WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

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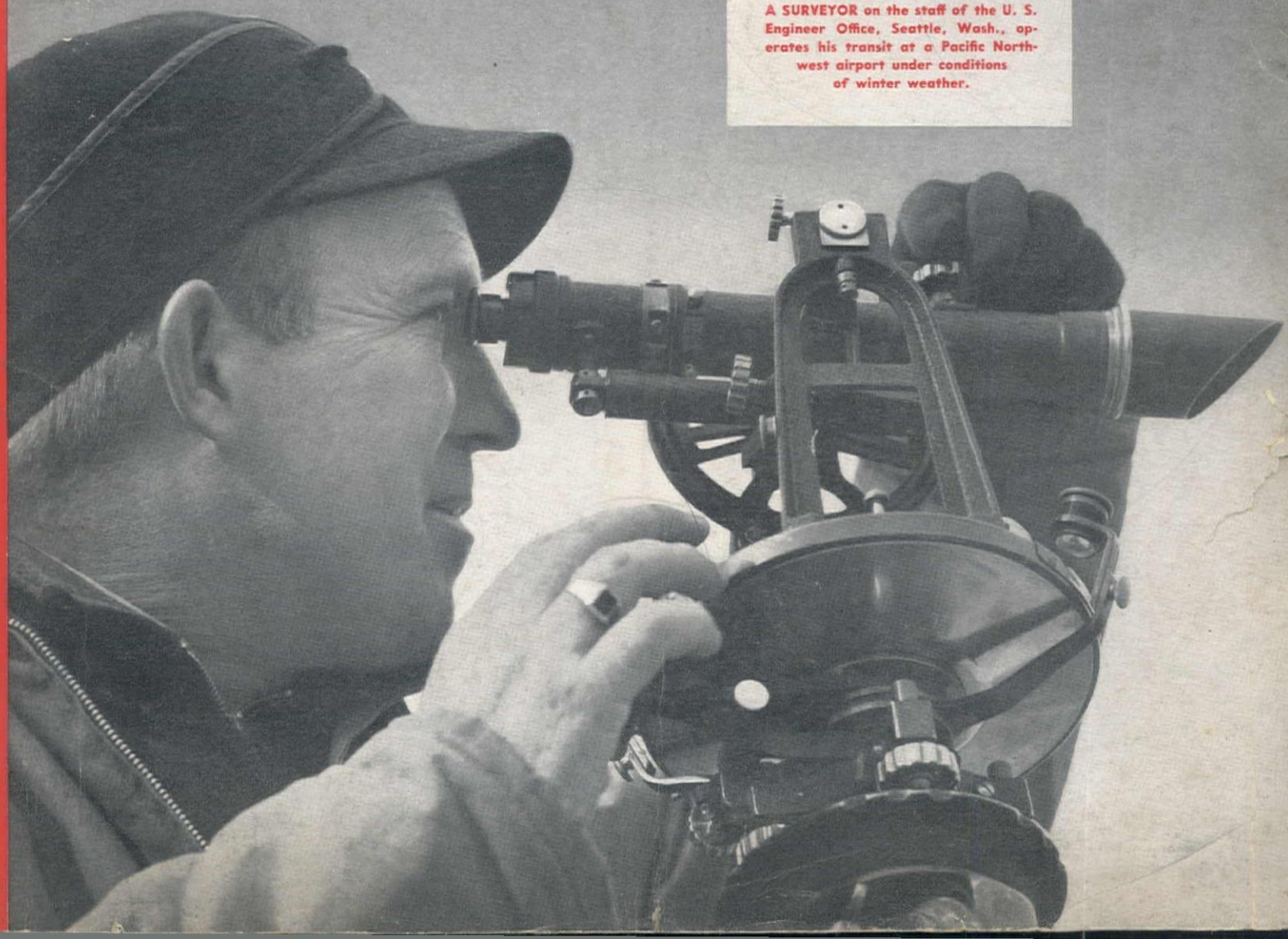
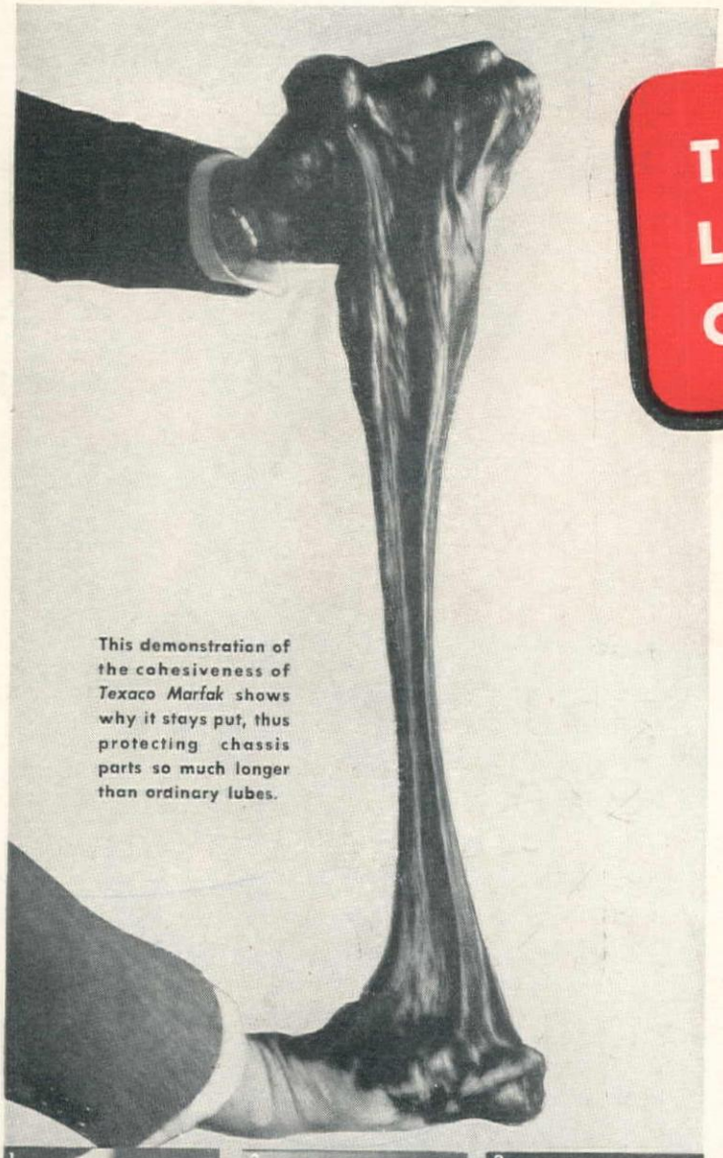
A SURVEYOR on the staff of the U. S. Engineer Office, Seattle, Wash., operates his transit at a Pacific Northwest airport under conditions of winter weather.



