necessary to incorporate two sharp turns in the overhead structure, thereby providing a 90-deg. crossing and avoiding the excess amount of steel that would have been required for a skew crossing. The curve at the south approach to the trestle is 10 deg., and that at the north 15½ deg.

The structure is double track with 9-pile bents 15 ft. c. to c. except on the curves. The outer piles in each bent are on a batter while the remainder are vertical. The actual crossing of the Southern Pacific track is accomplished by a 79-ft. span, consisting of two pair of 80-ft. steel turntable girders. The Southern Pacific Co. had recently replaced the turntables at several of its yards, and the girders from the old structures were purchased for use as the principal supporting members for this crossing. The four turntable girders (see accompanying photograph) were strengthened prior to erection in the overhead by the addition of vertical web stiffeners near the abutments. The girders are supported on mass concrete piers 32 ft. from footing to top, and spaced 79 ft. c. to c. Both piers are founded on piles. The pile trestle caps and other timbers in the structure were salvaged from the Key System pier, but the piles themselves are new material.

Organization

Not the least interesting of the entire project is the manner in which the operations were organized. Funds were supplied and work supervised by the United States Maritime Commission, of which Carl W. Flesher is regional director, D. W. Fernhout, chief plant engineer, and O. E. Carr, coordinator of transportation and housing. R. B. Hansen, formerly of the Southern Pacific Co., and the Western Pacific Railroad Co., was construction engineer for the Maritime Commission on the Shipyard Railway.

The principal contract was taken, and the work supervised, by the Key System, of which A. J. Lundberg is president, and Wm. P. St. Sure is vice president and general manager. S. G. Culver is vice president and chief engineer for the Key System.

The principal labor contract was awarded to Eaton-Smith Co. and Swinerton & Walberg Co. (joint subcontractors), both of San Francisco. A. T. Hass was project manager, and L. J. Fletcher assistant project manager for these contractors. C. K. Notley was the contractors' electrical superintendent.

Installation of the electrical equipment, including catenary, substations, signals, etc., was handled by Scott-Buttner Electric Co. of Oakland. Production of the ballast was handled under a subcontract by C. Dudley DeVelbiss, contractor of Oakland who set up a crusher on the north slope of the hill between Albany and El Cerrito to turn out the material. The piles for the trestle at the overhead crossing at Albany were driven and capped by Ben C. Gerwick.

The steel turntable girders were cleaned, strengthened, painted and erected by R. D. Russell & Company. Due to the heavy volume of traffic over the main lines of the Southern Pacific it was necessary to erect these girders in the very short interval between trains. They were erected in one and one-half hours.

Design of the overhead structure at Albany was undertaken by the bridge department of the Southern Pacific Co. under the direction of J. P. Dunnagan, bridge engineer.

Construction of the Shipyard Railway was begun on Aug. 12, 1942, and operation over the line was begun to one of the three shipyards on Jan. 18, 1943. It was extended to a second shipyard on Feb. 8, 1943, and to all three shipyards on Feb. 22, 1943.

Airport Paving in Winter—II

Runway work on an important Pacific Northwest airbase was complicated by three problems—preparation of subgrade, heating the concrete, and curing of the green concrete when laid. Excessive cold caused a delay of two weeks early in January

WINTER PAVING of a Pacific Northwest airbase by the Seattle District of the U. S. Army Engineers is proceeding on schedule, despite a two-week shutdown, due to blizzard conditions, according to late reports from this project which were outlined in *Western Construction News* last month.

This two-runway airbase has been using winter paving methods since December 1. Progress reports show temperatures are gradually rising. Although during the latter part of January subzero weather and unduly heavy snow conditions halted paving for two weeks, now warmer temperatures and familiarity with the problems of this cold-weather work, plus an increased production of aggregate and additional equipment are resulting in progress according to schedule.

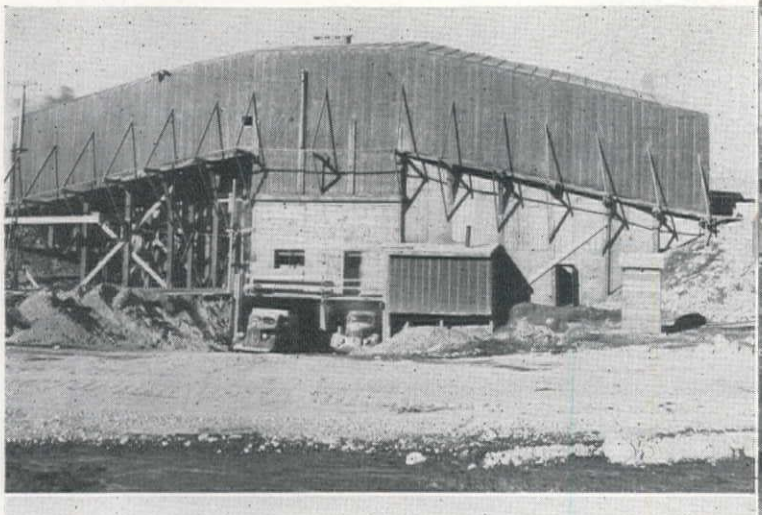
Crews operating on a single shift, six days a week, are now laying down better than 8,000 sq. yd. a day or 7,000 sq. yd. per calendar day. The two lanes, each 25 ft. wide, in which concrete is laid down are shaping up into the mammoth airbase contemplated in this War Department assignment. The steady rate of paving is enabling the Engineers and the contractor to keep the job absolutely up to date.

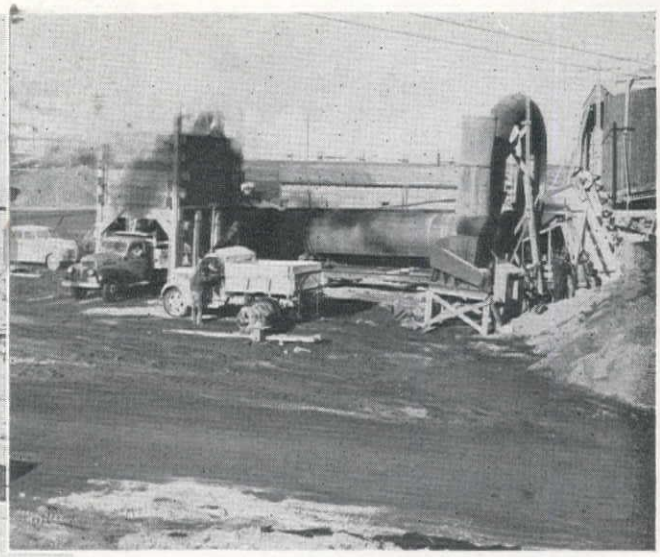
Three problems have been met in this cold weather paving job: preparation of the subgrade, heating the concrete and protection of the green concrete. Official Army Engineer photographs on these pages serve as a progress report on construction conditions at this Northwest job. Of the total paving work called for, that is 1,500,000 sq. yd. of concrete, approximately one-third has been laid and by early April progress will be accelerated to produce about 10,000 sq. yd. a day. A complete scheme for winter paving has been developed as construction has progressed and pending a complete engineering report in the May issue of *Western Construction News*, additional operation features are reported here.

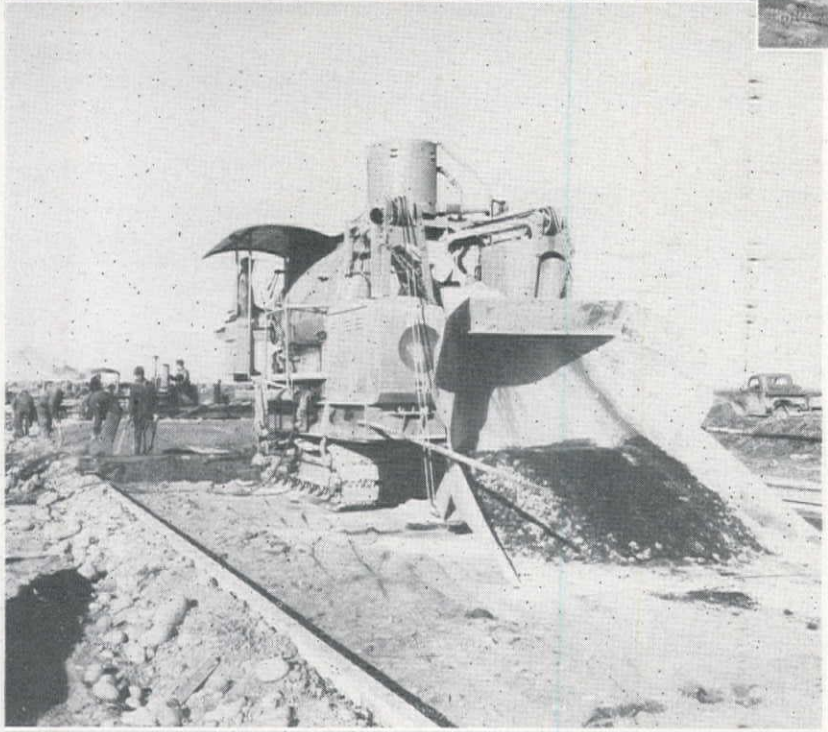
Closeup of mixer in operation, under conditions of extreme cold. A flame-thrower was installed at entrance opening of the mixer, to further heat already warmed aggregate. The picture at the top of the page shows digging operations in the frozen ground.

Aggregate production increased

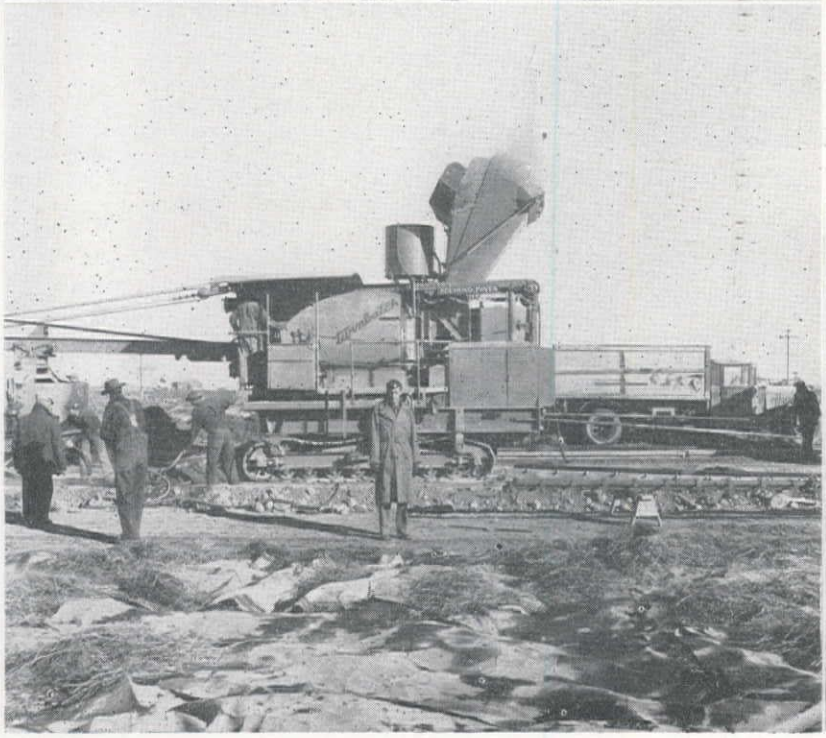
The output of aggregate has been increased. Prior to the initiation of paving operations, the first gravel plant was put into operation early last fall to develop a stockpile. This plant produced at the rate of 150 cu. yd. per hour and at the present time accounts for approximately 9,200 cu. yd. a week. It was deemed advisable to increase aggregate production and on December 28, a smaller plant was set up which now accounts for about 2,500 yards a week additional. Both plants, located on a nearby

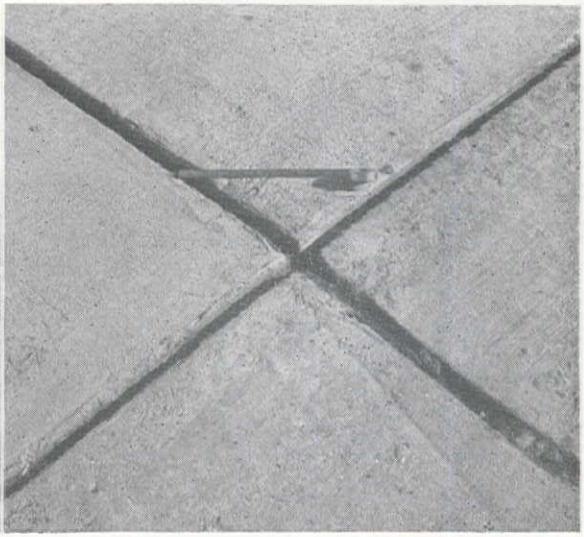






TOP RIGHT, the sand dryer and heater used in eliminating the water in the sand shown in operation. TOP LEFT, the inclosed bunkers of the batching plant, completely housed in and with steam coils in the sides of the bunkers. Both the hoppers and scales are located here, double equipment provided for increasing the batching on later spring schedules. Flame thrower blow torches installed in the mixing drums heated the aggregate with open flames before the addition of the water and during the mixing process. In addition, 2 per cent of calcium chloride was added to each batch to accelerate the initial set. LEFT, photo shows a paver moving forward, with one batch in the foreground and the crew ahead of the rodding machine in the background. BOTTOM LEFT, a side view of the paver with the skip raised, and an insulated tank truck delivering hot water in the background. BOTTOM RIGHT, a texture photograph showing expansion joints. Concrete in this picture is completely cured, a procedure involving the Hunt process curing membrane which was sprayed on, then two layers of Sisalkraft paper between which was a blanket of hay and straw.





water source and built about 100 yd. apart, draw from an unlimited natural supply. However, the sand obtained from this pit is slightly deficient in fines so another source furnishes blending sand in the amount of 10 per cent.

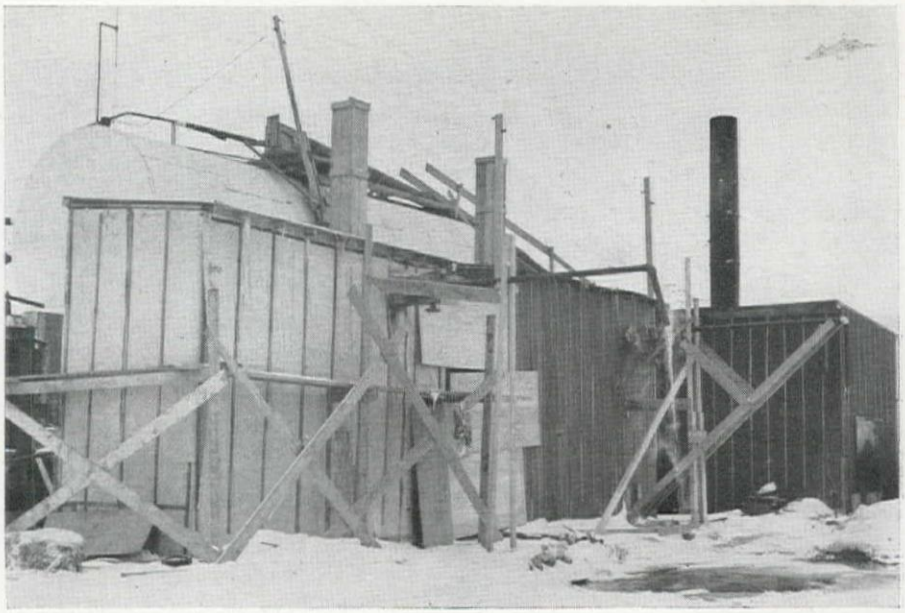
With normal specifications, approximately 1¼ bbl. of cement would be used in the mix, but due to the temperature problem 1½ barrels are used for cold weather laying. This approximates a 1:2.4:3.64 mix by volume. To accelerate the initial set of the concrete and speed finishing operations, two pounds of calcium chloride are added per sack of cement, the dry addition to the coarse aggregate proving the most satisfactory method.

Heating plant

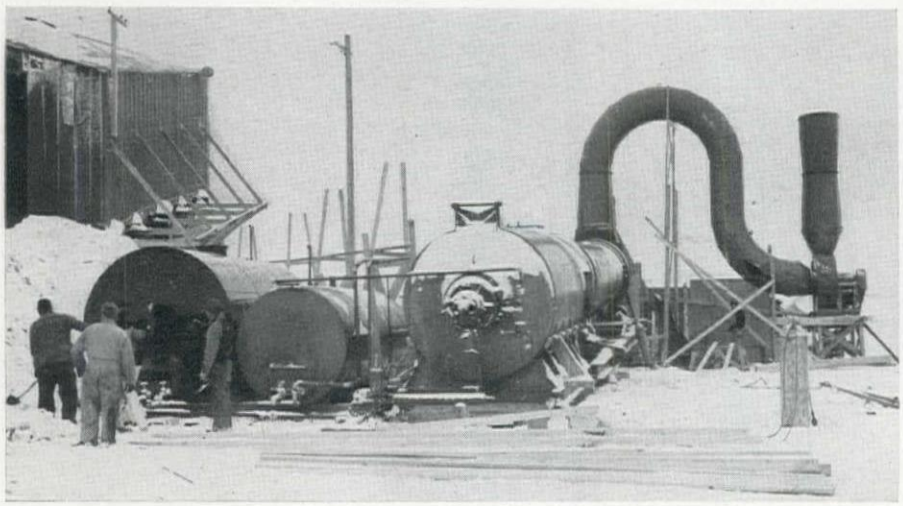
To turn out concrete at 60 deg. F. onto the subgrade, a compromise with the usual 70 degree temperature of normal paving, was the problem underlying all steps in this winter paving project. One of the difficult steps in raising the temperature of the ingredients of the concrete was heating the mixing water. The contractor constructed his own water heating plant, installing a cold water supply tank of 20,000 gal. and two 2,500-gal. auxiliary tanks, heated with one 130 h. p. and one 90 h. p. tank fitted with steam coils. The insulated tank trucks delivering hot water to the paving machines were remodelled for the purpose by reconstructing them with dead air space between two walls of plywood and the addition of an inner lining of fiber paper. These trucks carry steaming water at about 160 degrees F.

On a job of this scope the inventory of contractor's equipment includes many pieces of heavy equipment. Included at present on this list are:

2 34-E Ransome pavers
2 27-E Rex pavers
2 27-E Multi-Foote pavers
2 27-E Koehring pavers
1 Jaeger-Lakewood strikeoff machine
1 Blaw-Knox strikeoff machine
2 Koehring longitudinal finishers
1 Blaw-Knox cement silo
1 Butler cement silo
1 Butler cement hog
1 Isaacson TracDozer
1 1¼ Lima shovel
Butler scales
Caterpillar tractors
Tournapulls and carryalls



Special measures taken by the contractors on the winter paving job included: a water heating plant, shown above at the right; addition of 2 per cent calcium chloride directly to the mix, as shown in the center picture; and a sand dryer and heater, located near the mixing plant, as shown in the lower photograph.



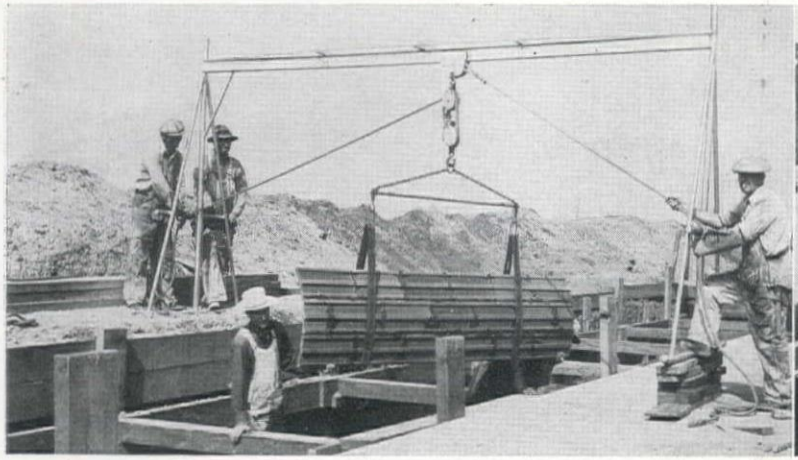
Note: The photograph on the cover of the February issue of *Western Construction News*, showing a surveyor at work under winter conditions on this Northwest airport, was taken by Leonard Fell, photographer at the Seattle, Wash., district engineer's office.

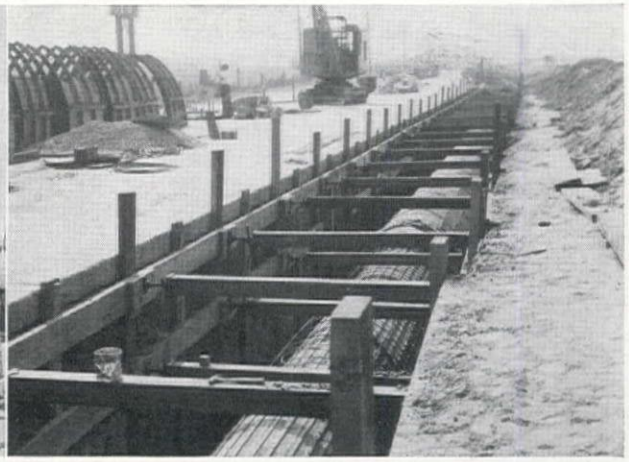
Central Valley Project Studies Post-War Plans

FORTY Federal, State, and local agencies are cooperating in the Central Valley project studies. The Bureau of Reclamation, which is conducting the studies, has outlined 24 basic problems to determine how the Central Valley project can contribute most to the war and to postwar readjustments and how it may be fitted best into the established economy of California.

Commissioner John C. Page of the Bureau of Reclamation, in announcing the list of participating agencies, expressed the hope that many others, particularly local groups, will join in the studies. "We are approaching these problems from the viewpoint of the residents in the Central Valley who will be benefited by the project.

"The nature of the problems requires the services of specialists in many fields, and the Bureau sought and will continue to seek the cooperation of all agencies who will contribute the special knowledge necessary for a thorough examination of the problems falling within the scope of the studies," Commissioner Page said.





LEFT, a portable I-beam gantry lifting a tile panel into place. RIGHT, shows tile lining in place ready for arch pour.

Sewer Constructed as Siphon

Los Angeles County Sanitation Districts build a tile-lined concrete sewer to augment an inadequate trunk across a pressure section in the Nigger Slough vicinity

By A. M. RAWN
Chief Engineer and General Manager
Los Angeles County Sanitation Districts
Los Angeles, Calif.

THE second unit of an originally projected double-barreled trunk sewer through a section in which the hydraulic gradient of the flow at capacity is above the surface of the ground, was recently completed by the Los Angeles County Sanitation Districts, on Wilmington Ave. about 4 mi. south of Compton, Calif. When the Districts' joint outfall trunk sewer was first placed in operation in 1928, only one unit of the siphon was built, and that was more than adequate to handle the flow of sewage at that time.

The section which operates as a siphon is about 2 mi. in length, being in the vicinity of the depressed and swampy area known as Nigger Slough. Since the normal sewage flow did not exceed twenty million gallons per day during the first ten years of operation, this single unit consisting of 60-in. reinforced concrete pipe, lined with clay tile, was adequate.

However, the unprecedented storms of early March, 1938, with attendant leakage into the sewerage system, combined with a steadily mounting normal flow, overtaxed the siphon, the maximum capacity of which was only 65 cu. ft. per sec. To the north and above the siphon, a 6-ft. 6-in. semi-elliptical monolithic structure of tile-lined reinforced concrete, having a capacity of 125 cu. ft. per sec. when flowing three-fourths full, emptied into the smaller tube, while to the south, or outlet end of the siphon, a 9-ft. 6-in. structure of similar design extends a distance of 3 mi. to the joint disposal plant. This larger conduit has a capacity of 153 cu. ft. per sec. at three-fourths depth.

Continued substantial increase of the sewage flow in combination with additional later storm water troubles, made the construction of the second barrel of this siphon imperative. Finances were not an important problem, since bonds originally voted in 1925 had included funds for this particular project.

Construction of the second parallel siphon started in July, 1940, as a co-operative project by the Works Progress Administration and the Sanitation Districts, being one of four units involving a total expenditure of about one million dollars for increased sewerage facilities. Total cost of the Wilmington Avenue siphon amounted to $405,000, of which the Districts' share, largely used for materials and equipment, amounted to $167,000. Most of the federal funds were allotted to labor, 3,350 man-months of work being performed.

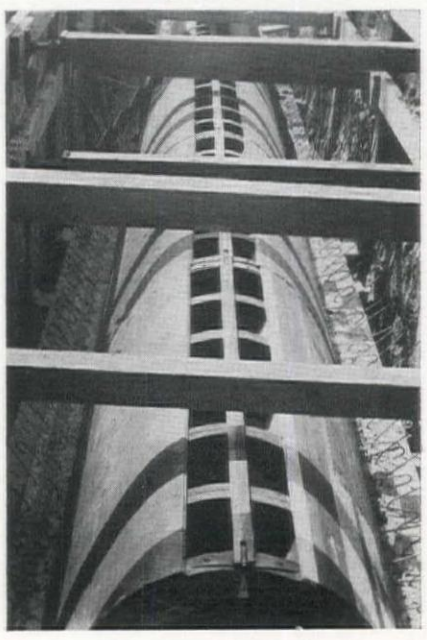
The new structure has a semi-elliptical cross-section, 5 ft. 6 in. in diameter, with reinforced concrete walls of varying thickness, faced with tile liners. Nine standard manholes afford access at intervals along the line, and have covers which can be clamped on to withstand a slight pressure from within. The sewer crosses Nigger Slough itself on a concrete culvert, and at that point a special by-pass structure with stop logs was built.

For most of its length, the sewer trench was located adjacent to a 40-ft. concrete road slab. A trencher with rotary side cutters excavated a trench 10 ft. in width, to an average depth of 12 ft. Excavation at street intersections was done with a clam-shell bucket and by hand, and dirt was removed by dump trucks to waste dump nearby. Ground water was encountered for about half the length of the project, and in many sections it was necessary to drive the sheeting with air hammers.

The invert was placed first, together with the lower 6 in. of side walls, and reinforcing steel was left protruding from these for later pour of the remainder of the walls. Except for one layer of ¾-in. round transverse bars in the invert, all steel used, about 300 tons, was ⅜-in. round.

When the job first started a 7-S mixer was used for the concrete, but this was soon changed to a 10-S mixer, with which it was possible to pour 50 cu. yd. per day. The adjacent concrete roadway made excellent footing for rubber-tired

A SEMI-ELLIPTICAL cross-section of reinforced concrete wall was used with tile lining, the walls of varying thickness.



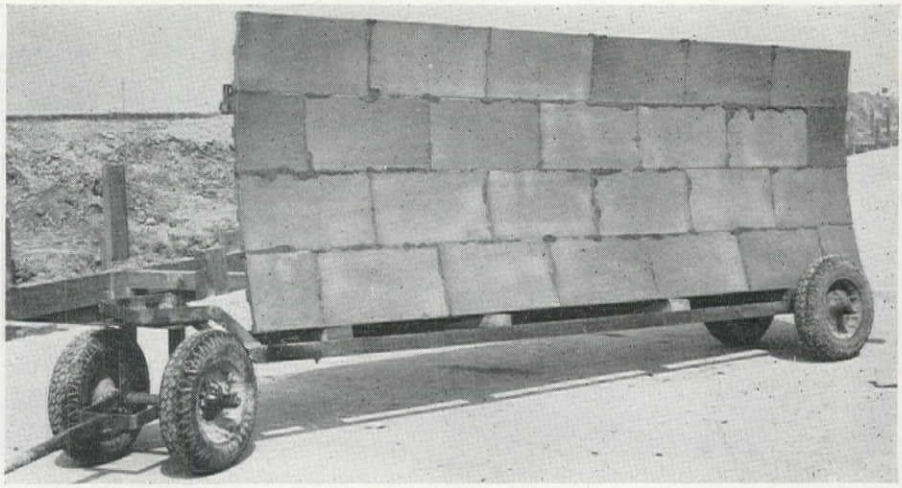
wheelbarrows and concrete buggies. A sliding hopper on a portable rack supported an 8-in. rubber hose, giving delivery to any part of the ditch. The steel-troweled invert finish was sprayed with Hunt curing compound, but wet burlap was used on the rough stub walls. The later arch pour was cured by painting the exterior with a cut-back curing compound.

The arch form sections were 9 ft. 1 in. in length and consisted of two curved panels with a single hinged joint at the top. A total of seventeen forms were made up of 2-in. segment ribs covered with 1 x 3-in. tongue and groove lumber. To admit interior light, the sheeting was omitted at the top of the form. A portion of the form was surfaced with sheet iron.

Erected on the completed invert, the bottom sill of the arch form was wedged on a timber of triangular cross-section that fitted the sloping bottom of the invert. Trench jacks and pipe spreaders held the forms out tightly at the bottom against the wall stubs poured with the invert. A special 3-wheeled, rubber-tired dolly was built to move and place these inside forms. It had a steel frame which supported two 2-ton hydraulic jacks that raised and lowered a cross arm which in turn engaged angle irons fastened to the inside of the forms. With this dolly the whole string of forms could be moved and set in place in two or three hours by a small crew which came on duty each day earlier than the rest of the workmen.

The final stage of construction was the lining of the interior surface of the sides and crown with 14 longitudinal rows of 9 x 18-in. vitrified clay liners. The four rows across the crown had a middle ordinate curvature of 9/16 in., while the balance were 3/16 in.

It was found that the most satisfactory method of applying these lining tiles was to assemble them in panels on jibs outside the structure. While on the jigs, a bituminous joint compound was poured into the cracks between the tiles. The two lower panels consisted of four rows of six tiles each, while the upper two panels had three rows of six tiles. Only two sets of jibs were built. They were lined with sheet iron and lasted throughout the job.



TRANSPORTING the 350-lb. tile panel required a 4-wheeled rubber-tired dolly built especially for this purpose, as is illustrated in the above photograph.

The tile panels, the larger of which weighed about 350 lb. were readily transported on a 4-wheeled rubber-tired dolly built for the purpose, and placed on the forms without any cracking of the joint compound. A portable I-beam gantry spanned the trench and carried a rope hoist and two slings of ¼ x 3-in. rubber belting to lift the panels from the dolly and lower them to their final position on the forms. After placement, wire clips temporarily held the two top panels in place while the joints were being filled with compound. Rubber strips and clay confined the hot compound to the joints.

Secondhand outside form panels were 6 ft. in length, of the single hinge type, and consisted of 2-in. sheeting bolted to four 4-in. channels. These form panels were metal lined and were placed by crane. Sufficient of these panels were available to permit pouring a 150-ft. section of the arch at one time.

As in the case of the invert, the arch concrete was poured through a rubber chute from a sliding hopper carried on a portable steel frame. Hand spading was employed on the arches, as it was feared that vibrators might crack the tile lining. Both inside and outside forms were stripped on the day following concrete placement.

Connections are now being made at either end to previously constructed wyes at the ends of the original single barrel. As soon as this is completed the new unit will be placed in service.

A BITUMINOUS joint compound is being poured into the cracks between tiles after the lining tiles have been made into panels while on jigs.

San Diego Seeks New Water Supply

FACED with a severe water shortage, the City of San Diego is seeking new sources of supply, according to Walter W. Cooper, city manager. Tremendous expansion in war industries and army, navy and marine installations have taxed existing supplies to the utmost. Cooper recently went to Washington to enlist the aid of the Bureau of Reclamation in determining the most feasible source of such additional supply, and the quickest way to get it into the San Diego water system.

One proposal is the extension of feeder lines from the Orange County branch of the Metropolitan Water District's Colorado River Aqueduct. A second is the construction of a new aqueduct from the Colorado River directly to San Diego; and a third is the construction of additional dams and supply lines in mountain areas to the north and east of the city. The completion of San Vicente Dam, now under construction, will aid in the immediate emergency, but this addition to the supply does not appear to be adequate for the population expansion anticipated in the coming years. For this reason, immediate action is required on one of the three proposals. No estimates of costs are as yet available, although it is expected that a new Colorado River survey would cost about $150,000.

Important Profits Tax Data

By GUSTAVE SIMONS
Tax Attorney
New York, N. Y.

THE PATRIOTIC CITIZEN is cheerfully prepared to share the full measure of his just tax responsibilities. However, Congress realizes that an unjust and discriminatory tax will weaken the structure of business in general and run counter to an effective war economy. Accordingly, it is entirely proper for the business man to take advantage of the means afforded by Congress for relief against excessive or discriminatory taxation.

The current Excess Profits tax is the highest in history and eliminates a large portion of profits. The tax was designed to reach only excess profits and still leave a healthy business structure. If in a given instance it takes too large a proportion of the current assets of a business organization, certain remedies are available and Congress has gone out of its way to provide relief in the 1942 Revenue Act.

Tax analysis represents a legitimate business activity, and a reasonable amount expended in such an analysis is itself a deductible item, which in excess profits taxation means that a major portion of the expenditure would be otherwise subject to taxation at the highest rate.

Tax saving opportunities

A business man giving consideration to tax savings opportunities cannot hope to review all of them, but certain ones may be particularly available in his industry. Here are some questions a business man may ask himself:

Can my concern eliminate the Excess Profits tax by qualifying as a personal service corporation? If it is possible to make sales or commissions rather than take title to merchandise, this is a possibility.

Should I dissolve my corporation and operate as a partnership? Usually the increasing rates of personal income taxation will not make this an appropriate change. Also, pension trust opportunities are lost. However, if there are many relatives, particularly adult children who are available to participate actively in the business, a gift of stock followed by dissolution of the corporation, and formation of a partnership among the family members is an opportunity that should be explored.

Should I seize the present opportunity afforded me by Congress to create retirement reserves for myself and my faithful employees? Congress has dealt favorably with pension and profit sharing trusts. For example, if a corporation is paying a business man a salary of $20,000 a year and could afford to pay him $5,000 more, but does not, the extra $5,000 may represent excess profits which will be almost entirely subject to taxation. On the other hand salary stabilization will probably preclude an increase of compensation to $25,000. Furthermore, even if compensation was increased by $5,000, added Federal and State income taxes would take approximately $3,000 of the amount. However, if the $5,000 is placed in a qualified pension or profit sharing trust, it (1) will be a deductible item for the corporation, (2) will create a reserve for the individual and his loyal employees, and (3) will not be taxable at current high rates to these individuals. This device is a good hedge against deflation because it takes current funds out of the market and creates reserves for future years. The favor shown by the government for this mechanism for tax savings is indicated by the fact that qualified pension trusts are exempted from the prohibitions of salary freeze.

Carry-forward of losses

The law now permits the carry-forward of losses in certain past years, and the carry-back of losses in future years.

For example: If 1943 represents a loss or very small profit, the difference between that and the credit allowed on the Excess Profits tax can be carried back to 1942. Therefore, if unusual profits were realized in 1942, with very high taxes, 1943 may present a good opportunity to embark on some new venture which may involve losses at first, because of the carry-back of unused excess profits credits.

The Government has promised to return 10% of the Excess Profits tax after the war as a credit. If the business man wants to realize cash on this credit now, he can within certain limits, pay debts of the corporation and use certain of these funds now and withhold them from payment of taxes instead of taking the post war credit.

In certain limited instances, it is better to use a large number of new corporations, each of which carries the $5,000 exemption for Excess Profits tax purposes, rather than to concentrate business activities in one corporation with but one exemption.

Relief under section 722

If consideration similar to the foregoing has not eliminated the Excess Profits tax problem, careful consideration should be given to relief permitted under Section 722 of the Internal Revenue Code.

The Excess Profits tax is designed to curb profiteering and to skim off the cream of profits.

It takes away most of the profits which exceed a normal base profit which is calculated in two fashions. A corporation existing before January 1, 1940, may calculate its base or normal income either by taking the average earnings for the years 1936, 1937, 1938 and 1939 which Congress deemed to be "a period of moderate prosperity for business in general," or it may take as its base a certain stipulated rate of return on its invested capital.

However, Congress realizes that in many instances the foregoing methods of measuring a base for normal income are not fair.

For example, if because of unusual circumstances a business made abnormally low profits in the base period (1936-1939 incl.), it may be permitted to reconstruct what would have been its income had the abnormal circumstances not intervened. Or, if a corporation organized after January 1, 1940, is one where invested capital plays little part in profits, such as a service organization (which because of some technicality cannot qualify as a personal service corporation), then the use of hypothetical or constructive base period average earnings will be permitted.

The Senate Finance Committee described its intention in formulating this relief as follows:

"In the light of the greatly increased excess profits tax rate, it is believed desirable to afford relief in meritorious cases to corporations which bear an excessive tax burden because of an abnormally low excess profits credit. Therefore section 722 which currently extends relief only in a limited class of cases is revised and broadened so as to remove existing inequities and to alleviate hardship in cases where relief cannot now be obtained. Under this revision, corporations satisfactorily establishing eligibility for relief will have their excess profits tax recomputed on the basis of the excess profits credit based on income. This credit will be predicated upon an amount which is a fair and just reflection of the normal earnings capacity of the business and which it is entitled to retain before the imposition of an excess profits tax. Such amount will be used as a constructive average base period net income, replacing the actual average base period net income in the recomputation of the tax under this section. In the case of eligible taxpayers not now entitled to use the excess profits credit based on income, provision is made for the use of such credit computed upon the constructive average base period net income."

Relief for older corporations

Relief for corporations formed prior to Jan. 1, 1940, is available under the following circumstances:

If normal production or operation was interrupted or diminished in the base period (1936-1939) because of events unusual or peculiar in the corporation's

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Gustave Simons has written extensively on this subject. Among recently published articles are: "Relief from Excess Profits Tax Burdens with Special Reference to Section 722 of the Internal Revenue Code"; "The Effect of the Revenue Act of 1942 and the Byrnes' Salary Freeze Orders on Insurance"; "Dangers of Double Domicile and Double Taxation"; "Death Tax Supremacy" and many others.

experience, such as fire, flood, or other physical catastrophe, then it is entitled to reconstruct what would have been its average income (against which the present taxes are measured) had the catastrophe not occurred.

If the business was depressed during this period because of temporary economic conditions peculiar to the business, it can qualify for relief.

For example, if the organization is a "one customer" business and in 1937 that customer was lost and two years were required to replace the customer, then actual earnings can be adjusted to what they would have been had this economic catastrophe not occurred. As a further illustration, if losses were sustained for a period of two years because of a bad price war, then there can be a reconstruction predicated upon the imaginary elimination of this price war.

If the industry has a profit cycle which differs materially in length or in extent from the general business cycle, or which is subject to sporadic or intermittent periods of high production and profits and the years 1936-1939, inclusive, do not represent the same average for the industry in question as they did for American business in general, then relief will be available. Examples given by the Senate Finance committee were in the machine tool industry, where tools remain in service for a log period and are replaced at intervals which may not coincide at all with the base period. Another example is the building industry.

Frequently businesses like the textile industry do not go in regular cycles at all, but have intermittent peaks due to fashion or other accidental combinations of events. Such an industry is the canning business where profit depends not only on the price of canned foods and the demand for the same, but also on whether or not the climate was favorable for the production of a large amount of the goods to be canned in a given year.

If during 1936-1939, or immediately before that time, the business changed its character, or if before January, 1940, it was committed to a course of conduct (evidenced by contract, expenditure of funds, etc.) which resulted in a change of business, then it may be permitted to shift back the change and reconstruct income as if the shift had been made at an earlier time.

For instance, an organization which until 1934 manufactured one type of textile, or sold one kind of tractor, and then shifted to another kind of textile, or another kind of tractor, but which, due to usual problems in creating a market, did not realize normal earnings on the new product until 1938, then it would be permitted to push forward, hypothetically, the income of this new business by two years so that normal profits would have begun not in 1938, but in 1936. Thus the average reconstructed base period earnings would be good for the entire period from 1936 to 1939.

Definition of "change"

The term "change" is defined as including differences in the operation or management of business, of products or services, in its production or operating capacity, in the ratio of non-borrowed capital to total capital, or the acquisition before January 1, 1940, of all or part of the assets of a competitor with resulting diminished competition. The change must have occurred before January 1, 1940, or the business must have been committed to it.

For example, if a concern contracted for the erection of a new factory in 1939 but the factory was not completed until 1941, then the change will be treated as having occurred prior to January 1, 1940.

In general, if during the years 1936-1939 a business was adversely affected by any cause which meant that these years did not represent a fair and normal standard of earnings, relief is available.

Relief for new corporations

If the business is one in which intangible capital is not permitted by the law, for technical reasons, to enter into your actual invested capital, or if little or no capital is necessary in the business, it is obviously unfair to tax on the basis of invested capital. Yet, as the law stands, apart from provisions such as these, the invested capital is the measure of the tax if the business was organized after January 1, 1940. Under such circumstances, too, relief will be available.

For instance, if a concern buys and sells on a consignment basis, or does a brokerage business, but cannot qualify as a personal service corporation because it has a large staff of assistants, or because it has stockholders holding more than 30% of its stock who do not engage in the business, then relief will be given.

If a concern started in business in 1940 and depended largely on business contacts and good will, and lost money for two years, but in 1942 started doing well, it would be permitted to reconstruct what its earnings would have been in 1936-1939 had the same business, contacts, and good will been in operation during that period of time.

Further, if the concern has very small invested capital because it leases rather than owns a large plant, invested capital would bear no real relationship to earnings and Congress has recognized that under those circumstances to take away most of the profits over a fair return on the small proportion of capital used would be unfair and it permits a reconstruction.

Time is of the essence

If it is necessary to reconstruct credit as indicated for the years 1940 and 1941, application must be made for this relief within six months after the passage of the 1942 Revenue Act, that is, by April 21, 1943. It is very important to do this for two reasons. If there were large excess profits in 1940 and 1941, application should be made for available relief in order to remedy the unfair tax situation. If earnings or losses were small in those years, it still is important that the base be built up because if it is larger, the concern gets a larger credit, and even if the earnings were less than this credit, the deficit between earnings and credit can be carried over.

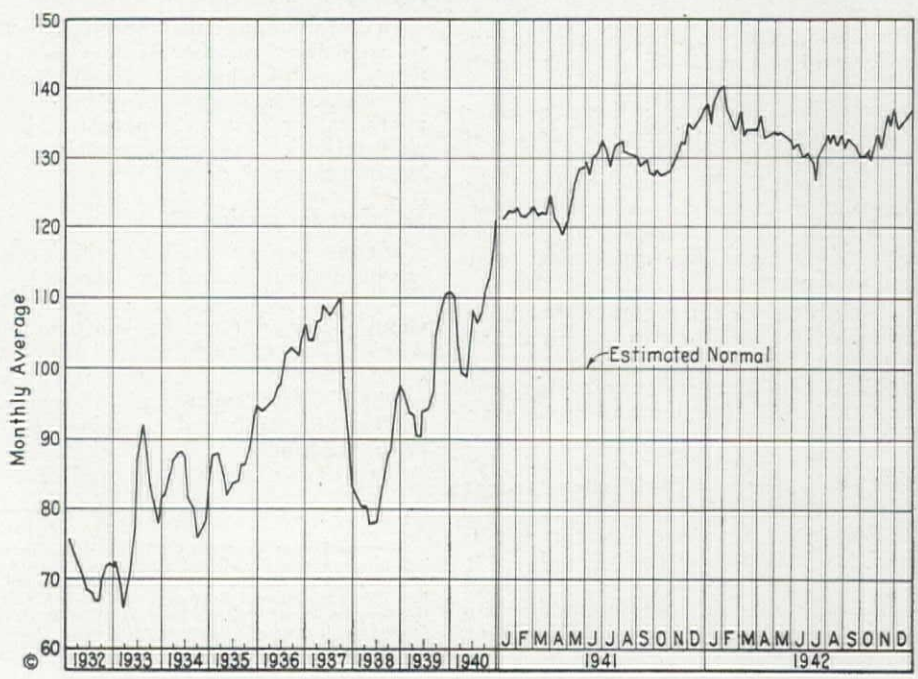
For example, suppose that a concern made an average of $100,000 for the period from 1936-1941, and then made $200,000 in 1942. If the base for 1936-1939 can be built up to $150,000 or more, it is evident that in 1940 and 1941, less money was earned than was permitted on this reconstructed credit base and the difference in 1941 can be carried over to 1942 and credited against the larger profit of that year. However, this opportunity will be lost if not taken before April 21st of this year.

Determining the right to relief

On important tax points, such as these, a specialist is needed. To do a good job

(Continued on page 134)

FIGURE 1 is a graph of general business conditions published in the New York Times on Jan. 3, 1943. Such graphs assist taxpayers to compare local and national business.



Turbine Shaft Machined in Place

When the 13-in. shaft of a hydro-electric turbine became scored in its lignum vitae bearings by an inrush of sandy water, an arc welded lathe was built on the job in a very narrow space, allowing machining of the part without dismantling

By
L. H. PARKER
Electrical Engineer

F. H. ROSELLE
Shop Foreman

LEONARD STROM
Welder
Turlock Irrigation District
Turlock, Calif.

THERE HAVE BEEN many jobs where electric welding has been used to good advantage, but not many where the urgent need for a solution to a particular problem has been greater than a recent one at the La Grange power station.

La Grange power house is owned and operated by the Turlock Irrigation District of Turlock, Calif. It is situated on the Tuolumne River below La Grange Dam, owned jointly by the Turlock and Modesto Irrigation Districts. The plant has a generating capacity of 4,000 kw. It was placed in operation in Dec. 1924.

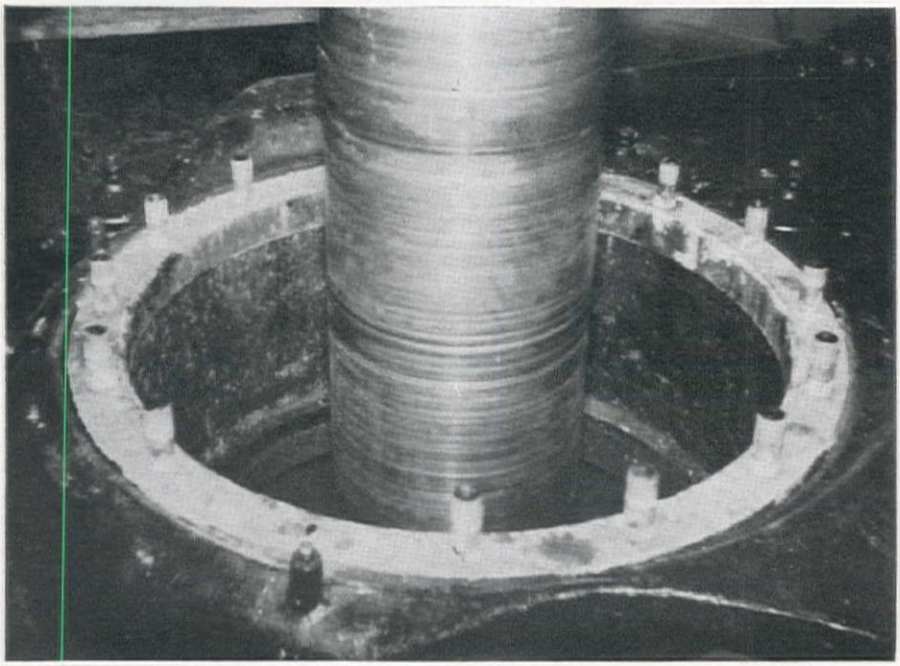
In 1941, a 13-in. hydroelectric turbine shaft, powered by 4,750-hp. turbine, was opened up for inspection after going out of balance. Inspection revealed the shaft to be seriously scored near a lignum vitae bearing. (See accompanying photograph.)

Plans for machining

The bearing operates in the water driving the turbine, and during an unprecedented inrush of rock and gravel through the intake tunnel, the bearing had become full of rock, resulting in scoring of the shaft. The scoring was so deep that the machine could no longer be operated. To remove the shaft meant dismantling the entire turbine and also taking the rotor out of the generator as it blocked the only opening through which the shaft could be removed from the turbine room. The estimated shutdown time for doing this, as well as transporting the shaft to a distant machine shop, returning and reassembling it, was about 14 working days. With a machine output of 3,350 kw., the loss for this length of time represented 1,125,600 kw.hr.

Several proposals were made for an attempt to machine the shaft while in place, but these were limited by the fact that there was only 9 in. of clearance between the shaft and the turbine bearing casting, which eliminated all the ideas for using any ordinary lathe carriage mountings. Then the idea was advanced that perhaps a lathe carriage and steady guide could be built in place in the 9-in. space around the shaft. If the steady guide was sufficiently strong, the turbine and its shaft could be turned under its own power, and the cutting tool on the lathe carriage would do the machining.

THE PHOTO shows the scarred condition of the 13-in. hydro-electric turbine shaft when the machine was opened up for inspection after going out of balance. This huge shaft is powered by a 4750 hp. turbine. Working space for machining was only 9 in.



Lathe built in place

Welding was the only possible solution for fabricating the lathe carriage and steady guide assembly with the degree of stiffness which would be required to eliminate chatter during machining. The steady guide was constructed in the barrel of the bearing opening. Just above the water level on the shaft were adjustable guides holding the shaft at 3 points. Then the lathe ways were built from two long cold rolled bars and the lathe frame welded in place, as shown in the accompanying photographs. The lathe carriage was carried on the long cold rolled bars, and held the machining tool. The tool holder was operated by an advancing screw which terminated in a hand crank at the top of the lathe carriage.

During the machining operation, the shaft was rotated under its own water power at about 60 r.p.m. Some trouble was experienced with the cutting tool dulling before a complete vertical cut could be completed. This problem was solved by the use of Lincoln "Toolweld" electrodes used on the tip of the cutting tool. Final finish on the shaft after the last cut had been made was quite satisfactory, and it is confidently believed that the job could be done again, if necessary.

The job was completed and the generator returned to service Aug. 9, 1941. After completion of the machining, the lathe and steady guide were removed from the bearing barrel without difficulty.

Comparison of costs

The savings made by building this metal cutting lathe right on the job by arc welding, as compared to the older method of dismantling the machine, are considerably more than would appear at first sight. This is not only because of the time and labor saving but also the "outage" time saved during which the machine could generate power. In addition, there is the saving in wear and tear on the machine every time it is dismantled.

An itemization of these savings would be obtained by comparing the costs of doing the job the old way compared to the costs for building the metal cutting lathe by arc welding and doing the job without dismantling the machine.

A. Cost of doing job by old way
   1. Dismantling time for 3,750 kva. generator and waterwheel and bringing shaft

up through stator opening. 4 men, 3 days @ $2.50 hour incl. overhead ..... $ 240.00

2. Trucking time from power plant to city machine shop, 1 day 30.00
3. Machining time at commercial shop, 1 day 38.00
4. Trucking time returning shaft to power plant, 1 day 30.00
5. Assembling, adjusting and testing complete unit, 4 men, 8 days 640.00
6. "Outage" time of generator, 14 days at 3,350 kw.; 1,125,600 kw.hr. @ 4½ mills kw.hr. 5,065.00
7. Wear and tear on machine from dismantling and reassembling (value not assigned) ....

Total Cost of doing job old way $6,043.00

(Generating unit out of service 14 days)

B. Cost of doing job by building metal cutting lathe by arc welding and doing turning job with shaft right in place

1. Building lathe ways and carriage, 185 lb. cold rolled shafting and bar steel ..... $ 9.25
   8 lb. 3/16-in. Fleetweld 5 rod ..... .80
   6 hr. welding and assembling 15.00
   Misc. adjusting screws, etc. ..... .20

   Total ..... $ 25.25
2. Building steady guide, 63 lb. bar steel ..... $ 3.15
   1 lb. ⅛-in. Fleetweld 7 rod .10
   4 hr. welding and assembling 10.00
   Misc. adjusting screws, etc. ..... .40

   Total ..... $ 13.65
3. Machining time on shaft after lathe was built and tested, 12 hr., 2 men @ $2.50 per hr. 60.00
4. Re-assembling turbine top bearing and putting generating unit back in service, 8 hr., 3 men at $2.50 per hr. 60.00
5. "Outage" time of generator, 4 days at 3,350 kw.; 321,600 kw.hr. @ 4½ mills kw.hr. 1,447.20

Total Cost of doing job new way $1,606.10

(Generating unit out of service 4 days)

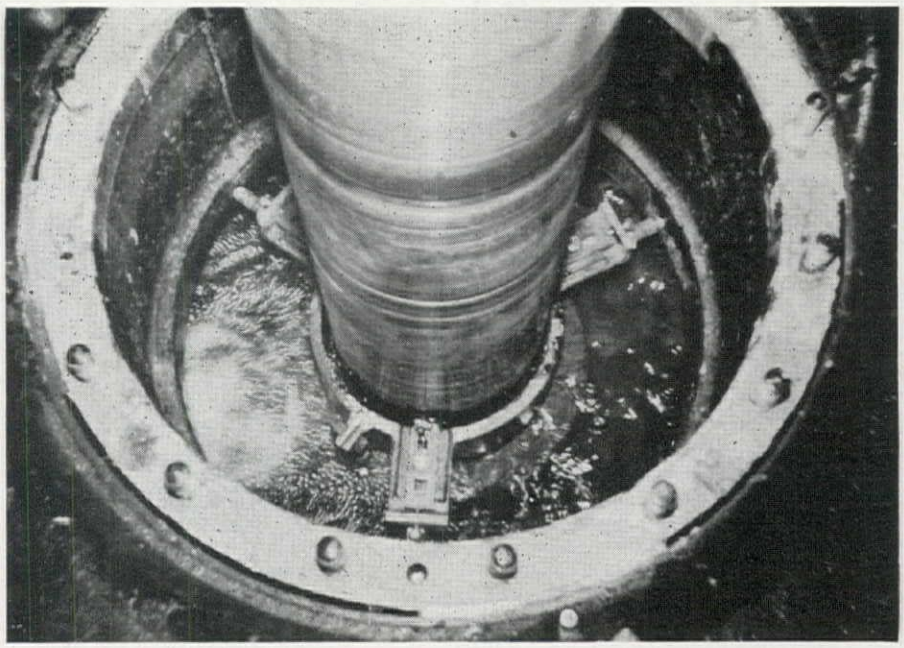
Savings

Difference between costs of doing job with arc welded lathe, compared to old method $4,436.90

(Plus indirect saving of wear and tear on machine if it had to be dismantled)

This saving due to the arc welding method amounted to 73 per cent of the former cost of doing the job the old way, and also made approximately 804,000 kw.hr. of power available to the nation that would otherwise have been lost from productive use.

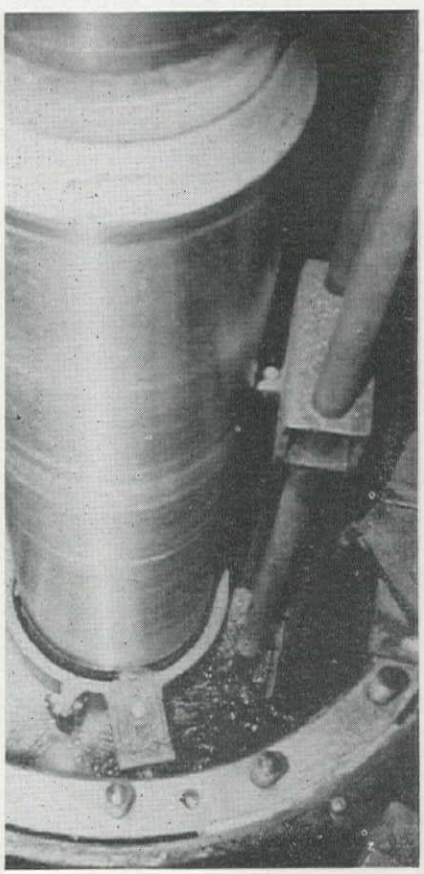
The new method also has a future benefit in that it will make possible the



THE STEADY guide has been fastened in place. This view is looking down the barrel of the bearing opening, to show the adjustable guides holding the shaft for working.

THE VERTICAL lathe has been set in place and the cutting tool in the movable tool holder carriage is taking the first cut.

NEARING COMPLETION of the difficult machining job. Only the deepest scores remain and the shaft is nearly smooth.



repair of these shafts at times when they otherwise would not be taken out of service except from break-down; in this way the efficiency of the machines can be kept up to higher standards. Worn or scored shafts do not permit the packing seals to function properly with consequent loss in power from the machines.

It is difficult to correctly show the amount of annual saving due to this arc welding process. There will always be the increase in efficiency of the machines from having these shafts in good condition, and this is evaluated later. There is also the saving in repair cost methods whenever unforeseen damage arises, but evaluating it can only be an estimate as it is dependent on the frequency of occurrence of some unknown condition. If it is assumed that about one year in every three will have high water conditions as in the past, and if such conditions even slightly damage even one machine out of the seven, the savings would amount to an annual average of $1,479.00. Steps have been taken to prevent an exact re-occurrence of this last damage; what the next will be is unknown but it is certain that a lathe that can be built in a 9-in. space on any of these vertical shaft generators, can effect substantial savings from year to year and restore the machines to service much faster than the old method.

Efficiency increase

If the efficiency of these machines is raised even one-half of one per cent which is a very conservative figure in view of the fact that in the past they have dropped an average of one per cent per year between periods of overhaul, the saving of this one-half of one per cent due to better shaft and seal conditions amounts to an average of $4,500 per year in power generated.

If industry as a whole used this process of building a metal cutting lathe by arc welding in narrow openings around hydroelectric generator shafts if needing repair, and if the ratio of savings held in the same ratio it held on this job, the net annual saving would amount to $18,000,000 in power gain.

This is using the ratio of total water power in use in the nation (19,000,000 hp.) compared to the water power involved on this job (4,750 hp.).

The social advantage of increasing the power available to the nation due to increase in operating efficiency is of even greater importance at the present time.

So it is felt that arc welding has made it possible to do a job that otherwise could not be done as well by any other method. It has made possible the building of a new tool that can be used in many ways as emergencies arise and time cannot well be spared for doing the job in the old way.

NOTE: Data and illustrations are from a study submitted by the authors to The James F. Lincoln Arc Welding Foundation in its recent Industrial Progress Award Program for reports of advancements and improvements made by the application of arc welding in design, fabrication, construction, and maintenance.

State of California Plans for Post-War Highways, Buildings

By C. H. PURCELL
Director, California Department of Public Works

ANTICIPATING A PERIOD of slack employment immediately following the successful conclusion of the present world war, and in order to return to first-class condition many highways now deteriorating due to abnormally severe use and reduced maintenance, the California Division of Highways has proposed a comprehensive program of post-war construction estimated to cost about $70,000,000 to complete, and which it hopes to have ready for commencement as soon as hostilities end. In addition, the Department of Public Works has proposed a building program for state offices in principal cities, amounting to about $7,500,000.

The selection of the character of projects on which it is advisable to proceed with plan preparation and right-of-way acquisition is governed by the necessity of providing adequate service to traffic. Such projects as are now under consideration by the Division of Highways may be listed as follows:

1. Construction and improvement projects on rural major traffic arteries deferred by reason of federal restrictions on materials, equipment and manpower.
2. Bridges and structures requiring reconstruction.
3. Major highway developments leading into and through metropolitan areas.

Major artery program

The State Highway budget program for construction has been composed, in normal times, of projects on which:

(a) The reconstruction of the surface or pavement was necessary due to deterioration or to increased heavier loads. The necessity for such reconstruction or improvement is based on several factors. An important one is excessive maintenance cost. In other words, when a section of roadway reaches the condition requiring excessive maintenance, economics of the situation requires and justifies reconstruction.

(b) Expansion of capacity or widening of highways due to large increase in volume of traffic is required. These include such projects as divided multi-lane roads.

(c) Elimination of congestion and removal of hazards to provide free, safe and comfortable movement is imperative. Betterment of line and grade are frequently necessary where traffic volume has increased sufficiently to produce serious congestion and hazard occasioned particularly by the limited physical characteristics of the road.

Projects of this character on rural main traffic routes make up a large part of the construction program. The studies conducted under the Highway Planning Survey have revealed that deficiencies of this kind in the State Highway system are not being corrected at the rate in which they are developing. Any lapse in a continuous program of improvement only aggravates the condition revealed by the planning survey.

Projects in the first category must be undertaken at the first opportunity for resumption of work. They are found in all parts of the State on main traffic routes such as: The Valley Road, Route 4, from Sacramento to Los Angeles; the Coast Road, Route 2, from San Francisco to San Diego; the Redwood Highway Route 1, from San Francisco to the Oregon Line; the Pacific Highway, Route 3, from Sacramento to the Oregon Line; the Main East-West routes, from San Francisco to Nevada, from Los Angeles easterly to Nevada and Arizona, and many others.

Bridge needs

A similar, and perhaps even more serious situation applies to the bridges and structures on the State Highway System. There are some 3,400 bridges on the present system. Of this number, approximately 350 are now posted for less than legal load limit. Most of these posted bridges are now on the less important or secondary roads. There are, however, a considerable number of structures on the main traffic routes which are approaching the condition requiring posting. Such important bridges as the interstate crossing of the Colorado River at Yuma, the Petaluma Creek Bridge on Route 8, the Rock Creek Bridge and the Little River Bridge on the Redwood Highway, the Sacramento River Bridge at Rio Vista, the Feather River Bridge at Marysville, and many others, are instances of this character. In a number of cases also, capacity is measured by width of the bridges and impaired clearance for normal traffic.

Federal limitations prevent the construction of new bridges or their reconstruction, and the Division is limited to making repairs and doing such reconditioning as will keep them in the best condition possible. These structures, however, should be replaced at the earliest possible moment and are, therefore, included in our proposed program of plan preparation.

Freeway development

For a number of years the situation of providing adequate service to large traffic volumes entering and passing through our metropolitan areas has been becoming more and more critical. Extended studies of the situation have led to adoption of routings designed as freeways to alleviate this condition. Development of plans and acquisition of right-of-way on such projects is an important part of the proposed program. Prepara-

tions of such plans and the acquisition of right-of-way for such projects requires considerably more study and time than is usually necessary for the other categories listed. In the past several years studies and preliminary plans have been instituted on a number of such routes.

Projects in this category would include portions of the Santa Ana Freeway, from Los Angeles to Santa Ana; the Ramona Freeway, from Los Angeles to Pomona; the Arroyo Seco-Figueroa Freeway extended southerly through Los Angeles to the Harbor; the Major Freeway, State Route 2 through Los Angeles from Aliso Street to Cahuenga Pass; the Bayshore Highway from San Francisco to San Jose; the East Shore Highway, from Oakland to San Jose; the Santa Barbara Freeway, through that city; the Inland Freeway into San Diego; and others leading into and through the larger cities.

Immediate consideration

Funds for such planned preparation and right-of-way acquisition are limited in the next biennium, but it is important that this work be undertaken:

First, to conserve time; to avoid delay by having everything ready to proceed with actual construction when materials and funds are available.

Second, because at this time the possibility is favorable to secure savings to the State in the cost of right-of-way acquisitions. Vacant properties are lower in price because improvements cannot be made now. Again delay in construction can be avoided if right-of-way is acquired, because negotiations for such acquisition require considerable time, especially on projects in urban areas where land is divided into many small parcels.

Third, readiness with plans and right-of-way at the time hostilities cease means that immediate employment can be provided for workers released from war industries and for returning service men.

Projects are located generally where unemployment will exist but are distributed on a fairly broad base, with particular emphasis on the areas of large employment, where the adjustment period may be particularly severe, even though temporary, for some time after the close of hostilities. Experience in using unemployed in carrying on successful construction work during the past depression has shown the limitations imposed in transporting workers to the job and with regard to other problems in connection with operating a project with unemployed.

Estimated costs

The estimated cost of surveys and plans for a program of projects as enumerated hereinbefore would exceed $6,000,000. The amount of plan work which may be completed would be measured by the number of qualified personnel which may be available. On such a basis the estimated amount which should be set up for surveys and plans for all four categories of projects is about $5,000,000.

The amount allocated in the budget for the 95th-96th fiscal year biennium for this engineering work is $4,000,000.

The cost of right-of-way acquisition required to protect the engineering locations, by acquiring the key sections of right-of-way on projects in the three classes described, will amount to about $15,000,000.

The amount allocated in the 95th-96th fiscal year budget for right-of-way is $6,000,000.

An additional amount of $1,000,000 for plan work and $9,000,000 for right-of-way acquisition to the budget allocations is recommended as essential for preparing a comprehensive program of plans that will assist considerably in promoting and speeding construction during the adjustment period.

The amount suggested here and the program of plan and right-of-way acquisition described will permit proceeding with construction amounting to approximately $70,000,000. Such estimate of construction, of course, is necessarily a very preliminary approximation, but judging from past experience in handling funds made available to the different Federal, City, and State agencies, it is a program that could be financed and carried through within a reasonable time.

Office buildings needed

In addition to these suggested highway improvements, the State Department of Public Works has suggested a capital outlay of approximately $7,500,000 to construct state-owned buildings for the purpose of replacing presently leased office space.

In considering capital outlay estimates for office use three general types of structures are usually normal for the service to be performed, namely, civic center structures which form the main district headquarters in the principal cities for the various agencies, off civic center structures of the type proposed by the Division of Highways for Los Angeles and San Francisco, and loft structures having large areas of the type needed by the Department of Employment and similar agencies.

The replacement of present leased areas in a civic center structure in Los Angeles would require an allocation of approximately $1,300,000 for the housing of the State agencies properly located adjacent to the present State building.

The replacement of leases in off civic center structures would require approximately $400,000 and the replacement of loft type areas would require approximately $1,090,000.

In Oakland the loft type replacement requirements total to approximately $100,000 while the remaining spaces listed total to $200,000.

In San Francisco a main structure to the amount of approximately $1,275,000 appears to be necessary. An off civic center structure for the Division of Highways totals to $160,000. Loft structures totaling $975,000 are also required.

In Sacramento it is contemplated that $1,625,000 will be required to adequately house the agencies now in leased space.

Requirements in the City of San Diego will total to approximately $500,000 for a structure in the San Diego Civic Center.

These figures in no case include land and in the consideration of any specific proposed structure based upon experience of past decades, the basic plan of such structures should be arranged in a manner which will permit of their expansion during the normal period of years which the building will serve of at least 100% either by additional stories or by additional wings. This latter requirement is a consideration in the acquisition of property.

All computations are based upon existing areas, plus a 25% increase factor based on premises under lease as of February 11, 1943. The total square footage under lease in Los Angeles is 346,295; in Sacramento, 166,102; in Oakland, 37,556; in San Francisco, 319,612.

Engineering costs will require an allocation of approximately $350,000.

Note: The above report is a statement by C. H. Purcell, director of the California Department of Public Works, to the Governor's Tax Committee, on proposed post-war construction activities of that department. Further articles on this highly important subject will appear in succeeding issues of Western Construction News.

Removal of Navigation Obstruction at Vancouver Narrows Will Begin Soon

IT IS EXPECTED by the British Columbia Bridge & Dredging Co. Ltd. that work of whittling the pinnacle off Ripple Rock, Seymour Narrows, may commence late in March. The placing of equipment on the big dredge, designed and built especially for work in these swift waters, is nearing completion, delayed somewhat by priority difficulties.

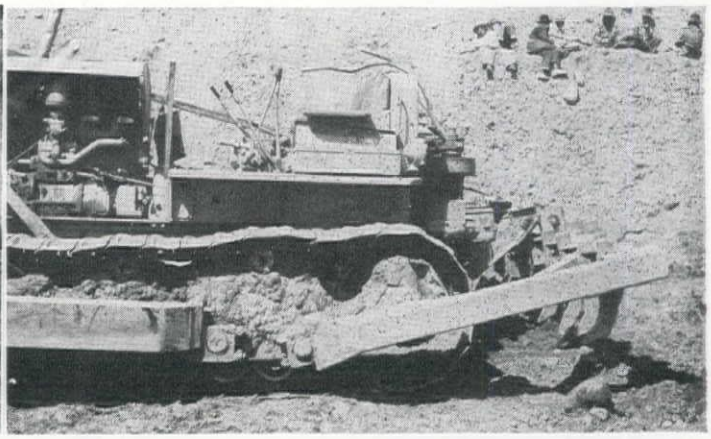
The work of making the huge concrete anchors is proceeding. These anchors are unusual in size. Two will weigh 250 tons each, four will weigh approximately 125 tons each. They will be dropped into the bottom of the Narrows, in 20 to 30 fathoms, and will be used to hold the barge rigidly in place while drilling operations and dredging of shattered rubble proceeds.

The 250-ton anchors will be cubes of solid concrete, 15 ft. square. The others will be half that size. They are being made in Vancouver, B. C., and will be loaded onto scows and thus transferred to the position they will occupy at the Narrows. The operation of launching them is another headache of the engineers in charge.

One proposal is to tilt them off the barges by opening the seacocks on one side, and filling the barge sufficiently to permit the masses of concrete to topple over into the saltchuck, where they will then remain until Gabriel blows his horn. The April, 1942 issue of *Western Construction News*, page 172, carried some previous data on this project.

HOW IT WAS DONE

JOB AND SHOP TIPS FROM THE FIELD EDITOR'S NOTEBOOK



Single Machine Combines Scarifier and Rock Rake

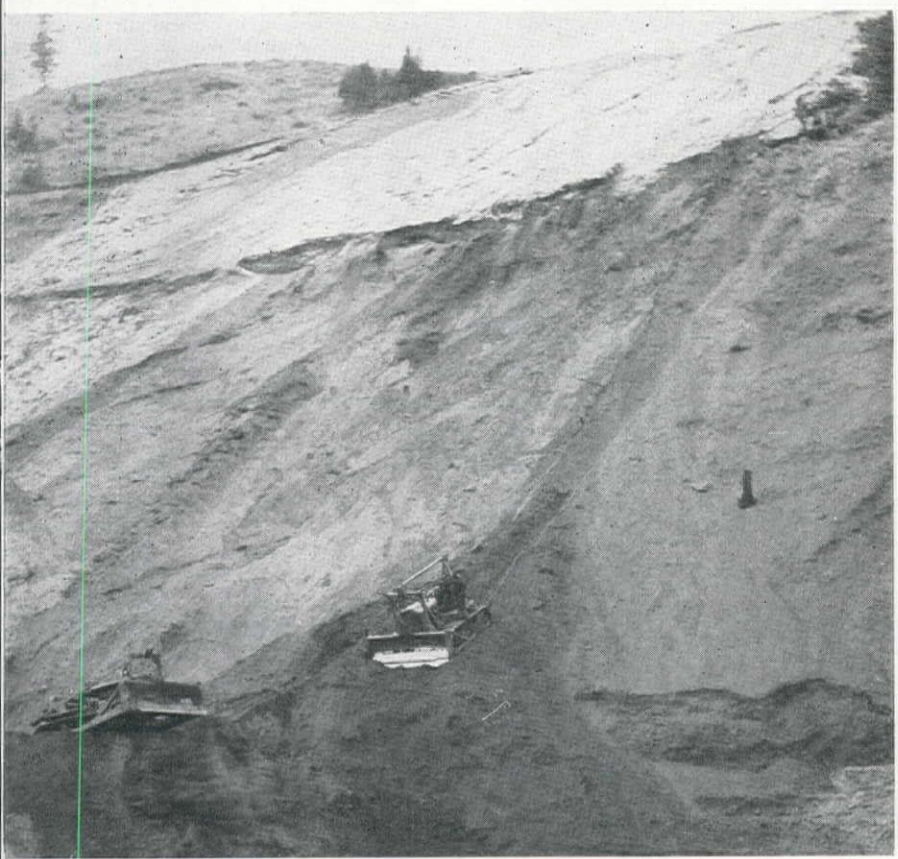
TO IMPROVE the bond between successive layers of the fill at Green Mountain dam in Colorado, a combination scarifier and rock rake has been developed by Warner Construction Co. of Chicago, contractors for the earth fill structure.

The photo at the left above shows the rake attached forward of the D8 Caterpillar tractor used for motive power, and that at the right shows the scarifier attached at the rear end.

In each case the angle of the teeth and their weight assures penetration into the material to be processed, and cables take power directly off the engine to lift them out or to hold them at a constant depth.

The machine is especially useful on roadways and temporarily compacted haul roads where heavy truck traffic has hardened the surface while giving adequate bond to lower layers. In these cases it is necessary to scarify before the rake can take hold. When loosened, the rake, the teeth of which are 6 in. apart, can remove all cobbles from the finer material to be compacted, thus saving screening.

Green Mountain dam is one of the principal structures of the Colorado-Big Thompson project, and is located about 23 mi. south of Kremmling, Colo. J. D. Fogg is general manager of the Warner Construction Co., and Edward Pearson is superintendent on the job. R. B. Ward is construction engineer in charge of the work for the Bureau of Reclamation, for whom the project is being built.



Steep Slope Excavation

PICTURE on the left shows the difficulties encountered in completing the excavation on the left abutment of the Anderson Ranch Dam in Elmore County, Idaho. Note the cable from the winch near the top of the picture to the D-7 bulldozer, which is operated up and down the steep slope.

The joint contractors on the $10,000,000 Bureau of Reclamation project are Morrison-Knudsen Co., Inc., Boise; J. F. Shea Co., Inc., Los Angeles; Ford J. Twaits Co., Los Angeles; and Winston Brothers Co., Los Angeles. All construction work on the earthfill dam and power plant was halted on Oct. 27 by the War Production Board, to be resumed after the war. The original time allowed for completion was 1670 days, and work began in the fall of 1941.

County Engineers Save Metal With Wood Manhole Covers

MANY TONS of cast-iron can be released for armaments in the future as the result of a new development, pressure-treated wood manhole covers as originated by engineers of Los Angeles County, Calif. The simplicity and speed with which the wood covers can be fabricated promise to extend their use throughout the country.

Faced with the urgent necessity of building many additional miles of sewer line to assure healthful living conditions for thousands of incoming war industry workers who have settled in unincorporated areas, the county has designed the pressure cover and concrete frame to save approximately 500 pounds of metal on each installation.

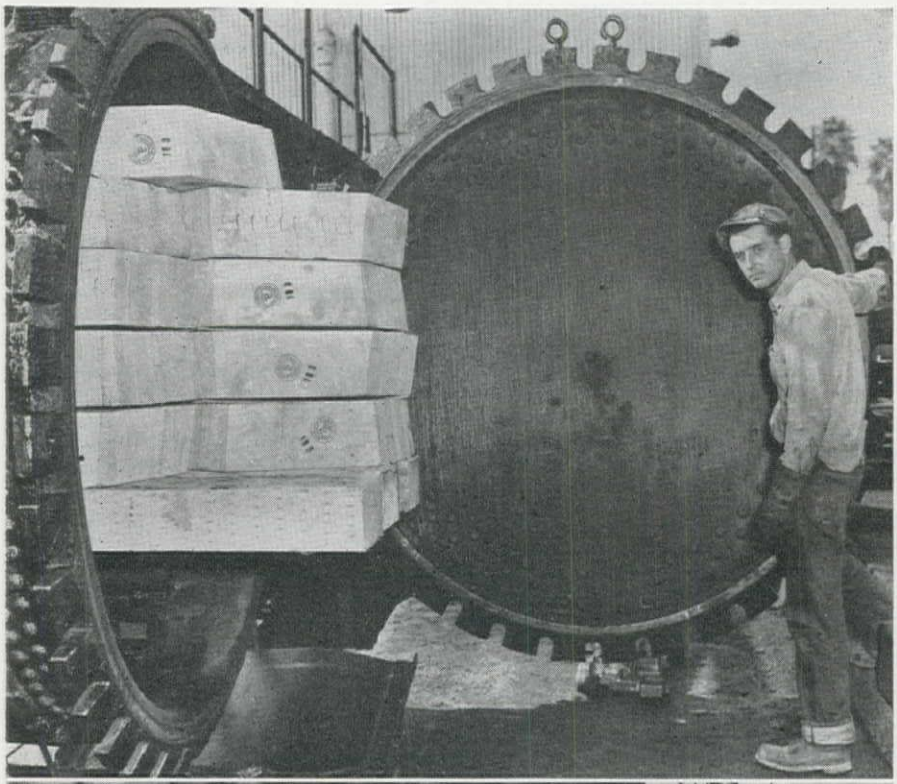
The cover is made with laminated wood strips fashioned in either hexagonal or circular shape. Plans call for nailing the 2x4x8-in. laminated strips with four 20 penny nails to each strip, and running at least two ⅜-in. bolts through all members, countersinking both ends. Where it is difficult to secure nails and bolts, Los Angeles officials point out that county and city engineers can use wood dowels and waterproof glue.

Alfred Jones, county surveyor and engineer, and C. E. Arnold, chief deputy, supervised the development of the metal-saving cover. Lumber yards in the Los Angeles area make these covers at a low price because they can be made up of short, otherwise unusable pieces of lumber.

Weight of the metalbound cover is approx. 130 pounds; the glued-in-dowel cover weighs slightly less. Lumber requirements total 63.3 board feet of No. 1 common Wolmanized or creosoted Douglas fir. The frame uses 0.14 cubic yards of class "A" concrete.

Two ¼-in. reinforcing rods are used in the concrete retainer, one upper and one lower, inside the perimeter. About 24 feet of rod is required to permit overlapping the ends.

Preservative treatment of the wood by a pressure-impregnation process in accordance with American Wood-Preservers' Assoc. standards is specified because decay and termite attack at the edges of the unit would seriously reduce the safety and useful life of the cover.



ABOVE—Three Los Angeles County, California, officials examine the county's recently designed wood manhole cover. The cover is constructed of pressure-treated (Wolmanized or creosoted) lumber. Each wood cover with its concrete frame saves approximately 500 lbs. of cast iron—the amount normally required for a metal unit. Shown (left to right) are COL. CARL H. REEVES, superintendent, maintenance department; ALFRED JONES, county surveyor and engineer; and LEE L. PAGE, senior road foreman.

LEFT, top—Although designed only as an emergency measure to replace cast iron, Los Angeles County's wood manhole covers are pressure-treated for protection against termites and decay. This picture, taken at the Wilmington, California, plant of American Lumber and Treating Company, shows a "charge" of covers in the "Wolmanizing" cylinder prior to treatment.

LEFT, bottom — A hexagonal-shaped cover is trimmed to size with a band saw. The laminated strips may be joined by glue or by the use of nails and bolts.

NEWS OF WESTERN CONSTRUCTION

MARCH, 1943

National Rainfall Record Set in California Flood

A NATIONAL all-time rainfall record was established in Los Angeles County, California, on Jan. 22-23 when 25.83 in. of precipitation fell at Camp LeRoy, north of Pasadena, in a 24-hr. period. The four-day storm which caused an estimated damage of $477,000 to the streets, bridges and flood control channels of the City of Los Angeles, did not do as much damage as the March 1938 flood, although many weather stations in the vicinity of Los Angeles reported precipitation of 30 in. for the four days, and 37 in. was reported in the Big Santa Anita Canyon. The fact that damage was relatively light was credited to the flood control works which had been completed since 1938 by the U. S. Engineer Department and the Los Angeles County Flood Control District.

Lloyd Aldrich, city engineer of Los Angeles, estimated that $153,000 would be required to clean debris from streets and make pavement repairs following the flood. Repairs to Arroyo Seco flood control channel in Los Angeles were estimated to cost $140,000, and in South Pasadena, $110,000. Shortly after the occurrence of the flood, the Los Angeles County Board of Supervisors approved an expenditure of $350,000 for construction of flood control structures along Rubio Wash to relieve the danger of flood damage in Altadena and Pasadena. Plans and specifications for the project are being presented to the War Production Board for approval and application is being made for priority ratings.

The City of Riverside, 60 mi. east of Los Angeles, lost its sewer farm in the same storm when settling basins on the west bank of the Santa Ana River were destroyed by flood waters. To replace the basins, the city leased land on the opposite side of the river, and construction of new basins was begun by city forces.

Hansen Dam, a $10,000,000 flood control structure constructed under the direction of the Los Angeles District of the U. S. Engineer Department on Tujunga Wash, received its first real test since its completion in 1941. In the late January storm, the peak discharge above the dam was about 21,000 sec. ft. To hold back the flow required less than half the storage capacity at the spillway crest. Had Hansen Dam not been in operation, the Wash would have overflowed the channel downstream and probably caused considerable damage.

At the height of the storm, two companies of Air Force troops under the direction of an engineer from the Los Angeles District Office made possible the uninterrupted production of aircraft at the Lockheed and Vega plants by an emergency program of sandbagging and levee construction along a nearby flood control channel which was threatened with overflowing.

To Finish Alaska Phone Line Soon

ANOTHER MAJOR PROJECT in the north nearing completion is the linking of Washington, D. C., and Fairbanks, Alaska, by telephone across Alberta, northeast British Columbia, Yukon and Alaska. Connections with the communications system of U. S. A. are made at Coutts, Alberta, and calls are routed through Helena, Mont. Present arrangements call for five talking circuits and 14 teletype circuits. Although the line will not be fully ready until April and crews are pressing the work throughout the winter, communication between Fairbanks and Washington is already possible.

Alberta Government Telephones, assisted by line construction crews from the Bell Telephone Company of Canada, are making necessary rearrangement of lines and construction of new lines between Edmonton and the international boundary. Sixty men are working to complete this link of the Alaska communication system. The problem of lines from Edmonton north is being handled by private contractors reporting directly to United States Signals.

Telephone and teletype lines do not follow the route of the Alaska highway but cut across country, it is understood. Some of the difficulties attending the big undertaking are reported by Hon. W. A. Fallow, Alberta minister of public works. "In the territory beyond the Peace River block, no communication lines were available. Airplane traffic was handled by radio telephone and telegraph. The problem of supplying lines between Dawson Creek and the far north became vital.

"To add to the difficulties, the telephone system of the Alberta Government Telephones did not extend into the Peace River country, although a local system connects all points in the Peace River block.

"Problems were: (1) Construction of a line between Dawson Creek and Fairbanks, (2) Filling in of the gap between Dawson Creek and Edmonton, and (3) Rearrangement of lines of Alberta Government Telephones from Edmonton to the international boundary."

New Wire Rope Practice Simplifications Made

A SIMPLIFIED PRACTICE Recommendation for Wire Rope has been approved for promulgation, according to an announcement by the Division of Simplified Practice, National Bureau of Standards. It will be effective from February 15, 1943, and will be identified as "R198-43." The program, which lists sizes, constructions, grades and breaking strengths of the vast majority of tonnage of wire rope, was developed by engineers of the wire rope industry, to serve as a wartime conservation measure and as a guide for post-war practice.

It is concerned primarily with items that are produced for stock purposes, and does not attempt to deal individually with the numerous and particular end uses to which wire ropes are put. These special purpose ropes will be furnished by the manufacturers, only when their necessity has been demonstrated. The producers of wire rope will view this necessity in the light of the war production program.

This simplification program, the result of long study by the industry, was passed through the regular procedure of the National Bureau of Standards at the request of the War Production Board. General adherence to the recommendation will result in a net reduction in

variety from 973 items to 643, or 33.9 per cent. The major production and use of wire rope and, therefore, the predominant tonnage, is covered by four different rope-constructions, where the reduction in variety will be from 352 items to 182, or 48 per cent.

Pending printing of R198-43, information concerning this recommendation may be obtained upon request from the Division of Simplified Practice, National Bureau of Standards, Washington, D. C.

Pan-American Highway Unit Opened in Mexico

AN IMPORTANT UNIT of the Pan-American Highway has been completed by the Government of Mexico, from Mexico City south to Oaxaca, a distance of 340 mi. With the addition of this stretch, first class highway transportation is now available from Laredo to Oaxaca, a total distance of 1,100 mi. In addition to this completed highway, the Mexican Department of Transportation is pushing construction of a new 1,376 mi. artery connecting El Paso, Texas, with Mexico City; a 328-mi. trunk highway from Mexico City to Tuxpan, on the Gulf of Mexico; and a 341-mi. road from Mexico City to Pozo Rica. United States Army operations on the Central American section of the Pan-American Highway are proceeding rapidly, and an additional contract for an 80-mi. section of the highway through Costa Rica was awarded last month to the Ralph E. Mills Co. of Roanoke, Va.

Fifteen Miles of Steel Pipe Offered for Sale

FIFTEEN MILES of 36 to 44-in. steel pipe and accessories, including transformers, motors and pumps, was offered for sale last month by the City of San Francisco. The material constituted the 20-mi. Corral Hollow pipe line on the Hetch Hetchy division of the San Francisco water system which was constructed in 1933 and 1934 but which was never placed in use. The line extends from the Thomas shaft on the Coast Range tunnels of the Hetch Hetchy line to Alameda Creek, and was intended to bypass several difficult tunnel sections of the Hetch Hetchy line and permit the use of a supplementary water supply from the Hetch Hetchy source before construction of the Coast Range tunnels had been completed.

In 1932, the San Francisco Water Department experienced a water shortage, and expecting a similar occurrence in 1933, undertook the construction of the Corral Hollow line. In 1933, the annual precipitation was sufficient to meet the city's water requirements, and in 1934, the Hetch Hetchy Coast Range tunnels were completed, so that the need for the Corral Hollow line never developed, and it never was completed or placed in service.

About 20 mi. of steel pipe ranging from 36 to 44 in. in diameter, and from ¼ to ½ in. in plate thickness was installed, together with a number of transformers, motors and pumps. The Water Department had contemplated a new use for this line, but recent restrictions caused by the war led the department to its decision to abandon the line and sell the materials. Before this decision was reached, the department had removed about 5 mi. of the pipe line and had found it to be in excellent condition. It had been coated and wrapped prior to laying, and had been in the ground for about 10 years although it had never been in use.

Utah Water Project Work Resumed After Shutdown

CONSTRUCTION of the canal system for the Provo River Project in Utah has been ordered resumed following a shutdown of the project by the War Production Board several months ago. Deer Creek Dam, an earthfill structure and a major unit of the project was completed last year, but the aqueduct from the reservoir to Salt Lake City has only been partially completed. It is the construction of this section of the project on which work will be resumed.

Dam Wrecked by Oregon Flood Will Be Rebuilt

GILPIN CONSTRUCTION CO., Portland, Ore., has been awarded a contract by the Hawley Pulp & Paper Co. to reconstruct portions of the Willamette River dam at Oregon City, which was badly damaged during the early January flood (see *Western Construction News*, Feb. 1943). The work will involve sinking a cofferdam across the east basin, removal of the old rock-filled crib dam, and construction of a concrete dam, provided sufficient materials can be secured. The new structure will be 1,000 ft. long, but reports indicate that it may not be possible to secure sufficient steel to complete the entire project in permanent construction.

Southern Construction Workers Frozen in Jobs

Construction workers in southern California have been frozen in present jobs under the War Manpower Commission's voluntary stabilization plan. H. R. Harnish, area director, said the move was necessitated to halt pirating of labor by war industries. Under this plan, no one may be hired without a certificate of availability from his previous employer, signifying release from his former job. The order applies to building trades, as well as to heavy construction, and is estimated to cover about 150,000 workers.

Pasadena Surveys Route for Additional Outfall Sewer

SURVEYS for the Westside outfall sewer to serve the entire western portion of the City of Pasadena, Calif., has been started. This sewer will join the main Pasadena outfall in South Pasadena. Although application has not yet been made to the War Production Board for materials for the new sewer, it is anticipated that no difficulty will be encountered in this matter, since the present sanitary facilities are considerably overloaded due to war housing expansion.

War Mineral Access Roads for Six Western States Gain WPB Approval

APPROVAL of construction of access roads in six western states has been granted by the War Production Board to speed up production of critical war materials. These access roads will reach 111 remote deposits of scarce war minerals, such as tungsten, manganese, mercury, copper, tin, nickel, and others. The total program is estimated to cost $4,200,000, and is divided according to the following schedule.

In Arizona, nine roads with a length of 141.5 mi., and costing $240,400 were approved. The first of these, a 13-mi. road giving access to a copper mine, was begun on Jan. 7.

In California, 44 roads, seven of which have been completed, were approved. The total length of these roads is 780 mi., and the cost is estimated to be $1,529,590.

In Idaho, 18 roads, costing $759,530 and totalling 352 mi. in length, will open up rich mineral and timber areas.

Sixteen projects were approved in Nevada, on one of which, leading to a vital tin deposit, construction was started Jan. 7. Total Nevada mileage will be 262 mi., and the cost is estimated at $494,629.

Eighteen projects, totaling 227 mi. in length and costing $747,825, won aproval in Oregon, with timber the chief objective although chrome, mercury and nickel will also be transported.

Expenditure of $498,259 was approved for 66.5 mi. of road in six projects in the State of Washington, where both timber and vital ores will be open for exploitation. Construction of these roads is made possible by an amendment to the 1941 Defense Highway Act which provides $10,000,000 for construction, maintenance and improvement of access roads to raw material sources when certified to the Federal Works Administrator by the chairman of the War Production Board. Most of the sum has already been allocated to provide over 3,000 mi. of road in 218 projects throughout the nation.

WASHINGTON NEWS

. . . for the Construction West

By ARNOLD KRUCKMAN

Washington, D. C.—By the time this is published, Senator Carl Hayden, senior Senator from Arizona, will have held his memorable meeting of the western state Senators. The 30 members of the conference are the Senators of the 15 western states in which irrigation is one of the paramount problems. *Western Construction News* and its lusty young sister periodical *Western Industry,* for some time have urged such coalition among the members of Congress from the West. Senator Hayden, who knows much about irrigation, is one of the few men in Congress who commands following in the House as well as in the Senate. He spent many years as a Representative of Arizona in the House, and has learned about the economic significance of water from the grand old man of reclamation, George H. Maxwell, the sage of western water policies, whose home in Phoenix is the shrine for students of water problems in all parts of the world.

It is quite possible the conference of the Representatives of the 15 western states in the House also will have been held in March. Unquestionably there will be a joint program which these western legislators will follow. Their present object is to show officials of the Government in Washington why irrigation and reclamation of additional land in the West is urgently important at this time. They will make clear that food is desperately needed now, will be just as desperately needed for the next two or three decades. They will show clearly that their program is fundamentally required to make effective the plan recently announced by the President which will create global international bodies to store reserves of food and to distribute the reserves when and where they are needed.

Secretary of Agriculture and Food Controller Wickard was notified of the coalition impending in Congress. This impelled him to hold action on the plan proposed by the Department of Interior. The reclamation program outlined by the western delegation in Congress naturally has the full support of Bureau of Reclamation, and it is regarded as more complete. The initial stage of the Hayden plan will bring into production within 3 years 800,000 acres of new projects, and 2,000,000 acres of new land to be irrigated by projects already in existence. These 2,800,000 acres of new production land are located in reasonably equal proportion among the 15 western reclamation states. The allocation of development naturally will be influenced by the type of crop to be raised, by growing seasons, by accessibility to transportation, and similar considerations that will determine the value of the crop to our economy.

Reclamation knowledge lacking

The Hayden move was very wise. Only we who are here actually comprehend how totally the men who administer the affairs of our Government lack knowledge of reclamation and irrigation. You people out there with a broad daily perspective do not realize that Washington is much closer to you than you are to Washington. Apparently few of you realize that there is not one man in the upper reaches of Government here who is a westerner or who really understands the West. Secretary Wickard, for instance, is a good farmer, and knows his middle-west, but it becomes obvious in casual conversation that the water problems of the western states are abstract theories and not practical problems to him. A demonstration in force, such as is precipitated by the Hayden action, is bound to impress him. He will be impressed by the unity of the western group, and by its knowledge of farming problems.

You will undoubtedly hear from time to time that he has been called into conference with the group. He will learn much about irrigation and reclamation he never knew before, and he will unquestionably be convinced that the West offers enormous resources for production of the meats, vegetables, and dairy products required in vast quantities and as swiftly as they may be had. It is the consensus here that Wickard will give the necessary approval that will launch the great reclamation program. The Bureau of Reclamation and the Department of the Interior are ready and eager. The final word rests with Wickard as Food Administrator and Director. His approval means that even the reluctant gentlemen of the WPB must let go of some of the precious machines and metals and other materials necessary to do the job. It will also energize the War Manpower Commission people, who may do something to provide the necessary labor.

Power needs

Donald Nelson recently wrote a note to David Lilienthal the TVA brasshat in which he predicted the nation would need more power than is now in sight. Lilienthal took the message so much to heart that he asked Congress to set up a reserve in TVA funds of $17,500,000 to use in case some of the present TVA frozen projects are brought to life on short notice. Apparently this intimation of the need for more power is regarded as applying also to other regions. Incidentally, the Federal Power Commission reports electric power produced for public use in 1942 reached the unprecedented total of 188,827,278,000 kilowatt-hours. This was a gain of 12.3% over the all-time high of 1941. The greatest increase of power consumption has been recorded in the West, the greatest in all the United States being registered in the Pacific Northwest.

Grand Coulee late in February received a new 75,000 kw. generator which was transferred from Shasta Dam. This brings the installation at Grand Coulee to a total of 400,000 kw. About the same time WPB gave an AA-3 rating preference to build a transmission line from Shasta Dam to Oroville, where the power will be delivered to the P. G. & E. In Arizona, WPB gave Interior an AA-4 preference rating to proceed with 5,500 acres in the Gila Project designed to grow guayule. Similar ratings were given for the building of small projects on the Buffalo Rapids in Montana.

You have undoubtedly heard that Representative Norman of Washington has introduced a bill which would compel the Federal Government to sell the Bonneville and Grand Coulee Dams to Washington and Oregon. Washington would have the sole privilege of buying Grand Coulee, and Bonneville would go to Washington and Oregon jointly. There is little chance the bill will get beyond the committee. Nor is there any great hope that Rep. Rankin's omnibus bill creating a vast chain of public utility and water authorities will get beyond the Committee. This type of legislation, extremely popular last year, has suddenly lost appeal in the new Congress, and undoubtedly is in limbo for the duration.

New assistant to Ickes

Michael W. Straus is the new First Assistant Secretary of the Interior. Straus, who originally hailed from San Diego, has been Ickes' publicity man ever since Ickes became Secretary of the Interior. Ebert K. Burlew, the retiring First Assistant Secretary, becomes a special assistant to Secretary Ickes. Straus' brother-in-law, William Warren, also formerly a newspaper reporter in San Diego, and for a time in charge of publicity in the Bureau of Reclamation, is expected to be appointed publicity man for the Department of Interior.