THE *Why* OF LONGER-LIVED CHASSIS PARTS



This demonstration of the cohesiveness of *Texaco Marfak* shows why it stays put, thus protecting chassis parts so much longer than ordinary lubes.

1. Try smearing *Marfak* across your palm. Note the tough film that cannot be broken no matter how heavy the pressure. This great film-strength is your assurance of more effective lubrication of all chassis parts.
2. Twirl *Marfak* around and around (as in a grease-lubricated universal joint). See how its cohesiveness holds it together.
3. Try to separate your fingers with *Marfak* between them. That "pull" demonstrates its adhesiveness, or its ability to cling to metal parts.

YOU can cushion chassis parts against road-shocks, lengthen their life, and reduce the time and labor spent in lubricating shackles, steering connections, etc. . . . by using *Texaco Marfak.*

Texaco Marfak provides a tough, adhesive-cohesive film that clings to metal, resisting the severest rain and road splash.

The reason behind *Marfak's* longer-lasting protection is this—while it liquefies inside a bearing, providing liquid lubrication, it maintains its original consistency at the outer edges, thus sealing itself in while sealing out dirt, grit, water.

For wheel bearings in heavy-duty service, specify *Texaco Marfak Heavy Duty* . . . it stays in bearings and off brakes . . . protects against wear.