Trouble in WPB

The most recent explosion in WPB brought out one good story that should interest you. Everything has been far from well in WPB for many months, and the firing of Eberstadt was simply a sort of carbuncle that was bound to come to a head if the New Deal crowd won the fight. Essentially the conflict was between New Dealers and ordinary people, with the Army-Navy angle as a secondary aspect. The fight is by no means over, since the Army and Navy do not easily take a licking.

The prize story concerns Commissioner Thomas H. MacDonald of Public Roads, usually equable and sweet-tempered. It is no secret that MacDonald has not been happy about the runaround he has had at the hands of some WPB grandees who are not very familiar with roads and road problems. When they gave a farewell party for retiring Vice Chairman James S. Knowlson it is

reported MacDonald was present. They say he walked up to the first WPB man he met and inquired: "Do you work for WPB?" "Yes," said the victim. "Well," said MacDonald, according to report, "I just want to tell you that I think the WPB is one of the most cockeyed creations in existence. And for fear you will not spread the word I am going to say it to some of the rest of your crowd." They say he moved around and told some of the others they did not have a man left who knew how to keep his word. The story is told and retold so often by WPB people that you get the impression they take it as gospel truth. MacDonald simply will not say.

Alaska highway notes

Maj. Chris J. Sherlock, president, American Road Builders' Association, is now chief operations officer for the Skagway, Alaska, District of the U. S. Army Engineer Corps. He was transferred from Denver where he became operations officer when he was commissioned in June. Senator Bone of Washington late in January introduced S. 579 which would provide $25,000,000 to build a highway between Prince George, B. C., and Whitehorse, Y. T., Canada, along the "A" route selected by the Alaskan International Highway Commission. It is reported the romance of the building of the 1,800-mile Alcan road has so stirred the country, particularly the story of the work of the contractors, that a playwright is feverishly finishing a play based on the effort, and that the play will be produced both on the stage and in the movies. It is one war story with tremendous action that does not involve battle and destruction, and therefore is expected to be outstandingly striking.

Contractors experience difficulties

The majority of contractors who have visited the Capital the past month have had problems to clarify in connection with OPA Maximum Price Regulation 215, and in connection with the renegotiation regulations. Army and Navy have let it be known they favor profit margins ranging from one-third to one-half of peacetime margins. The majority of contractors from the West Coast report after conferences with the Army and Navy officers that the Services apparently have little concept of the relationship between working capital and profits. They say they are usually asked to note "excessive profits should not be allowed merely because a company lacks adequate working capital in relation to a greatly expanded volume of business. Other measures may be availed of to provide adequate financing." The Services do NOT believe that renegotiations should be based on profits after, rather than before, taxes. They appear indifferent to the fact that excess profit taxes of 90% more than capture any excess profits stemming from war business. Most contractors feel that the academic military negotiators do not proceed with a knowledge of the practical problems of business. Undersecretaries Forrestal (Navy) and Patterson (Army) have been charged with working out a solution.

The award of the contract to widen and align 500 miles of railroad south of Mexico City to Morrison-Knudsen Co., Inc., Boise, Idaho, is the first apparent result of the agreement made between the U. S. State Department and the Foreign Minister of Mexico last December. Under this contract the United States agreed to finance the rehabilitation of the Mexican National Railways. The Mexican lines which will be widened and aligned include the main line from Laredo to Mexico City; the East-West line from Torreon to Monterey; the main line from Cordoba and Puerto Mexico to Suchiate, on the Guatemalan border, where the railroad crosses the Suchiate Bridge; and from Chihuahua to Torreon. Funds are supplied through the Reconstruction Finance Corporation. The technical work is conducted under the general supervision of the Office of Inter-American Affairs. The mission in Mexico is headed by Oliver M. Stevens, formerly Missouri Pacific head. In the mission are outstanding mechanical, track, and transportation technicians. The business of the project is conducted in the Capital by the Mexican Mission at the Mexican Embassy, and by the Office of Inter-American Affairs, particularly through Albert W. Kimber, Room 3726, Commerce Building, Washington, D. C. Other contracts for large scale projects are expected to be negotiated any time.

Meanwhile the U. S. Supreme Court on February 1, in the case of U. S. vs. Brooks-Calaway Co., ruled that floods are not always Acts of God and therefore cannot always be construed as unforeseeable. The firm sued for $3,900 deducted from the price for liquidated damage for delays in completing work. High water delayed the job 278 days. The Government held 183 days were due to conditions normally to be expected while 95 days were unforeseeable. The Court of Claims ruled in favor of the Company, ruling that all floods are unforeseeable. The Supreme Court holds that Article 9 of the standard form of Government construction contract covers normally expected high water which is foreseeable in the course of year, and that the contractor bases his bid on such foreseeable and probable conditions.

Projects in Mexico

A number of undertakings have been embarked upon by the Federal Government in Mexico. Some of them are under the wing of the Office of Inter-American Affairs (the Rockefeller agency), some come under the Department of State, some under the Bureau of Economic Warfare, some under the Reconstruction Finance Corporation. The projects under the direct supervision of RFC usually are carried under the sponsorship of some private corporation, but actual control of the work, the making of the contract, and the details of business, remain in Government control. Typical is the building of a great smelter and other works at Cananea, Sonora, to be operated by the Greene-Cananea Co. Details about this job are carefully hidden by the Government and by the Corporation. Actual supervision is vested in the Metals Reserve Corporation, a subsidiary of the RFC. Information about plans and prospective construction contracts may be obtained from the Defense Plant Corporation, U. S. Commercial Co., Metals Reserve Corporation, Disaster Loan Corporation or Defense Supplies Corporation, each of which may be addressed at 811 Vermont Ave., N. W., Washington, D. C.

Among the new appropriations in process in Congress is S. 564 introduced by Chairman Walsh of the Senate Committee on Naval Affairs which provides $210,000,000 to construct floating drydocks which may go with the American and Allied Navies to combat areas. The bill passed the House by voice vote. The docks will provide facilities for cruisers, destroyers, and patrol ships. Another bill, HR 1488, introduced by Rep. Robinson, Utah, authorizes the Secretary of War to provide a right-of-way over the Ogden Ordnance Depot Military Reservation for an oil pipe line to be granted to the Utah Oil Refining Co.

Miscellaneous

Selective Service Occupational Bulletin No. 9 classifies workers, employed in skilled jobs, by water, power, gas, and steam utilities as performing essential war work, and lists them as eligible for deferment. . . . War Department is moving part of its Office of Finance to Los Angeles. . . . Atlas Imperial Diesel Engine Company, Oakland, Calif., was awarded the Army-Navy Production Award Pennant "E" for outstanding performance on war work. . . . Awards for suggestions which improved production were made on Washington's birthday to 33 plants in 19 States including Marinship Corporation and the Metal Trades Council, AFL, Sausalito, Calif.; Northrop Aircraft Co., Hawthorne, Calif.; Western Electric Co., and Willamette Hyster Co., Portland, Oregon; Inspiration Consolidated Copper Co., Miami, Arizona. Individual awards were made to John Klock and E. L. Paulson, Sausalito, Calif.; William Robert Mordahl, Cheyenne, Wyo.; Allen P. Rogers, Inspiration, Ariz.; Bob Bartell, Sausalito; I. Williamson, Ray Erwin Steele and Wilmer Leroy Hifbee, Hawthorne (both Calif.); John W. Westlake and William Sweeney, Portland, Ore. . . . Wage and Hour and Public Contracts Division of the Department of Labor announced the Executive Order establishing a minimum 48-hour week does not supersede the Fair Labor Standards Act, the Walsh-Healey Public Contracts Act, or any other Federal, State or local law on hours of work or overtime. Detailed analyses to apply to specific situations and conditions may be had by writing to Wage-Hour and Public Contracts Divisions, 165 West 46th Street, New York, N. Y.

The Editor's Mail...

Sir:

The November 1942 issue of *Western Construction News* has just been received here, and I note with interest the article on page 485, by Clayton W. Paige.

This article is of special interest because it was written by the man who is now Executive Officer of this Battalion.

Lieutenant Clayton W. Paige, (CEC) USNR, on leave of absence as City Engineer of Burbank, California, is doing a fine job as a Naval Officer, and we are very proud to have him in our organization. He is still City Engineer of Burbank, and upon the cessation of hostilities, will resume his duties in that city.

Very truly yours,

L. J. BORSTELMANN,
Lt. Comdr. (CEC) USNR
Commanding

"Somewhere in the British Isles"
18 January 1943

NEW BOOKS...

MECHANICAL DRAWING — By Ervin Kenison, Professor Emeritus, Massachusetts Institute of Technology, and James McKinney, Educational Director, American School. Revised by Tom C. Plumridge, Head of Drafting and Design Department, American School. Published by the American Technical Society, Chicago, Ill. 330 pages, 5½x8½. Price $2.00.

An elemental treatment intended for self study, this volume makes a special attempt to develop the student's power of visualization and to create ideas in the making of working drawings. All of the common mechanical drawing materials and instruments are described, and their proper uses explained. The subject of lettering is treated in detail, although no great variety of lettering styles are provided as illustrations. Geometry and its applications to mechanical drawing are considered both in theory and in practical problems. About two-thirds of the volume is devoted to specific problems and exercises.

* * *

THE PARKING PROBLEM—Published by the Eno Foundation for Highway Traffic Control, Inc., Saugatuck, Conn. 82 pages, 6x9. Copies may be secured by writing to the Eno Foundation.

The realization of the serious problems existing due to the parking problem has led to this collection of ideas of other people and organizations for submission to those interested in bettering conditions and in getting a general knowledge of the work that has been done on the subject. Quotations of a few of the twenty-two inclusions contained in the report will best serve to indicate the scope of the material. The authors state that the parking problem will never be solved at the curb or center of the street, and that parking meters are not a solution to the problem but merely a palliative that aids in controlling curb parking. It is their conclusion that off-street parking and terminal facilities must be provided, and that mass transport vehicles should not only be encouraged but everything possible should be done to expedite their movement and encourage their usage. They also recommend the provision for off-street pick-up and delivery service in business districts. Income from parking meters and publicly owned parking lots should not be regarded as sources of income, and excess amounts above amortization, maintenance and operation charges should not be turned into general funds. The most obvious conclusions, and those most consistently disregarded in present-day practice, are of course, the facts that all parking regulations should be enforced impartially and continuously, and that parking regulations should be consistent and enforceable in themselves.

* * *

IV CONGRESO PANAMERICANO DE CARRETERAS—MEMORIA—Tomo I, II and III (Proceedings of the Fourth Pan American Highway Congress, Volumes I, II and III) (Spanish). Published under the direction of the Edificio de la Secretaria De Comunicaciones, Y Obras Publicas, Mexico, D. F. 635, 806 and 775 pages, respectively, 6¼x9¼.

This 3-volume report (printed entirely in Spanish) includes the complete proceedings of the Fourth Pan American Highway Congress held in the city of Mexico, D. F., Sept. 15-24, 1941. All of the papers presented by highway engineering authorities of the North and South American continents are included in the volumes. These include such well-known United States highway engineers as John T. Lynch, R. H. Baldock, Conde B. McCullough, Edward A. Willis, and E. E. East. Subjects covered by the papers include Highway Engineering, Finance and Administrative Problems, and Highway Operations and Maintenance. The volumes are well illustrated with maps of the various sections of the Pan American Highway, including a color map of Mexico, charts and tables.

* * *

A START IN METEOROLOGY—By Armand N. Spitz, in charge of Department of Meteorology, The Franklin Institute, Philadelphia, Pa. Published by The Norman W. Henley Publishing Co., 17 West 45th Street, New York, N. Y. 95 pages, 5½x7½. Price $1.50.

Intended specifically for the use of young people who are particularly interested in the pursuit of aviation as a profession, this book is extremely elementary in its presentation. It is profusely illustrated with simple sketches to amplify the text which is written in a most elementary manner. For one who is interested in learning the basic facts of meteorology without becoming involved in a highly technical discussion, this book should prove of interest.

* * *

AIR NAVIGATION FOR BEGINNERS—By Scott B. Lamb, Lieut. Commander, U. S. Navy, Retired, and Instructor in Navigation, Air-Mar Navigation Schools, Franklin Institute, Philadelphia, Pa. Published by The Norman W. Henley Publishing Co., 17 West 45th Street, New York, N. Y. 103 pages, 5½x7½. Price $1.50.

Written especially for young people who have an interest in aviation but have not as yet undertaken any formal education in the subject, this book is essentially elemental in its presentation of the subject of air navigation. Those thoroughly conversant with spherical trigonometry and geodetic surveying may find the presentation too elementary, but for those who are interested in learning the fundamentals of air navigation without becoming involved in mathematics they will find the text easy to read and follow. The text is widely amplified by simple sketches to assist the student in gaining an understanding of the problems.

The Employment Information Corner

Navy Yard workers

One thousand civilian workers are needed at the Pacific Coast's newest and one of its most important Navy Yards, Hunter's Point, near San Francisco. A rapid expansion of the yard's operations necessitate immediate employment of machinists, electricians, shipfitters, joiners, plumbers, painters, welders, boilermakers, drillers, laborers, and many other classifications of employment. Salaries range from $6.50 for laborers to $9.20 for journeyman mechanics. Working time is a minimum of 48 hr. per week, with time-and-one-half paid over 40 hr. Stenographers, typists, and clerks are also needed, and first-class salaries are being paid. Union membership is not required.

Hawaii and Panama

Civilian employees for Navy work are required in Hawaii and Panama, particularly in skilled mechanical and helper classifications. Helpers in all trades receive $1.14 per hour, and journeyman rates vary up to $1.77 per hour for loftsmen. Men are employed under contract requiring an 18-mo. stay on the job. Mechanics, blacksmiths, electricians, sheet-metal workers, instrument makers and automotive mechanics are among the openings available. Panama positions available include wood caulker, electroplater, pipe coverer, loftsman, coppersmith, metallurgist, and others, with wage scales approximately the same as those in Hawaii. Transportation is furnished free to both locations. Applications will not be received from men with 1-A draft classifications.

Excess Profits Tax Data

(Continued from page 122)

the tax counselor enlists the services of an accountant, attorney, and frequently an economist or engineer. However, the business man himself in the first instance can frequently tell whether there is a good possibility of relief.

First, he can ask himself whether any of the circumstances outlined above, in fact, occurred in his business.

Then he can compare roughly the profits in his own business or industry against the profits of business in general. Much data is available to assist in this. On January 3rd, 1943, the New York Times published the business graph shown in Fig. 1.

It is a relatively easy matter to obtain from trade associations, a graph of any particular industry's profits for the same period, and an accountant can prepare a graph of the individual concern's profits. Did they follow the same proportions as the graph of American business in general? If they did not, it is a symptom indicating possibility of relief.

The tax counselor's work

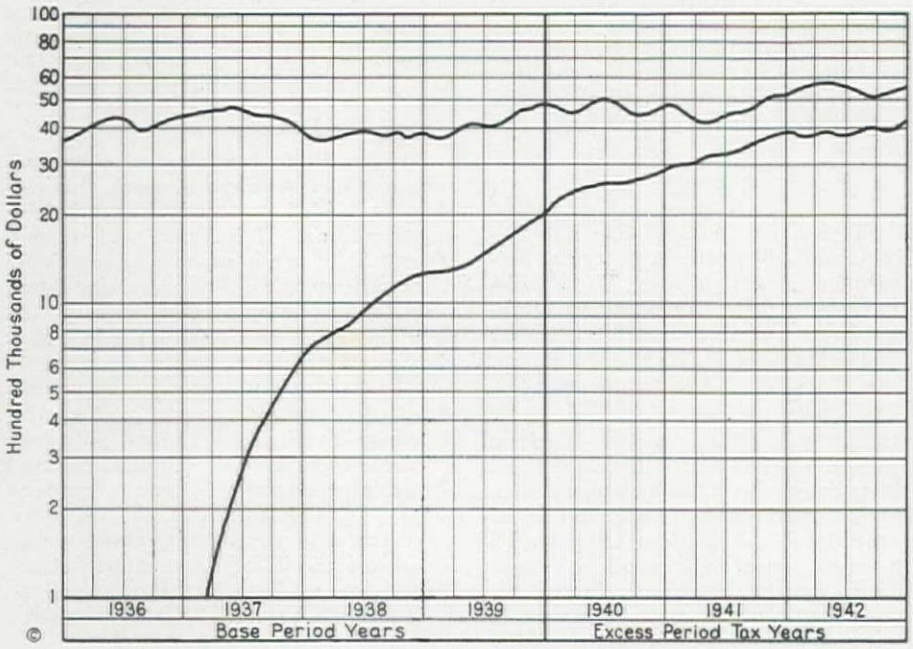
The tax counselor would also examine all tax records or other tax data, accountant's reports, minute books showing the structure of the organization, the forms of contracts used with customers, catalogues of merchandise, and advertisements. He would read the back issues of trade journals and cooperate with trade associations. He would study maintenance and payroll accounts to discover stoppages in production, and consult with the insurance broker to ascertain the occurrence of physical catastrophies. All these and many more can be presented in graph form, similar to that shown in Fig. 2.

A chart of this type would be valuable in supporting a claim for constructive average base period net income taking into consideration the income which would have been realized from Product "N" if the taxpayer corporation had "made the change" (i.e., gotten into production of this article) two years earlier. It likewise would be helpful in overcoming one of the stock objections on the part of Revenue Agents to all claims for relief under both sections 721 and 722, namely, that the increased income from a new product is due simply to improved business conditions, and is not attributable to the product itself, and that earlier development of the product would not have produced any more income in the earlier years because there would not have been sufficient demand for the product.

Additional good sources of statistical material are conferences with friendly competitors and tax practitioners; U. S. Tariff Commission Schedules; the Statistical Abstract of the U. S., published by the Department of Commerce; Wesley C. Mitchell's book on Business Cycles; Dun & Bradstreet's Files of National Industrial Conference Board; the U. S. Treasury Department's Statistics of Income; the New York Stock Exchange Magazine for December, 1942, which analyzed 487 listed corporations; Moody's Manual; 1942 Survey of Current Business, by the United States Department of Commerce; Federal Reserve Monthly Review of Credit and Business Conditions; and the New York Times of Sunday, January 3, 1943.

The foregoing procedures may seem to present hard problems but it is foolhardy in the worst degree to permit opportunities created by Congress to go by default. As indicated before, the expense of analyzing the situation is usually a deductible item, the facts developed will present a picture of the position of the individual business with relation to other members of the industry, and the position of the industry with reference to American business in general.

FIGURE 2 is typical comparison chart of sales of a given product, as related to sales of all other products for 12-mo. periods over the base and taxable years.



Authority Designs New Tacoma Narrows Bridge

A NEW SUSPENSION span on the site of the wrecked Tacoma Narrows Bridge is planned by the Washington Toll Bridge Authority. Present design calls for a four-lane structure with truss girders which will not obstruct wind passage as did the former plate girders. No portions of the original structure will be usable except the concrete piers and the cable anchorages, which however must be enlarged. Estimated cost of the new structure is about $6,500,000. Wind tunnel tests at the University of Washington have been in progress ever since the destruction of the original span. The Toll Bridge Authority has already initiated proceedings before the War Production Board and governmental fiscal authorities with the view of obtaining necessary priorities and finances for early construction, since they feel that the structure comes within the bounds of defense projects.

OBITUARIES . . .

Fred O. Hinman, 36, Colorado contractor and engineer, died February 4 in Pittsburgh, Pa. He was born at Cardinal, Colorado, and was active in highway construction the past ten years. At the time of his death he was secretary of Hinman Bros. Construction Co. of Denver, Colorado.

* * *

Rear Adm. Edward B. Fenner, retired, former commandant of the Puget Sound Navy Yard, and the 13th naval district, died suddenly on Feb. 13 in Seattle, Wash. His body was taken to Arlington National cemetery near Washington, D. C., for burial.

* * *

H. C. (Chris) Snead, an estimator for the past 11 years in the firm of Eaton & Smith, San Francisco, Calif., contractors, died Feb. 16 at Alameda, Calif. He was 67 years of age.

* * *

Frank T. Gleeson, who was a construction superintendent during construction of Boulder Dam, and many other important western structures, died recently in Los Angeles, Calif., at the age of 64.

* * *

Gottfried T. Lagerberg, an engineer with the U. S. Coast and Geodetic Survey from 1903 to 1936, when he retired, died recently in Seattle, Wash., at the age of 76.

* * *

Edward Ginley, an early building contractor in San Francisco, Calif., died in that city recently at the age of 82.

PERSONALLY SPEAKING

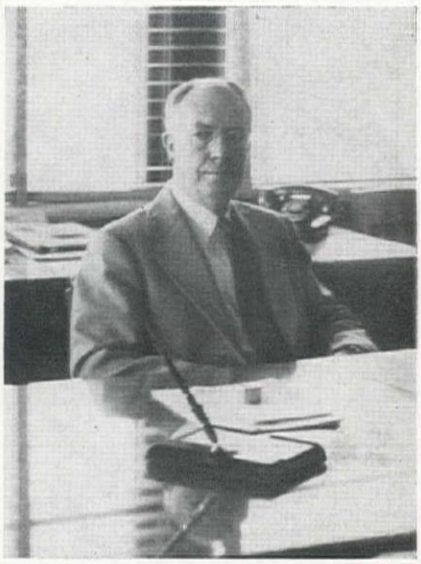
J. Perry Yates, office engineer for Six Companies, contractors, during construction of Boulder dam, and since engaged in other important engineering projects, is now general manager of the aircraft division of Bechtel-McCone-Parsons Corp., Los Angeles, Calif., directing construction and operation of an airplane modification plant at Birmingham, Ala., the cost of which is estimated to exceed $12,500,000. Ground was broken for the big plant on Jan. 15. Many western engineers are employed on the project.

* * *

James E. Roberts, of Moore & Roberts, has been elected president of the Central California chapter of the Associated General Contractors of America, for the year 1943. **George W. Williams,** of the G. W. Williams Co., is the new vice-president, and **Carl Gellert** of Standard Building Co. will serve as treasurer. **William E. Hague** was named secretary-manager. Other members of the board of directors are **Fred J. Early, Jr.,** of the construction firm bearing his own name, **Harry H. Hilp,** of Barrett & Hilp, **W. E. Lyons,** of Christensen & Lyons, and **William C. Tait,** of W. C. Tait, Inc.

* * *

Edward H. Honnen, widely known Colorado contractor and former president of the Colorado Association of Highway Contractors, was commissioned February 26th as a lieutenant commander in the construction battalion of the Navy. He will train at Williamsburg, Va. Honnen built, in addition to many highway and reclamation projects, the Rosemont dam near Colorado Springs, the first steel-faced dam to be constructed in this country.



BERNARD TOUHEY, formerly in the employ of the Federal government, and well-known among Arizona engineers, has been appointed State highway engineer, succeeding W. R. Hutchins.

* * *

C. L. McDonald has been elected president of the British Columbia Building and Construction Industries Exchange, Vancouver, B. C., for the year 1943. Vice-presidents elected at the same time are **J. G. Bennett** and **M. C. Cameron.** Directors to serve a two-year term are **T. C. Clarke, F. J. Hale,** and **F. Welsh.** Directors holding over are **A. S. Gentles, E. R. Gilley,** and **J. E. Buerk.**

* * *

W. C. Williams, Portland, division engineer for the Oregon state highway commission, and formerly in a similar position at La Grande, has been commissioned a captain in the Corps of Engineers, and is now at Camp Claiborne, La., for training. He has been succeeded by **Frank T. Young,** formerly resident engineer on the Front St. project in Portland.

* * *

Waldron H. Yarger, B. R. McGrath, Jr., and **Ted F. Hammett,** all engineers with the Bureau of Reclamation at the Denver, Colo., office have resigned to accept commissions in the Navy as lieutenants. The three men have all been with the Bureau of Reclamation for over 7 years and held positions in the various design departments.

* * *

Frank W. Parker, associate engineer with the U. S. Indian Irrigation Service, is now stationed in Chicago, Ill. Previous to that assignment, he was at the Iowa Institute of Hydraulic Research for a year, working on the research project entitled, "Study and Analysis of Sediment Loads in Streams."

* * *

W. H. Yeager, formerly chief draftsman of the Washington State Highway department, has been appointed county engineer of Thurston County, Wash., to succeed **Clarence V. Shain,** who resigned the position to become plans and training officer for the Washington state guard, with the rank of colonel.

* * *

John P. Densmore, assistant engineer for the Metropolitan Water District of Southern California during construction of the Colorado River aqueduct, is now a lieutenant in the Navy construction battalions, and is at present at Camp Peary, Va.

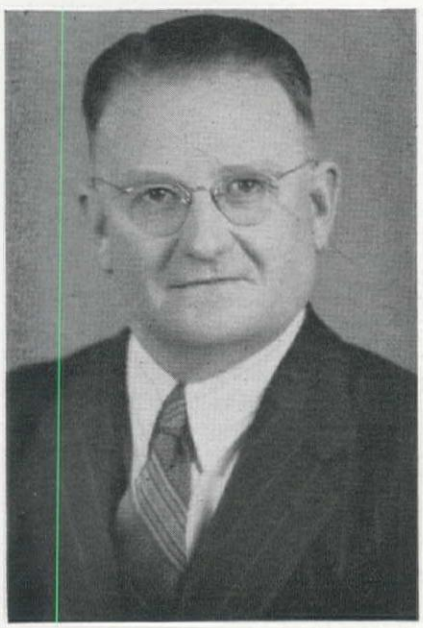
* * *

C. O. Crane, formerly a civil engineer with the Bureau of Reclamation, is now a lieutenant (j.g.) with the Bureau of Yards and Docks, Washington, D. C. His work is making special studies to determine the adequacy of shore facilities to care for a two-ocean navy.

* * *

Northern California men recently granted certificates of registration as civil engineers are: **V. Melvin Brown,** Alameda; **Milton F. Bourke, Richard E. Hall, Robert Horonjeff,** and **Norman T.**

DON C. McMILLAN has been named city manager of Alameda, Calif. He occupied a similar position at Ventura, Calif., for the past eight years.



JOSEPH D. WOOD will fill the double position of Director of Highways and Commissioner of Public Works in Idaho. He held the position of Public Works Commissioner prior to 1931.

Riffe, Berkeley; **E. I. Van Patten**, Fresno; **Frank W. Aitken, Jr.**, Larkspur; **H. F. Sherwood** and **Frank Edwin Wilson**, Marysville; **Albert M. Dunfee, J. Alton Johanek, Einar Larsen, Walter A. Leichtfuss, Jack Y. Long, Leslie M. Petersen, C. Harlan Ray** and **Robert Wm. Russell**, Oakland; **B. C. Welte**, Redwood City; **Edward John Carter**, Sausalito; **Ben Balala, Frederick W. Ervast, Rex H. Fulton, Nathan C. McCorkle, Thomas W. Reynolds** and **Ernest Zube**, Sacramento; **Blair I. Burnson, Mark E. Cessna, William R. Cobb, Arthur T. Hauck, John Sanders**, and **Carl A. Weers**, San Francisco; **John M. Olayos, Jr.**, San Rafael. Out-of-State engineers licensed to practice in California include: **John H. Bateman**, Kansas City, Kan.; **John W. McDuell**, Cambridge, Mass.; **John G. Cowan**, Camp Claiborne, La.; **E. G. Knudsen**, Salt Lake City, Utah.

Qualified as registered structural engineers were: **Clarence E. Rinne** and **Edwin A. Verner**, Berkeley; **Glen H. Philpot**, Burlingame; **James M. Fox**, Oakland. Licenses as land surveyors were granted to **Elmer W. Lane**, Bakersfield; **Paul H. Hardy**, Palo Alto, and **James R. McKenzie**, San Jose.

* * *

Maj. Chris J. Sherlock, 1942 president of the American Road Builders' Association, has been transferred from Denver, Colo., to Skagway, Alaska, where he is now chief operations engineer for the district office of the U. S. E. D.

* * *

William Popper, assistant engineer in the bridge department of the California Division of Highways, located at Sacramento, has been commissioned a first lieutenant in the Marine Corps, and is now located at San Diego, Calif.

JAMES B. KENNEY, formerly manager of the Colorado State Association of Highway Contractors, and more recently in business for himself, was elected 1943 president of the association.

LYMAN D. WILBUR, left, Los Angeles, Calif., district manager for Morrison-Knudsen Co., Inc., has been elected 1943 president of the Southern California Chapter of A. G. C. WALTER J. ESCHERICH, 1942 president, is congratulating the new executive.

Prof. Franklin Thomas, head of the department of civil engineering at California Institute of Technology, Pasadena, Calif., has been re-elected vice-chairman of the Board of Directors of the Metropolitan Water District of Southern California.

Walter Parsons, formerly operations manager for Northwest Engineering Co. in Los Angeles, Calif., has become general manager for Morrison-Knudsen Co., Inc., on their railroad operations south of Mexico City.

SUPERVISING THE JOBS

W. J. Dowell is project manager for Dowell Construction Co., Seattle, Wash., on the section of the Alaska Highway for which it is responsible, and **Robt. Woodward** is his assistant. **Bill Burnett** is office manager and **Paul Turner** and **Paul Lance** are construction superintendents, the former at Whitehorse, Yukon Terr., and the latter at Haines, Alaska. **C. L. Starwich** is the purchasing agent for the firm.

* * *

H. L. Morisette, superintendent, and **W. E. Baker**, general foreman, have just completed two highway contracts secured by Union Paving Co., San Francisco, Calif., near Reno, Nev., and have been assigned to another in the same locality, a 7.7-mi. highway job from Reno airbase to the Nevada-California state line near Purdy. It is a $205,853 project. Others on the job are **R. C. McNally**, plant foreman, and **F. C. Criely**, office manager.

* * *

John Jacoby and **A. D. Alexander** are foremen on construction of the Bow Lake airport near Seattle, Wash. This is a $2,000,000 contract secured by Johnson-Minnis & Moody-Vista, of Los Angeles, Calif. Other personnel on the project were named in the January issue of *Western Construction News*.

John R. Curry, a construction superintendent of many years experience on the Pacific Coast, is now construction superintendent at a lighter-than-air base being built at Hitchcock, near Galveston, Tex., for the Navy, by Norgaard & Shaw-Vilbig Bros., Inc.—Nathan Wohlfield, a combination of Dallas, Tex., contractors. It is a $10,000,000 job.

* * *

Norman G. Robinson is general superintendent on the $2,499,777 contract secured by Moore & Roberts, San Francisco, Calif., to construct 500 temporary family dwelling units and 200 dormitory accommodations for men in King Co., Wash. Assisting him is **T. C. Baines**, field superintendent. **Roy I. Gummere** is project manager.

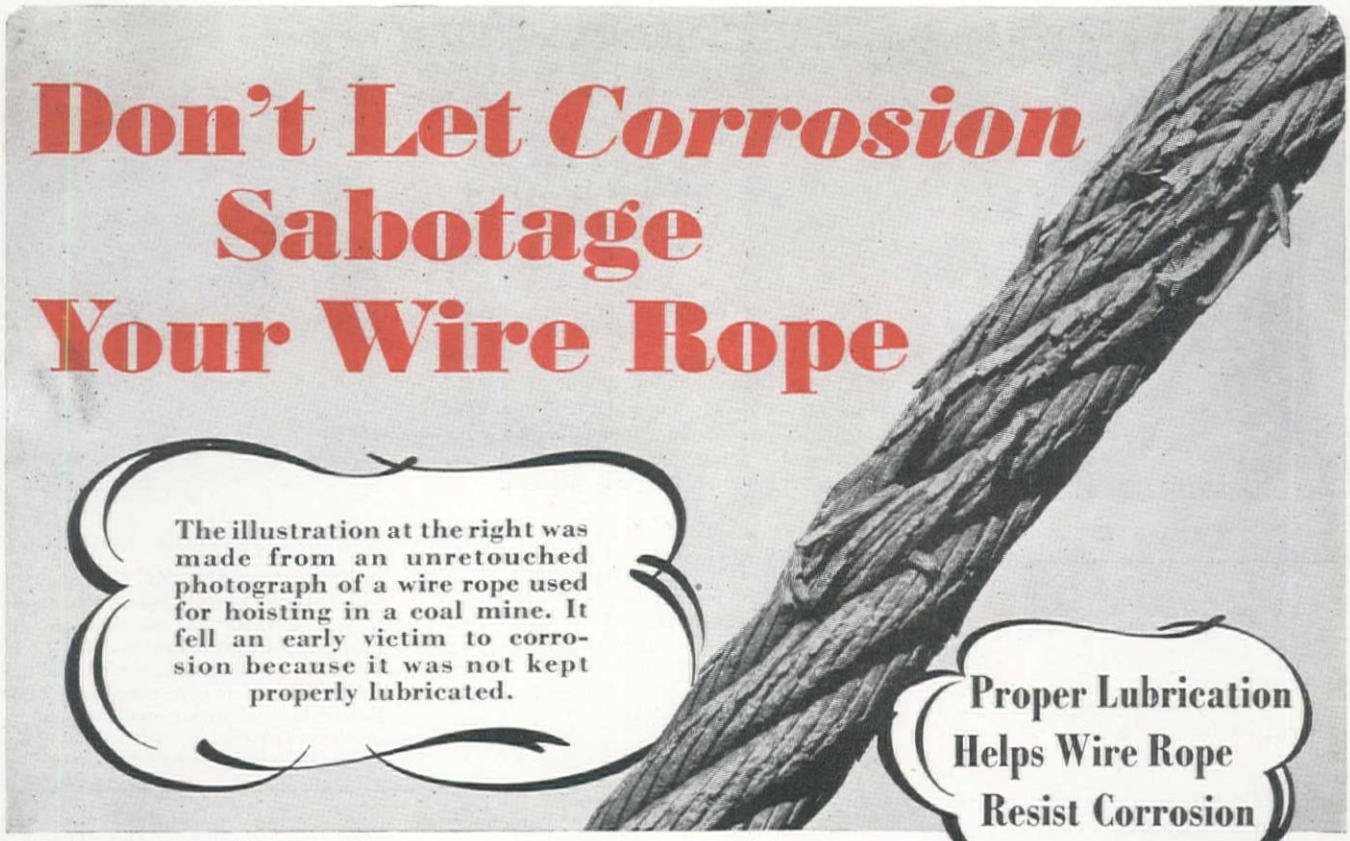
* * *

B. W. Porter is general superintendent for Anderson Building Co., Spokane, on the construction of reservoir and pumphouse for water supply system at a military site in Spokane County. **Walt Melcher** is job superintendent on the more than $50,000 project.

* * *

Al Gotterdam, formerly superintendent of large contracts at Fontana, Calif., and in Utah, has been made gen-

Don't Let *Corrosion* Sabotage Your Wire Rope



The illustration at the right was made from an unretouched photograph of a wire rope used for hoisting in a coal mine. It fell an early victim to corrosion because it was not kept properly lubricated.

Proper Lubrication Helps Wire Rope Resist Corrosion

CORROSION is an enemy saboteur that is constantly trying to destroy your wire rope. Unless combatted by proper lubrication, normal rope life is greatly shortened and a serious hazard to safety created.

Wire Rope is an intricate machine with many "bearings". If it is to give the full service of which it is actually capable, these points of contact — both externally and internally — must be kept correctly and adequately lubricated at all times.

The right kind of lubricant to use and the frequency with which it should be applied depends upon the conditions under which your rope is operating. When in doubt, we suggest you consult with an experienced wire rope manufacturer.

Now that steel is so urgently needed for so many implements of war, the more "work hours" you can get out of your wire ropes, the more steel you save for other vital purposes. So in all earnestness we repeat— *Don't let Corrosion sabotage your wire rope.*

• *Important* •

An idle wire rope is more vulnerable to corrosion than one in use, so be sure to give your ropes the protection of a good lubricant when they are not in service.

Western Distributors: ALBUQUERQUE: McChesney-Rand Equipment Co.; BILLINGS: Connelly Machinery Company; BOISE: Olson Manufacturing Company; CHEYENNE: Wilson Equipment & Supply Co.; DENVER: H. W. Moore Equipment Company; EL PASO: Zork Hardware Company; GREAT FALLS: Connelly Machinery Company; HELENA: Caird Engineering Works; LOS ANGELES: Garlinghouse Brothers; PHOENIX: Pratt-Gilbert Hardware Company; PORTLAND: Clyde Equipment Co., P. L. Crooks & Co., Inc.; SALT LAKE CITY: The C. H. Jones Equipment Company, Z. C. M. I.; SANTA ROSA: Berglund Tractor & Equipment Co.; SEATTLE: Clyde Equipment Co.; SIDNEY: Tractor & Equipment Company; SPOKANE: Nett-Atwater Company; STOCKTON: Hickinbotham Bros., Ltd.

A. LESCHEN & SONS ROPE CO.

WIRE ROPE MAKERS — ESTABLISHED 1857

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HERCULES (RED STRAND) WIRE ROPE

NEW YORK . . . 90 West Street
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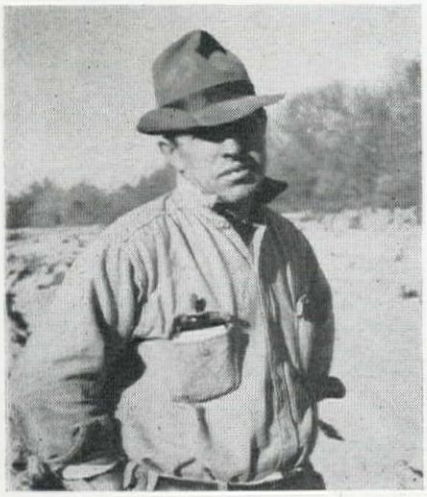
SAN FRANCISCO . . 520 Fourth Street
PORTLAND . . 914 N. W. 14th Avenue
SEATTLE . . 3410 First Avenue South



NEAL A. SAUL

eral superintendent for Tri-State Construction Co., of Portland, Ore., on that company's $695,860 contract to erect 200 housing units at Troutdale, Ore. **J. C. Sellard** is foreman on the job, and **L. J. Whetman** is timekeeper.

* * *

Verner C. Johnson, veteran superintendent for Flotation Systems, Inc., Los Angeles, Calif., has been assigned by the company to direct construction of utilities and a steam distribution system at a military camp in the Mojave desert of California. The contract runs between $100,000 and $500,000. **T. R. Gregory** is chief engineer.

* * *

Felix Accopaci is general superintendent for the Valley Construction Co., Seattle, Wash., on the company's contract to construct a water works for the city of Kirkland, Wash. **C. Busti** is the foreman on the job. **H. W. Poling** is resident engineer for the city.

* * *

Walter S. Cook will supervise construction of a reinforced concrete blanket on Los Angeles' north outfall sewer, where that structure is operating under pressure, near its discharge end. **Ralph Cook** will be carpenter foreman on the job, a $60,500 project for which Oberg Bros., Los Angeles, received the contract.

* * *

Max Dudley will supervise construction for Askevold & Rund, contractors of Great Falls, Mont., on their contract valued at $812,408, to construct 360 housing units in Portland, Ore. **Fred Brinkerman** is the architect for the contractors, and **Andy Olsen** will be general foreman.

* * *

F. M. Ireland is general superintendent, and **James F. Rabbitt** is his assistant, on construction of necessary buildings and facilities, including grading, for a 1,500-unit trailer camp at San Pablo, Calif., to afford temporary living quarters for shipyard workers. This is a $518,500 contract awarded to Heyman Bros., San Francisco, Calif.

Neal A. Saul, superintendent for J. E. Haddock, Ltd., of Pasadena, Calif., on many highway jobs in the past, has been given a new assignment by the contractor, a $136,409 contract to pave and improve the shoulders on 1.5 mi. of Imperial Highway in Los Angeles Co., Calif. **Dave Crockett** is office manager on the work.

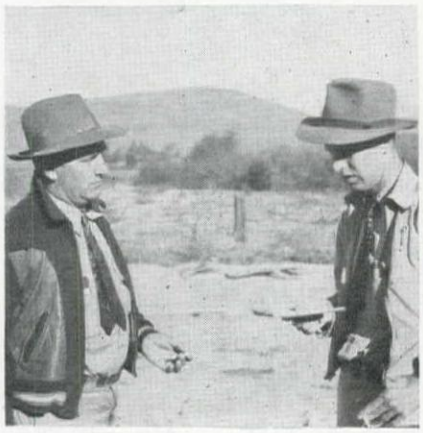
* * *

P. C. Guinn, formerly superintendent at the Draper Alpine tunnel at Draper, Utah, has taken the contract for a 5,000-ft. haulage tunnel for Molybdenum Corp. of America at Questa, N. Mex., and is supervising the work himself. **Ray Robinson** is electrician on the job, and **Edward L. Snell** is master mechanic. The job is now nearing completion.

* * *

Joseph Wheeler is superintendent, and **Leo Seifert** is assistant superintendent for Morrison-Knudsen Co., Inc., Boise, Ida., on a re-ditching and sloping contract secured by the M-K railroad division at Russell, Kan. Office manager on the job is **Jack Bailey.**

* * *



A. M. HARSH, left, superintendent, and K. E. Poss, assistant superintendent for Frederickson & Watson and Frederickson Bros., Oakland, Calif., on the 13-mi. contract to grade and plantmix surface between Santa Maria and Casmalia, Calif., a $701,495 project.

LET THEM KNOW . . .

Dear Sirs—Thanks for the notice in your last issue, giving my location at Camp Pendleton. It is the only way some of my old friends could know that I am still alive. I often see items and sometimes pictures of old friends that I would not know about otherwise.

T. N. Moore.

These personal columns are read by thousands of construction men. When you move or change your occupation, send the information to *Western Construction News* and it will be noted here for your friends to see.

JOHN L. THOMPSON, left, and MIKE SCHERUPP have formed a partnership to sub-contract dirt moving on important projects all over the West. Their firm, known as the Sierra Trucking Co., Reno, Nev., was organized in 1941 and has expanded to an ownership of hundreds of trucks, operating on defense projects in every western state.

George Singer has been appointed by Walton & Brown Electric Co., Salem, Ore., to direct construction of an electric distribution and street lighting system at an airbase under construction in Elmore Co., Idaho. The contract is valued at about $70,000.

* * *

Larry Sullivan has been named project manager by Case Construction Co., San Pedro, Calif., on the "more than $100,000" contract awarded to it for a 15,500-ft. access road in Los Angeles County, Calif. **Ralph Van Patten** will be construction superintendent.

* * *

J. R. Abbott is now employed by Longtin drilling contractors at the U. S. vanadium mine, near Bishop, Calif., engaged in a new type of long hole blasting made possible by the use of cast bits and special detonating fuse.

* * *

Cliff Rasch is general superintendent for Cecil R. Beal, contractor, on construction of a 100-ft. tower and 150,000-gal. water tank at Bremerton, Wash., in connection with a Federal Public Housing Authority project.

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William T. Bice is now a millwright foreman for the Austin Co., contractors on a defense power plant at Ludington, Mich. Bice is working especially on machinery installation.

* * *

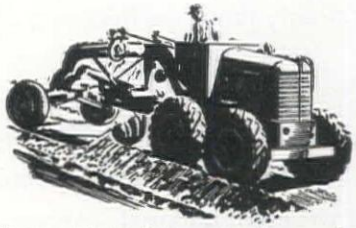
Walter A. Stull, formerly a foreman with Parker-Schramm Co., Portland, Ore., is now employed under civil service at the Farragut naval base in Idaho.

ANOTHER GREAT CHAPTER IN RAILROAD HISTORY

Here Currier and Ives, the famous portrayers of American life in the past century, picture their idea of the ultimate in convenient travel —a train of the 70's rolling through the cut outside Jersey City.

Today GM Diesel Locomotives *speed passengers from Chicago to Los Angeles, 2227 miles, in 41¼ hours, a business-day faster than in the middle nineteen thirties. In recent war emergencies GM freight locomotives on the Santa Fe have been an important factor in the rapid movement of precious war material between Chicago and the Pacific Coast.*

THE history of America is a history of progress in transportation. ★ This history is not completed. ★ General Motors locomotives have turned a new page in this record of progress. ★ The flowering of this new era when peace again returns is foretold in the tremendous strides already taken in meeting the challenges of war today.



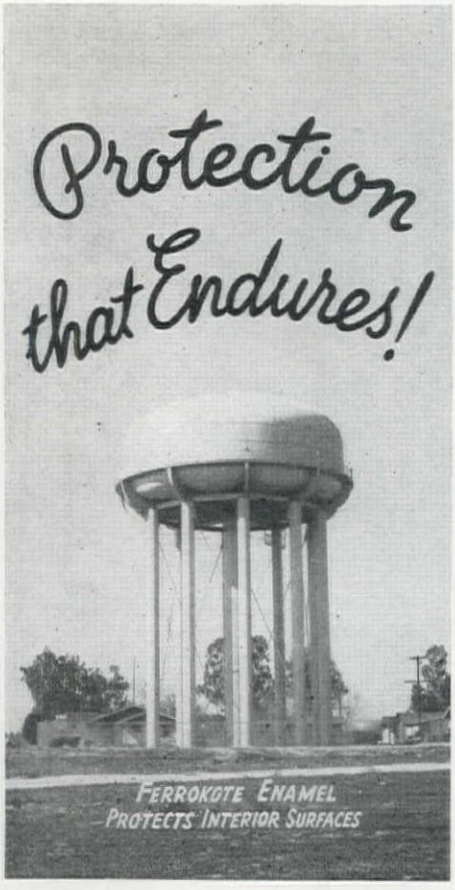
Reconstruction and new construction are going to need plenty of this hard-hitting, easy-on-the-fuel power. With normal refinement and development speeded up by war, with production expanded, GM Diesels will be ready to serve in more fields and in more ways than ever.

GM
GENERAL MOTORS
DIESEL POWER

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

ENGINES..300 to 2000 H.P...CLEVELAND DIESEL ENGINE DIVISION, Cleveland, Ohio

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



FERROKOTE ENAMEL, the latest development in Bituminous enamel, was wisely chosen to protect the interior surface of this 500,000 gallon water tank from corrosion.

This solid coating, heated and applied over its primer, renders a tough, adhesive coating approximately twenty times the thickness of paint.

Many different FERROKOTE coatings... each designed to meet some specific problem on steel, concrete or wood... are available to protect your structures from corrosion. Our thirty years of experience in the construction industry can help you solve your particular problem.

•

S. J. PORTER CO.
345 Vermont St., San Francisco, Calif.

UNIT BID SUMMARY

Bridge and Grade Separation...