Outstanding performance has made Texaco first in each of the fields listed below.

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 E. 42nd St., N. Y., N. Y.

THEY PREFER TEXACO

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

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

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

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

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

TEXACO REG. T. M.

TEXACO MARFAK

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

TRANSMISSION TIPS for EUCLID OPERATORS

● Transmissions in Rear-Dump and Bottom-Dump Euclids are built and designed for dependable performance and are more than adequate to handle the rated capacity of the unit in which they are installed. But improper use of the transmission leads to serious difficulty and may result in keeping equipment out of production. Here are five operating suggestions that will help to prevent trouble:

1.—Be sure to completely disengage the clutch before starting to shift gears, and complete each shift before re-engaging the clutch.

2.—Keep the transmission in a gear low enough to prevent overloading of the engine.

3.—Under tough hauling conditions, start in first speed of the low range.

4.—Select the proper gear for hauling up grade before reaching the steepest part of the grade.

5.—Stop the unit when shifting the transmission from low to high range, or from high to low range.

Complete operation and maintenance instructions for the transmissions in all EUCLIDS are contained in Page 16 of the Euclid Instruction Manual. If you need an extra copy of this page, write our Service Department for Form INS-214.

The EUCLID ROAD MACHINERY Co. · · Cleveland, Ohio

THE EUCLID ROAD MACHINERY CO.

3710 SAN PABLO AVENUE — PIEDMONT 8046 — EMERYVILLE, CALIFORNIA

CONTRACTORS' EQUIPMENT & SUPPLY CO., Albuquerque; INTERMOUNTAIN EQUIPMENT COMPANY, Boise; HALL-PERRY MACHINERY COMPANY, Butte; F. W. McCOY COMPANY, Denver; 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

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J. M. SERVER, JR.
D. F. STEVENS
Editors

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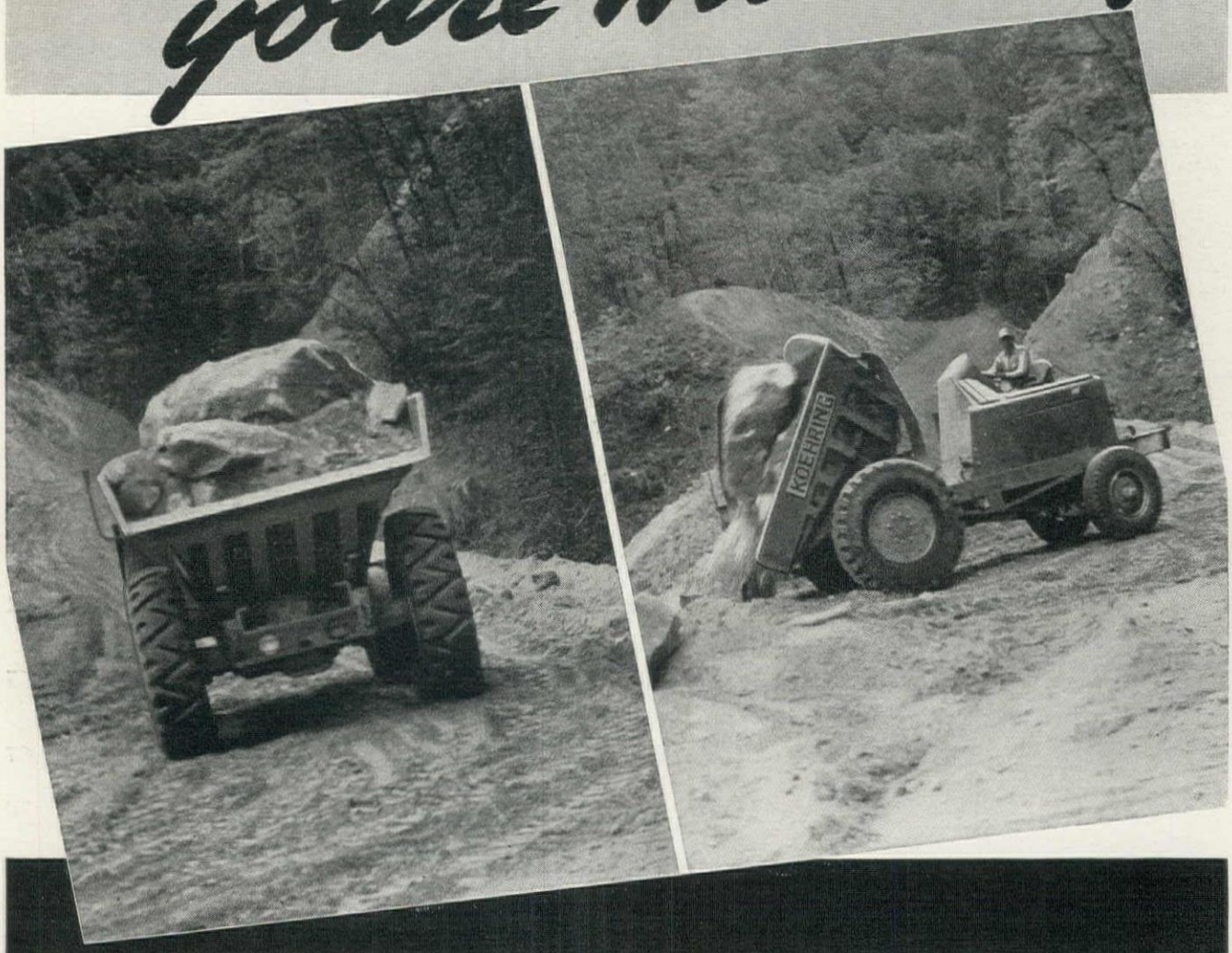
If it's Rock you're Hauling