Utah—Davis County—State—Surf. and Overhead

W. W. Clyde & Co., Springville, submitting bids of $100,384 for Schedule 1, and $31,300 for Schedule 2 (total $131,684), was low to the Utah State Road Commission, Salt Lake City, for construction of 3.5 mi. of 2½-in. roadmix bituminous surfacing (Sched. 1) and 2 timber overhead structures (Sched. 2) near the Clearfield naval supply depot. One bidder submitted a proposal on the roadwork only, while 7 others bid on the overhead structures only. The contract for both sections was awarded to the Clyde Co., whose total bid was somewhat less than the engineer's estimate. One of the overhead structures is 204.62 ft. in length, while the other is 117 ft. long. The roadway surfacing is 20 and 26 ft. in width. The bids submitted were as follows:

	Sched. 1	Sched. 2
(A) W. W. Clyde & Co.	$100,384	$31,300
(B) A. O. Thorn & Sons Construction Co.	103,272	41,150
(C) Olof Nelson Construction Co.	110,685	44,500
(D) Thomas and Allen Hunsaker	115,984	.....
(E) J. B. & R. E. Walker, Inc.	119,033	36,483
(F) Young & Smith Construction Co.	.....	31,351
(G) George M. Carruth & Son	.....	31,745
(H) Clifford Prince	.....	33,237
(I) S. E. Faddis Construction Co.	.....	34,371
(J) F. R. Knowlton	.....	35,655
(K) The Contracting Corp.	.....	39,169
(L) Jenson Bros.	.....	44,165
(M) Engineer's Estimate	102,833	31,165

Item	Units	Description	Item	Units	Description
(1)	72,400	Gal. Bituminous Material, Type MC-2	(16)	150	Lin. Ft. 24-in. Concrete Pipe
(2)	12,900	Gal. Bituminous Material, Type RC-3	(17)	102	Lin. Ft. 30-in. Concrete Pipe
(3)	3.428	Mile Scarifying and Mixing	(18)	30	Lin. Ft. 18-in. Conc. Pipe Syphons
(4)	640	T. Cover Material	(19)	1	Ea. 15-in. 45° Conc. Pipe Elbow
(5)	19,600	T. Cr. Rock or Cr. Gravel Surf. Course	(20)	1	Ea. 18-in. 45° Conc. Pipe Elbow
(6)	13,000	T. Gravel or Cr. Rock Base Course	(21)	48	Lin. Ft. Relaying 18-in. C.G.M. Pipe
(7)	67,700	Cu. Yd. Unclassified Excavation	(22)	32	Lin. Ft. Relaying 24-in. C.G.M. Pipe
(8)	440,000	St. Yd. Overhaul, Class "A"	(23)	325	Cu. Yd. Excavation for Structures
(9)	13,700	yd. Mi. Overhaul, Class "B"	(24)	10	Cu. Yd. Concrete, Class "A"
(10)	1,290	1000 Gal. Watering	(25)	55	Cu. Yd. Concrete, Class "B"
(11)	945	Hour Rolling	(26)	250	Lin. Ft. Concrete Curb No. 1-C
(12)	375	Cu. Yd. Channel Excavation	(27)	120	Lin. Ft. Concrete Curb No. 1-CC
(13)	240	Lin. Ft. 12-in. Concrete Pipe	(28)	44	Ea. Guide Posts
(14)	120	Lin. Ft. 15-in. Concrete Pipe	(29)	7,200	Lin. Ft. Moving Fence
(15)	396	Lin. Ft. 18-in. Concrete Pipe	(30)	4	Ea. F.A.P. Markers

SCHEDULE NO. 2 (TWO OVERHEAD STRUCTURES)

Timber Overhead Structure

(31)	140	Cu. Yd. Excavation for Structures	(34)	2,600	Lin. Ft. Piles Treated
(32)	109	MFBM Lumber Treated (Coast Region Douglas Fir)	(35)	1	Ea. Furn. Pile Driving Equip.
(33)	4	MFBM Lumber Untreated (Coast Region Douglas Fir)	(36)	1	Ea. Removal of Existing Structures

Timber Sidewalk for Overhead Structure

(37)	10	Cu. Yd. Excavation for Structures	(39)	0.5	MFBM Lumber Untreated (Coast Region Douglas Fir)
(38)	4.0	MFBM Lumber Treated (Coast Region Douglas Fir)	(40)	100	Lin. Ft. Piles Treated
			(41)	1	Ea. Furn. Pile Driving Equipment

UNIT BIDS

Item	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
(1)	.11	.12	.14	.125	.15								.11
(2)	.13	.14	.14	.125	.15								.11
(3)	800.00	900.00	800.00	$1,000	$1,000								750.00
(4)	3.50	4.00	4.00	5.00	4.00								3.00
(5)	1.25	1.25	1.40	1.40	1.30								1.20
(6)	1.20	1.25	1.35	1.35	1.30								1.15
(7)	.35	.30	.35	.30	.45								.35
(8)	.015	.02	.015	.03	.02								.02
(9)	.20	.15	.20	.25	.20								.20
(10)	1.50	1.50	2.00	3.00	2.00								1.50
(11)	3.50	4.00	5.00	6.00	4.50								5.00
(12)	1.00	1.00	1.00	1.50	1.00								.40
(13)	1.35	2.50	1.50	1.15	1.75	NO BID	NO BID	NO BID	NO BID	NO BID	NO BID	NO BID	2.10
(14)	1.60	2.75	1.85	1.35	2.00								2.95
(15)	2.25	3.50	2.10	1.56	2.75								3.60
(16)	2.60	4.50	2.50	2.15	4.00								4.00
(17)	3.15	5.50	3.75	2.60	4.75								5.30
(18)	2.50	5.00	3.00	1.50	4.50								4.00
(19)	10.00	9.00	20.00	11.00	12.00								50.00
(20)	10.00	12.00	25.00	14.00	15.00								50.00
(21)	1.00	1.00	1.00	.30	1.00								.50
(22)	1.00	1.00	1.00	.50	1.25								.50
(23)	2.00	2.00	2.00	1.60	2.00								1.00
(24)	40.00	40.00	45.00	32.00	80.00								40.00
(25)	35.00	40.00	45.00	30.00	35.00								35.00
(26)	2.00	1.50	1.50	2.50	1.50								1.75
(27)	2.50	3.50	3.00	4.50	4.00								4.00
(28)	5.00	5.00	4.00	5.61	6.00								3.00
(29)	.10	.15	.12	.15	.15								.15
(30)	15.00	10.00	20.00	15.00	20.00								10.00
(31)	2.00	6.00	2.00		2.00	2.50	1.50	4.00	1.80	2.00	3.20	3.00	2.00
(32)	200.00	250.00	250.00		227.00	184.00	180.00	194.00	244.12	220.00	254.00	275.00	180.00
(33)	200.00	200.00	200.00		190.00	150.00	150.00	300.00	108.75	140.00	220.00	160.00	150.00
(34)	2.00	3.00	3.50		2.60	2.50	2.00	1.95	1.73	2.45	2.10	3.25	2.50
(35)	300.00	600.00	500.00		800.00	600.00	500.00	800.00	800.00	500.00	500.00	$1,300	500.00
(36)	$1,500	$2,000	$5,000		900.00	$2,000	$4,000	$2,500	500.00	$2,300	$1,750	$2,000	$2,500
(37)	2.00	6.00	2.00	NO BID	3.00	2.50	1.50	4.00	1.80	2.00	2.50	3.00	2.00
(38)	200.00	250.00	250.00		380.00	200.00	200.00	194.00	189.75	250.00	455.00	215.00	180.00
(39)	200.00	200.00	200.00		380.00	200.00	200.00	300.00	163.45	190.00	400.00	160.00	150.00
(40)	2.00	3.00	3.50		3.00	3.00	2.00	1.95	2.35	3.00	3.00	3.10	2.50
(41)	300.00	400.00	100.00		200.00	200.00	500.00	800.00	150.00	250.00	100.00	100.00	100.00

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IT'S your problem and ours too! And it's got to be licked. Equipment must last longer—emergency repairs must be made quickly, with a minimum use of critical, hard-to-get materials.

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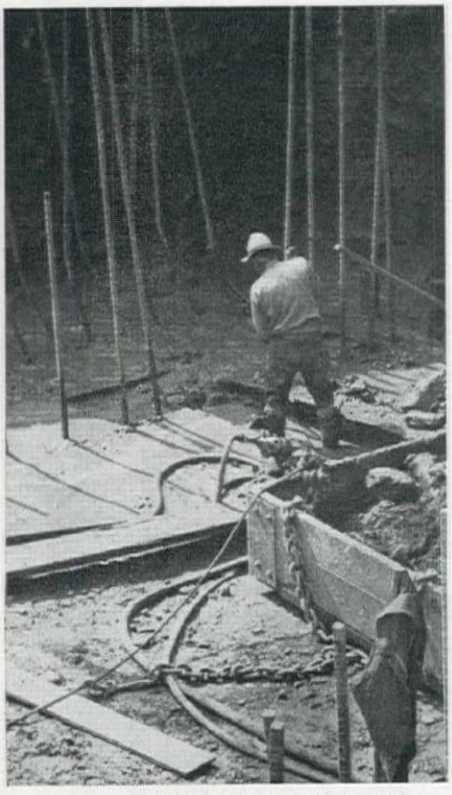

GOODALL "Buckskin" air hose, boots and clothing prove their durability under tough working conditions at the P. G. & E. Pit 5 project diversion dam, near Redding, Calif.

TOUGH working conditions demand the highest quality rubber goods—especially on rush war jobs which can't wait for costly delays due to repair work. That's why GOODALL products are so much in demand today by contractors all over the West. They know that GOODALL will do the job faster, safer and cheaper. Investigate GOODALL'S "Standard of Quality" line today.

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Mills—Trenton, N. J., established 1873

California—Santa Barbara County—State—Steel & Conc. Overheads

Kiss Crane Co., El Cerrito, bid low to the California Division of Highways, Sacramento, at $96,120, on construction of two structural steel and concrete overhead crossings over the tracks of the Southern Pacific Railroad, at Casmalia and Schuman. Railroad rails to be split and made into reinforcing steel is to be furnished by the state, as is also the structural steel to be used in the structures. Other material will be supplied by the contractor. Priorities of A-1-a have been assigned for ferrous materials and A-1-j for other materials. The following bids were submitted:

(1) Kiss Crane Co. ..... $ 96,120
(2) N. M. Ball Sons 98,284
(3) Oberg Bros. 100,560
(4) Fredrickson & Westbrook Co. and Fredrickson Bros. 101,750
(5) Trewhitt-Shields & Fisher $115,728
(6) Bent Construction Co. 118,769
(7) E. E. Smith 120,319
(8) Ralph A. Bell 133,547

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1,800 cu. yd. roadway excavation	1.00	1.00	1.50	.60	2.10	2.50	2.00	4.00
575 cu. yd. structure excavation	5.00	3.27	4.00	3.00	4.25	6.00	6.00	4.00
12 MFBM redwood timber, SAH struc. grade	300.00	210.00	300.00	275.00	236.00	300.00	250.00	240.00
1,155 cu. yd. Cl. "A" portland cem. conc.	36.00	37.50	40.00	38.50	51.00	51.00	47.00	50.00
148,000 lbs. structural steel	.13	.12	.12	.17	.10	.14	.17	.20
1,500 lbs. fabricating and erecting struc. steel (furn. by state)	.40	.40	.20	.30	.26	.50	.50	.35
3,930 lin. ft. furn. treated timber piles	1.50	1.70	1.50	1.60	1.50	1.30	2.00	1.70
96 ea. driving piles	75.00	60.00	60.00	69.00	87.00	75.00	50.00	96.00
75 sq. yd. membrane waterproofing	4.00	2.00	3.00	1.00	1.00	12.00	2.00	1.00
179,000 lbs. bar reinforcing steel	.07	.08	.08	.06	.075	.065	.066	.08
Lump sum Miscellaneous items of work	500.13	$3,500	$1,500	$1,840	$4,830	$2,000	$5,450	$3,000

Utah—Salt Lake County—State—Conc. T-beam Overhead

Gibbons & Reed, Salt Lake City, bidding $132,976, were low to the Utah State Road Commission, Salt Lake City, on construction of a concrete T-beam overhead, a concrete T-beam bridge, and a concrete box culvert, on 21st South St., between Main St. and the Utah ordnance plant. The contract was awarded to the firm. The length of the overhead is 236 ft., and of the bridge is 171.83 ft. The low bid was somewhat lower than the engineer's estimate. The following bids were submitted:

(1) Gibbons & Reed $132,976
(2) Young & Smith Construction Co. 135,465
(3) George M. Carruth & Son 141,522
(4) W. W. Clyde & Co. $170,727
(5) A. O. Thorn & Sons Construction Co. 186,783
(6) Engineer's Estimate 138,078

	(1)	(2)	(3)	(4)	(5)	(6)
525 cu. yd. excavation for structures	3.00	5.00	5.00	5.00	9.00	2.00
160 cu. yd. concrete, Class "A"	35.00	42.00	34.40	40.00	45.00	37.00
36,500 lb. reinforcing steel	.09	.07	.08	.10	.12	.09
(1) CONCRETE T-BEAM OVERHEAD						
600 cu. yd. excavation for structures	3.50	3.00	2.00	5.00	9.00	2.00
1,000 cu. yd. concrete, Class "A"	35.00	38.00	40.00	47.00	45.00	37.00
230,000 lb. reinforcing steel	.09	.07	.08	.10	.12	.09
29,000 lb. structural steel	.22	.25	.25	.28	.35	.17
511 lin. ft. concrete handrail	4.00	7.00	6.00	8.00	9.00	6.00
6,000 lin. ft. piles treated	2.20	2.00	2.30	2.50	3.50	2.50
1 ea. furnishing pile driving equipment	400.00	$1,000	500.00	500.00	500.00	$1,000
1 ea. electrical equipment	200.00	500.00	100.00	500.00	500.00	300.00
200 lin. ft. 6-in. or 8-in. perforated C.G.M. pipe underdrains	1.25	2.00	3.00	1.25	1.25	2.00
(1) BRIDGE OVER 20-FT. SPAN						
300 cu. yd. excavation for structures	3.50	5.00	5.00	10.00	9.00	3.00
400 cu. yd. concrete, Class "A"	35.00	38.00	39.00	47.00	45.00	37.00
90,000 lb. reinforcing steel	.09	.07	.08	.10	.12	.09
1,700 lb. structural steel	.22	.25	.25	.28	.35	.17
375 lin. ft. concrete handrail	4.00	7.00	6.00	8.00	9.00	6.00
1,400 lin. ft. concrete piles	8.50	8.00	9.00	11.00	10.00	8.00
1 ea. test pile	800.00	800.00	200.00	800.00	600.00	500.00
1 ea. furnishing pile driving equipment	400.00	700.00	500.00	$1,000	300.00	$1,000
1 ea. removal of existing structures	$4,000	$4,000	$5,000	$5,000	$5,000	$2,000
60 lin. ft. 6-in. or 8-in. perforated C.G.M. pipe underdrain	1.25	2.00	3.00	1.25	1.25	2.00
34 lin. ft. 6-in. or 8-in. C.G.M. pipe	1.25	2.00	3.00	1.25	1.00	2.00

Dam . . .

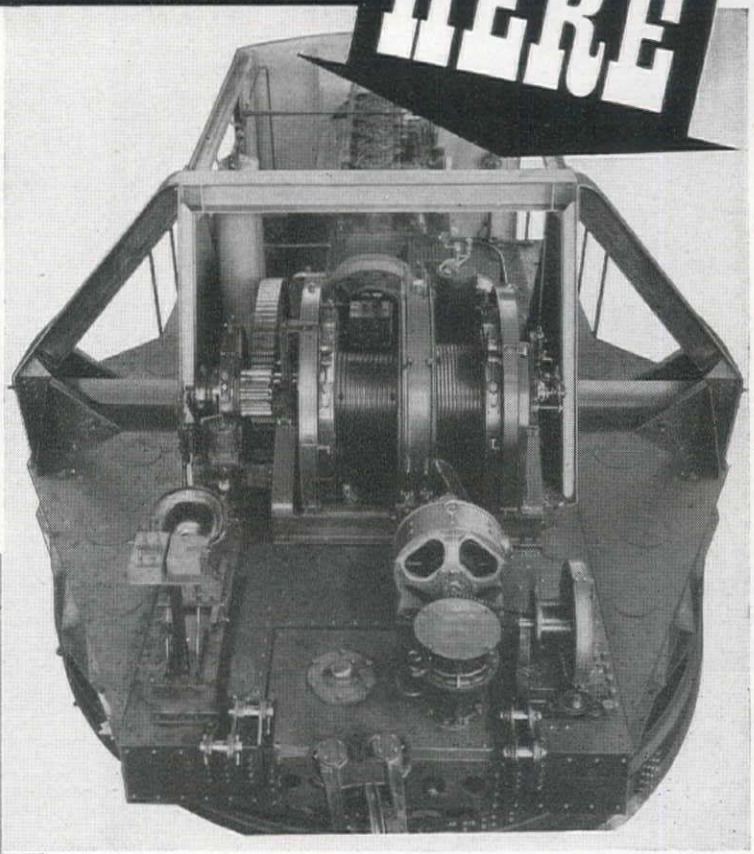
Washington—Whatcom County—City—Arch Dam Raise

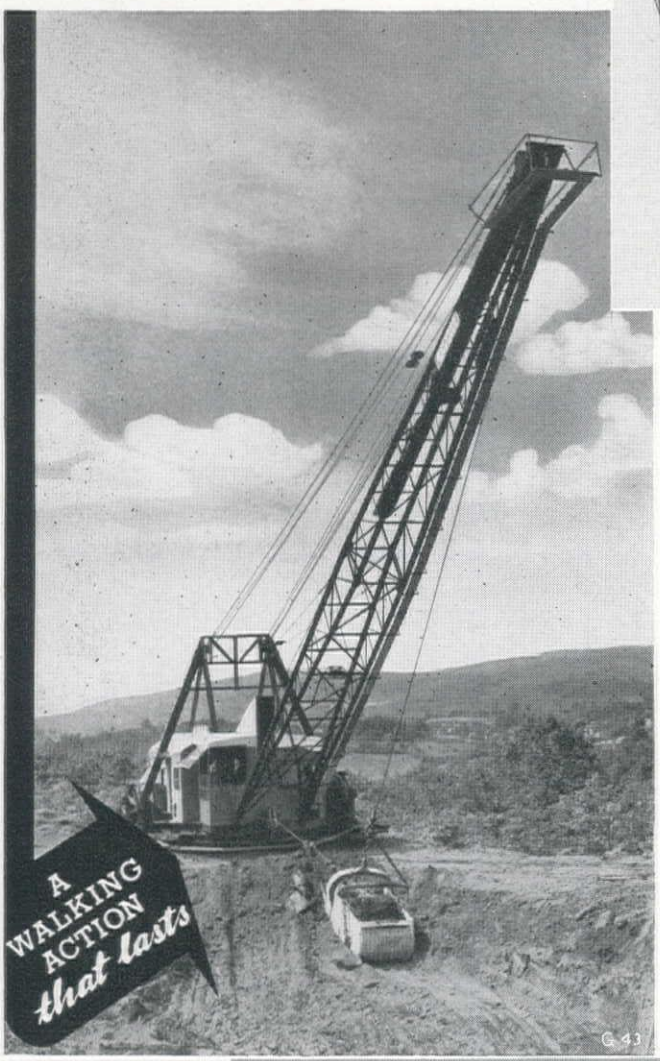
General Construction Co., Seattle, Wash., J. F. Shea Co., Inc., Los Angeles, Calif., and Morrison-Knudsen Co., Inc., Boise, Idaho, bidding jointly, submitted low bid to the Board of Public Works, Seattle, at $7,144,923, for construction of the second step of Ross Dam, a major unit of the Seattle City Light Department's Skagit River hydroelectric development. A further raise is planned for a later date. The dam is designed as a variable radius arch structure, and was built to its present height of 305 ft. in 1939. The new contract will add 160 ft., making the crest about 465 ft. above bedrock. For the third and final step, the type of dam will be changed by widening the base, adding a blanket over the downstream face, and placing another raise of 175 ft. on top of the crest. The type will thus be converted to a gravity arch, and the final structure will be the second highest in the world, exceeded only by Boulder Dam. A grid-style key system is formed into the first two steps to hold the new blanket face. Included in this contract are overflow spillways and penstocks for use in ultimate power generation. However, the powerhouse will not be added until the contract is let for the third stage. Although no power will be generated at Ross Dam by virtue of either of the first two stages, the added storage capacity will enable two City Light plants downstream to increase their output by about 67,700-kw. without installation of any additional generating equipment. The initial stage cost about $4,900,000. Bids were opened on two previous occasions within the last year on the second stage, but higher construction costs had boosted the proposals so much above estimates, that the bid calls were cancelled. However, Federal funds were finally made available to an extent sufficient to meet the increased costs, and the contract was awarded to the General-Shea-M.-K. combination. Included in the bids is an estimate of $208,105 for payment of state sales tax by the contractor. An effort was made to exempt purchases of material for the dam for this tax, but the State Legislature refused to concur in the plan. Bids were submitted as follows:

(Continued on next page)

SIMPLICITY HERE

MEANS EXTRA YARDAGE EVERY SHIFT





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

BUCYRUS MONIGHAN

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BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE, WISCONSIN

★ *Dependable Low-Cost Power Wheeled Anywhere on the Job*

★ For Concrete Vibrating, Wet Wall Rubbing, Sanding, Wire Brushing, Drilling, Sawing with Circular Saw, Pumping and Sharpening Tools.

★ 8 quickly interchangeable tools for these tasks can be changed as easily as bits in a brace.

★ Eliminates time lost installing electric power on the job.

★ Eliminates need for generator or compressor set.

★ Saves time, labor, material and improves workmanship.

Variable speed gasoline engine starts easily, runs all day on 1½ to 2 gallons of gasoline, requires little attention and little maintenance.

Variable engine speeds 1000 to 3000 r.p.m. Countershaft speeds 3000 to 7000 r.p.m. ***Available for Victory Construction. Full details upon request.***

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(1) General Construction Co., J. F. Shea Co., Inc., and Morrison-Knudsen Co., Inc. $7,144,923

(2) Guy F. Atkinson Co. $ 8,018,632

(3) S. A. Healy Co. 10,011,806

		(1)	(2)	(3)
113,000	cu. yd. rock excavation	8.00	8.80	11.00
170	lin. ft. drilling 4-in. vertical vent hole	15.00	14.00	12.50
Lump sum	Removal of timber crib and end walls	$15,000	$10,000	$15,000
8,000	lin. ft. drilling 1¼-in. grout holes not more than 30 ft. deep	3.50	2.75	3.00
2,500	lin. ft. drilling 1½-in. grout holes 30 to 50 ft. deep	3.50	2.75	3.00
1,000	lin. ft. drilling 1½-in. grout holes 50 to 100 ft. deep	3.50	2.75	3.00
5,000	lin. ft. drilling 1½-in. grout holes 100 to 150 ft. deep	3.50	2.75	3.00
6,000	lin. ft. drilling 1½-in. grout holes 150 to 500 ft. deep	4.50	4.00	4.00
5,000	cu. ft. pressure grouting of foundation	3.00	2.50	2.75
2,000	lin. ft. drilling drainage holes not more than 50 ft. deep	4.50	5.00	4.00
1,500	lin. ft. drilling drainage holes 50 to 100 ft. deep	4.50	5.00	4.00
1,500	lin. ft. drilling drainage holes 100 to 150 ft. deep	4.50	5.00	4.00
2,000	lin. ft. 1½-in. welded steel pipe for foundation grouting	0.75	0.60	0.75
3,500	lin. ft. 2-in. welded steel pipe for foundation grouting	1.00	0.75	1.00
1,600	lin. ft. 4-in. welded steel pipe for foundation drainage	2.00	2.10	2.00
15,400	lin. ft. 8-in. porous concrete tile drain	2.00	1.90	2.00
3,850	lin. ft. 20-in. split porous concrete tile drain	6.00	5.75	6.00
5,600	lin. ft. 15-in. copper water seals, in upstream face of dam	3.00	2.50	3.75
12,000	lin. ft. 15-in. galvanized iron grout stops	1.50	1.40	2.10
25,000	lin. ft. ½-in. black pipe for grouting contraction joints	0.50	0.45	0.50
11,000	lin. ft. 1½-in. black pipe for grouting contraction joints	0.80	0.75	0.75
2,500	units black grouting units, complete	3.00	2.50	3.50
750,000	lbs. furnishing and installing reinf. steel	0.08	0.09	0.08
5,800	lin. ft. black electrical metal conduit, to 1¼-in. diam., hot dipped in asphalt	1.00	0.90	0.75
4,650	lin. ft. black electrical metal conduit, 1¼-in. to 3-in. diam, hot dipped in asphalt	2.00	2.00	1.20
1,000	lin. ft. black electrical metal conduit, 3½-in. diam, hot dipped in asphalt	3.00	2.75	2.00
1,000	lbs. electrical metal panel and pull boxes	1.00	1.25	1.00
7,000	lin. ft. electrical wiring to No. 12 A.W.G.	0.15	0.12	0.15
1,500	lin. ft. electrical wiring No. 12 to No. 8 A.W.G.	0.30	0.25	0.20
3,080	lin. ft. stranded electrical wiring, No. 8 to No. 00 A.W.G.	0.50	0.45	0.50
40,000	lin. ft. cables for resistance thermometers and meters	0.35	0.35	0.50
14	ea. electric resistance thermometers	15.00	6.00	10.00
255	ea. elastic wire strain meters	30.00	25.00	40.00
16	ea. elastic wire joint meters	30.00	27.50	40.00
260	lin. ft. black welded pipe railing, 1½-in. diam	5.00	4.00	5.00
Lump sum	Extension of gaging well	$9,000	$1,000	$6,353.52
64,500	sq. ft. roughening surface of existing dam	0.60	0.75	0.50
470,000	bbls. cement, EA-C 150 Type II (bulk)	2.60	2.85	3.25
1,000	bbls. cement, EA-C 150 Type II (sacked)	3.00	3.60	3.50
3,000	bbls. cement, EA-C 150 Type II (paper sacked)	3.20	3.40	3.30
3,500	bbls. cement, EA-C 150 Type III, "Hyurly"	4.00	3.90	4.00
290,000	cu. yd. concrete, Class "A"	8.87	10.65	14.00
124,000	cu. yd. concrete, Class "B"	8.87	10.65	14.00
Lump sum	Concrete cooling pumping plant	$50,000	$25,000	$90,100
1,500,000	kw-hrs. electrical energy for pumping cooling water	0.04	0.01	0.02
340,000	lbs. metal tubing and fittings for concrete cooling system	0.25	0.27	0.21
125	cu. yd. reinf. conc. in valve house, Class "C"	40.00	50.00	45.00
125	cu. yd. reinf. conc. in valve house, Class "D"	40.00	50.00	45.00
180	cu. yd. reinf. conc. in stairway shaft house, Class "D"	40.00	81.00	45.00
60	treads circular stairway	10.00	15.00	25.00
100	cu. yd. reinf. conc. other than in valve houses, Class "C"	30.00	40.00	30.00
350	cu. yd. reinf. conc. other than in valve houses, Class "D"	30.00	40.00	30.00
3,000	cu. yd. reinf. conc. in spillway training walls	40.00	30.00	25.00
50	cu. yd. concrete, Class "E"	40.00	16.00	50.00
83,500	lbs. 48-in. electrically welded steel pipe	0.25	0.25	0.20
96,500	lbs. 72-in. electrically welded steel pipe	0.25	0.25	0.20
93,081	lbs. electrically welded steel pipe, installation only	0.10	0.09	0.08
490	cu. yd. conc. backfill around pipes in dam, Class "A"	20.00	22.50	25.00
210	cu. yd. conc. backfill around pipes in dam, Class "B"	20.00	22.50	25.00
270,000	lbs. trash racks, roller paths, vent pipes, stop log guides and other structural steel	0.20	0.22	0.20
Lump sum	Two 6x8-ft. self-closing Broome gates	$16,000	$15,000	$35,000
Lump sum	Frames, guides and transition sections for Broome gates and one electric driven traveling gate hoists	$44,000	$40,000	$45,000
Lump sum	Additional chain for gates	$5,500	$5,000	$6,000
150,000	lbs. installation of Broome gates, hoisting cables, chain and hoists	0.09	0.09	0.075
2	ea. 72-in. butterfly valves with motor, piping, floor stand, remote control units, etc.	$22,000	$28,000	$32,000
2	ea. 48-in. butterfly valves with motor, piping, floor stand, remote control units, etc.	$14,000	$15,000	$17,000
130,000	lbs. installing butterfly valves and appurtenances	0.09	0.05	0.075
3,500	cu. yd. conc. in diversion tunnel plug, Class "A"	15.00	14.00	25.00
25,000	F.B.M. lumber for Howe truss, in place	0.20	0.22	0.175
15,000	F.B.M. lumber for roadway, in place	0.15	0.18	0.15
3%	State Sales Tax	$208,104.54	$233,552.39	$291,606

Highway and Street . . .

Nevada—Washoe County—State—Surface

Union Paving Co., San Francisco, Calif., submitted a low bid of $205,853 to the Nevada Department of Highways, Carson City, Nev., and was awarded the contract to grade and place a plantmix surface on 7.7 mi. of State highway No. 9 between the Reno airbase and the Nevada-California state line, near Purdy. The following submitted bids:

(1) Union Paving Co. $205,853

(2) Nevada Rock & Sand Co. 221,968

(3) M. J. Ruddy & Sons $234,245

(4) Sierra Trucking Co. 257,667

		(1)	(2)	(3)	(4)
Lump sum	Signs	500.00	700.00	600.00	500.00
11,064	lin. ft. remove fence	0.05	0.05	0.12	0.05
124	lin. ft. remove culvert pipe	1.00	2.00	1.25	1.00
4	ea. remove headwalls	10.00	10.00	12.00	40.00
80,143	cu. yd. roadway excavation	0.50	0.67	0.68	0.50
256	cu. yd. drainage excavation	1.00	0.50	1.55	0.60
22	sta. "V" type ditches	5.00	10.00	6.00	20.00
5,001	cu. yd. borrow	0.40	0.44	0.55	0.50

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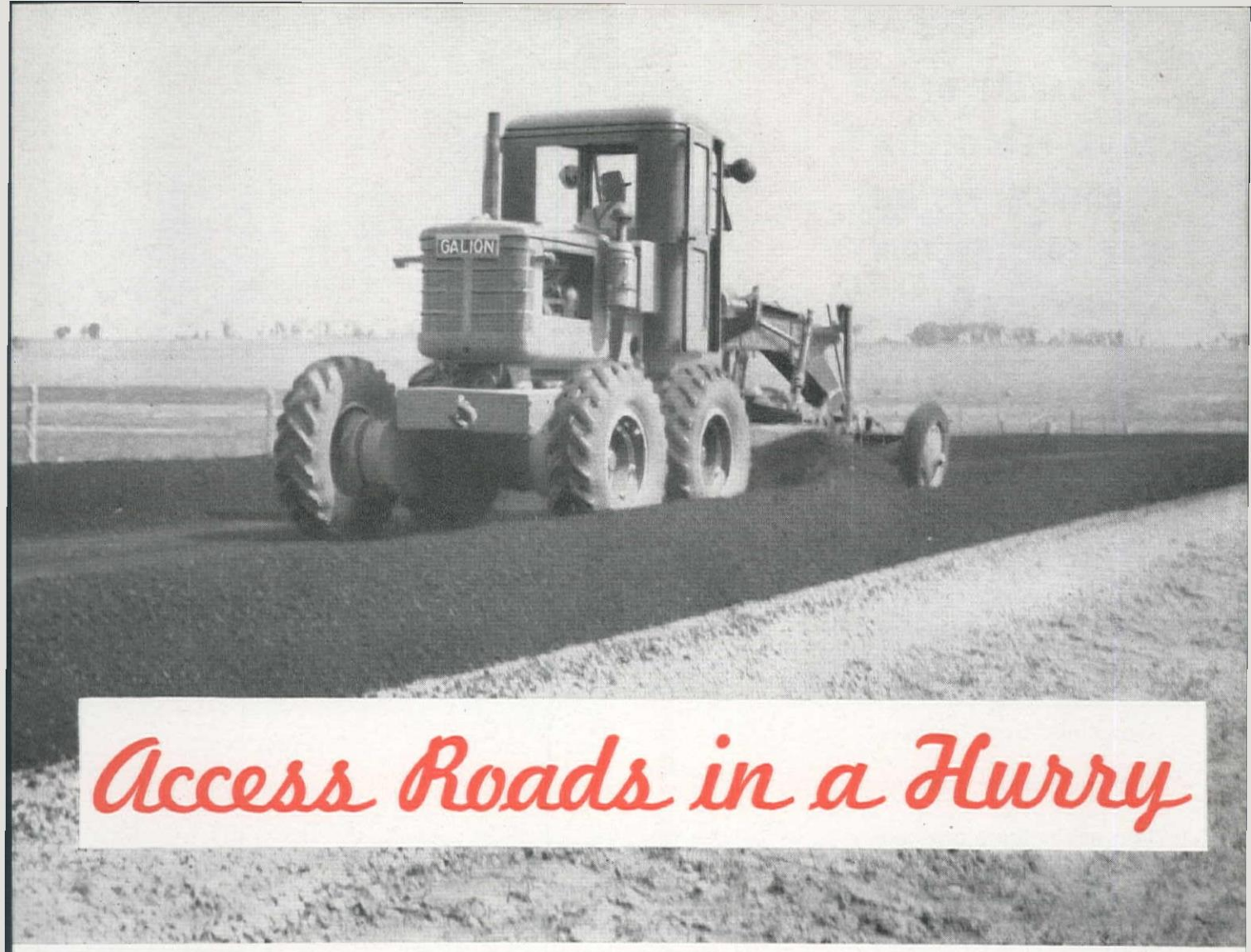

Access Roads in a Hurry

One of the big Galion graders demonstrates its ability to serve on an access road as a modern, high-speed tool of construction in the war effort.

. . . BUILD THEM . . . MAINTAIN THEM WITH GALION GRADERS AND ROLLERS!

GALION motor graders are seeing plenty of service these days on rush construction of many access roads in the West. GALION'S fast action speeds the drying out of the road mix material, following the initial grading work . . . then mixes the oil for the final stage.

GALION'S, new and old motor graders and rollers, are in demand by western contractors because they know that rugged construction means work will be kept ahead of schedule.

If you are unable to secure new GALION models, see that your present machines are serviced and reconditioned when necessary by your nearest GALION distributor.

SEE YOUR NEAREST DISTRIBUTOR FOR SERVICE AND REPAIRS

BROWN-BEVIS EQUIPMENT CO., Los Angeles, California and Phoenix, Arizona; F. RONSTADT HARDWARE CO., Tucson, Arizona; H. W. MOORE EQUIPMENT CO., Denver, Colorado; HALL PERRY MACHINERY CO., Butte, Montana; MORROW & CO., Albuquerque, New Mexico; ARNOLD MACHINERY CO., Salt Lake City, Utah; NELSON EQUIPMENT CO., Portland, Oregon, Seattle, Washington, and Twin Falls, Idaho; WESTERN TRACTION CO., San Francisco, California; ORMANDE C. BELL, Reno, Nevada.

●

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

FOR ALL OF YOUR PETROLEUM REQUIREMENTS ON ANY CONSTRUCTION JOB... CALL

SEASIDE

For your rolling stock Seaside offers a complete line of Diesel Fuels, Diesel Oils, Gasolines and Greases. For your actual construction needs there are Seaside Asphalts and Road Oils.

Behind each product is more than 45 years' experience in developing petroleum products as fine as money can by. Each will do its specific job efficiently and economically.

Call Seaside for all of your petroleum requirements.

SEASIDE OIL COMPANY
General Offices
SANTA BARBARA, CALIFORNIA

CARE FOR YOUR CAR-FOR YOUR COUNTRY

108	sta. slope rounding	10.00	5.00	7.50	15.00
179,219	yd. sta. overhaul	0.01	0.015	0.01	0.02
12,208	yd. mi. overhaul	0.15	0.15	0.12	0.15
642	hr. 8-ft. tamping roller	6.00	9.00	7.00	8.00
214	hr. power roller	6.00	6.00	6.00	7.00
520	cu. yd. structure excavation	3.00	2.00	2.00	2.50
676	cu. yd. backfill	1.50	0.90	0.75	3.00
3.57	mi. subgrade, Type "B"	250.00	200.00	250.00	700.00
4.14	mi. reshape roadway	600.00	125.00	750.00	$1,000
Lump sum	Roadside cleanup	500.00	500.00	500.00	500.00
2,022	M gals. water	2.00	2.00	2.00	4.00
26,628	T. Type 1 gravel base	0.50	0.75	0.55	0.80
34,123	T. Type 2 gravel base (1-in. size)	1.00	0.95	1.10	1.75
86	T. liquid asphalt Type MC2 (prime under plantmix)	25.00	22.00	22.40	25.00
520	T. blotter sand (prime)	2.00	3.00	1.00	4.00
85	T. liquid asphalt, Type MC2 (seal plantmix)	25.00	22.00	22.40	30.00
677	T. blotter sand (seal)	2.00	3.00	1.00	5.00
819	T. asphalt cement 200-300 Pen. (plantmix)	25.00	21.00	22.40	24.00
12,220	T. Class F2 plantmix bit. surface	3.00	2.65	3.35	3.00
4,146	T. Class F2 plantmix bit. leveling course	2.75	2.90	3.35	3.00
170	cu. yd. Class "B" concrete	25.00	37.00	30.00	30.00
11.62	MFBM Port Orford cedar	200.00	180.00	125.00	140.00
218	lin. ft. 4-in. vitrified pipe	0.50	0.75	0.65	0.50
132	lin. ft. 30-in. reinforced concrete pipe	6.00	9.50	6.55	7.00
57	lin. ft. 36-in. reinforced concrete pipe	10.00	14.00	8.25	8.00
18	lin. ft. 42-in. reinforced concrete pipe	12.00	19.00	10.85	10.00
60	lin. ft. 48-in. reinforced concrete pipe	16.00	25.00	13.65	14.00
105	lin. ft. relay culvert pipe	1.50	2.50	1.00	2.00
46	cu. yd. grouted hand-laid riprap	20.00	25.00	17.00	10.00
20	ea. move pipe culvert headwalls	50.00	12.50	25.00	125.00
36	ea. culvert markers	4.00	5.00	3.50	5.00
32,227	lin. ft. construct fence	0.17	0.20	0.35	0.20
626	lin. ft. reconstruct fence	0.10	0.20	0.25	0.10
14	ea. 14-ft. wire gates	25.00	35.00	30.00	25.00
21	ea. monuments	4.00	5.00	3.50	5.00
177	lin. ft. 18-in. plain concrete pipe	2.75	3.50	3.10	3.00
162	lin. ft. 24-in. plain concrete pipe	6.00	5.50	4.40	3.50
125	lin. ft. 1-in. iron pipe	0.50	0.40	0.13	0.50
44	lin. ft. 2-in. iron pipe	0.75	0.75	0.26	1.00
Lump sum	Miscellaneous work	250.00	250.00	250.00	250.00

California—Santa Clara County—State—Grade & Surf.

Union Paving Co., San Francisco, at $37,054, was low bidder to the California Division of Highways, Sacramento, for 0.9 mi. of grading and plantmix surfacing on Hendy Ave. and E. California Ave. in Sunnyvale. Both corrugated metal pipe and concrete pipe, for use in drainage structures, is to be furnished by the state, but all other material is the responsibility of the contractor. Bids received were as follows:

(1) Union Paving Co.	$37,054	(3) L. C. Smith	$38,699
(2) A. J. Raisch	38,492	(4) California Paving Co.	38,932

(Continued on next page)

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STONE WALL use JACKSON

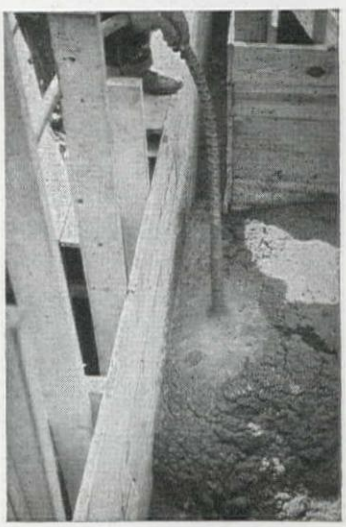
Concrete Vibrators

they're OLD CAMPAIGNERS on the PACIFIC NAVAL BASES and have been chosen exclusively by many large defense contractors for economical and dependable service.

For profitable speed and "designed to take it" equipment buy

JACKSON vibrators

you can't BEAT good CONCRETE

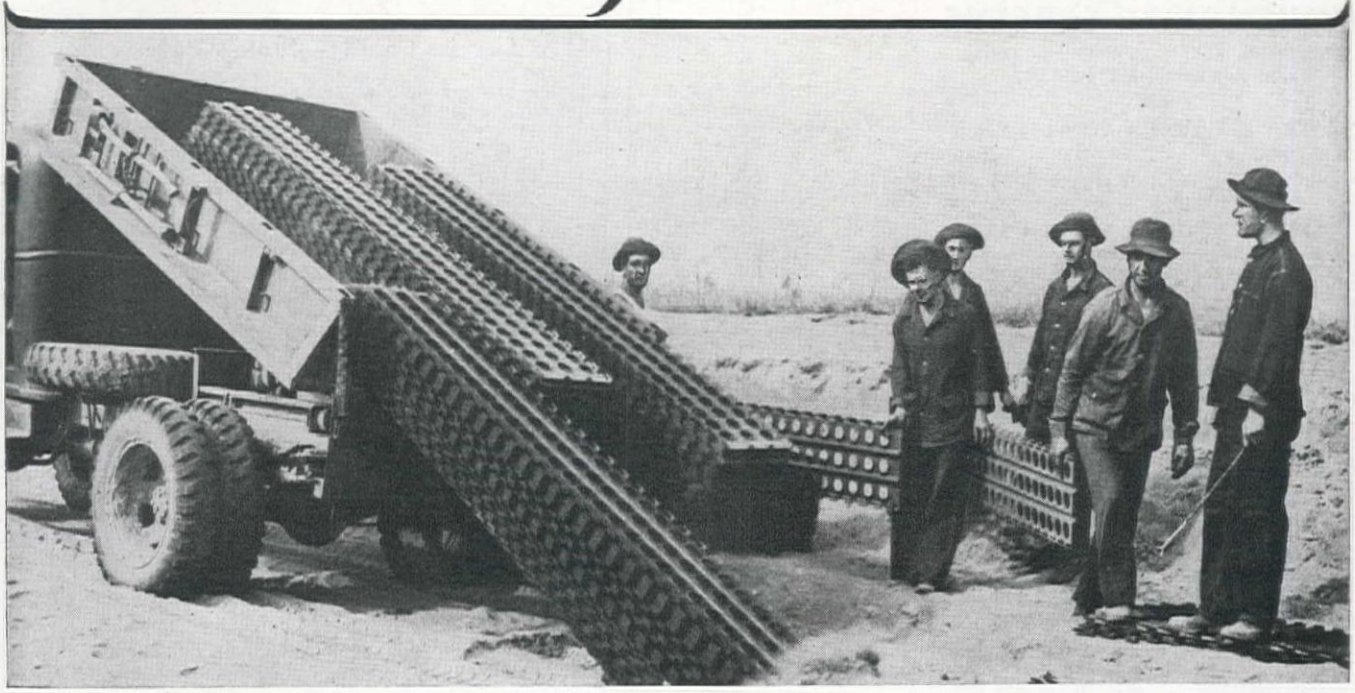


Electric Tamper & Equipment Co.
Ludington, Michigan

Bases for BOMBERS

★ *Made by* HERCULES

★ *Delivered by* HERCULES



Besides HERCULES Speedraulic Hoists and Dump Bodies for civilian use and the huge Cargo Bodies produced for the U. S. Army, thousands of Airplane Landing Mats for emergency "Bomber Bases" have been turned out by the big Hercules plant the past year. HERCULES Dump Cargo Bodies, like the one shown above, mounted on a Chevrolet chassis, are used for transporting such materials on many fronts.

REMEMBER THESE "HERCULES" FEATURES!

- Exclusive Center-Lift Hoist Action
- Double Bridge-type Lift Arms
- Balanced Piston Valve, with finger-tip control
- 6", 7", 8" and 10" Hoists

Heavy production for war will continue in all lines until victory is won, but if your need is essential, your Hercules distributor can take care of you.

UTILITY TRAILER SALES, Seattle, Wash.; NEWELL TRUCK EQUIPMENT CO., Portland, Oregon; 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, Montana; WYOMING AUTOMOTIVE SUPPLY CO., Casper, Cheyenne, Rock Springs, Sheridan, Wyoming; McKELVY MACHINERY CO., Denver, Colo.; MORROW & CO., Albuquerque, New Mexico.

HERCULES STEEL PRODUCTS CO.

GALION OHIO

GREATER ENDURANCE
HIGHER ABRASIVENESS
EXTRA TOUGHNESS

SUPER STRENGTH SS Pacific SS SPRING STEEL

SUPER STRENGTH SPRING STEEL

WOVEN WIRE SCREENS

MADE WITH A SPECIAL NEW HI-CARBON AND HI-MANGANESE CONTENT
for
SAND • GRAVEL • COAL • ORE
VIBRATORS, SHAKERS, CONES, CYLINDERS

Pacific "SSSS" Screens will cut your costs and increase plant production!