KOEHRING DUMPTORS ARE YOUR BEST BET

Here is good pictorial proof that Koehring Dumptors can haul and dump rock of any reasonable size and come speeding back for more. Wide body opening means easy loading, and gravity dumping is instantaneous. The massive chassis easily withstands the shock of constant heavy duty service. Koehring Dumptors will save you valuable time too, with three speeds in either direction, quick load spotting and dumping up to the edge of the fill. Haul rock faster with a Koehring Dumptor.

Your Koehring Dumptor will last much longer with proper lubrication and care . . . depend on your Koehring equipment distributor and use genuine Koehring parts.

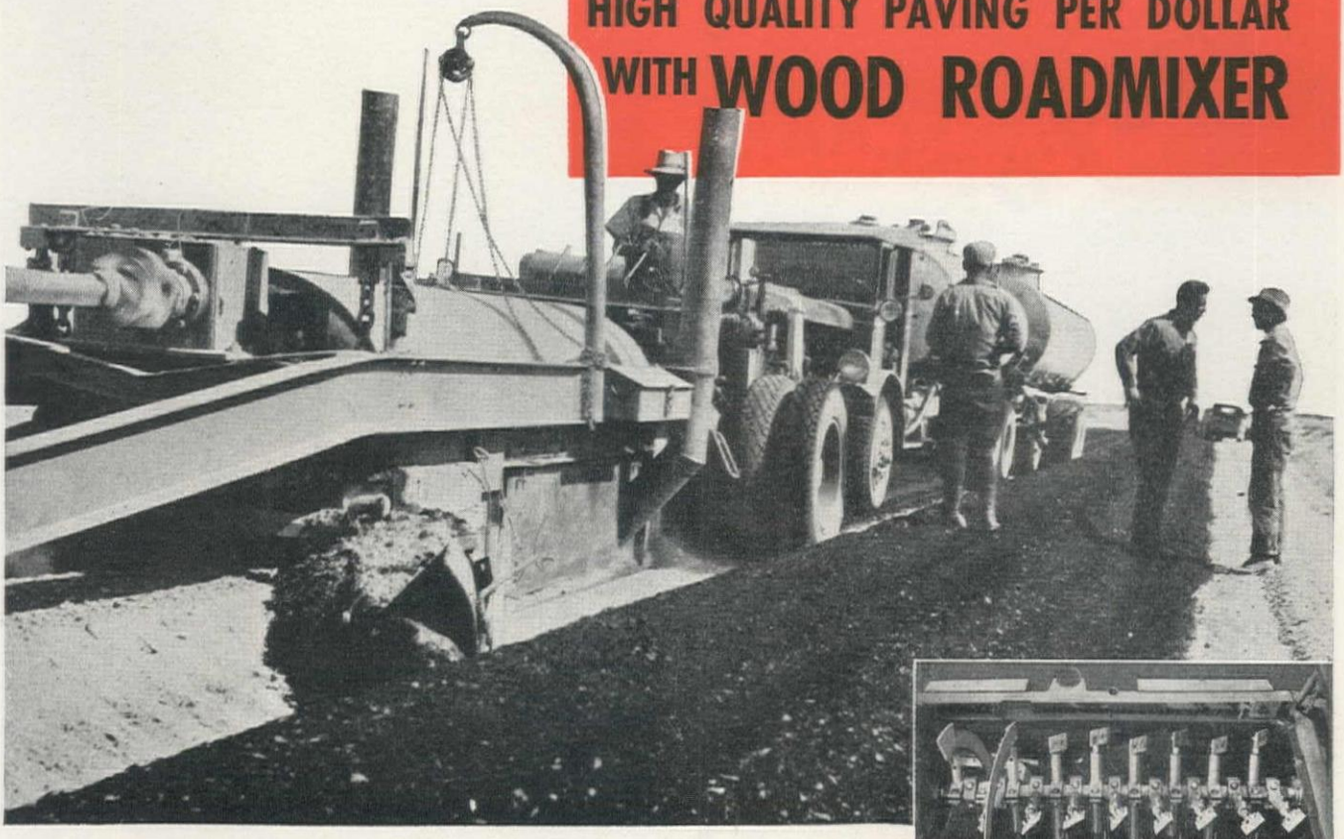
KOEHRING COMPANY • *Milwaukee, Wis.*

KOEHRING HEAVY DUTY

HEAVY-DUTY CONSTRUCTION EQUIPMENT

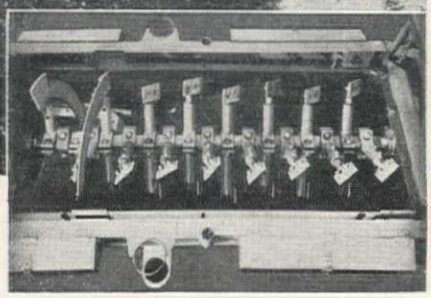
HARRON, RICKARD & McCONE CO., San Francisco-Los Angeles • PACIFIC HOIST & DERRICK CO., Seattle, Wash. • WESTERN CONSTRUCTION EQUIPMENT CO., Billings • CONTRACTORS EQUIPMENT CORP., Portland • LUND MACHINERY CO., Salt Lake City • NEIL B. McGINNIS CO., Phoenix, Ariz. HARRY CORNELIUS CO., Albuquerque, New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

...GET *MORE MILES* OF HIGH QUALITY PAVING PER DOLLAR WITH WOOD ROADMIXER



Wood Roadmixers lay more miles of high quality paving per dollar than any other method of pavement construction. The reasons are simple. *First,* Wood Roadmixer employs the traveling plant method of pavement construction—picks up the aggregate, mixes it, and deposits it while the Roadmixer travels at a regulated speed. *Second,* only three pieces of equipment are needed, the Roadmixer, a crawler tractor and a supply truck. Usually the tractor and supply truck are already available. *Third,* two men can handle the entire unit and turn out as much as 2,000 tons of mix in an 8-hour day.

Paving dollars go farther with Wood Roadmixers. This fact is being proven every day on jobs in this country and abroad. For faster and better pavement construction at less cost, learn all the facts about Wood Roadmixers.