PROMPT DELIVERIES MAINTAINED

PACIFIC
WIRE WORKS, INC.
4515-29 SIXTH AVE. SOUTH
SEATTLE, WASHINGTON
Established 1891

		(1)	(2)	(3)	(4)
5	cu. yd. removing concrete	8.00	10.00	12.60	20.00
11,000	cu. yd. roadway excavation	.62	.90	.88	1.00
400	cu. yd. structure excavation	3.00	2.50	2.08	4.00
50	cu. yd. ditch and channel excavation	3.00	2.50	2.08	4.00
5,400	cu. yd. imported borrow	1.80	1.40	1.80	1.00
Lump sum	Dev. water supply and furnish. watering equip.	500.00	250.00	100.00	500.00
175	M. gals. applying water	3.00	2.00	2.50	3.00
49	sta. finishing roadway	15.00	20.00	10.00	15.00
10	T. asphaltic emulsion (seal coat)	30.00	30.00	32.50	30.00
110	T. screenings (seal coat)	4.00	5.00	4.20	6.00
36	T. liquid asphalt MC-2 (Pr. Ct. & Pen. Tr.)	25.00	20.00	32.50	30.00
110	T. liquid asphalt MC-5 (P.M.S.)	20.00	15.00	16.00	5.00
2,200	T. mineral aggregate (P.M.S.)	4.50	4.90	4.35	5.00
21	T. natural rock asphalt	10.00	10.00	10.50	10.00
14	ea. redwood covers	20.00	10.00	12.00	10.00
20	cu. yd. Class "A" Portland cement conc. (struc.)	25.00	35.00	30.00	40.00
105	cu. yd. Class "B" Portland cement conc. (crbs., gtrs. & Sidew.)	18.00	20.00	19.00	25.00
90	lin. ft. 18-in. vitrified clay pipe	2.00	4.00	3.00	4.00
207	lin. ft. salvaging existing pipe culverts	.50	1.00	.80	1.00
20	ea. adjusting existing manholes to grade	15.00	20.00	15.00	15.00
108	lin. ft. placing 12-in. corr. metal pipe	.50	.50	.50	2.00
212	lin. ft. placing 12-in. conc. pipe	.50	.50	1.00	2.00

California—Los Angeles County—State—Pave

J. E. Haddock, Ltd., Pasadena, bidding $136,410, was low and received the contract from the California Division of Highways, Los Angeles, to resurface about 1½ mi. of Imperial Highway, between Anza Ave. and Sepulveda Blvd. with asphaltic concrete surfacing, and to grade and surface the shoulders on the same highway with similar surfacing on cement-treated base. The following bids were submitted:

(1) J. E. Haddock, Ltd. $136,410
(2) Vido Kovacevich 140,155
(3) United Concrete Pipe Corp. 146,797
(4) Oswald Bros. 179,421
(5) Carlo Bongiovanni $179,970
(6) Warren Southwest, Inc. 194,595
(7) Griffith Co. 199,561

		(1)	(2)	(3)	(4)	(5)	(6)	(7)
90	cu. yd. removing concrete	7.50	12.00	5.00	10.00	10.00	7.00	16.00
80	stas. clearing and grubbing	20.00	10.00	40.00	30.00	20.00	49.00	30.00
24,000	cu. yd. roadway excavation	.70	.65	.70	1.00	.93	1.00	1.20
1,000	cu. yd. structure excavation	1.25	2.50	2.50	2.50	3.00	2.50	2.50
26,000	cu. yd. imported borrow	.72	.75	.80	1.40	.97	1.20	1.80
Lump sum	Developing wtr. sply. & furn'g wtg. equip't.	700.00	225.00	$2,000	600.00	$2,500	700.00	$1,000
1,000	M. gals. applying water	1.50	1.50	2.00	2.75	2.00	2.80	4.00
80	stas. finishing roadway	15.00	6.00	10.00	8.00	10.00	14.00	10.00
250	T. liquid asphalt, RC-3 (B.S.T.)	16.00	15.00	20.00	14.00	18.00	16.80	20.00
20,500	sq. yd. preparing, mixing and shaping surface	.13	.15	.12	.20	.27	.24	.14
9,550	T. asphaltic concrete	3.85	3.90	4.50	4.00	4.79	4.50	4.20
40	T. asphaltic emulsion	35.00	32.50	30.00	60.00	30.00	32.00	30.00
18,500	sq. yd. cement treated base	.30	.30	.30	.50	.30	.60	.30
3,800	bbls. Portland cement (C.T.B.)	2.50	2.50	2.50	2.60	2.75	3.00	2.80
145	cu. yd. Class "A" P.C.C. (structures)	25.00	38.00	40.00	33.00	50.00	50.00	41.00
1,600	lbs. miscellaneous iron and steel	.16	.15	.20	.15	.30	.30	.18
6,000	lbs. bar reinforcing steel (structures)	.08	.09	.10	.07	.10	.085	.09
1,700	cu. yd. Cl. "A" P.C.C. (curbs, gtrs., sdwks, drwys. and Lcl. depressions)	17.00	17.00	14.00	20.00	22.00	23.50	22.00
15	cu. yd. Cl. "C" P.C.C. (pipe reinforcing)	13.50	17.50	12.00	16.00	20.00	15.50	16.00
160	lin. ft. 18-in. plain conc. pipe	2.00	1.90	3.00	2.00	6.00	2.80	3.40
16	lin. ft. 30-in. R.C.P. (std. str.)	6.00	5.50	7.00	6.00	10.00	8.00	9.00
0.45	mi. removing and restoring property fence	450.00	$4,900	600.00	$4,000	$3,334	$6,336	$3,000

Oregon—Jackson County—State—Grade & Surf.

Tru-Mix Concrete Co., Medford, at $49,026, submitted the only bid, and received the contract from the Oregon State Highway Department, Portland, to grade, surface, and oil the Tolo-Camp White access road. The same contractor had previously been awarded the contract to construct a timber trestle on this road. The unit bids were as follows:

Lump sum	clearing and grubbing	$1,000
320	cu. yd. trench excavation, unclassified	2.50
22,500	cu. yd. general excavation, unclassified	.50
19,500	yd. stas. short overhaul	.03
50	cu. yd. stas. long overhaul	.45
37	stas. grader work	20.00
1.95	mi. finishing roadbed and slopes	450.00
80	lin. ft. 12-in. concrete pipe	1.72
300	lin. ft. 18-in. concrete pipe	2.55
260	lin. ft. 24-in. concrete pipe	4.35
70	lin. ft. 36-in. concrete pipe	8.60
64	lin. ft. 18-in. concrete siphon pipe	3.50
8	cu. yd. concrete end basins	40.00
140	cu. yd. structural excavation	5.00
10	cu. yd. structural excavation below elevations shown	.10
25	cu. yds. Class "B" concrete	35.00
5	MFBM untreated lumber in substructure	100.00
60	lin. ft. untreated trestle superstructure	34.00
12,000	cu. yd. pit-run gravel in base	1.10
1,900	cu. yd. ¾-in. - 0-in. granite in leveling course	2.25
600	cu. yd. filler	.10
900	yd. mi. hauling filler	.05
350	M. gals. sprinkling	3.00
2.65	mi. preparing of base	100.00
1,050	cu. yd. furnishing and placing aggregates	4.00
56	T. furnishing and placing 151-200 asphalt	40.00
32	T. furnishing and placing RC-3 or emulsified asphalt	35.00

Utah—Millard County—State—Surf.

W. W. Clyde & Co., Springville, submitted the low proposal of $54,052 to the Utah State Road Commission, Salt Lake City, for construction of a 1½-in. roadmix bituminous surfaced road between Delta and the Japanese relocation center, a distance of 11.7 mi. The following bids were received:

(1) W. W. Clyde & Co. $54,052
(2) J. W. Whiting Construction Co. 61,257
(3) J. M. Sumsion ..... (partial) 30,205
(4) A. O. Thorn & Sons Construction Co. $76,018
(5) Engineer's Estimate 57,617

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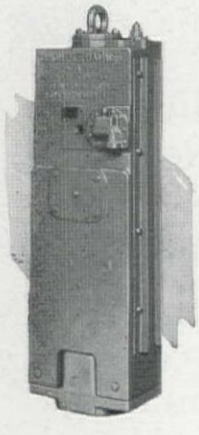

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Write for Bulletin 184

Elizabeth, N. J.

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PILE DRIVER HOISTS

War demands "guts" in shovels, too!

1/2 YD. Model 50

5/8 YD. Model 60

3/4 YD. Model 70

Buckeye Clippers have plenty

From Alaska to Africa, Clipper full-revolving, convertible shovels proved that they have the "guts" to take it—that *Mevac* metered vacuum control gives faster, smoother, fuller loads whether it's 10° below zero or 110° above—that Clipper's dual right angle drive conserves power—that automatic swing brake, vacuum control dipper trip and other Clipper exclusive features *do* cut seconds off every operation in the working cycle.

After this global scrap is over, "guts" in equipment are going to count more than ever. Check the Clipper's "24 points of preference" and its war record to date and you'll want it on your construction jobs after the Axis has *surrendered unconditionally.*

Wars demand scrap.
Invest in War Bonds.
No laying down on jobs.

BUCKEYE TRACTION DITCHER CO.
Findlay, Ohio

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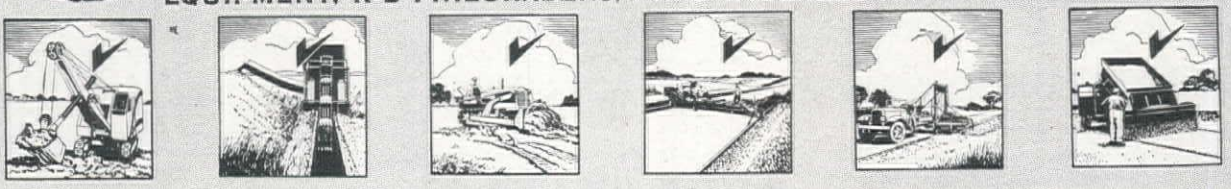
CONVERTIBLE SHOVELS, TRENCHERS AND BACKFILLERS, TRACTOR EQUIPMENT, R-B FINEGRADERS, ROAD WIDENERS AND SPREADERS



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SCHEDULE NO. 1	(1)	(2)	(3)	(4)	(5)
40,000 T. crushed rock or crushed gravel surf. course	.73	.89	.....	1.00	.80
200 hr. rolling	4.00	4.00	.....	5.00	6.00
SCHEDULE NO. 2					
120,000 gal. bituminous material, Type MC-2	.10	.10	.13	.15	.11
22,000 gal. bituminous material, Type RC-3	.12	.13	.12	.15	.11
11.687 mi. scarifying and mixing	600.00	650.00	750.00	900.00	650.00
800 T. cover material	3.00	3.00	4.00	4.00	1.50

Airport . . .

Oregon—Morrow County—State—Flight Strip

E. C. Hall, of Eugene, and J. C. Compton, of McMinnville, were low bidders at $290,785 to the Oregon State Highway Department for grading and paving with asphaltic concrete the Southwest Boardman flight strip, one of the emergency landing fields being built throughout the West. The following bids were submitted:

(1) E. C. Hall & J. C. Compton $290,785
(2) Porter W. Yett 330,055
(3) Babler Bros. $454,245
(4) M. L. O'Neil & Son 473,099

	(1)	(2)	(3)	(4)
Lump sum, clearing and grubbing	$6,000	$15,000	$1,500	$2,000
87,000 cu. yds. general excavation, unclassified	.90	.70	2.85	2.25
Lump sum, finishing and trimming earthwork	$14,000	$5,000	$5,000	$5,000
40 lin. ft. 18-in. concrete pipe	5.00	2.50	4.00	3.00
55,000 cu. yds. pit-run gravel in sub-base	1.40	2.00	1.70	1.75
16,000 cu. yds. 1-in. - 0 gravel in base and shoulders	2.00	3.00	2.35	3.50
550 cu. yds. ½-in. - 0 gravel in binder course	3.00	4.00	3.35	5.00
2,200 M-gals. sprinkling	3.00	2.00	3.00	3.00
Lump sum, preparation of base	$2,500	$4,000	$3,000	$2,500
90 tons furn. and placing RC-3 asphalt in binder course	35.00	40.00	31.50	40.00
8,600 tons Class "B" asphaltic concrete	7.00	8.00	7.10	8.50
60 tons furn. and placing emuls. asphalt in seal coat	35.00	40.00	35.00	40.00
270 tons furn. and placing aggregate in seal coat	5.00	4.00	7.10	5.00
1,100 rods woven wire stock fence	5.00	4.00	7.00	6.00
1 only wood gates in stock fence	35.00	25.00	35.00	25.00
2 only wind cones	100.00	75.00	150.00	100.00

PIPE *for Every* PURPOSE

Whether it's a Giant Corrugated Culvert or the simplest of water systems—there's a Beall pipe to fit the job. You'll find that engineers and contractors specify Beall pipe because they have learned to depend on its uniform quality.

Beall industrial pipe ranges from 4" to 84" diameter and it includes pipe for every purpose.

MUNICIPAL WATER SYSTEMS
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PORTLAND, OREGON

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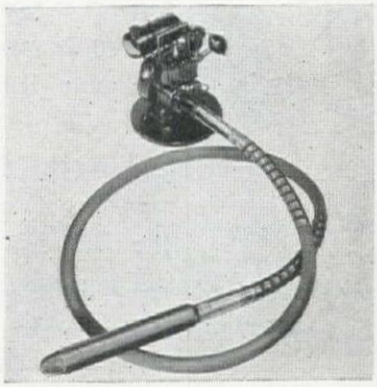

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1½ HORSE POWER

Light Weight—Big Wallop—4000 to 7000 Vibrations per minute.

Master Equipment is competitive in price, superior in performance and quality.

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- Gas-Electric Generator Plants, 650 Watts to 9400 Watts—AC or DC.
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- Concrete Surfacing Attachments.
- Master Power Blow Hammers and Tools.
- Complete line of High Speed Tools.

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INGERSOLL SHOVELS
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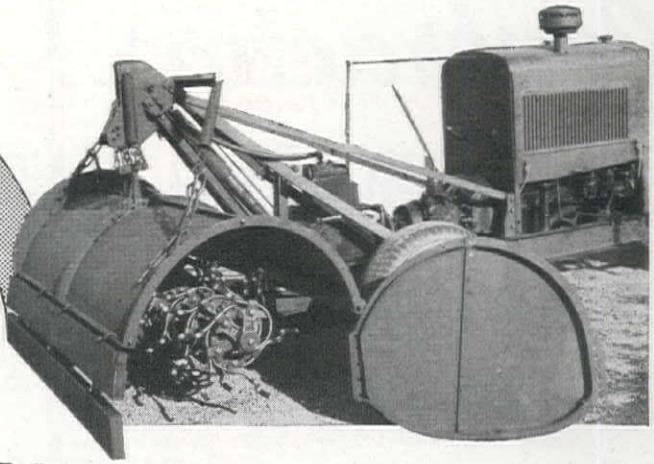
BETTER HIGHWAYS
to the **SKYWAYS**



ROTOTILLER

TRADE MARK REG. U.S. PAT. OFF

ROADMAKER

SOIL STABILIZATION is speeding military operations wherever our armed forces are or go. Using local materials or any others available, highways, landing strips and airfields can be built or repaired faster, better, more economically.

ROTOTILLER Roadmaker is the pioneer "3-in-1 Rotary Action Machine" especially designed and built for soil-cement and soil stabilization work. The "3-in-1 Rotary Action" assures more accurate control in both wet and dry mixing operations as well as more thorough pulverization of materials. The fast-revolving, self-sharpening tines thoroughly mill the earth from top to bottom to a depth of 12 to 18 inches *in one operation.*

GET THE FACTS on this 1943 job-tested ROTOTILLER Roadmaker. Write for descriptive literature.

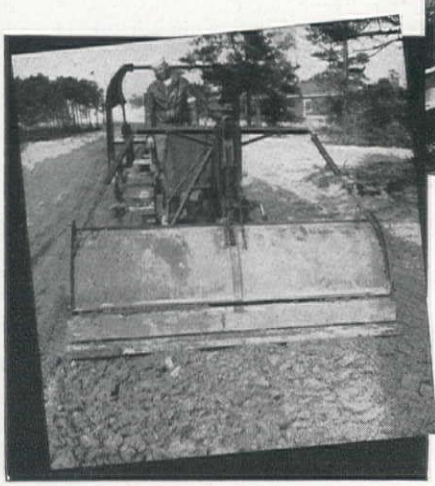
7 STAR FEATURES

1. Improved, self-sharpening, single unit spring-tines.
2. 4-speed transmission permits use for scarifying as well as mixing.
3. Flexible tilling unit gives fast, easy operation; sharp turns with safety.
4. Weight of tilling unit variable to suit conditions; lessens wear.
5. Depth of operation regulated to within one-half inch.
6. Powerful 6-cylinder Chrysler motor operates economically on 1 to 2½ gallons of gasoline per hour, depending on conditions.
7. Strong, dependable ROTOTILLER Roadmaker cuts 6 ft. wide, 12 to 18 inches deep, with complete ROTOTILLAGE across entire width of cut — no untilled areas.

•

Post war plans undoubtedly will call for thousands of miles of soil-cement and oil stabilized secondary roads. Returning soldiers will find economic security in this work. Then, as now, ROTOTILLER Roadmaker will serve faithfully and well.

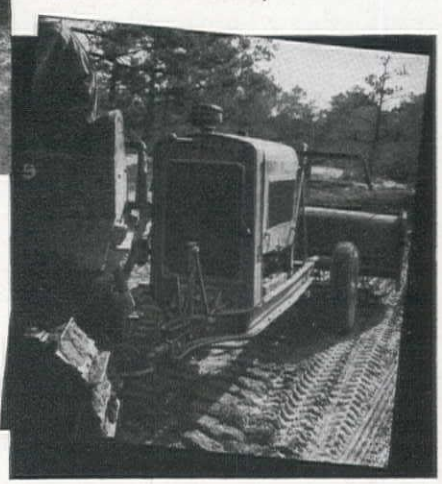
ROTOTILLER, Inc.
Dept. R TROY, N. Y.



ABOVE: Mixing clay and sand to depth of 12 to 14 inches on experimental project for U. S. Naval Construction Battalions (Seabees). Note fine pulverization and uniformity of mix.

LEFT: Scarifying to rebuild old road.

RIGHT: ROTOTILLER Roadmaker takes sharp turns with safety without taking tines from ground or stopping tillage unit.



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- Contracts taken any place in the West
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When you need Dump Trucks, Water Wagons, limited amounts of road building or maintenance, why not have this handled by a Company which specializes in this type of work.

Why bother with payroll and other details when the services of an established company are available.

SIERRA TRUCKING CO.'S record for the past year includes one job of over one million dollars for dirt and aggregate trucking alone.

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1420 So. Virginia St., Reno, Nevada

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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.

Large Western Projects...

CONTRACTS AWARDED

J. E. Haddock, Ltd., Pasadena, Calif., were awarded the contract of $136,409 for 1.5 mi. resurf. pave. with asph. conc. and grade and surf. shoulders on Imperial Hwy., betw. Anza Ave. and Sepulveda Blvd., in Los Angeles County, by California Division of Highways, Los Angeles.

Ramon Berneas, Ensenada, Lower California, for a highway south from Ensenada for general transportation and military purposes, by Department of Public Works, Terr. of Lower California, Mexicali.

Piazza & Huntley, San Jose; **Larson Bros.,** Pacific Beach; and **Harms Bros.,** Sacramento, Calif., bidding jointly, were awarded a contract of over $500,000 for runways and appurt. facils. at Contra Costa Co., California, by U. S. Engineer Office, Sacramento.

Macco Construction Co., Clearwater, and **E. S. McKittrick Co.,** Huntington Park, Calif., bidding jointly, at $1,625,700, received a contract for aviation shore facil. at the naval air station, San Diego, by Bureau of Yards and Docks, Washington, D. C.

Kiewit-Honnen-Condon, Colorado Springs, Colo., received the contract of over $500,000 for an auxiliary air field, including 316,000 sq. ft. of stabilized runways, at an unannounced county, by U. S. Engineer Office, Denver.

Skousen Bros., Albuquerque, N. Mex., over $500,000 for airfield facilities in Lea Co., N. Mex., by U. S. Engineer Office, Albuquerque.

P. S. Lord, Portland, Ore., at $200,000 (approx.), received contract for a sewage treatment plant and appurt. work in Deschutes Co., Ore., by U. S. Engineer Office, Portland.

McNeil Construction Co., Los Angeles, Calif., bidding $10,275,000, received the award for a battalion replacement center at Pleasanton, Calif., by Bureau of Yards and Docks, Washington, D. C.

Robert McCarthy Co., San Francisco, Calif., over $6,000,000 for 4,000 war housing units at various locations in Richmond, Calif., by U. S. Maritime Commission, Oakland.

Clyde W. Wood, Los Angeles, Calif., over $1,000,000 for buildings, util., landing fields and roads on an island in Los Angeles Co., by U. S. Engineer Office.

A. Farnell Blair, Decatur, Ga., over $5,000,000 for buildings in Coryell Co., Texas, by U. S. Engineer Office, San Antonio.

Robert E. McKee, Los Angeles, Calif., received a $4,241,500 award for four housing projects in various counties in Utah by Federal Public Housing Authority, San Francisco, Calif.

Sound Construction & Engineering Co., Seattle, Wash., was awarded a $2,706,415 contract for 1,500 dwellings, an administration building and utilities near Ogden Meadows, Clark Co., Washington, by Vancouver Housing Authority.

Housing contracts in Seattle, Wash., were awarded as follows: **Lease & Leigland,** Seattle, $843,000 for 450 housing units on scattered sites in West Seattle; **Strand & Son,** Seattle, $684,000 for 400 housing units on the Lakewood Golf Course, by Housing Authority, Seattle.

Housing contracts in Spokane Co., Wash., were awarded as follows: **Clifton & Applegate** and **Henry Georg,** Spokane, $819,000 for 400 temporary housing units; **Benjamin H. Sheldon,** Spokane, $999,900 for 500 temporary housing units, and an additional contract for 113 more units, by Federal Housing Authority, Spokane.

Kuney-Johnson, Bremerton, Wash., was awarded the contract of $406,231 for a junior high school bldg. in Bremerton, by Board of School Directors. Kitsap Co.

Permanent Construction Co., Milwaukee, Wisconsin, received a $600,000 (approx.) award for a pilot plant for the manufacture of sponge iron at Laramie, Wyo., by Bureau of Mines, Washington, D. C.

Peter Kiewit Sons Co., Omaha, Nebr., over $1,000,000 for 185 bldgs. and utilities for a prisoners' camp in Converse Co., Wyoming, by U. S. District Engineer Office, Omaha, Nebr.

General Construction Co., Ltd., Granville Island, British Columbia, at $950,000, received the award for temporary accommodations at an R. C. A. F. station, in British Columbia, by Dept. of Munition & Supply, Ottawa.

Pacific Bridge Co., San Francisco, Calif., was awarded a $13,410,000 contract for a steel floating drydock at Alameda, by Bureau of Yards & Docks, Washington, D. C.

Macco Construction Co., Clearwater, Calif., $7,570,500 for addtl. facil. at a destroyer base in San Diego Co., California, by Bureau of Yards & Docks, Washington, D. C.

Pollock Stockton Shipbuilding Co., Sacramento, was awarded the contract of $6,420,000 for 6 sections of steel sectional floating drydock, at Stockton, by Bureau of Yards and Docks, Washington, D. C.

James I. Barnes Construction Co., Santa Monica, Calif., $2,470,000 for a housing project in Tooele, Utah, by Federal Public Housing Authority, Kansas City, Mo.

Highway and Street . . .

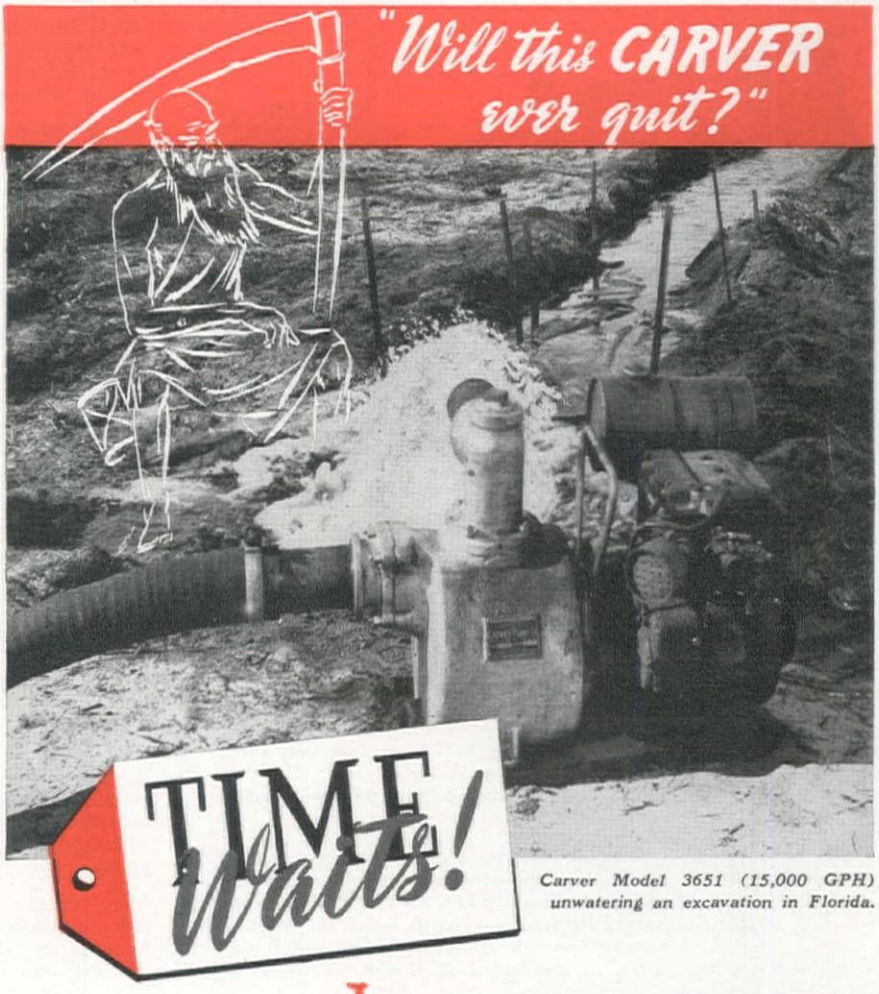
CONTRACTS AWARDED

Arizona

PINAL CO.—**Tiffany Construction Co.,** Box 846, Phoenix—less than $50,000, for improving streets at an airfield—by U. S. Engineer Office, Phoenix. 2-8

California

CONTRA COSTA CO.—**A. J. Clausen,**



Carver Model 3651 (15,000 GPH) unwatering an excavation in Florida.

JOB records show that Carver Certified Pumps stymie the wear and tear of Time . . . keep their original lightning-fast prime, their original high efficiency even after hundreds of *extra* hours of service. On the really tough jobs where the water's full of mud or abrasive sand or grit, these rugged Carvers make an even better showing, for they're designed and built to handle the toughest jobs with easy-job economy.

Before you buy a pump, check the facts on Carver performance . . . you'll be hours and dollars ahead! See your dealer, or write us direct for complete information on Carver gas engine, electric motor or belt driven pumps from 3,000 to 125,000 GPH.

THE CARVER PUMP CO., Muscatine, Iowa

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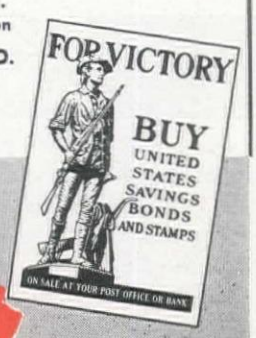

CARVER CENTRIFUGAL Certified PUMPS

the BUDA EARTH DRILL

FOR drilling up to 42" in diameter, and up to 50 feet in depth, the BUDA Earth Drill is unsurpassed for speed and economy!

For instance, on a bridge job completed by a large Northwest railroad, a 3-man crew with one BUDA Earth Drill put in accurately spaced vertical holes 19" in diameter through 18 feet of clay and hard dirt . . . and saved $7,859.56 on the job!

On pole line construction, an Ohio public utility reported a 40% reduction in hole cost and an increase in productivity per man of 108%!

When time is short and labor hard to get, you can't afford to overlook the speed and economy you'll get from BUDA Earth Drills. Write or wire NOW for your free copy of the Buda Earth Drill bulletin.

PERFECT ALIGNMENT on foundation piles is assured when holes are prebored with the Buda Earth Drill.

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686 Cragmont Ave., Berkeley—$9,744, for 1 mi. of grading sidewalk area, placing imported borrow, and const. portland cement conc. sidewalks on east side of 14th St. in Richmond—by Division of Highways, Sacramento. 2-2

LOS ANGELES CO.—**Ansco Construction Co.,** 2725 Atlantic Ave., Long Beach—less than $50,000, for clearing, grubbing, excavating and compacting fill at an Air Corps ferrying command—by U. S. Engineer Office, Los Angeles. 2-23

LOS ANGELES CO.—**J. E. Haddock, Ltd.,** 3538 E. Foothill Blvd., Pasadena—$136,409, for 1.5 mi. resurf. pave. with asph. conc. and grade and surf. shoulders on Imperial Hwy., betw. Anza Ave. and Sepulveda Blvd.—by California Division of Highways, Los Angeles. 2-3

LOS ANGELES CO.—**Vido Kovacevich,** 5400 Imperial Blvd., South Gate—less than $50,000, for street improvements at a subdepot—by U. S. Engineer Office, Los Angeles. 1-29

LOS ANGELES CO.—**C. J. Paradis,** 2320 Idell St., Los Angeles—less than $50,000, for a patrol road at an airport—by U. S. Engineer Office, Los Angeles. 2-18

LOS ANGELES CO.—**V. S. Price,** 1023 Waterloo St., Los Angeles—$11,902, for improvements on San Pedro St., near Manchester Ave.—by Board of Public Works, Los Angeles. 2-24

SAN BERNARDINO CO.—**Bonadiman-McCain,** 1709 W. 8th St., Los Angeles—less than $50,000, for roads at a camp—by U. S. Engineer Office, San Bernardino. 2-4

SAN BERNARDINO CO.—**Lloyd Wright,** 5212 Biloxi St., N. Hollywood—less than $50,000, for street extension at an army air base—by U. S. Engineer Office, San Bernardino. 2-24

SAN MATEO CO.—**Hayward Building Materials Co.,** Atherton and Jackson Sts., Hayward—$15,000, for producing and stockpiling plantmix surf. at Granada pit, about one-half mi. east of State Hwy.—by California Division of Highways, San Francisco. 2-1

YUBA CO.—**Hemstreet & Bell,** Box 906, Marysville—$12,006, for approx. 3 mi. of grading and plantmix surf. on crusher run base, on South Willow Ave., between Pasada Ave. and Feather River Blvd.—by Division of Highways, Sacramento. 2-17

Idaho

ELMORE CO.—**Ertz-Burns Co., Lorenz Bros., Donald M. Drake,** and **Parker-Schram Co.,** Couch Bldg., Portland, Ore.—$40,000 approx. for cantonment streets and appurtenant work at a military site—by U. S. Army Engineers, Portland. 2-23

New Mexico

BERNALILLO CO.—**Brown Brothers,** P. O. Box 1479, Albuquerque—less than $50,000, for roads at an airfield—by U. S. Engineer Office, Albuquerque. 2-10

LEA CO.—**Denison, Martin & Cowart,** Albuquerque—less than $50,000, for road const. at an airfield—by U. S. Engineer Office, Albuquerque. 2-15

Oregon

CROOK & WHEELER CO.—**M. C. Lininger & Sons,** Medford—$23,500, for 10,000 cu. yds. cr. rock in stockpiles on Ochoco Summit Rock Production project on the Ochoco highway—by Oregon State Highway Commission, Portland. 2-18

KLAMATH CO.—**M. C. Lininger & Sons,** Medford—$33,300 for approx. 11,500 cu. yds. of cr. rock in stockpiles at Chemult Rock Production project on The Dalles-California & Willamette highways—by Oregon State Highway Commission, Portland. 2-18

Texas

TARRANT CO.—**Texas Bitulithic Co.,** Box 5297, Dallas—under $50,000, for street, walks and drainage—by U. S. Engineer Office, Denison. 2-17

Utah

DAVIS CO.—**W. W. Clyde & Co.,** 203 Beason Bldg., Springville—$100,384, for 3.5 mi. of 2½-in. roadmix bitum. surf. road; and $31,300, for two timber overhead struct., near the Clearfield naval supply depot—by State Road Commission, Salt Lake City. 2-8

MILLARD CO.—**W. W. Clyde & Co.,** 203 Beason Bldg., Springville—$54,052, for 11.7 mi. of partly gravel surf. and partly road-

415,000 TONS of ROCK for VICTORY

LESS THAN SEVEN MONTHS OUTPUT for the KASER CONSTRUCTION CO. ADEL • IOWA

Output like this means something to you for the future! 415,000 tons of stabilized base, concrete aggregate and sub-base materials (all for vital defense projects) is a real indication of what Cedarapids plants are doing under pressure.

This is the output of *one* Cedarapids plant owned by the Kaser Construction Company of Adel, Iowa, on their Lecompton, Kan., Eudora, Kan., and Pawnee, Okla., jobs which cover a period of less than seven months time.

Output like this can only be accomplished with trouble-free service day after day—the kind of service that you are going to require after the "Duration".

It doesn't matter what your aggregate reduction and producing problem is—whether it is small or large—Cedarapids plants can be engineered for any combination of final size or production. *Iowa can meet your future plans* whether it is for crushers, screens, bins, asphalt plants, driers, or portable or stationary plant equipment. Now is the time to familiarize yourself with Cedarapids equipment. Come to headquarters for aggregate producing equipment.

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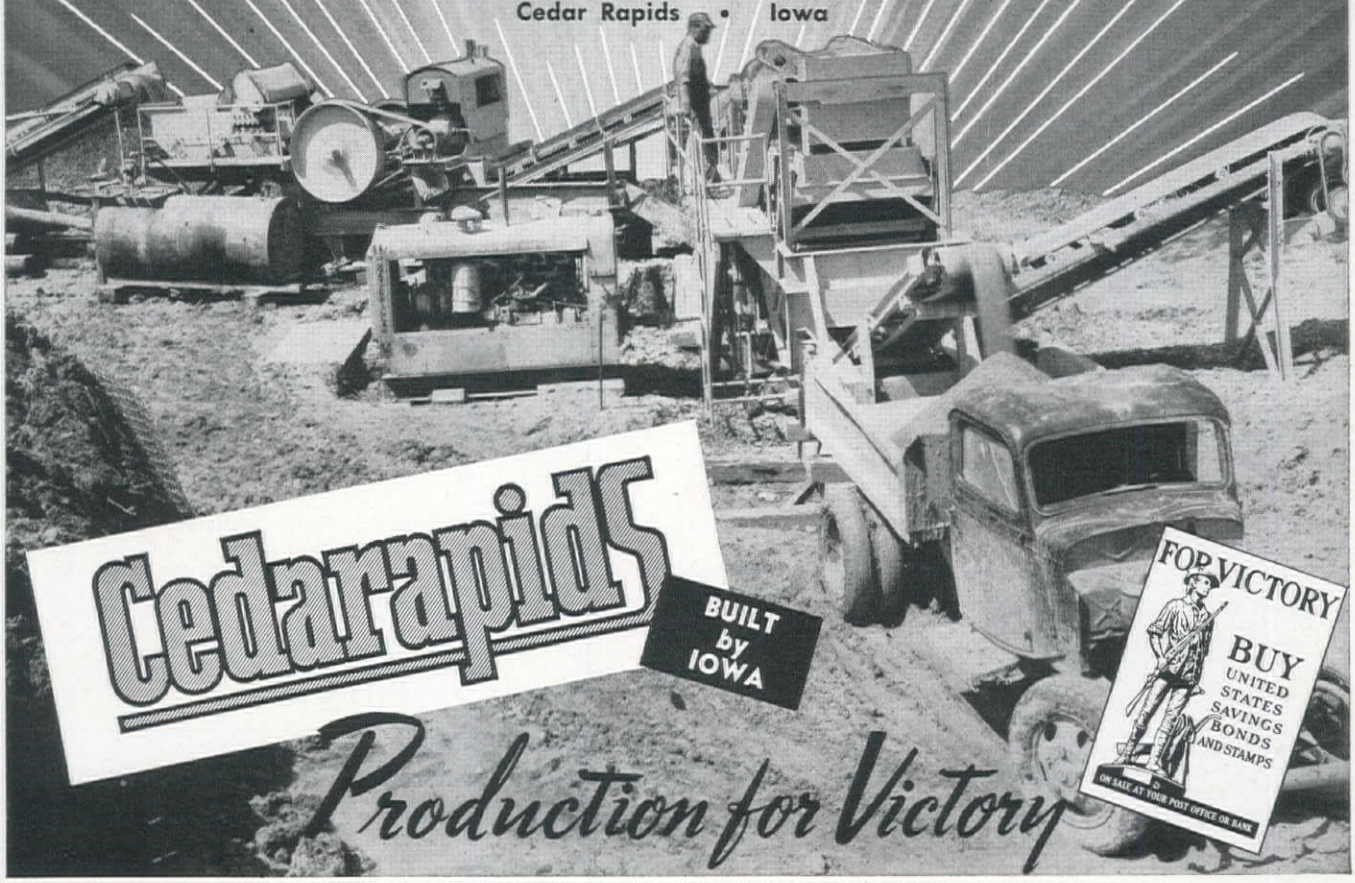

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Production for Victory

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mix bitum. surf. road, between Delta and Japanese Relocation Center—by State Road Commission, Salt Lake City. 2-1

Washington

CLARK CO.—**Porter W. Yett,** 6500 NE Ainsworth, Portland, Ore.—$87,830, for an access road to Kaiser Shipyards in Vancouver—by City Council, Vancouver. 2-3

PIERCE CO.—**Paine-Gallucci** and **Harrison Bros.,** Tacoma—$19,806, for widening and filling of 11th St.—by City Council, Tacoma. 2-18

WALLA WALLA CO.—**Max J. Kuney Co.,** N. 120 Ralph St., Spokane—over $125,000, for bitum. paving of roads and parking areas—by U. S. Engineer Office, Portland, Oregon. 1-29

Mexico

LOWER CALIFORNIA—**Ramon Berneas,** Ensenada—for a highway south from Ensenada for general transportation and military purposes—by Department of Public Works, Terr. of Lower California, Mexicali. 2-16

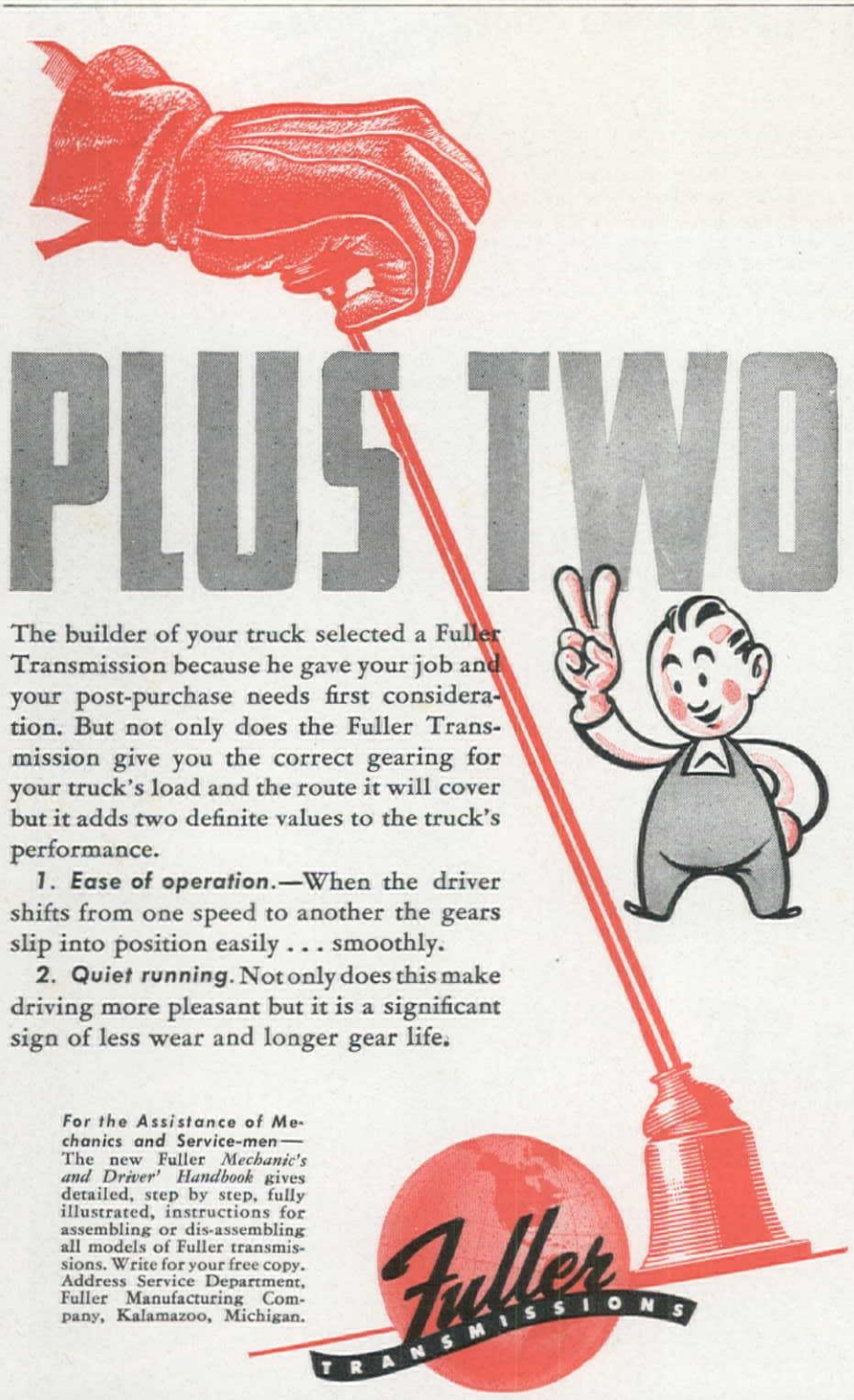
PROPOSED PROJECTS

Oregon

KLAMATH CO.—No bids were received on 8,000 cu. yds. of cr. rock in stockpiles at the Crescent Rock Production project on The Dalles-California highway. 2-18

Territories

ALASKA—Congress is considering appropriation for a second Alaska highway, to run from Whitehorse and Prince George, Canada, to Fairbanks, Alaska, to cost approximately $25,000,000. 2-4



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1. ***Ease of operation.***—When the driver shifts from one speed to another the gears slip into position easily . . . smoothly.

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Bridge . . .

CONTRACTS AWARDED

California

ELDORADO CO.—**M. A. Jenkins,** 3560 Broadway, Sacramento—$6,338, for repairs to the Rattlesnake bridge across the American River near Rattlesnake Bar—by Board of Supervisors, Placerville. 2-8

LOS ANGELES CO.—**C. J. Paradis,** 2320 Idell St., Los Angeles—under $50,000, for four bridges at various locations—by U. S. Engineer Office, Los Angeles. 2-11

SANTA BARBARA CO.—**Kiss Crane Co.,** Box 161, Berkeley—$96,120, for two structural steel and concrete overhead crossings over Southern Pacific tracks at Casmalia and Schuman—by Division of Highways, Sacramento. 2-19

Utah

WEBER CO.—**Young & Smith Construction Co.,** 1678 Browning Ave., Salt Lake City—$59,442, for a continuous concrete T-beam overhead structure betw. Nye's Corner and Wilson Lane—by Utah State Road Commission, Salt Lake City. 2-24

PROPOSED PROJECTS

Utah

TOOELE CO.—Plans are being prepared for an underpass on the U. P. R. R. near Tooele—by Utah State Road Commission, Salt Lake City. 2-11

Washington

PIERCE CO.—The Washington Toll Bridge Authority is preparing plans for a new Tacoma Narrows four-lane suspension bridge struct. with a truss girder. Estimated cost, $6,500,000. 2-3

Airport . . .

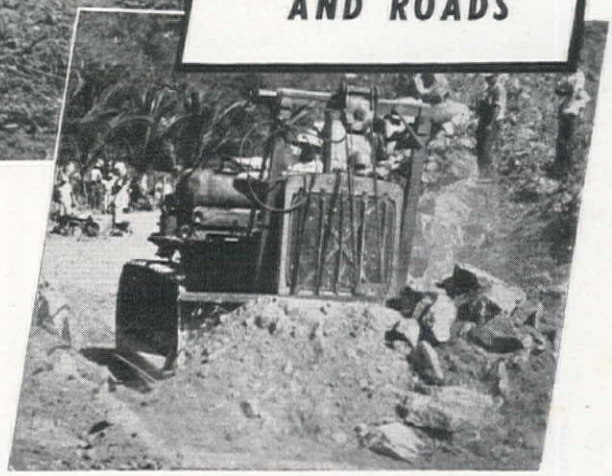
CONTRACTS AWARDED

Arizona

MOHAVE CO.—**Robert Doudell,** Box 488, San Jose, Calif.—over $100,000, for five auxiliary landing fields at an air force

DIGGING DEEP INTO JUNGLES

BUILDING AIRFIELDS, BASES AND ROADS



Wooldridge scrapers are carrying their share of the load on the far flung battlefronts of the world. In dense jungles they are at work with American forces clearing the way for airfields, bases and roads. On the burning sands of the desert they are dependably laying the groundwork for allied victories, to come. Wherever there's a need for moving world's of earth faster there's a need for Wooldridge Heavy-duty Earthmoving Equipment. When you buy — specify Wooldridge.

Wooldridge Scrapers are available in sizes ranging from 9 to 30 cubic yard capacities.

WITH WOOLDRIDGE HEAVY DUTY EARTH MOVING EQUIPMENT

Wooldridge Scrapers are supplied to the United States Government for two line operation, permitting two drum power units to be used.

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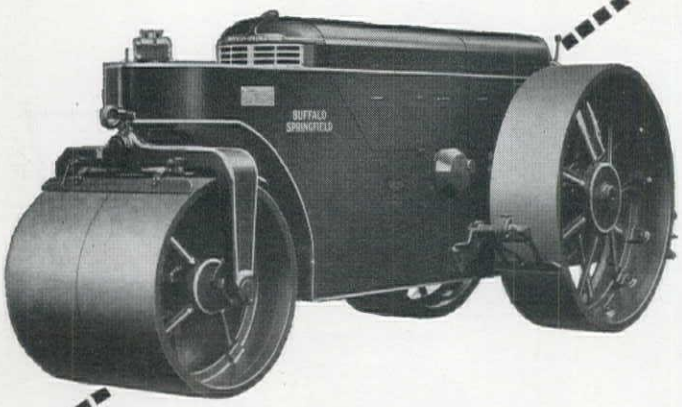
EXCLUSIVE ROAD ROLLER BUILDERS FOR 50 YEARS.....



.....THE

BUFFALO-SPRINGFIELD ROLLER COMPANY

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Spears-Wells Machinery Co., Oakland
Ray Corson Machinery Co., Denver
Steffeck Equipment Co., Inc., Helena
R. L. Harrison Co., Inc., Albuquerque
Tri-State Equipment Co., El Paso
Cramer Machinery Co., Portland
Construction Equipment Co., Spokane
Wortham Machinery Co., Cheyenne
Landes Tractor & Equipment Co., Salt Lake City

flexible gunnery school—by U. S. Engineer Office, Los Angeles Calif. 2-24

MOHAVE CO.—**Gibbons & Reed,** 259 SW 3rd St., Salt Lake City, Utah—over $100,000, for a landing field at an operating base—by U. S. Engineer Office, Los Angeles, Calif. 1-29

California

CONTRA COSTA CO.—**Piazza & Huntley,** 195 N. 6th St., San Jose; **Larson Bros.,** 2024 Feldspar St., Pacific Beach; and **Harms Bros.,** Rt. 4, Box 2220, Sacramento—over $500,000, for runways and appurt. facils.—by U. S. Engineer Office, Sacramento. 2-13

LOS ANGELES CO.—**West & Sommers,** 2401 Beverly Blvd., Los Angeles—under $50,000, for taxiways for airport gasoline fueling system—by U. S. Engineer Office, Los Angeles. 2-10

SAN DIEGO CO.—**Macco Construction Co.** and **E. S. McKittrick Co.,** 815 Paramount Blvd., Clearwater—$1,625,700, for aviation shore facil. at the naval air station—by Bureau of Yards & Docks, Washington, D. C. 2-9

SAN JOAQUIN CO.—**A. Teichert & Son, Inc.,** Box 1113, Sacramento—over $15,000, for paving—by U. S. Engineer Office, Sacramento. 2-2

Colorado

PUEBLO CO.—**Northwestern Engineering Co.,** 1311 St. Joe St., Rapid City, S. Dak.—for runways and taxiways at an airport—by U. S. Engineer Office, Denver. 2-18

UNANNOUNCED CO.—**Kiewit-Honnen-Condon,** Colorado Springs—over $500,000, for an auxiliary air field, including 316,000 sq. ft. of stabilized runways—by U. S. Engineer Office, Denver. 2-11

Idaho

POWER CO.—**Morrison-Knudsen Co.,** Boise—over $175,000, for grading and paving—by U. S. Engineer Office, Portland, Oregon. 1-29

New Mexico

DE BACA CO.—**Walter L. Denison,** 207 S. Hermosa Ave.,

GRUENDLER CRAFTSMANSHIP

Employed by U.S.A. in the WAR EFFORT

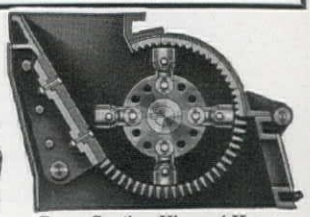
★ ROCK CRUSHERS ★

STATIONARY or MOBILE for Military Highways . . . Access Roads, Army and Navy Air Base Construction

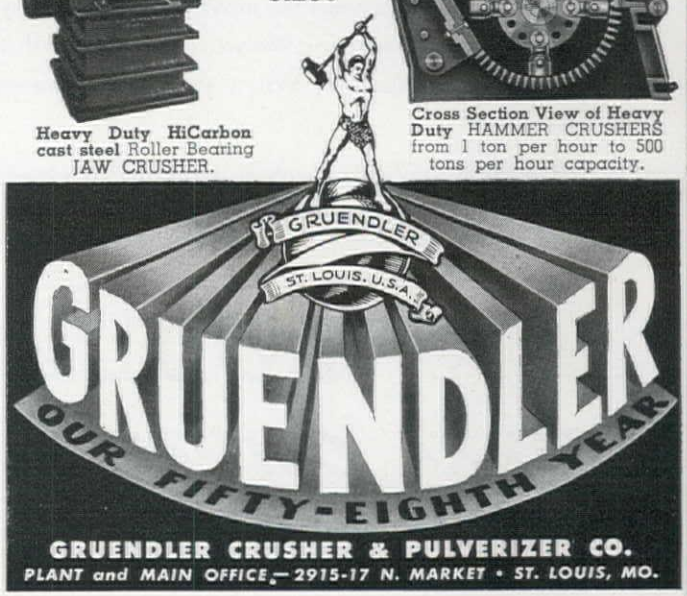
GRUENDLER ENGINEERS on the Job to help you in any way, NOW and for your post war plans—Blue Prints or Practical Suggestions Sent—No Obligations—Write for Illustrated Bulletins and Catalog "Number 601"

Heavy Duty HiCarbon cast steel Roller Bearing JAW CRUSHER.

Built in many sizes



Cross Section View of Heavy Duty HAMMER CRUSHERS from 1 ton per hour to 500 tons per hour capacity.



GRUENDLER CRUSHER & PULVERIZER CO.

PLANT and MAIN OFFICE—2915-17 N. MARKET • ST. LOUIS, MO.

Ever see an Explosive Rivet?

HERE'S a rivet that's making history—an *Explosive* Rivet—a new development by du Pont. It's a dramatic example of the control achieved by Du Pont Explosives Research over the action of explosives.

In the shank of this rivet there's a tiny explosive charge—the smallest "load" used in industry. Yet the job this tiny charge does in millions of Explosive Rivets makes aircraft production faster.

Explosive Rivets speed up "blind" riveting—that is, riveting in places where you can't reach one side of the rivet to back it up. To "drive" or set these rivets you simply apply the tip of an electrically heated iron to the rivet head.

In 2 seconds or less, heat fires the charge—forming a perfect, barrel-shaped head on the blind end. Expansion is so uniform and precise that this rivet meets the high standards required for America's finest military aircraft.

At du Pont the same men, the same fund of experience and laboratory facilities responsible for perfecting and manufacturing Explosive Rivets are constantly at work producing new and better commercial explosives and blasting supplies. That is why you can count on Du Pont Explosives to give you the maximum in safe, economical, and effective blasting. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington, Delaware.

DOING SOME BLASTING?
Call on Du Pont for the explosives, blasting supplies and experience you need to do the job right.

"RED CROSS* EXTRAS"—among the best all-around explosives available.

"GELEX"* semi-gelatin dynamites—save money on many jobs which formerly required gelatins.

ELECTRIC BLASTING CAPS—reliability proved by over one billion sold to date.

*Trade Mark

DU PONT
REG. U. S. PAT. OFF.

EXPLOSIVES

Products of Modern Research and 141 Years of Experience

Albuquerque—over $50,000, for dust palliative treatment at an airfield—by U. S. Engineer Office, Albuquerque. 2-24

LEA CO.—**Skousen Bros.**, 205 Springer Bldg., Albuquerque—over $500,000, for airfield facilities—by U. S. Engineer Office, Albuquerque. 2-16

Utah

TOOELE CO.—**Intermountain Contractors**, 325 Atlas Bldg., Salt Lake City—$300,000 (approx.), for extension to a plane anchorage—by U. S. Engineer Office, Salt Lake City. 2-23

Washington

GRANT CO.—**McAtee & Heathe**, E. 3527 Trent Ave., Spokane—over $100,000, for conc. paving—by U. S. Engineer Office, Seattle. 2-2

PROPOSED PROJECTS

California

LOS ANGELES CO.—The War Dept., Washington, D. C., has authorized additional work at an army air force installation to cost approx. $1,000,000.

New Mexico

VARIOUS COS.—New Mexico State Highway Department is planning federally-financed flight strips in several locations, to cost a total of $3,000,000. 2-4

Water Supply . . .

CONTRACTS AWARDED

Arizona

MARICOPA CO.—**N. P. Van Valkenburgh**, 8609 San Vincente Ave., South Gate, Calif.—$44,612, for overhead sprinkler system and appurtenant works at the Deer Valley Nursery, Phoenix—by Emergency Rubber Project, Los Angeles, Calif. 2-24

PINAL CO.—**Fisher Contracting Co.**, 516 S. 7th St., Phoenix—over $50,000, for water and sewer systems and appurt. facil. at a fixed gunnery sub-post—by U. S. Engineer Office, Phoenix. 2-4

California

FRESNO CO.—**E. T. Haas Co.**, 1104 Merchants Exchange Bldg., San Francisco—over $50,000, for water and sewer system—by U. S. Engineer Office, Sacramento. 1-28

KERN CO.—**Edward R. Siple Co.**, 2545 San Fernando Rd., Los Angeles—less than $50,000, for 9,200 lin. ft. of 6-in. water pipe for hospital water supply at a bombing range—by U. S. Engineer Office, Los Angeles. 2-25

Idaho

ELMORE CO.—**Ertz-Burns & Co., Lorenz Bros., Donald M. Drake** and **Parker-Schram Co.**, Couch Bldg., Portland, Ore.—less than $50,000, for water storage facilities and pumping system at a military site—by U. S. Army Engineers, Portland. 2-23

Oregon

UMATILLA CO.—**J. C. Papin**, Sandy—under $50,000, for water and sewer facilities—by U. S. Engineer Office, Portland. 2-17

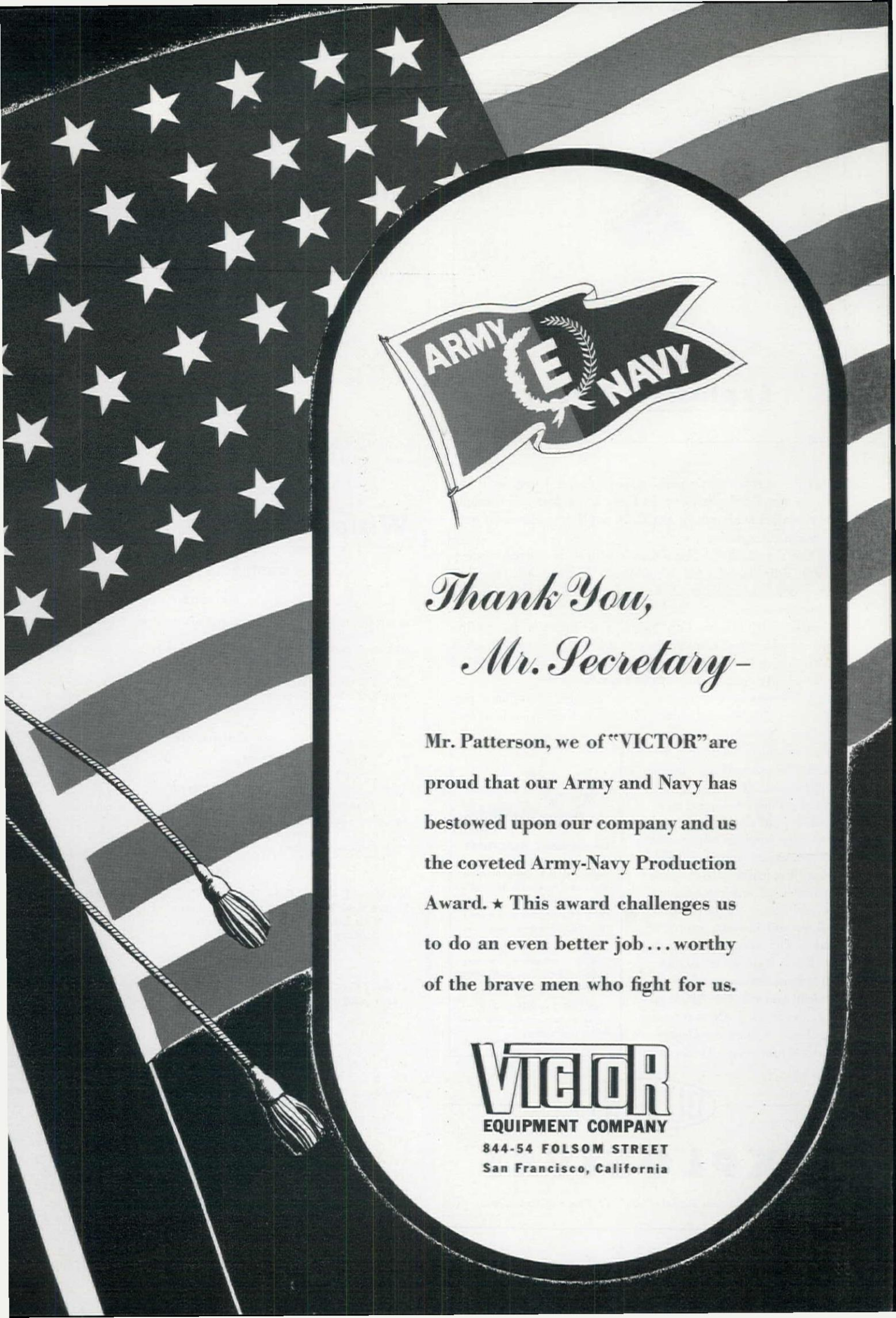
Texas

HIDALGO CO.—**General Air Conditioning Co. of the Pacific**, 116 New Montgomery St., San Francisco, Calif.—$57,777, for overhead sprinkler system at the Edinburg Nursery, Edinburg—by Emergency Rubber Project, Los Angeles, Calif. 2-24

Utah

CARBON & EMERY COS.—**Claybaugh, Simpson & Reiff**, Grand Junction, Colo.—for a new water pipe line from Big Springs Ranch to Cedar—by Denver & Rio Grande Railroad Co., Denver, Colo. 2-4

GRAND CO.—**Mack Drilling Co.**, Salt Lake City—for drilling four new wells near Moab—by Potash Co. of America. 2-11



Thank You,
Mr. Secretary–

Mr. Patterson, we of "VICTOR" are proud that our Army and Navy has bestowed upon our company and us the coveted Army-Navy Production Award. ★ This award challenges us to do an even better job . . . worthy of the brave men who fight for us.

VICTOR
EQUIPMENT COMPANY
844-54 FOLSOM STREET
San Francisco, California

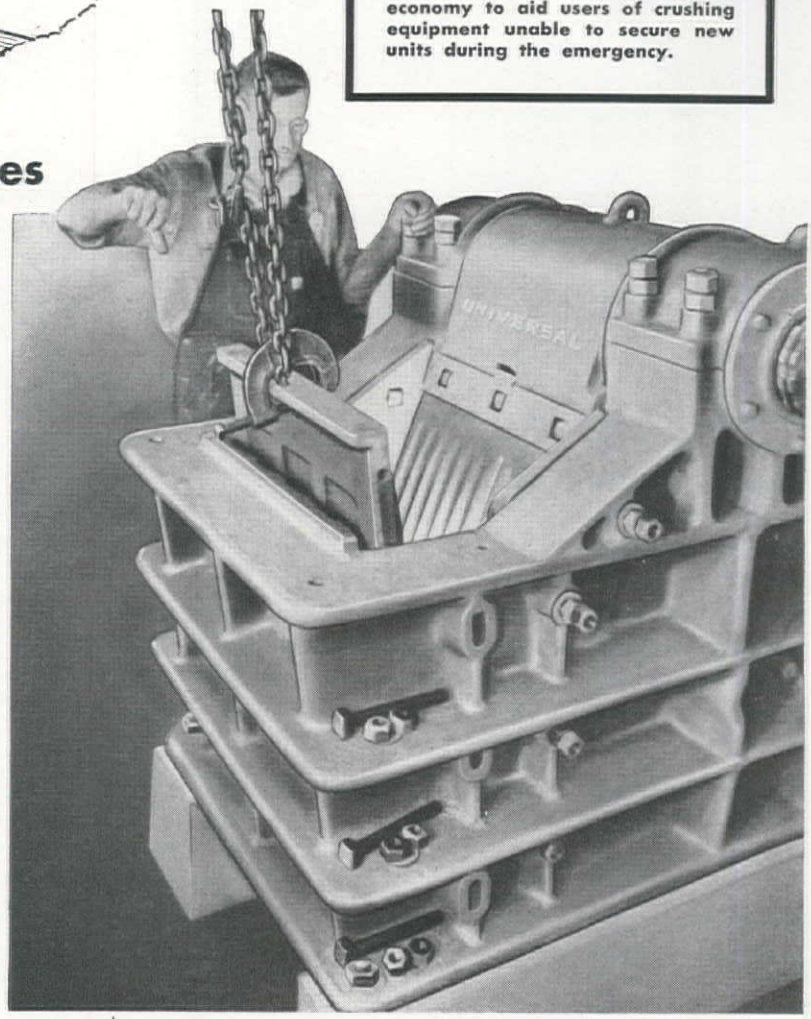
The Care and Feeding of Rock Crushers

No. 2 of a series of advertisements in the interests of national economy to aid users of crushing equipment unable to secure new units during the emergency.

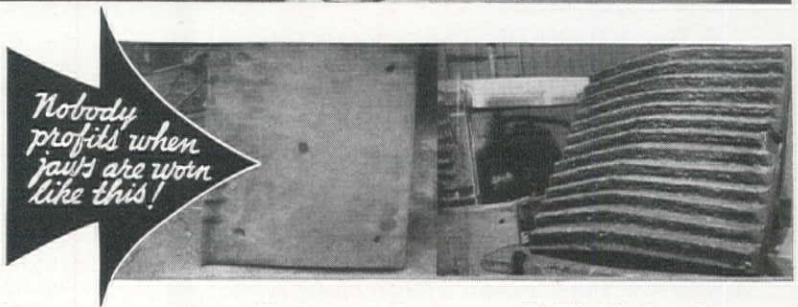
Reverse Worn Jaw Plates for Maximum Service

Jaw plates are made reversible so they can be turned end for end when the lower end becomes worn. Jaw plates should be reversed as soon as they have become worn to a point of decreasing plant capacity—worn jaws will not grab and crush material. They cause material to slip and accelerate wear. Too, wear forms pockets at base of jaws preventing release of material and decreasing capacity. Cheek plates and wedges should be reversed, too (older models of equipment do not allow for this change) when jaws are reversed, for maximum efficiency and service.

Most worn jaw plates can be salvaged by build-up welding and the use of filler bars. You boost production when you keep corrugations at the lower end of the jaws—you conserve vital metal when you build up worn jaws.



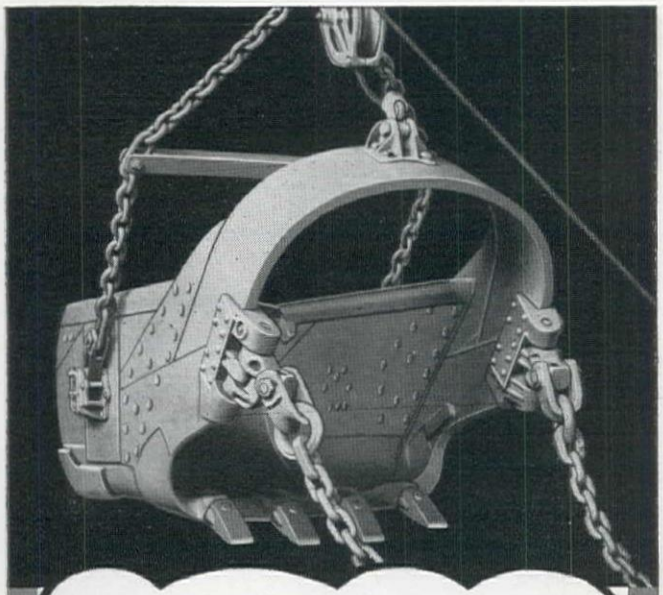
UNIVERSAL ENGINEERING CORP.
Formerly the Universal Crusher Co.
323 8th Street West
CEDAR RAPIDS, IOWA



Sold and Serviced by

LeRoi-Rix Machinery Company, Los Angeles
Landes Tractor & Equipment Co., Salt Lake City, Utah
Western Traction Company, San Francisco, Calif.
Morrow & Co., Albuquerque, N. M.
The Sawtooth Co., Boise, Idaho
L. A. Snow Co., Seattle, Wash.
Midland Implement Co., Billings, Montana
Contractors Equipment Corp., Portland, Ore.
J. D. Evans Equipment Co., Casper, Wyo.
States Tractor & Equipment Co., Phoenix, Ariz.
Lomen Commercial Co., Alaska
F. W. McCoy Company, Denver, Colo.
Empire Equipment Co., Spokane, Wash.
O. C. Bell, Reno, Nevada

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



A PAGE AUTOMATIC DRAGLINE BUCKET WILL

BOOST PRODUCTION ON YOUR JOB TOO!

On YOUR Coal Stripping, Air Base, Cantonment, Levee Building or General Construction job—PAGE AUTOMATIC DRAGLINE BUCKETS will BOOST PRODUCTION . . . make the most of Manpower and Machine!

A Page AUTOMATIC Dragline Bucket DIGS RIGHT IN. It is so shaped and designed that it AUTOMATICALLY lands in digging position with ALL its weight on the teeth. This means FASTER DIGGING AT ANY DEPTH . . . More dirt moved per shift.

Dragline operators on urgent "Victory" projects all over the nation depend on Page AUTOMATIC Dragline Buckets to get their jobs done F-A-S-T-E-R. They know that *a PAGE Bucket will outdig any other bucket of equal size and weight.*

PAGE ENGINEERING COMPANY
Chicago, Illinois

PAGE *Automatic* **DRAGLINE BUCKETS**

★ ★

BOOST PRODUCTION . KEEP AMERICA STRONG

★ ★

PROPOSED PROJECTS

Arizona

PIMA CO.—The City of Tucson contemplates instal. of a water system at the housing project on the rodeo grounds on the Nogales Hwy., at an estimated cost of $25,000. 2-2

Utah

SALT LAKE CO.—The Salt Lake City Commissioners plan to build a reservoir for the Water Works Dept., at an estimated cost of $99,000. 2-19

Sewerage . . .

CONTRACTS AWARDED

Arizona

PINAL CO.—**Vinson & Pringle,** 2020 W. Grant St., Phoenix—under $50,000, for a sewage treatment plant at an auxiliary operating base—by U. S. Engineer Office, Phoenix. 2-17

California

CONTRA COSTA CO.—**De Luca & Son,** 1745 Filbert St., San Francisco—$30,455, for an interceptor sewer in Richmond—by Federal Works Agency, Los Angeles. 2-16

CONTRA COSTA CO.—**McGuire & Hester,** 796 66th Ave., Oakland—$59,055, for Richmond intercepting sewer—by Federal Works Agency, San Francisco. 2-19

MARIN CO.—**Mario Bottini,** 802 C St., San Rafael—$4,737, for widening pavement and installing storm drain at Linden Lane and Rt. 1, in San Rafael—by California Division of Highways, San Francisco. 2-5

LOS ANGELES CO.—**P. & J. Artukovich,** 3755 W. 60th St., Los Angeles—$30,000, for 14,000 lin. ft. of 6-in., 8-in. and 12-in. vitr. clay pipe sewer in Sepulveda and Avalon Blvds., near Wilmington—by Watson Land Co., Los Angeles. 2-3

LOS ANGELES CO.—**Vido Kovacevich,** 5400 Imperial Hwy., South Gate—$4,685, for drainage ditch and appurt. structures, southwest of Montebello—by Board of Supervisors, Los Angeles. 2-17

LOS ANGELES CO.—**George Miller,** 2147 W. Silver Lake Dr., Los Angeles—$7,500, for 12-in. and 18-in. storm drain approx. 1,364 ft. long, near Berth 109, Los Angeles Harbor—by Board of Harbor Commissioners, Los Angeles. 2-15

LOS ANGELES CO.—**Oberg Bros.,** 3914 W. Slauson Ave., Los Angeles—$21,900, for an emergency sewage by-pass struc. on the Venice outfall sewer, 2,150 ft. east of Washington St.—by Board of Public Works, Los Angeles. 2-1

LOS ANGELES CO.—**Oberg Bros.,** 3914 W. Slauson Ave., Los Angeles—$4,800, for emergency sewage by-pass struct. on north outfall sewer at Vernon and Fifth Avenues—by Board of Public Works, Los Angeles. 2-1

SAN BERNARDINO CO.—**M. J. Brock & Son,** 107 N. Larchmont Blvd., Los Angeles—less than $50,000, for an outfall sewer at an air depot—by U. S. Engineer Office, San Bernardino. 2-24

SAN FRANCISCO CO.—**Eaton & Smith,** 715 Ocean Ave., San Francisco—$16,880, for drainage system in Arlington St., north of St. Mary's Ave., San Francisco—by Department of Public Works, San Francisco. 1-29

SAN FRANCISCO CO.—**M. J. Lynch,** Barneveld and Oakdale Ave., San Francisco—$39,610, for Jackson St. sewer betw. Battery and Sansome Sts., in San Francisco—by Department of Public Works, San Francisco. 2-5

SAN FRANCISCO CO.—**E. J. Treacy,** 430 Call Bldg., San Francisco—$1,036 at Alta Plaza, $1,343 at Alamo Square for installation of drain tile—by Board of Park Commissioners, San Francisco. 2-24

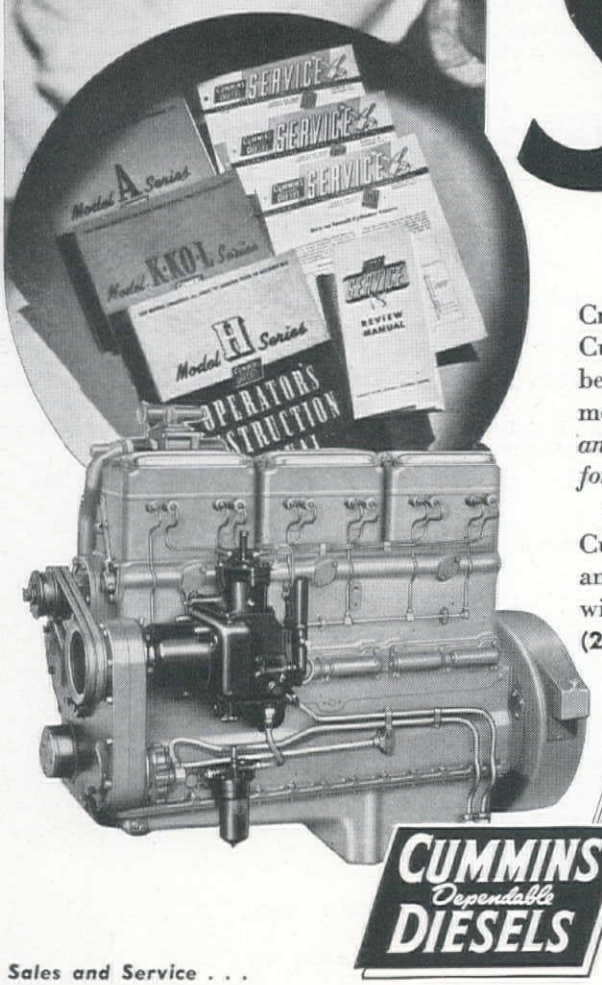
SAN FRANCISCO CO.—**E. J. Treacy,** 430 Call Bldg., San Francisco—$1,474, for sewer replacement at Sigmund Stern Grove—by Dept. of Public Works, San Francisco. 2-19

New Mexico

BERNALILLO CO.—**Cooper-Staehlin-Whisler,** Albuquerque

Service

... keynote for the duration



Crucial months lie ahead. More work will be demanded of your Cummins Dependable Diesels than ever before. New engines will be hard to get for reasons which you well understand. This simply means that your present Cummins Diesels must carry the load . . . *and they will carry the load providing you make service your keynote for the duration.*

This doesn't mean, however, that you will have to pamper your Cummins Diesels. They were built for tough jobs and 24-hour duty and they will give you this kind of performance indefinitely if you will observe these cardinal rules: **(1)** Keep your engines clean; **(2)** Don't tinker; **(3)** Adopt a regular schedule of preventive maintenance; **(4)** Follow the recommendations in the Operator's Instruction Manual; **(5)** When in doubt, always consult your Cummins Dealer. CUMMINS ENGINE COMPANY, Columbus, Indiana.

CUMMINS Dependable DIESELS

ARMY NAVY

Illustrated at the left is the 150 hp. Model H Cummins Dependable Diesel. This engine's economy, stamina and flexibility have been proved in all types of construction and material handling operations, in trucks, shovels, compressors, etc. With the Models A, HS (supercharged) and L, it gives you a complete line of dependable power for CHEAPER YARDAGE *—33 to 250 hp.*

Sales and Service . . .

Fresno, California, Watson & Meehan; **Los Angeles, California,** Diesel Motor Sales & Service Corporation; **Nanaimo, B. C.,** Cummins Diesel Sales of B. C., Ltd.; **Phoenix, Arizona,** Watson and Meehan; **Portland, Oregon,** Cummins Diesel Sales of Oregon, Inc.; **Salt Lake City, Utah,** Cummins Intermountain Diesel Sales Corporation; **San Francisco, California,** Watson & Meehan; **Seattle, Washington,** Cummins Northwest Diesel Sales; **Spokane, Washington,** Cummins Diesel Sales of Spokane; **Vancouver, B. C.,** Cummins Diesel Sales of B. C., Ltd.

UNIT POWER SHOVELS will be Ready for TOMORROW'S OPERATIONS

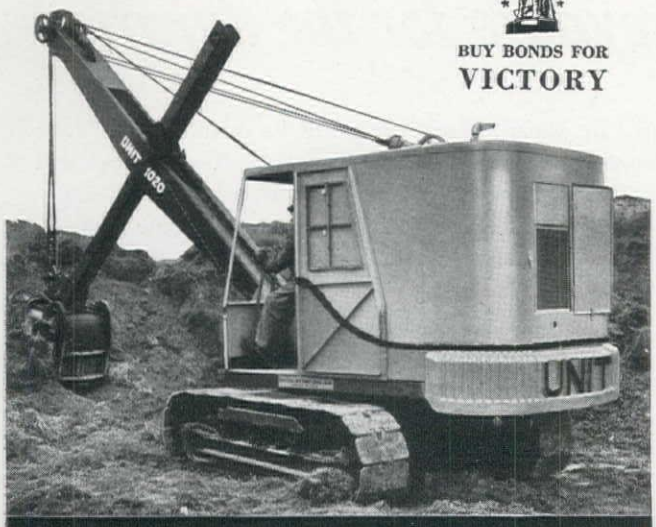
The Universal Unit Power Shovel Corporation was the first Wisconsin manufacturer to receive the much coveted U. S. Army-Navy "E" Award . . . for excellence in the production of war equipment.

TODAY is not too early to begin planning and preparing for that tomorrow when warring nations shall have laid down their arms and declared a permanent armistice against destruction. And that day will herald the world's greatest era of new construction.

New equipment will be needed. Faster equipment. Rugged, dependable earth-moving machinery. You will need Power Shovels that move fast, and bite hard and deep. Shovels, cranes and draglines that are quick on the swing, steady and positive on the "crowd", easy to handle, and versatile in their operations. You can expect this, and much more, from UNIT equipment.

UNIT Power Shovels will be ready for tomorrow's operations. Greatly expanded production facilities (now devoted exclusively to war work), *plus* long-range planning and broad engineering experience in the construction field, are basic factors that will contribute to the quick availability of UNIT Equipment . . . ⅜-, ½-, and ¾-yd. sizes.

BUY BONDS FOR VICTORY



UNIVERSAL UNIT POWER SHOVEL CORP.
MILWAUKEE, WIS., U. S. A.

A 3946-½A

—under $50,000, for airfield sewer facilities—by U. S. Engineer Office, Albuquerque. 2-17

Oklahoma

TILLMAN CO.—**Vilbig Construction Co.**, 817 Bourbon St., Dallas—over $50,000, for drainage facils.—by U. S. Engineer Office, Denison, Tex. 2-19

Oregon

DESCHUTES CO.—**P. S. Lord,** 3036 NE 20th St., Portland—$200,000 (approx.), for a sewage treatment plant and appurt. work—by U. S. Engineer Office, Portland. 2-3

Texas

BASTROP CO.—**Leland Fikes,** Dallas—over $100,000, for additional units to a sewage disposal plant—by U. S. Engineer Office, San Antonio. 2-20

BROWN CO.—**C. H. Harrison,** Waco—over $100,000, for additions to a sewage disposal plant—by U. S. Engineer Office, San Antonio. 2-20

Washington

KING CO.—**C. V. Wilder,** 2006 State St., Bellingham—$139,685 for sewage disposal system, omitting treatment plant—by City Council, Kirkland. 2-15

PIERCE CO.—**Thorburn & Logozo,** 4608 36th Ave., SW, Seattle—$21,288, for trunk sewer in Olympic Blvd. from 6th Ave. and Rochester St. to the Narrows—by Board of Contracts and Awards, Tacoma. 2-15

PIERCE CO.—**C. V. Wilder,** 2006 State St., Bellingham—$82,665, for sewers in the Salishan housing project of 2,000 units—by City Council, Tacoma. 2-11

PROPOSED PROJECTS

Colorado

EL PASO CO.—A sewage disposal plant and a water reservoir for a military installation is being planned by U. S. Engineer Office, Denver. 2-10

Waterway Improvement . . .

CONTRACTS AWARDED

California

ALAMEDA CO.—**Olympia Dredging Co.,** 525 Market St., San Francisco—$15,000 (approx.), for 30,000 cu. yd. dredging at Grove St. Terminal—by Port of Oakland. 2-9

LOS ANGELES CO.—**Standard Dredging Corp.,** 325 Central Bldg., Los Angeles—$31,200, for removal of 26,000 cu. yds. of bottom material from slip No. 1, Los Angeles inner harbor—by Harbor Commission, Los Angeles. 1-28

SAN FRANCISCO CO.—**Healy Tibbitts Construction Co.,** 1100 Evans Ave., San Francisco—$7,964, for replacing piles and repairing wharves at San Francisco Yacht Harbor—by Board of Park Commissioners, San Francisco. 2-2

Oregon

MULTNOMAH CO.—**Gilpin Construction Co.,** 4850 N. W. Front, Portland—$40,000, for dredging channel of Columbia River below Bonneville locks—by U. S. Engineer Office, Portland. 2-18

Canada

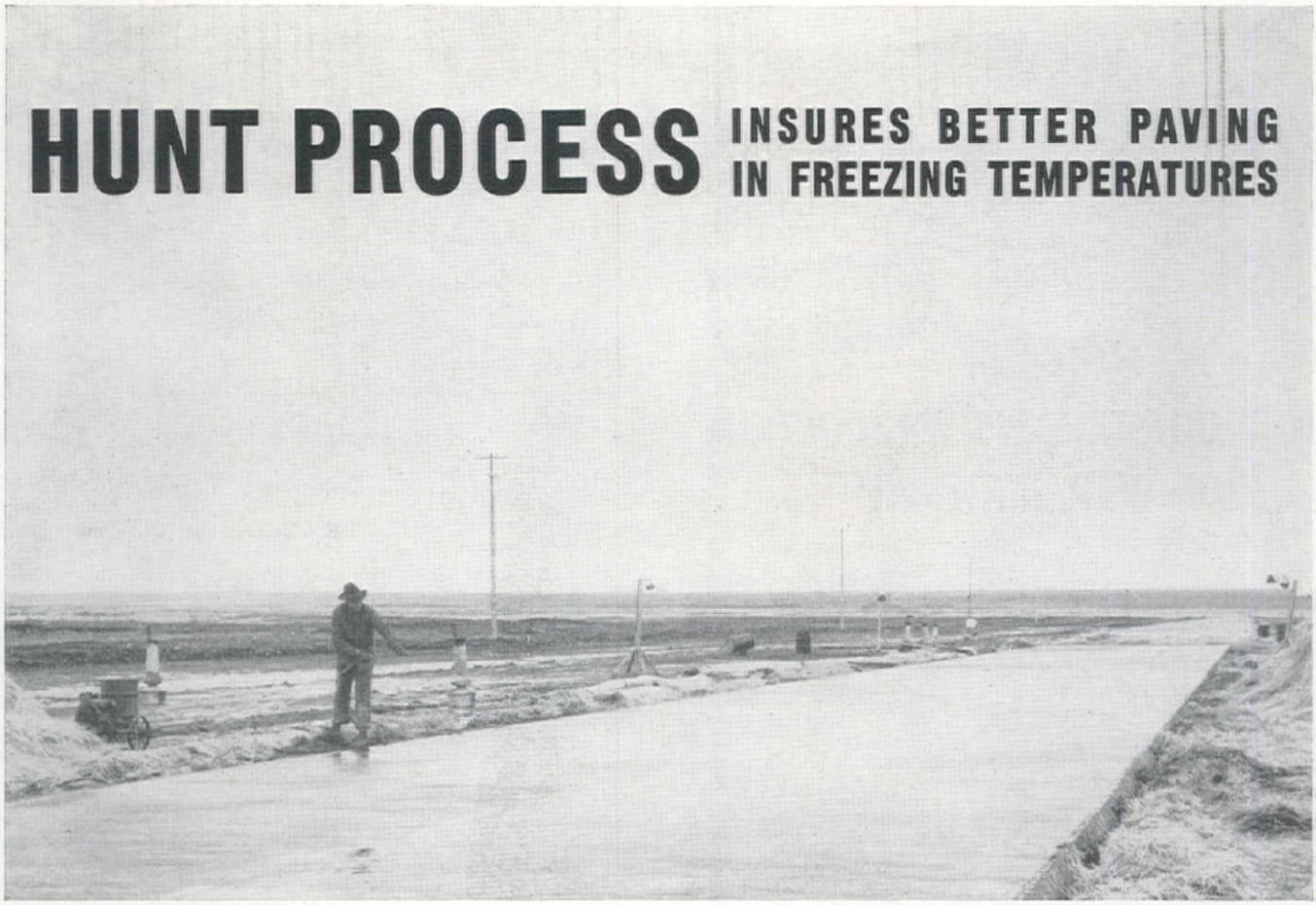
BRITISH COLUMBIA—**Gilley Bros., Ltd.,** 902 Columbia St., New Westminster—$35,000 (approx.), for placing 16,000 tons of rock at low points on the jetty at Steveston—by Dominion Department of Public Works, Ottawa.

PROPOSED PROJECTS

California

LOS ANGELES CO.—All bids were rejected for channel protection along the Los Angeles River, near Colfax St., by Board of Public Works, Los Angeles. 2-17

HUNT PROCESS INSURES BETTER PAVING IN FREEZING TEMPERATURES



Spraying Hunt Process Curing Membrane on big airport runway in Pacific Northwest that had to be completed despite temperatures as low as 5 degrees. Note ease of application.

REMOVE UNCERTAINTY FROM WINTER CURING

Water will evaporate from concrete even though the temperatures are below freezing. However, the chemical reaction between the cement and the water (hydration) practically ceases at 40 degrees F. Even at best, when the concrete is immediately covered with an insulating blanket such as straw, the hardening or curing process progresses slowly. Thus for positive curing during cold weather, means should be provided which will insure the presence of water in the concrete for a period of time much longer than for the normal "curing period."

This can best be done by the application of Hunt Process, which seals into the concrete all the mixing water, and prevents its loss by evaporation for a considerable length of time. Therefore, when the temperature of the concrete is at 40 degrees F. or above, there is ample water available for hydration even though several weeks may have elapsed since the actual placing.

Also, by the use of Hunt Process, the cooling action of evaporation is eliminated, and the temperature of the concrete is raised by the heat generated by the reaction of the cement and water.

DISTRIBUTORS

The Lofland Company	Dallas, Texas
The Colorado Builders' Supply Co.	Denver, Colorado
Grace Brothers, Limited	Honolulu, T. H.
The Carter-Waters Corporation	Kansas City, Mo.
Townsco Equip. Co.	Oklahoma City, Okla.
Baker-Thomas Lime & Cement Co.	Phoenix, Arizona
P. L. Crooks & Co., Inc.	Portland, Oregon
American Asphalt Roof Corp.	Salt Lake City, Utah
A. R. Reid Co.	San Francisco, Calif.
Charles R. Watts & Co.	Seattle, Wash.
A. E. Foreman & Sons	Vancouver, B. C.

HUNT PROCESS CO.

7012 Stanford Avenue — Los Angeles, California

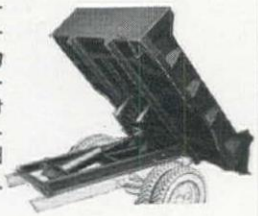
ARMY E NAVY

★ ★ ★ Award

ANTHONY HYDRAULIC HOISTS AND BODIES

"FOR OUTSTANDING PRODUCTION OF WAR MATERIALS"

The Anthony Co. and its Employees are proud of this accomplishment . . . It is a fitting climax to our 25 years of conscientious service to the Hoist and Body industry. It is an inspiration to better our record in 1943 and for years to come.



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NOW IN OUR 25th ANNIVERSARY YEAR

ANTHONY COMPANY, INC.

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TEAMWORK for SECURITY

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PORTLAND CEMENT PORTLAND CEMENT

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METAL LATH PRODUCTS

EMPIRE GYPSUM PLASTER

STANDARD GYPSUM PLASTER

PACIFIC PORTLAND CEMENT COMPANY

FOR SOUND CONSTRUCTION

Dam . . .

CONTRACTS AWARDED

Oregon

CLACKAMAS CO.—**Gilpin Construction Co.,** 5500 N. W. Front Ave., Portland—for a coffer dam, preparatory to reconstruction of the Willamette Falls dam—by Hawley Pulp & Paper Co., Oregon City. 2-15

Irrigation . . .

CONTRACTS AWARDED

California

RIVERSIDE CO.—**Concrete Conduit Co.,** Box 129, Colton—$5,737, for 2,500 ft. of 16-in. conc. irrigation pipe in place at Whittier Ranch, near Coachella—by Emergency Rubber Project, Los Angeles. 2-24

STANISLAUS CO.—**Ed Erickson,** Rt. 4, Box 1516, Modesto—$3,100, for concrete lining and piping in the Filburn branch of the Delmas ditch—by Turlock Irrigation District, Turlock. 2-11

STANISLAUS CO.—**McMillan & Norseen,** 427 Mill St., Turlock—$1,757, for concrete lining and piping in the Franzi branch of the Fox-Wagner ditch—by Turlock Irrigation District, Turlock. 2-11

STANISLAUS CO.—**Lloyd W. Terrell,** 221 9th Ave., Turlock—$1,800, for concrete lining and piping, in the Vogt branch of the Macedo ditch—by Turlock Irrigation District, Turlock. 2-11

PROPOSED PROJECTS

California

STANISLAUS CO.—Plans are available for three jobs near Turlock: improvements in the Arnold ditch; improvements in the Goodrich branch of the Delmas ditch; improvements in the Krahn branch of the McPherson ditch. 2-25

Building . . .

CONTRACTS AWARDED

Arizona

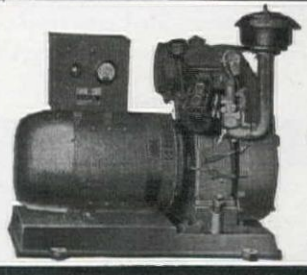
COCHISE CO.—**E. Samuel Gercke,** 802 E. 6th St., Tucson—

STERLING QUALITY

STERLING LIGHT PLANTS

Simple - Dependable - Rugged

BUILD FOR DEFENSE with STERLING PUMPS HOISTS and LIGHT PLANTS



The choice of leading contractors everywhere. Write for literature and prices.

STERLING MACHINERY CORP.

405-13 SOUTHWEST BLVD. KANSAS CITY, MISSOURI

The Army's rolling to Alaska... on the road that *"couldn't be built"*

Man had never set foot on much of the wild frontier territory through which Army Engineers and contractors have punched their way to build the Alaska Highway . . . the most important military project since the Panama Canal.

Mountains stood in the way . . . their very grades hidden beneath the camouflage of forests never before penetrated. So did hundreds of bleak miles of muskeg, black mud and sub-artic ooze deep enough to swallow huge motor trucks and leave no trace of where they had stood.

Indomitable men and machines . . . many of them White trucks . . . slashed their way through, *and in record time.* Vital projects of this kind dramatize the wartime importance of motor trucks.

But your truck, too, is important because *it cannot be replaced.* To conserve its life is your patriotic duty.

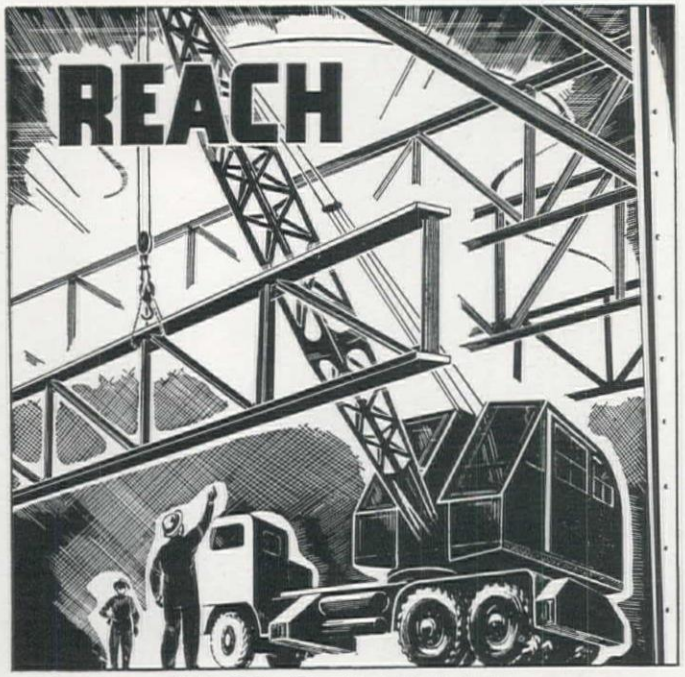
Investigate now the White Cooperative Plan of Truck Conservation —a definite method prolonging truck life and saving critical materials. It provides all the facilities to enable you to fulfill the conservation pledge which the Office of Defense Transportation has asked every truck owner to sign.

White

THE WHITE MOTOR CO. • Cleveland

Builders of U. S. Army Tank Destroyers, Scout Cars, Half Tracs, Prime Movers and Cargo Trucks, the complete line of Super Power Trucks and Tractors, City and Inter-City Coaches, Safety School Buses and the Famous *White Horse.*

FOR MORE THAN 40 YEARS THE GREATEST NAME IN TRUCKS



5- to 12-Ton Capacity * Air Controls

Reach out . . . get more construction and materials-handling jobs done faster with wheel-mounted MICHIGAN Mobile Cranes! Bulletin C describes time-saving, cost-cutting MICHIGAN features.