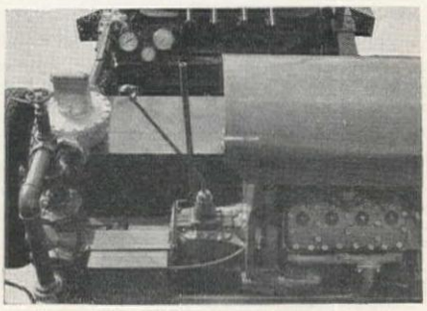


Continuous and Thorough Mixing

One-pass mixing continuously and thoroughly mixes aggregate with binder. Material is discharged at end of drum.

Accurate Pick-up and Proportioning

Roadmixer makes clean pick-up of material, which passes into mixing drum with accurate binder proportioning.



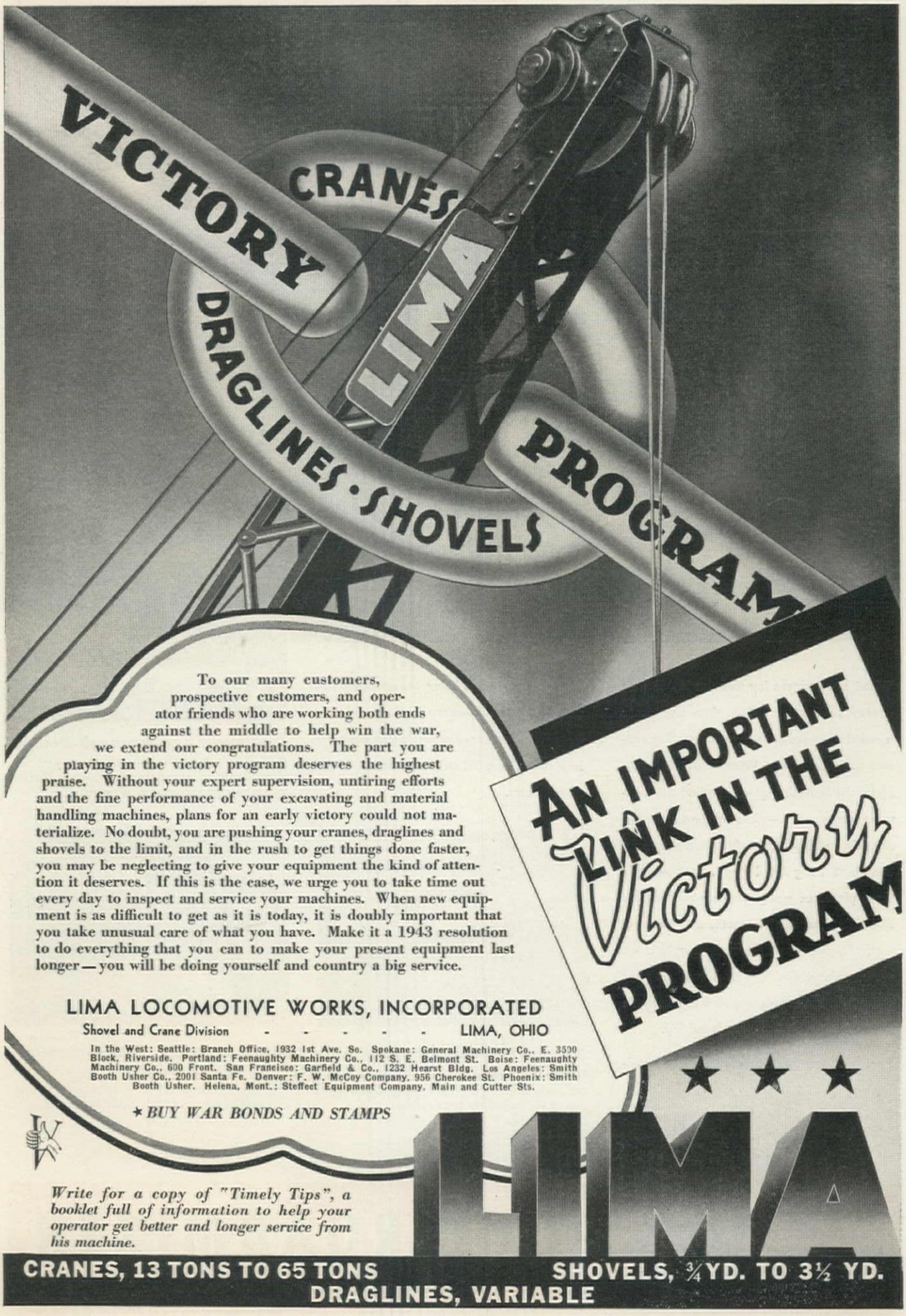
Accurate Binder Volume Control

Liquid binder is delivered to mixing drum through spray nozzles. Volume and pressure are accurately controlled by metering!