MICHIGAN
POWER SHOVEL COMPANY
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for temporary housing project of 236 family units and 286 dormitory units at Warren—by Federal Housing Authority, San Francisco, Calif. 2-23

COCHISE CO.—**Paul E. Griffin,** 7219 Sepulveda Blvd., Van Nuys, Calif.—over $50,000, for addtl. temporary bldgs. at an advanced training school—by U. S. Engineer Office, Phoenix. 2-24

COCONINO CO.—**Bailey & McCoy,** 1130 Lowell Ave., Tucson—over $100,000, for bldgs., electrical distrib. system and open storage sheds with necessary util. for civilian housing—by U. S. Engineer Office, Albuquerque, N. Mex. 1-28

COCONINO CO.—**Del E. Webb Construction Co.,** 302 S. Third Ave., Phoenix—for 200 temporary dwelling units in Flagstaff—by Federal Public Housing Authority, San Francisco, Calif. 2-3

MARICOPA CO.—**Glenn Chipperfield,** 2717 N. 16th St., Phoenix—$71,178, for 30 temp. dwelling units at Gila Bend—by Federal Public Housing Authority, San Francisco, Calif. 2-5

MARICOPA CO.—**George C. Gammill,** 530 Pioneer Dr., Prescott—$115,890, for 50 temporary dwelling units at Wickenburg—by Federal Public Housing Authority, San Francisco, Calif. 2-4

MARICOPA CO.—**H. R. Meadows,** 2815 N. Central, Phoenix—$90,500, for 40 dwelling-unit housing project at Buckeye—by Federal Public Housing Authority, San Francisco, Calif. 2-19

MARICOPA CO.—**Del E. Webb Construction Co.,** 302 S. 23rd Ave., Phoenix—$60,000 (approx.), for a city-county health center in Phoenix—by the Maricopa County Supervisors, Phoenix. 2-24

MOHAVE CO.—**Del E. Webb Construction Co.,** 302 S. 23rd Ave., Phoenix—over $100,000, for line maintenance shed at a gunnery school—by U. S. Engineer Office, Kingman. 2-24

PIMA CO.—**M. M. Sundt Construction Co.,** Box 2592, Tucson—for 400 trailer units in two locations—by Federal Public Housing Authority, San Francisco, Calif. 2-3

PINAL CO.—**John W. Murphey-Leo B. Keith Bldg., Co.,** 411 E. 3rd St., Tucson—over $100,000, for addtl. temporary bldgs. at an airfield—by U. S. Engineer Office, Phoenix. 2-15

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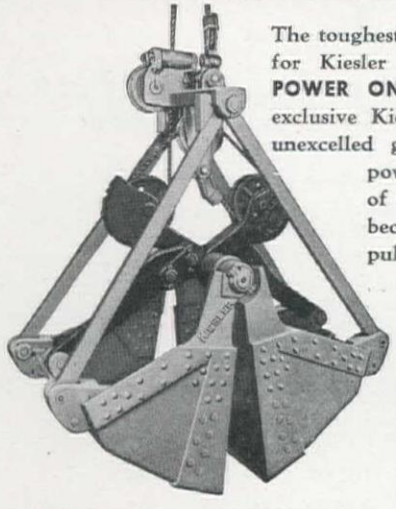

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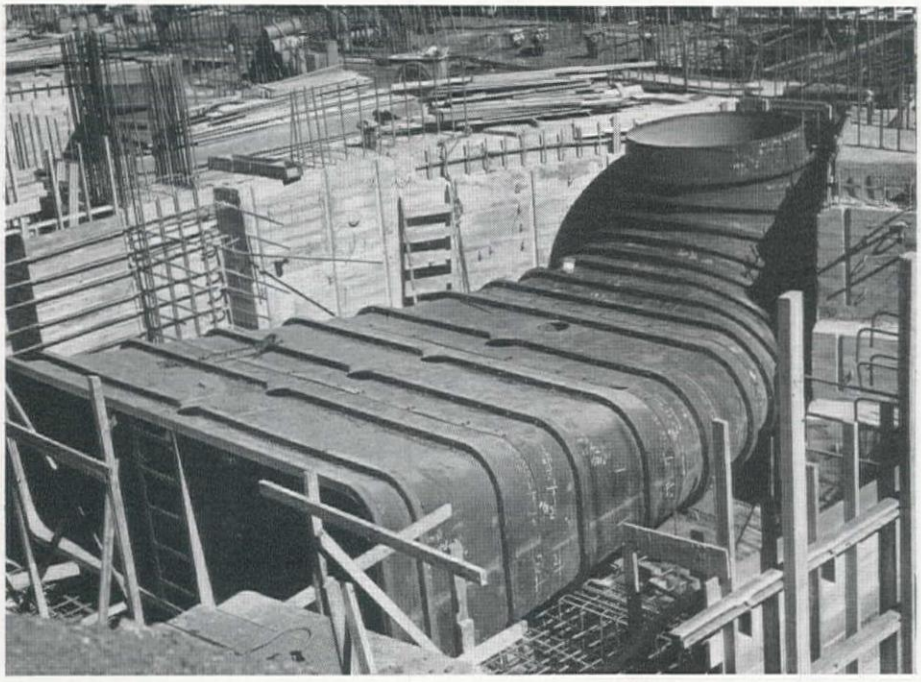

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ALAMEDA CO. — **McNeil Construction Co.**, 5860 Avalon Blvd., Los Angeles—$10,275,000, for a battalion replacement center at Pleasanton—by Bureau of Yards and Docks, Washington, D. C. 2-15

COLUSA CO.—**Claude P. Lindsay,** 824 Taraval St., San Francisco—$172,513, for struct. and services at Arbuckle emergency rubber labor camp—by Department of Agriculture, Los Angeles. 2-8

CONTRA COSTA CO.—**Louis Dunn, Inc.,** 799 Monadnock Bldg., San Francisco—$70,000 (approx.) for a commercial bldg. at Harbor Gate subdivision near Stege—by Housing Authority, Richmond. 2-5

CONTRA COSTA CO.—**Heyman Bros.,** 564 Market St., San Francisco—$85,894, for two dormitories and administration building in the Columbia Park project near Camp Stoneman—by Contra Costa County Housing Authority, Martinez. 2-19

CONTRA COSTA CO.—**Robert McCarthy Co.,** 1050 Kirkham St., San Francisco—over $6,000,000, for 4,000 war housing units at various locations in Richmond—by U. S. Maritime Commission, Oakland. 2-25

FRESNO CO.—**Harris Construction Co.,** Box 109, Fresno—over $100,000, for addtl. bldgs.—by U. S. Engineer Office, Sacramento. 2-10

KERN CO.—**Midstate Construction Co.,** 251 Kearny St., San Francisco—$160,000 (approx.) for a guayule rubber plantation labor camp at Lamont—by Emergency Rubber Project, Los Angeles. 2-24

KERN CO.—**T. S. McNair,** 410 Washburn St., Corona—$156,699 for structures and services at Wasco labor camp—by U. S. Department of Agriculture, Emergency Rubber Project, Los Angeles. 2-16

KERN CO.—**Eric Flodine,** 2021 Wellington Rd., Los Angeles—$116,259 for structures and services at Shafter Labor Camp—by Emergency Rubber Project, Los Angeles. 2-26

LOS ANGELES CO.—**Gail A. Bell,** 816 W. 5th St., Los Angeles—over $100,000, for personnel shelters at aircraft mfg. plant—by U. S. Engineer Office, Los Angeles. 2-15

LOS ANGELES CO.—**Charles Buschlen,** 7070 Franklin Ave., Los Angeles—over $50,000, for new bldgs. and alterations and additions to existing ones at an ordnance training center—by U. S. Engineer Office, Los Angeles. 2-17

LOS ANGELES CO.—**Cameron & Tarnutzer,** 450 N. Camden Rd., Beverly Hills—over $100,000, for addtl. buildings at an air corps ferry command—by U. S. Engineer Office, Los Angeles. 2-18

LOS ANGELES CO.—**H. M. Keller Co.,** 4604 Hollywood Blvd., Los Angeles—over $50,000, for temporary frame bldgs.—by U. S. Engineer Office, Los Angeles. 2-20

LOS ANGELES CO.—**C. T. & W. P. Stover,** 116 Alexander St., Claremont—$150,000 (approx.), for a housing project of 22 bldgs. at the Polaris Flight Academy, Lancaster—by Defense Plant Corp., Los Angeles. 2-18

LOS ANGELES CO.—**Ford J. Twaits Co.,** 451 S. Boylston St., Los Angeles—for a steel tube mill for Pacific Tube Co., in East Los Angeles—by Defense Plant Corp., Washington, D. C. 2-3

LOS ANGELES CO.—**Clyde W. Wood,** 816 W. 5th St., Los Angeles—over $1,000,-

000, for bldgs., util., landing fields and roads on an island—by U. S. Engineer Office, Los Angeles. 2-2

MERCED CO.—**Midstate Construction Co.**, 251 Kearny St., San Francisco—$100,000, for guayule rubber plantation labor camp at Los Banos—by Emergency Rubber Project, Los Angeles. 2-24

MERCED CO.—**C. T. & W. P. Stover**, 116 Alexander St., Claremont—$175,000 (approx.), for 80 family dwellings, 2 dormitory bldgs. and 1 warehouse, in Dos Palos—by Defense Plant Corp., Los Angeles. 2-15

MONTEREY CO.—**J. Paul Campbell**, 5601 W. Manchester Ave., Inglewood—$87,805 for construction of structures and services at Soledad Labor Camp—by Emergency Rubber Project, Los Angeles. 2-26

NAPA CO.—**Heraty, Gannon & Koller**, 3625 McArthur Blvd., Oakland—$291,962, for 200 war dwelling units in Napa—by Housing Authority, Napa. 2-1

RIVERSIDE CO.—**Griffith Co.**, 1060 S. Broadway, Los Angeles—over $500,000, for ferry command buildings—by U. S. Engineer Office, Los Angeles. 2-11

RIVERSIDE CO.—**H. M. Keller Co.**, 4604 Hollywood Blvd., Los Angeles—$41,827, for structures and services at Romoland labor camp—by Emergency Rubber Project, Los Angeles. 2-25

SACRAMENTO CO.—**Campbell Construction Co.**, 800 R St., Sacramento—over $100,000 for bldgs.—by U. S. Engineer Office, Sacramento. 2-23

SACRAMENTO CO.—**Campbell Construction Co.**, 800 R St., Sacramento—over $50,000, for buildings—by U. S. Engineer Office, Sacramento. 2-19

SACRAMENTO CO.—**C. C. Moore & Co., Engineers, Inc.**, 450 Mission St., San Francisco—over $100,000 for extension to central steam plant—by U. S. Engineer Office, Sacramento. 2-26

SACRAMENTO CO.—**H. W. Robertson**, 3004 F St., Sacramento—over $100,000, for temporary frame bldgs.—by U. S. Engineer Office, Sacramento. 2-17

SAN BERNARDINO CO.—**Larfield Construction Co.**, 2725 Woodhaven Dr., Los Angeles—$184,650, for 53 dwellings in the Scenic Knoll Tract, south of Urbita Springs, San Bernardino—by G. G. Larfield, San Bernardino. 2-25

SAN BERNARDINO CO.—**Max Maltzman** and **W. E. Robertson**, Box 8318, West Adams Station, Los Angeles—over $100,000, for depot supply buildings at an air depot—by U. S. Engineer Office, San Bernardino. 2-19

SAN BERNARDINO CO.—**Robert E. McKee**, 4700 San Fernando Rd., West Los Angeles—over $50,000, for civilian mess and post exchange facil. at an air depot—by U. S. Engineer Office, San Bernardino. 2-2

SAN DIEGO CO.—**M. H. Golden Construction Co.**, 3485 Noell St., San Diego—over $100,000, for a bldg.—by U. S. Engineer Office, San Diego. 2-23

SAN DIEGO CO.—**W. D. Haxton**, 4271 Landis St., San Diego—$31,000, for addns. to La Jolla Jr.-Sr. High School, San Diego—by Unified School District, San Diego. 2-2

SAN DIEGO CO.—**Gunnar Johnson**, 2515 33rd St., San Diego—$87,355, for

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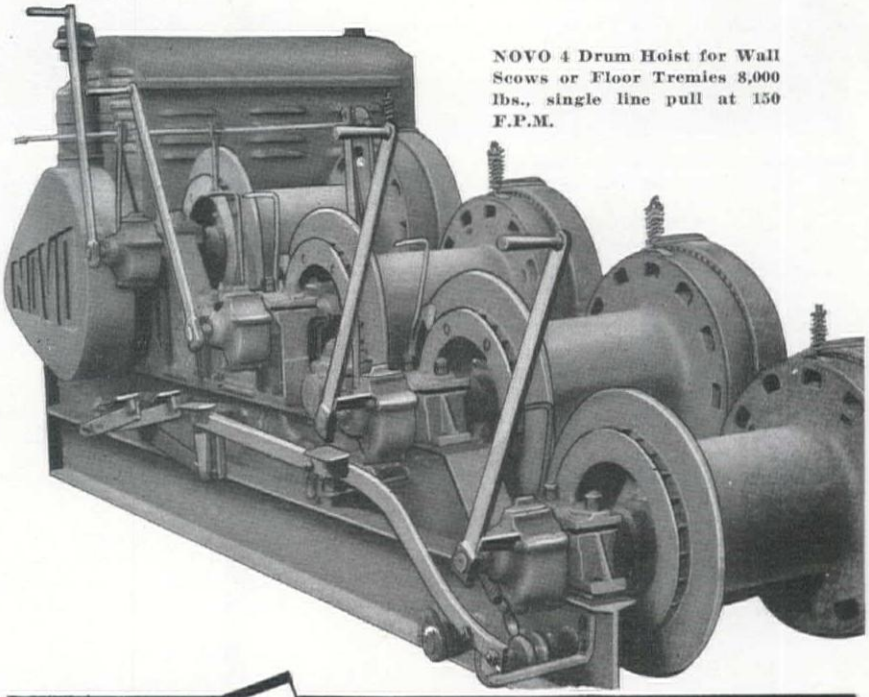

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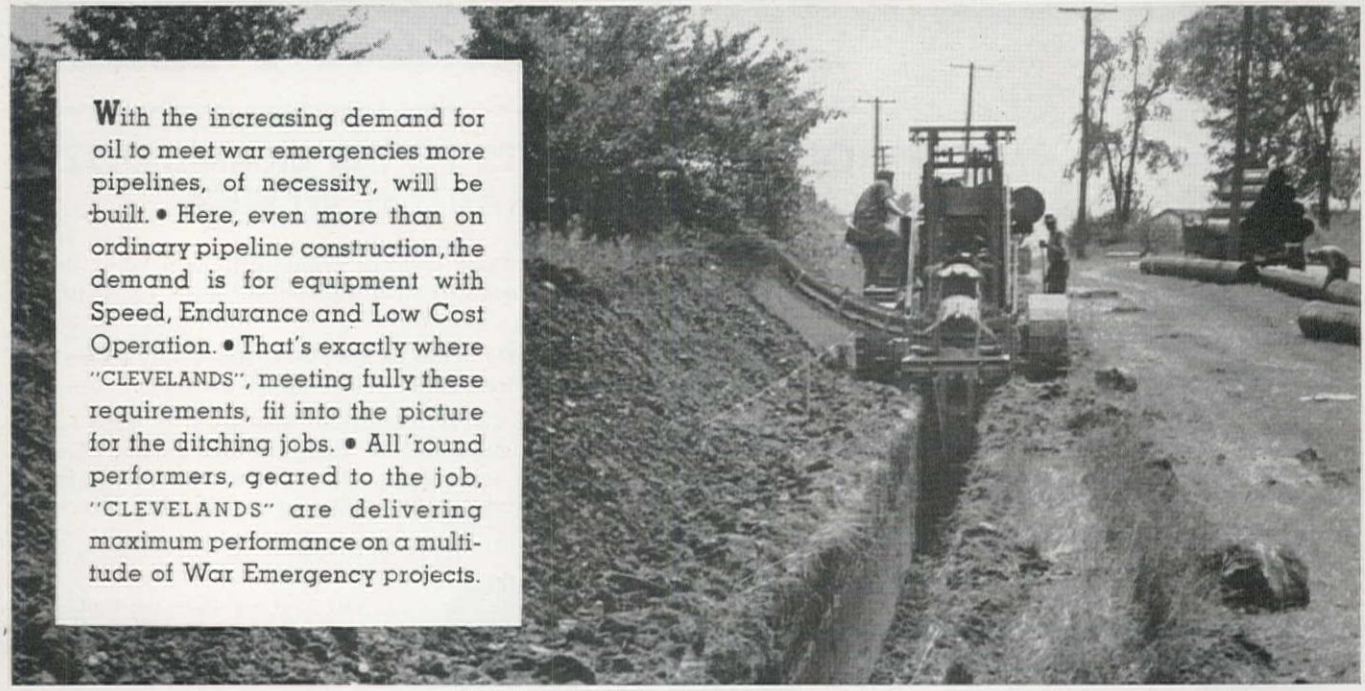

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SAN JOAQUIN CO.—**A. R. Liner,** Box 43, Merced—over $50,000, for a bldg.—by U. S. Engineer Office, Sacramento. 2-24

SAN LUIS OBISPO CO.—**Wm. C. Crowell Co.,** 495 S. Arroyo Parkway, Pasadena—$327,000, for 60 war dwelling units for couples and 140 for families—by San Luis Obispo Co. Housing Authority, Paso Robles. 2-23

SAN LUIS OBISPO CO.—**DeLuca & Sons,** 1745 Filbert St., San Francisco—$100,000, for 195 dormitory units at Camp Roberts—by San Luis Obispo Co. Housing Authority, Paso Robles. 2-24

SANTA BARBARA CO.—**Bennett & Stevens,** 35 N. Raymond Ave., Pasadena—over $100,000, for addtl. hospital bldgs. and utilities at a general hospital—by U. S. Engineer Office, Santa Maria. 2-24

STANISLAUS CO.—**J. S. Metzger & Sons,** 3045 Gilroy St., Los Angeles—$88,000 for structures and services at Newman Labor Camp—by Emergency Rubber Project, Los Angeles. 2-26

VENTURA CO.—**Hommes & Eudemiller,** 6521 Wilshire Blvd., Los Angeles—$268,-428, for housing project of 180 temporary units, near Oxnard—by Federal Public Housing Authority, San Francisco. 2-11

YOLO CO.—**Claude P. Lindsay,** 824 Taraval St., San Francisco—$157,991, for struct. and services at the Woodland emergency rubber labor camp—by Department of Agriculture, Los Angeles. 2-8

Colorado

LAS ANIMAS CO.—**Larson & Udeson,** 309 Wilda Bldg., Denver—over $100,000, for an internment camp addition of approx. 80 buildings—by U. S. Engineer Office, Denver. 2-18

PUEBLO CO.—**Platt Rogers, Inc.,** Box 153, Pueblo—for 210 frame housing units at Pueblo—by Federal Public Housing Authority, Kansas City, Mo. 2-18

Nebraska

BOX BUTTE CO.—**Busboom & Rauh,** 109 E. Iron Ave., Salina, Kansas—over $50,000, for warehouse, motor repair shop and cold storage bldg.—by U. S. Engineer Office, Omaha. 1-29

Nevada

LINCOLN CO.—**Hommes & Eudemiller,** 6521 Wilshire Blvd., Los Angeles, Calif.—for temporary housing project of 110 units at Pioche—by Federal Housing Authority, San Francisco, Calif. 2-17

CLARK CO.—**O. & O. Novelty Co., Inc.,** 1325 Lander St., Reno—$33,772, for 2 units at the Las Vegas elementary school—by Federal Works Agency, Los Angeles, Calif. 2-2

New Mexico

CHAVES CO.—**H. E. Webb Construction Co.,** Lubbock, Texas—over $50,000, for 2 ward bldgs. at an airfield—by U. S. Engineer Office, Albuquerque. 2-2

CURRY CO.—**M. M. Sundt Construction Co.,** 440 S. Park Ave., Tucson, Arizona—over $100,000, for addtl. housing and technical facil. at an airfield—by U. S. Engineer Office, Albuquerque. 2-9

GRANT CO.—**Mayfield & Leavell,** 802 Bassett Tower, El Paso, Texas—for a housing project of 200 units at Hanover—by Federal Public Housing Authority, Fort Worth, Texas. 2-4

LUNA CO.—**K. L. House Construction Co.,** Albuquerque—over $50,000, for addtl. temp. construction at an airfield—by U. S. Engineer Office, Albuquerque. 2-19

LUNA CO.—**J. E. Morgan & Sons,** 210 N. Campbell St., El Paso, Texas—over $50,000, for addtl. bldgs. at an airfield—by U. S. Engineer Office, Albuquerque. 2-9

SAN MIGUEL CO.—**R. J. Minton Construction Co.,** 406 Montgomery St., San Francisco, Calif.—over $50,000, for addtl. bldgs. at an airfield—by U. S. Engineer Office, Albuquerque. 2-24

Oregon

JACKSON CO.—**Dan J. Malarkey,** 923 S. W. 17th Ave., Portland—$271,674, for 125 family housing units at Medford—by Jackson County Housing Authority, Medford. 2-18

JACKSON CO.—**Northwest Construction Co.,** 2014 NE Sandy Blvd., Portland—$37,960, for remodeling existing garage bldg. as recreation bldg. in Medford—by Federal Works Agency, Seattle, Wash. 2-3

MULTNOMAH CO.—**Chas. R. Schmeideskamp,** Oswego—$139,453, for five emergency school bldgs. in Portland—by Federal Works Agency, Seattle, Wash. 2-1

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CORYELL CO.—**A. Farnell Blair,** Decatur, Ga.—over $5,000,000, for bldgs.—by U. S. Engineer Office, San Antonio. 2-5

KINNEY CO.—**Lee A. Christy,** 503 Builders Exchange Bldg., San Antonio—over $500,000, for temporary frame bldgs.—by U. S. Engineer Office, San Antonio. 2-13

PRESIDIO CO.—**Gough Bros.,** Houston—over $50,000, for addtl. bldgs. at an airfield—by U. S. Engineer Office, Albuquerque, N. Mex. 2-11

REEVES CO.—**W. T. Davis, Inc.,** Albuquerque, N. Mex.—over $50,000, for addtl. airfield housing and technical facilities—by U. S. Engineer Office, Albuquerque, N. Mex. 2-17

REEVES CO.—**R. J. Minton Construction Co.,** 406 Montgomery St., San Francisco, Calif.—over $50,000, for additional airfield bldgs.—by U. S. Engineer Office, Albuquerque, N. Mex. 2-11

TARRANT CO.—**James T. Taylor & Sons,** 606 First Natl. Bank Bldg., Fort Worth—over $100,000 for hangar, housing and facilities—by U. S. Engineer Office, Denison. 2-26

WARD CO.—**Taylor & Chambers,** Roswell, N. Mex.—over $100,000, for additional airfield housing and technical facilities—by U. S. Enginer Office, Albuquerque, N. Mex. 2-16

Utah

TOOELE CO.—**Olson Construction Co.,** Hill Field—over $100,000, for civilian war housing—by U. S. Engineer Office, Salt Lake City. 2-1

UTAH CO.—**Groneman & Co.,** F. & M. Bank Bldg., Provo—$360,000, for 60 brick houses on the state highway—by J. Erval Christense, Orem. 1-29

VARIOUS COUNTIES—**Robert E. McKee,** 4700 San Fernando Rd., West Los Angeles, Calif.—$4,241,500, for four housing projects—by Federal Public Housing Authority, San Francisco, Calif. 2-16

Washington

CLARK CO.—**Heinricks & Quoidback Co.,** 117 W. 23rd St., Vancouver—$458,800, for 200 row-house dwelling units in the Fruit Valley district—by Housing Authority, Vancouver. 2-1

CLARK CO.—**King Co.** and **Drexel Scott,** Vancouver—$206,000, for an addn. to the hospital—by Clark General Hospital, Vancouver. 2-3

CLARK CO.—**Ralph & Horowitz,** 1825 N. Flint, Portland, Ore.—for a west outfitting bldg. of 284x62 ft., at Vancouver shipyard—by Kaiser Company, Vancouver. 2-2

CLARK CO.—**Reimers & Jolivette,** Railway Exchange Building, Portland, Ore.—for an electrical warehouse two stories high, 208x160 ft. in area, at Vancouver shipyard—by Kaiser Company, Vancouver. 2-2

CLARK CO.—**Reimers & Jolivette,** Railway Exchange Building, Portland, Ore.—for a two-story addn. to the present outfitting bldg., 364x125 ft., at Vancouver shipyard—by Kaiser Company, Vancouver. 2-2

CLARK CO.—**Sound Construction & Engineering Co.,** 1017 Northern Life Tower, Seattle—$2,706,415 for 1,500 dwellings, an administration bldg. and utilities near Ogden Meadows—by Vancouver Housing Authority. 2-10

GRANT CO.—**Clyde M. Ludberg,** W. 326 1st Ave., Spokane—over $50,000, for warehouses—by U. S. Engineer Office, Seattle. 2-2

KING CO.—**J. C. Boespflug Construction Co.,** Securities Bldg., Seattle—$106,000, for a business center in the Renton housing project—by Housing Authority, Renton. 2-24

KING CO.—**Brady Construction Co.,** 1166 Mercer St., Seattle—$377,500 for housing project in Rainier Valley—by Seattle Housing Authority. 2-18

KING CO.—**A. W. Johnson** and **Goetz & Brennan,** 914 Seaboard Bldg., Seattle—over $50,000, for 3 military buildings—by U. S. Engineer Office, Seattle. 2-18

KING CO.—**Lease & Leigland,** Dexter Horton Bldg., Seattle—$843,000, for 450 housing units on scattered sites near the Cooper School in West Seattle—by Housing Authority, Seattle. 2-24

KING CO.—**A. F. Mowat Construction Co.,** 1331 3rd Ave., Seattle—over $50,000, for a Radar station—by U. S. Engineer Office, Seattle. 2-18

KING CO.—**Rainier Construction Co.,** American Bldg., Seattle—$67,552 for 40 housing units at Minor and Boren Aves., in Seattle—by Seattle Housing Authority, Seattle. 2-11

KING CO.—**Strand & Son,** 1905 15th Ave. North, Seattle—$684,000, for 400 housing

units on the Lakewood Golf Course—by Housing Authority, Seattle. 2-15

KING CO.—**Washington Lumber & Construction Co.,** 3447 Fourth Ave. S., Seattle—$79,795 for an elementary school building at 112th Ave. N.E. and N.E. 65th St.—by Kirkland School Board. 2-25

KITSAP CO.—**J. W. Bailey Construction Co.,** 228 9th Ave. North, Seattle—$170,100, for a 90-unit dormitory at Bremerton—by Housing Authority, Bremerton. 2-24

KITSAP CO.—**Kuney-Johnson Co.,** Box 150, Bremerton—$406,231, for a junior high school bldg. in Bremerton—by Board of School Directors, Kitsap Co. 2-18

KITSAP CO.—**S. S. Mullen,** 1222 8th Ave. West, Seattle—$610,837, for the Franklin D. Roosevelt hospital in Bremerton—by Bureau of Yards and Docks, Washington, D. C. 2-9

KITTITAS CO.—**Gaasland Construction Co.,** 1161 Ellis St., Bellingham—over $100,000 for housing—by U. S. Engineer Office, Seattle. 2-2

PIERCE CO.—**O. F. Larson & Son,** Pacific Savings Bldg., Tacoma—over $50,000, for erection of a building and warehouse—by U. S. Engineer Office, Fort Lewis Area. 2-17

SPOKANE CO.—**Clifton & Applegate** and **Henry Georg,** Box 1473, Spokane—$819,113, for 400 temporary housing units—by Federal Public Housing Authority, Spokane. 2-9

SPOKANE CO.—**Hansen & Weidner,** E. 3806 30th St., Spokane—over $50,000, for warehouses and other buildings—by U. S. Engineer Office, Seattle. 2-24

SPOKANE CO.—**Hazen & Clark,** Welch Bldg., Spokane—over $50,000, for a post util. area—by U. S. Engineer Office, Seattle. 2-2

SPOKANE CO.—**Benjamin H. Sheldon,** 2022 W. Third St., Spokane—Addition to original contract price of $976,000 for 113 more units in housing project in High Bridge park area—Federal Housing Authority, Spokane. 2-19

SPOKANE CO.—**B. H. Sheldon,** 2202 W. Third St., Spokane—$999,900, for 500 temporary housing units—by Federal Public Housing Authority, Spokane. 2-9

SPOKANE CO.—**Sound Construction & Engineering Co.,** 1701 Northern Life Tower, Seattle—over $500,000, for warehouses—by U. S. Engineer Office, Seattle. 2-3

SPOKANE CO.—**Henrik Valle Co.,** 407 Third Ave. W., Seattle—over $50,000, for a repair bldg.—by U. S. Engineer Office, Seattle. 2-24

SPOKANE CO.—**Clifton & Applegate & Henry Georg,** Box 1473, Spokane—over $100,000 for storage facilities and hangar—by U. S. Engineer Office, Seattle. 2-26

THURSTON CO.—**Dolph Jones,** 2213 N. Procter St., Tacoma—$62,200, for a nurses' home at St. Peter's Hospital, Olympia—by Federal Works Agency, Seattle. 3-2

Wyoming

ALBANY CO.—**Permanent Construction Co.,** Milwaukee, Wisconsin—$600,000 (approx.), for a pilot plant for the manufacture of sponge iron at Laramie—by Bureau of Mines, Washington, D. C. 2-11

CONVERSE CO.—**Peter Kiewit Sons' Co.,** Omaha National Bank Bldg., Omaha, Nebr.—over $1,000,000 for 185 bldgs. and utilities for a prisoners' camp—by U. S. District Engineer Office, Omaha, Nebr. 2-10

Canada

BRITISH COLUMBIA—**General Construction Co., Ltd.,** Granville Island—$950,000 for temporary accommodations at an R. C. A. F. station—by Dept. of Munitions & Supply, Ottawa.

PROPOSED PROJECTS

Arizona

COCHISE CO.—Authorization has been made by the War Dept., Washington, D. C., for an internment camp in the vicinity of Douglas, to cost approx. $1,500,000. 2-17

MARICOPA CO.—Plans are being prepared for enlargement of the Southwest hospital in Mesa, to cost about $100,000. 2-9

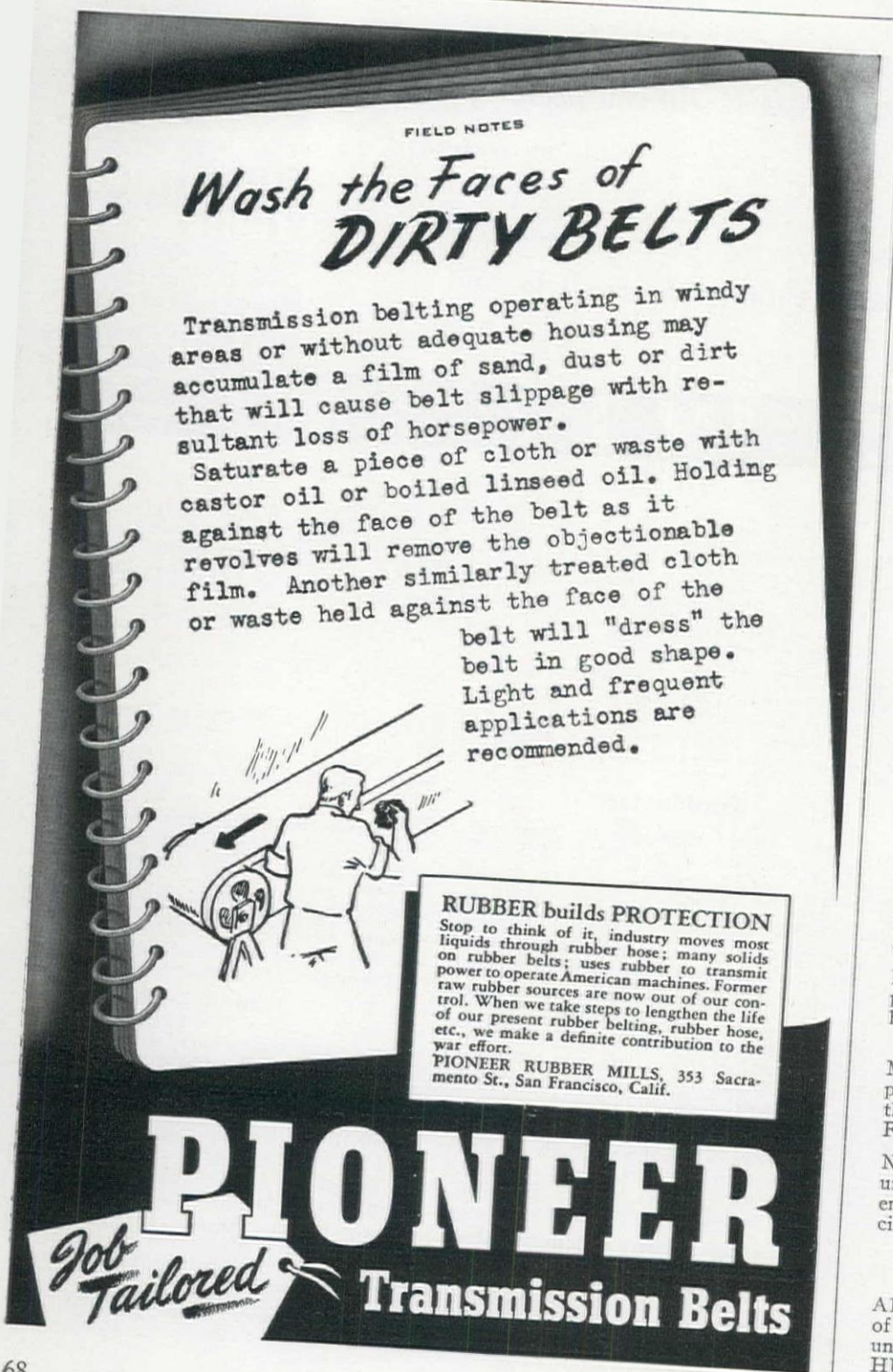
MARICOPA CO.—A 150-unit housing project is being planned for Avondale by the Federal Public Housing Authority, San Francisco, Calif. 2-17

NAVAJO CO.—A housing project of 155 units is planned for Winslow by the Federal Public Housing Authority, San Francisco, Calif. 2-19

California

ALAMEDA CO.—The Housing Authority of the City of Oakland is planning a 600-unit trailer camp in Oakland. 2-17

HUMBOLDT CO.—Plans for a new hos-



WORLD BATTLE FRONTS ARE PROVING GROUNDS FOR THE CLEAVER-BROOKS *HEATING PRINCIPLE!*

Effective use of the Cleaver-Brooks multipass, down-draft heating principle has been made in the construction of special mobile heating —sterilizing—disinfecting and distilling equipment now in service with our armed forces on all fronts.

For heating—circulating—pumping all grades and kinds of oils and bituminous materials in tank cars or storage, Cleaver-Brooks Tank Car Heaters or Pumping Boosters do the job faster—save fuel, time and money. Write for information.

CLEAVER-BROOKS COMPANY
5100 No. 33rd St., Milwaukee, Wisconsin

CLEAVER-BROOKS TANK CAR HEATERS...BITUMINOUS BOOSTERS...AUTOMATIC STEAM PLANTS

HOWARD-COOPER CORPORATION, 1520 Fourth Ave., South, Seattle, Washington. Also: 703 North Division St., Spokane, Washington; 307 S. E. Hawthorne Blvd., Portland, Oregon; Klamath Falls, Oregon; Eugene, Oregon. EDW. F. HALE COMPANY, 925 Harrison Street, San Francisco, California. SMITH BOOTH USHER, Phoenix, Arizona. Also: 2001 Santa Fe Avenue, Los Angeles, California. INTER-MOUNTAIN EQUIPMENT CO., Broadway at Myrtle St., Boise, Idaho. O. C. BELL, 649 John Fremont Drive, Reno, Nevada. LUND MACHINERY COMPANY, 49 North Second Street, West, Salt Lake City, Utah. H. W. MOORE EQUIPMENT CO., Sixth and Acoma Streets, Denver, Colorado. R. L. HARRISON CO., INC., 209 North Fourth Street, Albuquerque, New Mexico. HALL-PERRY MACHINERY CO., 802 Iron St., Butte, Montana. Also: Great Falls, Montana; Billings, Montana.

pital are being made by the Sisters of St. Joseph, at Arcata. 2-18

NAPA CO. — The Napa Union High School District is planning a 16-classroom addition, of emergency war type construction, to cost approx. $100,000. 2-24

SAN BERNARDINO CO.—Plans are being prepared for 95 dormitories and 34 temporary dwelling units at Twentynine Palms by Federal Public Housing Authority, San Francisco. 2-19

SAN DIEGO CO.—The Federal Public Housing Authority is planning a new elementary school building for the Chesterton housing project near San Diego. Cost to be $100,000. 2-18

SAN JOAQUIN CO. — Plans are being prepared for a housing project of 200 family dwelling units at Stockton—by Housing Authority of the County of San Joaquin, Stockton. 2-17

SAN MATEO CO.—The Housing Authority of South San Francisco is preparing plans for 200 family units on San Mateo Ave., near 7th St. 2-17

SISKIYOU CO. — Plans are being prepared for 20 dwelling units for couples and 40 for families at Happy Camp, by Federal Public Housing Authority, San Francisco. 2-24

SANTA BARBARA CO.—Plans are being prepared for 100 family dwelling units and 60 accommodations for couples at Lompoc — by Federal Public Housing Authority, San Francisco. 2-19

Nevada

MINERAL CO. — Hospital facilities at Hawthorne have been approved by the President, to cost approx. $113,000. 2-19

DE BACA CO.—Plans are being prepared for 100 dormitory units, 60 accommodations for couples and 85 family units at Fort Sumner — by Federal Public Housing Authority, Fort Worth, Tex. 2-23

Washington

FRANKLIN CO.—Presidential approval has been aanounced for a standard-type recreation bldg. in the city of Pasco to accommodate men stationed at nearby military and naval bases. To cost $67,000. 2-3

ISLAND CO. — Approval has been announced for 150 family dwelling units and 45 accommodations for couples at Oak Harbor — by Federal Public Housing Authority, Washington, D. C. 2-4

KING CO.—The 13th Naval District has announced that the new naval hospital in Seattle will be expanded to accommodate 1,500 casualties. Cost to be in excess of $1,000,000. 2-18

KING CO.—Presidential approval has been announced for const. and equip. of an elementary school bldg. in White Center, for approx. 350 pupils, to cost $68,500. 2-3

KING CO.—Plans have been completed for an elementary school bldg. at Renton, to cost about $148,500. 2-18

SKAGIT CO. — Approval has been announced for 75 family dwelling units at Anacortes — by Federal Public Housing Authority, Washington, D. C. 2-4

WALLA WALLA CO. — Authorization has been granted for the expansion of an existing army hospital, to cost approx. $1,000,000. 2-5

Canada

ALBERTA — Providing necessary material priorities can be secured, a $500,000 tuberculosis sanitorium will be built on the University campus at Edmonton by the Alberta Provincial Govt.

Miscellaneous . . .

CONTRACTS AWARDED

Arizona

MARICOPA CO. — **J. K. Thomas** and **Beyer Construction Co.**, 533 Chamber of Commerce Bldg., Los Angeles—over $50,000, for sub-depot facilities—by U. S. Engineer Office, Phoenix. 2-18

California

ALAMEDA CO.—**Pacific Bridge Co.**, 333 Kearny St., San Francisco — $13,410,000, for a steel floating drydock at Alameda—by Bureau of Yards & Docks, Washington, D. C. 2-5

FRESNO CO.—**Pacific Pipe Line Construction Co.**, 8732 S. Juniper St., Los Angeles—less than $100,000, for utilities—by U. S. Engineer Office, Sacramento. 2-3

FRESNO CO.—**Stewart & Nuss, Inc.**, 410 Thorne Ave., Fresno—$19,800, for 26,400 ft. of rail removal and repaving on various Fresno streets—by War Materials, Inc., San Francisco. 1-29

HUMBOLDT CO.—**Eureka Ship Builders, Inc.**, Eureka—$35,970 (each) for six tugs—by Maritime Commission, Washington, D. C. 2-2

KERN CO.—**Associated Engineers**, 3606 El Camino Real, Palo Alto—$135,993, for overhead sprinkler installations and water supply lines at Worthington and Caliente nurseries, near Bakersfield—by U. S. Dept. of Agriculture, Emergency Rubber Project, Los Angeles. 2-18

KERN CO.—**W. F. Waldon**, 222 S. Union St., Bakersfield—$65,528, for 92,400 ft. of rail removal and repaving on various Bakersfield streets — by War Materials, Inc., San Francisco. 1-29

LOS ANGELES CO.—**Schroeder & Co., Inc.**, Box 308, Roscoe—$39,226, for 3 in. bitum. embankment paving, storm water run-off channel and roadways at Elysian Reservoir — by Department of Water & Power, Los Angeles. 2-1

SAN BERNARDINO CO.—**Contracting Engineers Co.**, 2310½ W. Vernon Ave., Los Angeles—over $50,000, for a gasoline fueling system at an air depot—by U. S. Engineer Office, San Bernardino. 2-2

SAN BERNARDINO CO. — **Flotation Systems, Inc.**, 4031 Goodwin Ave., Los Angeles—over $100,000, for util. and steam distrib. system at a hospital at an anti-aircraft range—by U. S. Engineer Office, San Bernardino. 2-2

SAN BERNARDINO CO.—**E. A. Kaiser Co.**, 8825 Olympic Blvd., Beverly Hills—over $100,000, for service command troop facilities—by U. S. Engineer Office, San Bernardino. 2-17

SAN DIEGO CO.—**Macco Construction Co.**, 815 Paramount Blvd., Clearwater—$7,570,500, for addtl. facil. at a destroyer base—by Bureau of Yards & Docks, Washington, D. C. 2-9

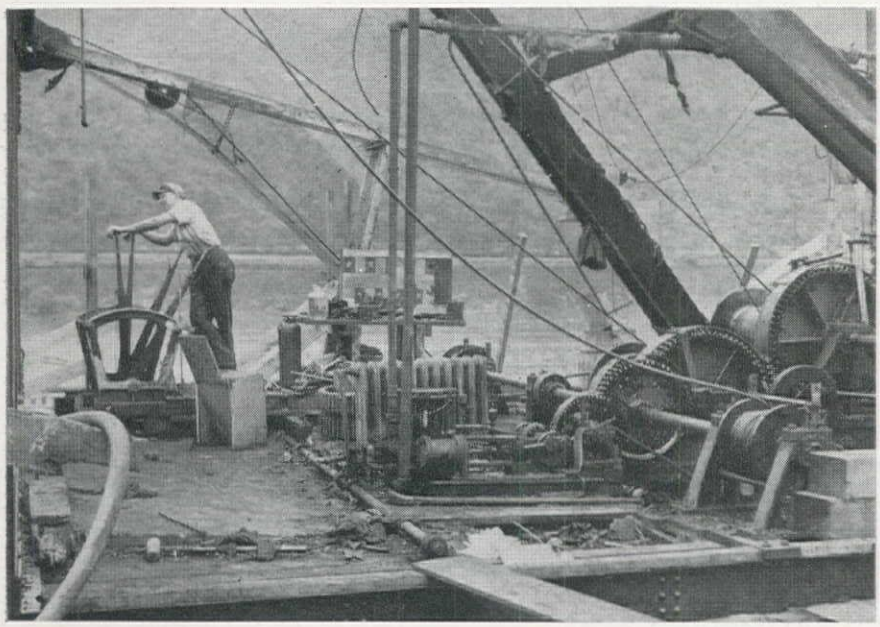
SAN DIEGO CO.—**Pacific Bridge Co.**, 333 Kearny St., San Francisco—$773,000, for 3 timber floating drydocks at San Diego — by Bureau of Yards & Docks, Washington, D. C. 2-5

SAN DIEGO CO.—**Joseph Papotta**, 482 S. Fraser St., East Los Angeles—$23,597, for excavation and foundation work for new hospital bldg. at San Diego County Hospital — by Federal Works Agency, Los Angeles. 2-15

SAN JOAQUIN CO.—**Pollock Stockton Shipbuilding Co.**, Forum Bldg., Sacramento—$6,420,000, for six sections of steel sectional floating drydock, at Stockton—by Bureau of Yards & Docks, Washington, D. C. 2-11

UNANNOUNCED CO. — **Pacific Coast Engineering Co.**, Drawer E, Alameda — $250,000, for 100-ton floating derrick in the Twelfth Naval District — by Bureau of Yards & Docks, Washington, D. C. 2-23

Like old friends they last well.



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Still in use after 45 years service for McCrady-Rodgers Co.

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LIDGERWOOD Established 1873
MANUFACTURING COMPANY
Main Office and Works ELIZABETH, NEW JERSEY

STEERING GEARS, WINDLASSES, TOWING ENGINES.

Builders of fine Hoisting Machinery for over 69 years

Idaho

ELMORE CO.—**Walton & Brown Electric Co.**, Salem, Ore.—$70,000 (approx.), for an electric distrib. system and street lighting system—by U. S. Engineer Office, Portland, Ore. 2-3

Nebraska

CLAY CO.—**Wyatt C. Hedrick**, Fort Worth, Texas—over $100,000 for architect-engineer services in the design of project and supervision of construction—by U. S. Engineer Office, Omaha. 2-26

HALL CO.—**E. J. Tipton**, Denver, Colo.—over $50,000 for architect-engineer services in the design of project and supervision of construction — U. S. Engineer Office, Omaha. 2-26

REDWILLOW CO.—**E. T. Archer & A. W. Archer**, Kansas City, Mo.—over $50,000, for architect-engineer services in the design of project and supervision of construction—by U. S. Engineer Office, Omaha. 2-26

Oklahoma

CARTER CO.—**General Engineering Co.**, Fort Worth, Texas—over $50,000, for gasoline and fueling systems—by U. S. Engineer Office, Denison, Texas. 1-28

COMANCHE CO.—**A. C. Shelton & Son**, Lawton—over $50,000 for a target rifle range—by U. S. Engineer Office, Denison, Texas. 2-26

Oregon

CLATSOP CO. — **Astoria Marine Construction Co.**, Astoria—Two wooden subchasers of 136-ft. length — by Bureau of Yards & Docks, Washington, D. C. 2-15

LINCOLN CO. — **Siletz Boat Works**, Kernville—$39,524 (each), for two tugs—by Maritime Commission, Washington, D. C. 2-2

TILLAMOOK CO. — **V. D. Reverman**, 1605 SE 49th Ave., Portland—$44,298, for roads and other facilities for a 150-unit

trailer camp at Tillamook — by Housing Authority, Portland. 2-5

TILLAMOOK CO. — **Steinbach Iron Works,** Tillamook—$38,264 (each), for 3 tugs—by Maritime Commission, Washington, D. C. 2-2

Utah

DAVIS CO.—**Ashton, Evans & Hodgson,** Salt Lake City; **Blanchard & Maher,** 369 Pine St., San Francisco, Calif.; and **Clyde C. Kennedy,** 604 Mission St., San Francisco, Calif.—$90,000 for architectural and engineering services at Clearfield Naval Supply depot — by Bureau of Yards & Docks, Washington, D. C. 2-4

TOOELE CO. — **James I. Barnes Construction Co.,** 1119 Montana St., Santa Monica, Calif. — $2,470,000, for housing project in Tooele — by Federal Public Housing Authority, Kansas City, Mo. 2-17

Washington

CLARK CO.—**Yelton Plumbing & Heating Co.,** Vancouver—$54,989, for plumbing and heating for the Clark General Hospital in Vancouver—by Clark General Hospital, Vancouver. 2-3

KING CO.—**Sound Construction & Engineering Co.,** Northern Life Tower, Seattle —over $500,000, for barges—by U. S. Engineer Office, Seattle. 2-5

KITSAP CO. — **Valley Construction Co.,** 8423 48th St., Bremerton—$64,842 for 12-in. pipe line and appurtenant facilities, including a submarine line across Washington Narrows—by Federal Works Agency, Seattle. 2-18

KITTITAS CO.—**Gaasland Construction Co.,** 1161 Ellis St., Bellingham—over $50,000 for util. yard facil.—by U. S. Engineer Office, Seattle. 2-1

MASON CO.—**Aqua Systems, Inc.,** New York City—over $50,000, for a gasoline distribution system — by U. S. Engineer Office, Seattle. 2-13

PIERCE CO.—**J. M. Martinac Shipbuilding Corp.,** 1404 E. D St., Tacoma—for 4 heavy wooden tugs—by Bureau of Yards & Docks, Washington, D. C. 2-15

PIERCE CO.—**Western Pipe & Steel Co.,** 200 Bush St., San Francisco, Calif. — $109,931, for fabrication, erection and testing of steel surge tanks and testing welded shaft liners for the La Grande tunnel and power house on the second Nisqually power project — by Board of Contracts and Awards, Tacoma. 2-4

SNOHOMISH CO.—**General Construction Co.,** 3840 Iowa, Seattle—less than $50,000, for riprapping and grading at military site—by U. S. Army Engineers, Seattle. 2-18

SPOKANE CO. — **Clifton & Applegate** and **Henry Georg,** 628 Hutton Bldg., Spokane—over $100,000, for sub-depot facilities—by U. S. Engineer Office, Spokane. 2-18

SPOKANE CO.—**Ford J. Twaits Co.,** 451 S. Boylston St., Los Angeles, Calif.—over $100,000, for a gasoline storage system—by U. S. Engineer Office, Seattle. 2-3

Canada

BRITISH COLUMBIA—**Tomlinson Construction Co.,** 10013 101st Ave., Edmonton, Alberta—about $105,000, for installation of ground services at an R. C. A. F. station—by Dept. of Munitions & Supply, Ottawa.

Mexico

VARIOUS STATES—**Morrison-Knudsen Co.,** 411 W. 5th St., Los Angeles, Calif. and 76 Ave. Juarez, Mexico City—for realignment and widening of approx. 500 mi. of railroad south of Mexico City—by Mission on Mexican Railways, Washington, D. C. 2-9

PROPOSED PROJECTS

California

LOS ANGELES CO. — The Redondo Beach City Council is considering transfer of bond funds voted in 1938, amounting to $125,000, for const. of a bulkhead along the city's north beach. 2-9

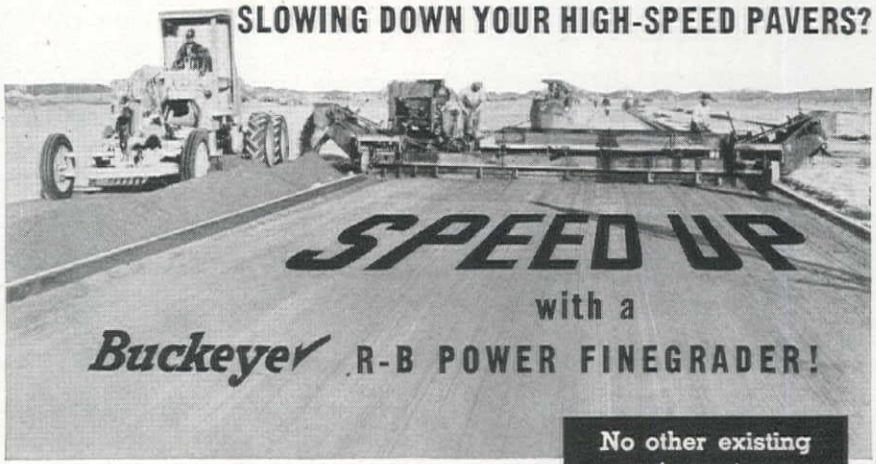
Texas

EL PASO CO. — Emergency Rubber Project, Los Angeles, Calif., is having plans prepared for a guayule rubber labor camp near El Paso. 2-23

Central States

The War Production Board has approved of a 20-in. pipeline, 830 mi. in length, from Beaumont, Tex., to Seymour, Ind. 2-3

ARE *OUT-of-DATE* FINEGRADING METHODS SLOWING DOWN YOUR HIGH-SPEED PAVERS?



SPEED UP with a Buckeye R-B POWER FINEGRADER!

No other existing equipment can prepare subgrade as quickly, cheaply and accurately as a BUCKEYE R-B POWER FINEGRADER

TODAY'S rush jobs call for speed from start to finish. Concrete and black-top pavers have been stepped up to record-breaking performances, yet on many jobs paving output is still keyed to out-of-date finegrading methods that waste time, paving material and money.

Power finegrading with job-tested Buckeyes delivers an accurate, smooth grade at rates to keep pace with your fastest paver. Slow hand operations are eliminated; there are no variations in grade to waste costly paving material . . . the job's done *right* and done *fast!*

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FINDLAY • OHIO

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

THE BUCKEYE TRACTION DITCHER CO., Findlay, Ohio

See our advertisements on pages 79 and 149.

TRADE WINDS

News of Men Who Sell to the Construction West

PACIFIC NORTHWEST

S. A. Hayes, formerly manager, and **John H. Shafer,** formerly assistant manager of motor truck sales and service for *International Harvester Co.* at Seattle, have both resigned to enter military service.

* * * *

Merle J. Attridge, for 15 years with the Washington Water Power Co., Spokane, where he was last manager of customer contact work, has joined the staff of the *Graystone Concrete Products Co.,* Seattle, where he will serve in the personnel and cost accounting department.

* * * *

Markey Machinery Co., Seattle, has been presented with the Army-Navy "E" pennant in recognition of its excellent performance in production of war materials. Capt. R. P. Luker, commanding officer of the Seattle naval station, presented the pennant, and **C. H. Markey,** president of the company, accepted the award. Individual "E" pins were also given to workers.

* * * *

Star Iron & Steel Co., Tacoma, has been awarded the Army-Navy "E" for outstanding production of war materials. **R. N. Allen,** president of the firm, received the award.

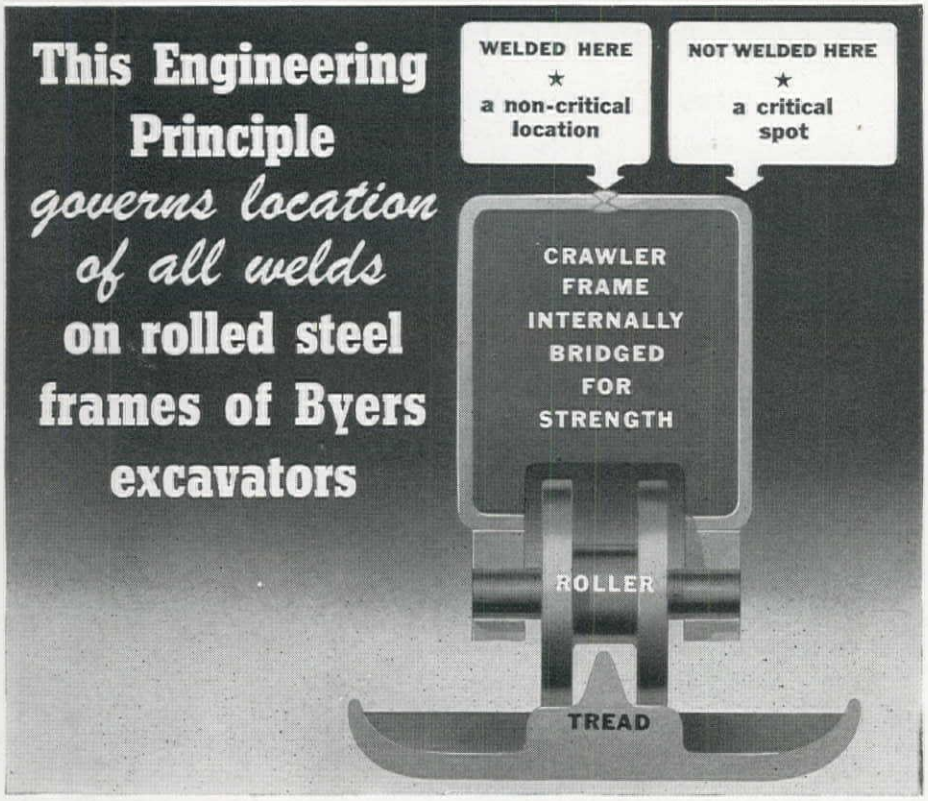
* * * *

Ralph K. Gottshall, who has been manager of the Northwest district for *Atlas Powder Co.,* with offices in Seattle, has been transferred to the general offices of the company in Wilmington, Del., where he will be director of sales for the explosives department. **William T. Mahood** has been appointed to the northwest post, succeeding Gottshall.

* * * *

F. J. Balzer, president of the *F. J. Balzer Machinery Co.* of Seattle, died suddenly on January 30 in Seattle. He was very well known in the machinery business in the vicinity of Puget Sound.

* * * *



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EDWARD R. BACON CO., San Francisco
NELSON EQUIPMENT CO., Portland and Seattle Offices
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WILLARD EQUIPMENT, LTD., Vancouver, B. C.

Specify **BYERS**
CRANES and SHOVELS
RAVENNA, OHIO
DISTRIBUTORS THROUGHOUT THE WORLD

GUS N. ARNESON, for the past six years chief of research for Douglas Fir Plywood Association at its Tacoma, Wash., laboratories, has been called to the government's Forest Products Laboratory at Madison, Wisconsin, to organize additional studies of war uses for wood, glue and plywood.

CALIFORNIA

At a truck and bus conservation meeting sponsored by *Mack-International Truck Co.* in San Francisco recently, over 1,000 truck and bus drivers from the bay area took the "Keep 'em rolling" pledge administered by **J. R. Willhide,** district manager of the Office of Defense Transportation. The prin-

cipal address of the evening was delivered by **Albert G. Crockett,** transportation engineer of the Mack company.

* * * *

Victor Equipment Co., San Francisco, on February 6 was awarded the Army-Navy "E" pennant in recognition of excellence in the production of welding and cutting equipment, now in use in every corner of the world where American soldiers and technicians are quartered. Addresses were made by numerous civil and military authorities, and messages were received from Capt. Eddie Rickenbacker and other important persons, before the pennant was awarded to **L. W. Stettner,** president of the company, by Maj. Gen. Barney E. Giles, on behalf of the Army and Navy departments in Washington, D. C. Individual "E" lapel pins were presented to Victor employees by Lt. Comdr. Jas. S. Moulton, U. S. N. R.

* * * *

H. C. Sage, formerly assistant manager of farm and industrial equipment for *International Harvester Co.,* in San Francisco, Calif., left the employ of the company on January 1 to enter business for himself.

* * * *

Federal-Mogul Service, manufacturers of sleeve bearings for motor equipment, with main office in San Francisco, has established a branch factory at 1830 H St., Fresno. **Earl Lewis** will be manager of the Fresno operations.

* * * *

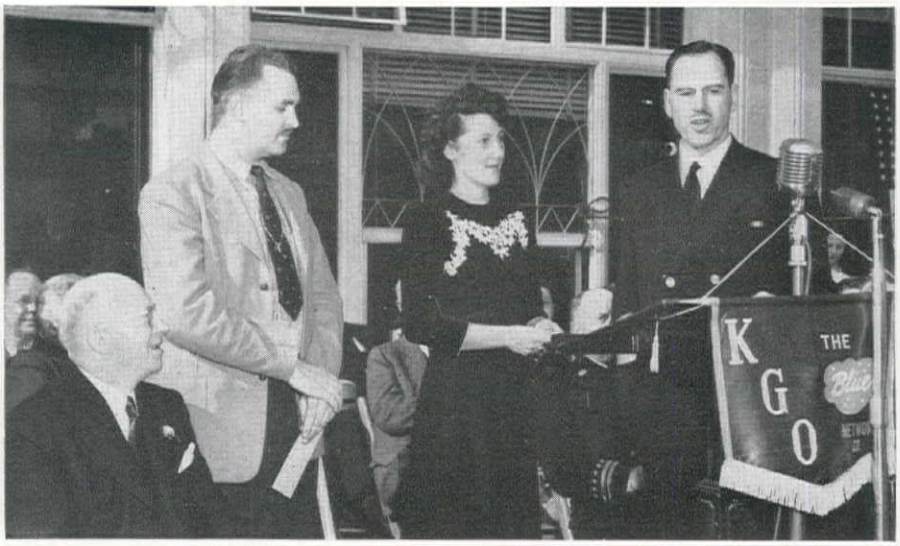
Tucson Metal Manufacturing Co., which recently established a branch factory in Glendale, has taken over the Southern California Edison building, in Redondo Beach, for a second subsidiary. The building has lain vacant for about 15 years. **Harry B. Groom** and **O. T. Swanson** are supervising renovation of the building and installation of forges and other equipment.

* * * *

A. Horne, formerly with L. H. Butcher Co., and for the last four years sales manager of Machinery & Equipment Co., San Francisco, has established the *A. Horne Machinery Co.,* at 1188 Harrison St., San Francisco, to deal in fabricated products and construction equipment, featuring used equipment.

* * * *

R. C. Garvey has been appointed district sales manager for *Jones & Laughlin Steel*



PRESENTATION of "E" lapel pins at the ceremonies at the award of the Army-Navy "E" pennant to Victor Equipment Co., San Francisco, Calif., was made by LT. COMDR. JAS. S. MOULTON, U.S.N.R., to MISS MARY SNYDER and A. H. ANDERSON, on behalf of the 250 employees of the firm, which is engaged in manufacture of welding and cutting equipment.

THE H-S 4A PORTABLE CONCRETE DRILL

Newest H-S Model. Powerful—compact—portable—with capacity from 1½" to 4" clean, dustless holes up to 20" depth through concrete, tile, marble, stone and ceramic products.

Rolls easily from job to job. Eliminates spalling—saves time and money. Write for literature and prices. Inquiries invited from equipment distributors.

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Immediate Delivery Subject to Prior Sale

GOOD USED COPPER WIRE

Approx. 10 tons—Used 3/0 GROOVED BARE COPPER TROLLEY WIRE.
Approx. 4½ tons—Used 4/0 H. D. BARE SOLID ROUND COPPER WIRE.
Approx. 49 tons—*Used 4/0 INSULATED SOLID ROUND COPPER WIRE.
Also lesser quantities of 4/0 Grooved and 4/0 Fig. 8 BARE COPPER TROLLEY WIRE.
*Single Braid Weatherproof Insulation.

DULIEN
STEEL PRODUCTS, INC.
OF WASHINGTON
414 FIRST AVE. SO., SEATTLE, WASH.
Other Offices—Portland and Butte
Affiliated Offices—New York, New Orleans, San Francisco and Los Angeles

Ready for Distribution Soon . . .
CONSTRUCTION DESIGN CHARTS

With jobs piling up there's no time to waste these days on tedious figuring of routine problems. The new edition of *Construction Design Charts,* by Prof. James R. Griffith, gives you the answers in a flash! Engineers—carpenters—concrete men—foremen—superintendents—there's a whale of a value in this book for every man engaged in construction today! The new revised edition contains 72 charts, instead of the 48 published in the original book. *Construction Design Charts* is the only book of its kind ever published by *Western Construction News.* Covered in sturdy black fabrikoid, stamped in gold, the book has a special metal binding that allows each page to lie flat for easy reference.

For purchasers of the original edition a 50-page supplement is being prepared for insertion in the first volume. It contains the 24 charts not included in the 1940 edition. Price $1.25. Orders must be prepaid.

YOU GET ALL THIS

How Nomographs Are Constructed
Concrete Design
Concrete Form Design
Earthwork
Highway Design
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Structural Design
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YES, I want a copy of CONSTRUCTION DESIGN CHARTS, for which I enclose $3.00. Add 9c sales tax if ordering from a California address. If I'm not completely satisfied, I can return book in 10 days and get my money back.

Name.....
Address.....
P. O.....
State.....
Position.....
Company.....

Corp., in San Francisco, to succeed **C. P. Hensley**, who has retired.

* * * *

Harry C. Collins, a veteran in the sales of mining and construction equipment, has formed a new partnership to be known as the *Collins & Hamilton Equipment Co.* The new firm is located at 2421 E. 57th St., Los Angeles, and for the duration will specialize in reconditioning of used equipment.

* * * *

D. H. Patterson, Jr. of *Fibreboard Products, Inc.*, San Francisco, has been named to the W. P. B. advisory committee to the paperboard industry.

Charles W. Huse, director of public relations at *Columbia Steel Co.*, San Francisco since 1937, has entered the U. S. Marine Corps as a first lieutenant. **Frank A. Burns**, his assistant, has been appointed acting public relations director.

* * * *

Paul M. McConihe, petroleum engineer and manager of lubricant sales for *Seaside Oil Co.*, Santa Barbara, has been commissioned a captain in the Marine Corps, and is now stationed at San Francisco. **Greydon C. Howell**, secretary of the company, has joined the American Red Cross, and **George D. McPhee**, assistant secretary will fill his post. **Earl C. Beaulieu** becomes assistant secretary.

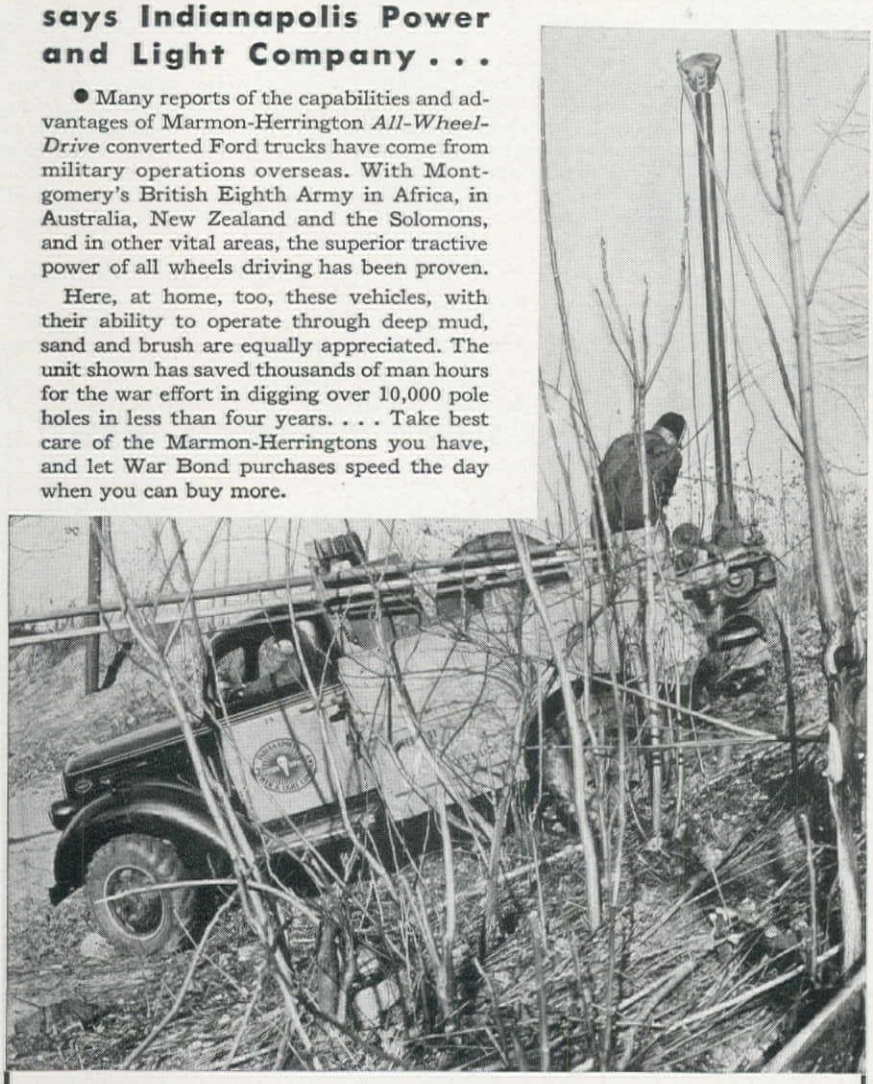
PAUL M. McCONIHE

"INDISPENSABLE"

says Indianapolis Power and Light Company . . .

● Many reports of the capabilities and advantages of Marmon-Herrington *All-Wheel-Drive* converted Ford trucks have come from military operations overseas. With Montgomery's British Eighth Army in Africa, in Australia, New Zealand and the Solomons, and in other vital areas, the superior tractive power of all wheels driving has been proven.

Here, at home, too, these vehicles, with their ability to operate through deep mud, sand and brush are equally appreciated. The unit shown has saved thousands of man hours for the war effort in digging over 10,000 pole holes in less than four years. . . . Take best care of the Marmon-Herringtons you have, and let War Bond purchases speed the day when you can buy more.



MARMON-HERRINGTON

All-Wheel-Drive

MARMON-HERRINGTON COMPANY, Inc.

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Week-end Vacations

With new reduced rates now in effect during "The Duration" the Santa Barbara Biltmore offers you an ideal place for a weekend vacation. Both rooms and meals, on the European plan, are moderately priced. ☆ In addition to the many attractions that the hotel offers you, guests also have the privilege of enjoying the world renowned Coral Casino.

WILL P. TAYLOR, Manager

Reservations

ALLIED HOTELS AND APARTMENTS

666 So. LaFayette Park Place, Los Angeles

745 Market Street, San Francisco

SANTA BARBARA *Biltmore*

DAN R. RANKIN has been appointed chief engineer of the Peerless Pump Division of Food Machinery Corporation, Los Angeles. For the past five years he has been assistant to the Chief Engineer. Continuous research in hydraulics is going forward under Rankin's direction, to adapt Peerless products to new applications in many varied fields.

AMONG THE MANUFACTURERS

Louis G. Bissell, for many years a director and counsel of *Mack Trucks, Inc.,* Long Island City, N. Y., has been elected chairman of the board. At the same time, **Charles T. Ruhf,** formerly operating vice president of *Mack Manufacturing Corp.,* was made president of the latter corporation and executive vice-president of the parent company.

* * * *

William R. Jackson has been made secretary-treasurer of *Pittsburgh-Des Moines Steel Co.,* succeeding **George A. Smith,** who is retiring after 44 years of active service. Other new appointments in the company include **R. J. Jackson** as assistant secretary-treasurer, and **A. B. Sanderson** as a director.

* * * *

Charles A. Crane, who entered the employ of *Templeton, Kenly & Co.,* manufacturers of lever, screw and hydraulic jacks, in 1898, as his first job out of school, has returned to the company after many years of work in the construction field. His new connection is as assistant to the president.

* * * *

W. I. Galliher has been appointed executive sales manager of the Columbia Chemical division of *Pittsburgh Plate Glass Co.,* Pittsburgh, Pa., manufacturers of heavy industrial chemicals, such as alkalies, chlorine, calcium chloride, and specialties. He succeeds **Eli Winkler,** who is being retained as executive consultant.

* * * *

A special award of honor was presented to *E. I. du Pont de Nemours & Co., Inc.,* Wilmington, Del., for "distinguished service to safety" recently by the National Safety Council. Records showed that 38 of the du Pont plants had no reportable accidents in at least 18 months.

* * * *

Edward J. Schroeter, president and general manager of the *Huber Manufacturing Co.,* Marion, Ohio, died suddenly on Jan. 1. He had occupied the position since 1940. He was 51 years of age.

* * * *

E. C. Fink, president and chairman of the board of *Mack Trucks, Inc.,* died in New York City, on Jan. 1, at the age of 62. He had occupied the position since January, 1937. Under his guidance, all three Mack plants received Army-Navy "E" awards for excellence in war production.

* * * *

Charles H. Eisenhardt has been appointed assistant manager of the electrical, wire rope and construction materials sales division of the *American Steel & Wire Co.,* a subsidiary of United States Steel Co. He succeeds **R. L. Rhodes,** who resigned recently. He has been special sales representative in Washington, D. C.

* * * *

John M. Frank, president of the *Ilg Electric Ventilating Co.,* Chicago, Ill., was elected president of the National Associa-

GENERAL SUPERCRANES CONSERVE VITAL FUEL, MAN-POWER and MACHINERY

GENERAL recommends the continued purchase of War Bonds and Stamps —and the observance of preventive maintenance to keep your machinery running.

Powered by one motor and controlled by one man the SUPERCRANE moves about freely on its pneumatic tires. Movement is much faster, with reduced wear on moving parts.

Available as Crane, Clamshell, Dragline, Magnet and Pile Driver.

For Further Details Contact

OSGOOD GENERAL DISTRIBUTORS: M. M. McDowell & Sons, 2244 First Avenue South, Seattle, Washington; F. J. Balzer Company, 2244 First Avenue, South, Seattle, Washington; Capitol Tractor & Equipment Co., 1025 East 4th Street, Reno, Nevada; Morrow & Company, 1017-1025 North 4th Street, Albuquerque, New Mexico; Power Equipment Company, 601 East 18th Avenue, Denver, Colorado; Smoot Machinery Company, 2320 Neff's Lane, Salt Lake City, Utah.

The OSGOOD COMPANY
Sizes: ½ to 2½ Cu. Yd.
Diesel - Oil - Gas - Electric
Associated with The GENERAL EXCAVATOR CO.

The HERCULES COMPANY
HERCULES "IRONEROLLERS"
6 to 12 Tons
Diesel or Gasoline
Associated with The GENERAL EXCAVATOR CO.

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OSGOOD MARION OHIO U.S.A. GENERAL HERCULES
Sizes: ⅜-½-⅝-¾ Cu. Yd.
Diesel—Gas—Electric
SHOVELS
DRAGLINES - CRANES
Crawler & Wheel Mounted
THE GENERAL EXCAVATOR COMPANY, Marion, Ohio

tion of Fan Manufacturers, at its recent annual meeting held in Buffalo, N. Y. Members of the association account for approximately 80 per cent of the fan production of the nation.

* * * *

Louis F. Theurer, industrial sales manager for *Pittsburgh Plate Glass Co.,* at Milwaukee, Wis., has been appointed west coast divisional director, to succeed **Floyd S. Green,** who retires after 40 years' service with the company and its subsidiaries. **R. I. Ogle,** industrial paint sales representative in Chicago, will succeed to Theurer's former position at Milwaukee.

* * * *

B. C. Heacock, chairman of the executive committee of *Caterpillar Tractor Co.,* Peoria, Ill., who has been director of the Priorities Control Division of W. P. B., has been named Deputy Director General for Distribution, to succeed **J. A. Krug,** who has been made Power Director.

* * * *

The first Army-Navy "E" award for tractor production was presented to the Springfield, Ill., plant of *Allis-Chalmers Manufacturing Co.* recently. Col. John S. Seybold, chief of procurement section, U. S. Army, Washington, D. C., spoke of the importance of the tractor in modern warfare, and revealed that one of the machines was the first piece of equipment to land at Guadalcanal. The award was accepted for the company by **Don Schweitzer,** manager of the Springfield works. Employee pins were presented by Lt. Comdr. Walter J. Eden, U. S. N. **Walter Geist,** president of the company, and **W. A. Roberts,** manager of the tractor division, also participated in the ceremonies.

DISPLAYING the Army-Navy "E" award made to the Allis-Chalmers plant at Springfield, Ill., are left to right, RAY DOWNEY, employee; COL. JOHN S. SEYBOLD, U.S.A.; DON SCHWEITZER, Springfield works manager; and W. A. ROBERTS, manager of the Allis-Chalmers tractor division.

* * * *

Broderick & Bascom Rope Co., St. Louis, Mo., has won a renewal star from the Army and Navy for their "E" flag, denoting another six months of outstanding production accomplishment. Commander W. F. Veatch, commander of the Sixth Naval Reserve area, handed the new pennant to **Charles E. Bascom,** secretary-treasurer of the company, on Dec. 16. World-wide distribution of the company's wire rope in the war effort was cited by Commander Veatch in his address.

* * * *

American-Marietta Co., Chicago, Ill., has acquired control of the *Ferbert-Shorndorfer Co.,* industrial paint manufacturer of Cleveland, Ohio. The new affiliate will operate as an American-Marietta subsidiary, with **David Andrew** continuing as president, and **Guy Bartholomew,** as vice-president. Ninety-five per cent of the output of the Cleveland plant is going to war work.

* * * *

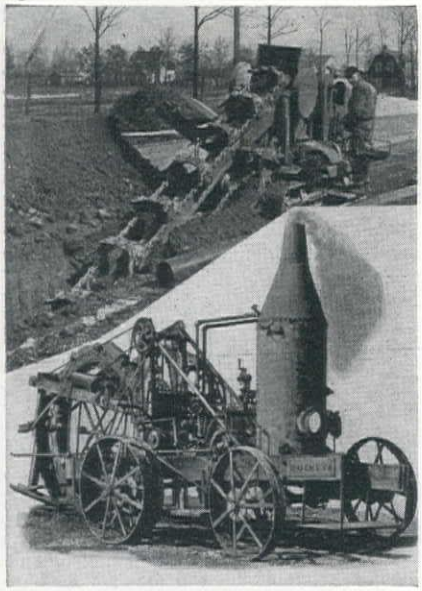
Every contractor or operator using construction equipment has been asked by *Thew Shovel Co.,* Lorain, Ohio, to conserve all the equipment in his possession in the interest of America's war effort. The company is offering a red, white and blue emblem for the operator to display on his equipment to show that he is enrolled in the conservation drive.

* * * *

James R. Hewitt has been appointed vice-president of the *American Manganese Steel* division of the American Brake Shoe and Foundry Co., Chicago Heights, Ill., effective January 1.

* * * *

A. W. Herrington, chairman of the board of *Marmon-Herrington Co., Inc.,* Indianapolis, Ind., has been elected a director of the Army Ordnance Association. Herrington is also a past president of the Society



A COMPARISON of the first Buckeye Traction ditcher with a modern Model 410 is shown in the photo. The company is celebrating its fiftieth anniversary this year, producing for the war effort.

of Automotive Engineers and a governor of the Society of American Military Engineers.

* * * *

R. B. Harvey, sales manager of the Novo Engine Co., Lansing, Michigan, has been appointed chairman of the Contractor's Pump Bureau. This is an organization of manufacturers of contractor's pumps, and determines all standards for pumps used in the construction industry. Harvey has also been recently appointed to the Contractors' De-watering and Supply Pump Manufacturers' Advisory Committee and the Air Cooled Engine Industry Advisory Committee of the War Production Board, committees to promote workable standards

R. B. HARVEY

and simplification of procedure between the manufacturers and the WPB.

* * * *

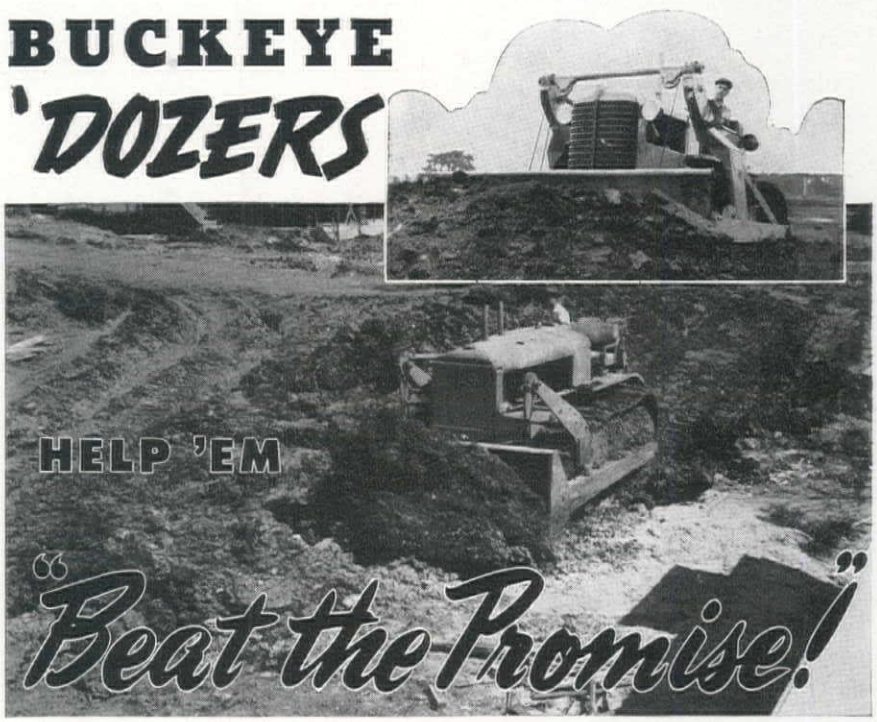
Chester F. Conner, manager of distributor sales in the industrial products division of *B. F. Goodrich Co.,* Akron, Ohio, has been appointed to the staff of advisors on mechanical rubber goods in the office of the Rubber Director, WPB, Washington, D. C.

* * * *

Before 4,000 workers and special guests, the Army-Navy "E" award for production excellence was presented to the Peoria, Ill., plant of *R. G. LeTourneau, Inc.* In a letter from Robert P. Patterson, Undersecretary of War, the award was cited as being for "accomplishing more than seemed reasonable or possible a year ago." The fact that LeTourneau equipment is now found all over the face of the earth, wherever American soldiers are in action, was stressed by army supply officers on the program. Part of the credit for the achievements of the factory was given to earthmovers of the country, whose peace-time use of the equipment made development of the company's production facilities and trained personnel possible.

* * * *

Willard Equipment Co., Vancouver, B. C., has been appointed representative of the *Lima Locomotive Works, Inc.,* in British Columbia. The company handles a full line of contractors' machinery, railroad equipment, and construction supplies.



WHERE speed and sustained high output is a *must*, you'll find fast-working Buckeye cable 'dozers hard at work. These output-makers have what it takes to deliver the *most* out of every hour on the job—accurate, lightning-fast cable control; balanced weight that helps, not hinders, tractive effort; scientific blade design to roll bigger-yardage loads and make it easier on the tractor—every practical feature you need in a 'dozer that can help you beat today's hurry-up schedules.

Get the facts about Buckeye tractor equipment—'dozers, trailbuilders and power control units.

For real help on your tractor equipment problems, see your Buckeye distributor and get the *facts* about Buckeye Bulldozers, Trailbuilders and Power Control Winches.

See our ad on pages 71 and 149.

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

THE BUCKEYE TRACTION DITCHER CO., Findlay, Ohio

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Our Los Angeles plant is equipped and staffed to provide Western industry with quality products, and prompt friendly service of exactly the same calibre which the Dandux trade mark has assured other canvas users for years.

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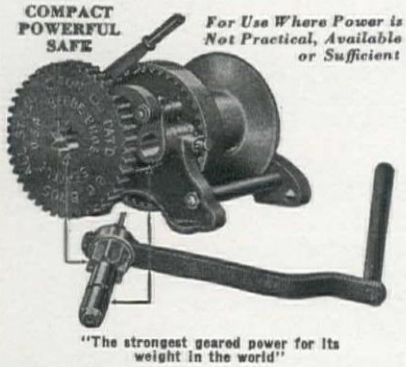

"The strongest geared power for its weight in the world"

Three sizes: 2-, 5- and 15-ton. Capacity comparison figuring ½" flexible plow steel cable.

2-ton "Lightweight"	75 ft.
5-ton "General Utility"	250 ft.
15-ton Triple-Geared "Special"	1200 ft.

With patented instant gear change and positive internal brake that never fails, and will lock and hold load until released.

Ratios	Weight	Price
2-ton 4 & 22 to 1	60 lb.	$50
5-ton 4 & 24 to 1	110 lb.	$75
15-ton 4, 19 & 109 to 1	680 lb.	$250

15-ton special priced f. o. b. Seattle. 5-ton size can also be furnished from factory with special 16" or 24" wide drum in place of standard drum 8" wide. Scatter them around the job to suit, one or 100, distributing the load "evenly". Place assembled pipe lines, caissons, trusses, girders, or what have you. Just be sure of your rigging and anchorage. Manpower never grew that could break a Beebe Heist on a fair pull—a 5-ton General Utility withstood a mechanical pull of 41,000 lbs. on official test, breaking a ¾" plow steel cable with Hoist remaining intact.

Complete literature and list of dealers principal U. S. cities and foreign gladly mailed. Warehouse supply stocks for dealers: Seattle, Chicago, Brooklyn, Houston.

BEEBE BROS.

2726 Sixth Ave., So. SEATTLE, WASH.

NEW EQUIPMENT

MORE COMPLETE information on any of the new products or equipment briefly described on these pages may be had by sending your request to the Advertising Manager, Western Construction News, 503 Market St., San Francisco, Calif.

Clear View Dust Respirator

Manufacturer: Mine Safety Appliances Co., Pittsburgh, Pa.

Equipment: All-plastic dust respirator.

Features claimed: Efficient, compact, lightweight respirator, made of transparent plastic. It is durable, odorless, non-corrosive, and does not conduct electricity or heat. May be inspected without removal. Self-adjusting facepiece has sponge rubber cushion. The equipment is similar to respirator formerly made by the company of aluminum.

Diesel Lubricating Oil

Manufacturer: Gulf Oil Corporation, Pittsburgh, Pa.

Equipment: Heavy duty lubricating oils.

Features claimed: Newly-developed detergent oils for use in trucks, tanks, and jeeps have now been approved by leading manufacturers of Diesel engines for trucks and tractors. They are non-corrosive to alloy bearings and eliminate ring sticking and engine deposits. Also useful in gasoline engines where service demanded is extremely heavy. Commercial name of the product is Gulf Dieselube H. D.

Concrete Curing Compound

Manufacturer: Lyons & Rood, Inglewood, Calif.

Equipment: "Sealkure," a clear concrete curing compound.

Features claimed: Does away with burlap, straw, earth, or other curing covers. It is applied as soon as water sheen has disappeared, being a uniform solution, easily sprayed, and has no tendency toward separation of the particles. It contains an inert dye that marks treated areas, thus preventing duplication and waste, but which fades out in a few days. Moisture retention with this product is 98 per cent.

Safety Extension Light

Manufacturer: Davis Emergency Equipment Co., Newark, N. J.

Equipment: Safety extension light.

Features claimed: Absolute safety from electric shock, because the light is so designed that the guard serves as the on-and-off switch. When unscrewed, the current is automatically off. The light has a guard of heavy fibre, and is made wholly of non-conductive and indestructible materials, eliminating need for repairs and replacements.

Magnetic Motor Starters

Manufacturer: General Electric Co., Schenectady, N. Y.

Equipment: A-C combination magnetic starter.

Features claimed: Full-voltage starting of induction motors up to 7½ h.p. Motor-circuit switch and magnetic starter are incorporated in one compact unit to conserve space and installation time, and improve appearance. To facilitate mounting groups of starters together, the operating handle is projected from front rather than the side of the case. Overload relays are adjustable for automatic reset and protect the motor from overheating due to repeated overloads, sustained overloads, or too frequent starting.

Daché Designed Safety Hats

Manufacturer: B. F. McDonald Co., Los Angeles, Calif.

Equipment: Women's safety hats.

Features claimed: Four designs of women's safety hats, designed by Lilly Daché, famous headwear designer. Made of plastic mesh and transparent mesh, with decorative binding and

ornamentation. Sizes are adjustable, and all four models are ventilated to keep them cool and comfortable. Hats are attractive, at the same time protecting women from danger of flying hair being caught in moving parts of machinery.

DYKE BROS.

Manufacturers and Jobbers of Building Materials

Little Rock, Ark.	Houston, Texas
Fort Smith, Ark.	Dallas, Texas
Oklahoma City, Okla.	Texarkana, U.S.A.
Kansas City, Mo.	Memphis, Tenn.
Joplin, Mo.	Chattanooga, Tenn.
Shreveport, La.	New Orleans, La.
Birmingham, Ala.	

Ditch Maintainer

Manufacturer: Willamette Hyster Co., Portland, Ore.

Equipment: Hystevator ditcher.

Features claimed: Especially useful for maintenance of ditches along highways, and is also used by maintenance crews to load rock and asphalt. It can be used on any standard make of truck, leaves a ditch of proper contour, digs as it loads, needs no separate power plant or power takeoff, is quickly installed or removed, does not impede traffic, and does not straddle ditch, thus making work possible against cut banks.

New Cutting Torch

Manufacturer: National Cylinder Gas Co., Chicago, Ill.

Equipment: Cutting torch.

Features claimed: Rugged, fast, and designed to handle, in addition to regular plate cutting, such jobs as hole piercing, billet deseaming, cast iron, and rivet washing. New mixing principle provides fast preheating and oversize oxygen passage permits fast economical operation on all thicknesses of metal. Stainless steel oxygen and acetylene needle valves are non-seizing and non-scoring, to provide sensitive and positive preheat flame adjustment.

Transformer Cooler

Manufacturer: General Electric Co., Schenectady, N. Y.

Equipment: Forced-cooled power transformer.

Features claimed: Greatly increased rate of heat dissipation permits construction of forced-cooled transformers with considerable saving of steel and copper. The radiating surface is concentrated in a relatively small space in the cooler, from which the heat is removed by forced air. These coolers can also be attached to old-type transformers, with resultant increase of capacity. The cooler is composed of rows of steel-finned tubes, bolted to a steel frame attached to the transformer tank. The cooler is self-draining and self-venting, and each cooler section includes one or more fans powered by thermally protected motors.

LITERATURE . . .

Copies of the bulletins and catalogs mentioned in this column may be had by addressing a request to the Advertising Manager, Western Construction News, 503 Market St., San Francisco, Calif.

Unit Structures, Inc., Peshtigo, Wis.—Pamphlet on laminated arches and beams gives detailed drawings and dimensions for this type of wood construction, along with many illustrations of successful installations. Also given is partial description and illustration of fabrication of arch and beam segments in the company's factory. Pictures include installations in churches, halls, barns, barracks, bridges, hangars, and many other structures.

Precision Bearings, Inc., Los Angeles, Calif.—Pamphlet on Ahlberg ground bearings, which can be reground, showing types of wear on bearings, and demonstrating saving by using re-ground units. Retainers and various other accessories are also illustrated, as is grinding, packaging and distribution system of the company.

Chain Belt Co., Milwaukee, Wis.—Bulletin 422 on Pumpcrete practice contains 164 pages, and is profusely illustrated, both by pictures and drawings, showing pumpcrete installations in all sections of the country. Reprints of articles from many technical

GLUE & PLASTERBOARD PERFORM NEW KAISER MIRACLE AT VANPORT

RIGHT: *Brushing Laucks Construction Glue on studding before applying Wallboard.* **LEFT:** *Frank Stepanek, "expediter" of glue and plasterboard walls, for world's largest housing project.*

THAT 4-DAY SHIP that Kaiser built is no greater speed miracle than the 10,000-unit housing project for the Kaiser shipyard workers . . . where glue and plasterboard formed a new dry-wall partnership to speed this world's largest housing job.*

Working with Laucks glue specialists and U. S. Gypsum Co., Frank Stepanek, sub-contractor in charge of this work, developed the technique of applying USG's predecorated Sheetrock for walls. By *using Laucks Construction Glue in place of nails* he was able to erect completely finished walls quickly, economically, without defacing the surface . . . saving critical steel nails at the rate of 17,500 lbs. per 5 million sq. ft. of plasterboard!

**Wolff and Phillips, Architects.*

Perhaps Laucks glue knowledge can help *you* . . . whether it's arches, beams, prefabricated houses, or something else you're building. Our 20 years' experience provide us with the "know how" to guarantee the right use of the right glue. (Wire, write or phone if you're interested in facts and figures on this Vanport job.)

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FIFTH
from $2.
529 SOUTH FIGUEROA

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This trip, why not enjoy the superlative charm of a beloved city's most distinguished hotel?

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REDWOOD ROOM
(with walls 2000 years old)
Finest foods and cocktails in an atmosphere of grandeur.

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SAN FRANCISCO
RICHARD I. SCOLLIN, Manager

magazines covering important concrete projects are given. The pumpcrete method is clearly outlined for engineers not familiar with its operation. Comparisons of costs on representative jobs of different kinds are given in the second section, and the third chapter deals with distributing methods. Concrete and pumpcrete data are given in chapters 4 and 5 and 70 pages are devoted to typical jobs. This manual of concrete placement by the pumpcrete method is an important addition to the library of contractors, engineers, estimators and operating men.

Douglas Fir Plywood Assoc., Tacoma, Wash.—Two additions to the loose-leaf handbook, "Technical Data on Plywood," described in the January issue of *Western Construction News*, are devoted (1) to a revised commercial standard on Douglas fir plywood, which became effective Nov. 16, 1942, and (2) to basic information on the insulating properties of plywood. In this latter section, tables of insulation properties are given for various illustrated types of wall construction.

Black & Decker Mfg. Co. and **Van Dorn Electric Tool Co.**, Towson, Md.—Report entitled, "They Used their Heads," deals with the adaptation of portable electric tools to war production emergencies. Many uses of electric tools are both photographed and explained, showing adaptations for which they were never designed but for which they have proved satisfactory on emergency and rush projects. Instances of such conversion are shown in airplane factories, machine shops, food processing plants, boat building establishments, electrical manufacturing, furniture work, and many other fields.

General Electric Co., Schenectady, N. Y. —Motor Fitness Manual, especially designed for operators of plants converted to war production. The booklet is divided into nine sections, devoted to such subjects as "How to select and apply motors," "Secondary ratings of standard integral-hp motors," "Easy and practical ways to determine WR^2," "How to select A-C control," and other helpful matters. In each section the discussion and data are complete and understandable, containing valuable information for small operators. The last pages list other G-E motor literature and sales and service offices.

Certain-teed Products Corp., Chicago, Ill. —Form No. 5564 describes gypsum exterior board and laminated roof decking, both made of non-critical materials and designed to speed up wartime construction. General descriptions, including fire-resisting properties, are given, and some technical data and application rules are given.

Hotstream Heater Co., Cleveland, Ohio —Pamphlet covers selection of controls for fuel conservation. The use and value of combustion instruments is discussed in relation to various types of coal and oil burners. For coal, hand-fired, underfeed and spreader stokers, and forced draft, installations are covered. For oil, natural draft, manually controlled, and both semi-automatic and full automatic burners, are included. Descriptions of instruments are also given.

CORRECTION

American Social Hygiene Assoc., Inc. New York, N. Y.—The announcement in the December issue of *Western Construction News* failed to state that the cost of the series of posters on control of social diseases, was fifty cents.

Opportunity Section

This widely-read column can help you to sell your used machinery and other used equipment. For rates, write to the Opportunity Section, Western Construction News, 503 Market Street, San Francisco, Calif.

WANTED

1 Diesel electric shovel, suitable for coal stripping operation, equipped with approximately 90' boom and 5 - 6 yard dipper, capable of stripping up to 40' overburden. Either crawler or walking type acceptable. Must be in good operating condition. Reply Box No. 700, Western Construction News, 503 Market St., San Francisco, California.

New Equipment Ready for Immediate Delivery
Subject to Government Regulations

1—105 cu. ft. Gardner-Denver portable Air Compressor, gasoline driven, Model WBD
1—230 cu. ft. Gardner-Denver belt-driven Air Compressor, two stage, Model WBQ
4—9 cu. ft. pneumatic tired Concrete Carts
2—3½S Smith Concrete Mixers, pneumatic tired, two wheel trailer mounting
1—47 hp. 1800 r.p.m. Hercules Diesel Engine Power Unit with clutch type power takeoff (no priority required)
1—Burch X Cel Street Sander for ice control
1—Warco Pull Grader, 10 ft. blade, gasoline engine, 8 station power control
Also considerable reconditioned equipment

THE SAWTOOTH CO., Boise, Idaho

Opportunity Section

(Continued)

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1—8 wheel, oil burning, locomotive steam crane.
1—4 wheel oil burning steam crane.
1—Osgood crane, on crawlers, one yard, heavy duty.
1—Tractor, Caterpillar type. Best "60".
2—200 H.P. Boilers, 100 lbs. W.P.
1—Guniting Machine, Air Drive and nozzle.

For particulars, contact:

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FOR SALE . . .

Three type SK Westinghouse, 75 KVA Transformers, 6900, 6585, 5960 volts to 460, 230 volts, 60 cycle, style number 305127. Good condition. Presently located at Casper, Wyoming. Contact Rocky Mountain Drilling Company, Box 1526, Casper, Wyoming, or 437 South Hill Street, Los Angeles, California.

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GOOD USED WIRE ROPE

Removed from Shasta Dam Cableways

7/8" - 6/19 Plow - S.P. - Reg. Lay - H.C.
7/8" - 6/25 Super Plow - Lang Lay I.W.R.C.
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Lengths from 200 ft. to 6000 ft.

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FOR SALE . . .

One Cletrac 55 tractor and Wood-Isaacson Hydraulic angle dozer. Very good mechanically. Only used 3 years, overhauled once. Floyd K. Olsen, Box 104, Ephraim, Utah.

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Skid-Mounted Pumping Unit

(1)—D-4400 Cat. Motor Direct-connected to (1)—4" Krogh Gritty Water Pump Cap. 500 G.P.M. at 150' Head.

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Allis-Chalmers Hoist, 30,000 lb. 870 F.P.M., Single Drum, 7000' 1 1/4" rope. Capacity, with two 400 H.P. Electric Motors.
Ottumwa Hoist, 6,500 lb. 450 F.P.M., Single Drum, 100 H.P. Electric Motor.
LOCOMOTIVES—36" Ga. 4, 8 and 15 ton. Trolley and combination types.
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PUMPS—Deep Well, Vertical and Horizontal Centrifugal.
Complete description and prices upon request.
Also complete line of pipe, tubes, valves and fittings 3/8" to 24".

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