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



To our many customers, prospective customers, and operator friends who are working both ends against the middle to help win the war, we extend our congratulations. The part you are playing in the victory program deserves the highest praise. Without your expert supervision, untiring efforts and the fine performance of your excavating and material handling machines, plans for an early victory could not materialize. No doubt, you are pushing your cranes, draglines and shovels to the limit, and in the rush to get things done faster, you may be neglecting to give your equipment the kind of attention it deserves. If this is the case, we urge you to take time out every day to inspect and service your machines. When new equipment is as difficult to get as it is today, it is doubly important that you take unusual care of what you have. Make it a 1943 resolution to do everything that you can to make your present equipment last longer—you will be doing yourself and country a big service.

AN IMPORTANT LINK IN THE *Victory* PROGRAM

★ ★ ★

LIMA LOCOMOTIVE WORKS, INCORPORATED

Shovel and Crane Division - - - - - - LIMA, OHIO

In the West: Seattle: Branch Office, 1932 1st Ave. So. Spokane: General Machinery Co., E. 3500 Block, Riverside. Portland: Feenaughty Machinery Co., 112 S. E. Belmont St. Boise: Feenaughty Machinery Co., 600 Front. San Francisco: Garfield & Co., 1232 Hearst Bldg. Los Angeles: Smith Booth Usher Co., 2001 Santa Fe. Denver: F. W. McCoy Company, 956 Cherokee St. Phoenix: Smith Booth Usher. Helena, Mont.: Steffect Equipment Company, Main and Cutter Sts.

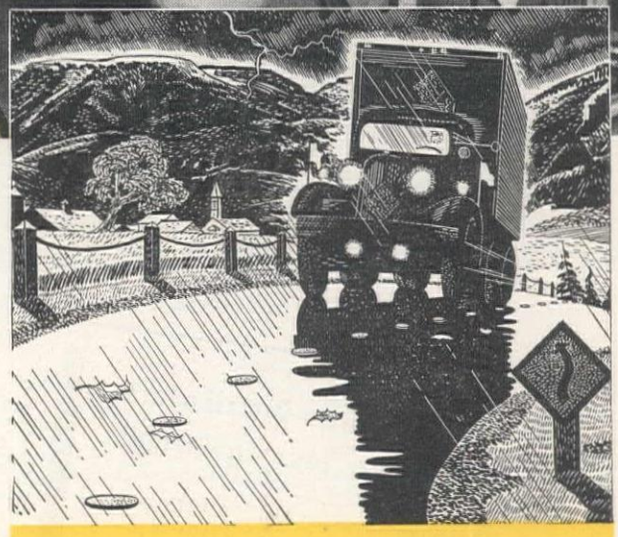
★ *BUY WAR BONDS AND STAMPS*

Write for a copy of "Timely Tips", a booklet full of information to help your operator get better and longer service from his machine.

LIMA

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

IT TAKES A *Two-Fisted Man* TO HANDLE A "GOV'MENT RED-HOT"



. . . AND A *Two-Fisted Oil* TO RUN IT!

WITH EVERY MINUTE COUNTING, and maintenance doubly important, the use of a "doubtful" oil is next to sabotage. War materials *must* get through on time.

To "keep 'em rolling—longer" operators are turning to the lubricants that are tough enough to stand the pace. That's why you'll find Shell Diesel and gasoline engine oils, chassis lubricants and greases number one in scores of the country's leading truck and bus fleets. Shell Automotive and Industrial Lubricants have *proved* they have the stuff.

Let the Shell man tell *you* about the plan that has helped operators chop down maintenance costs, increase engine efficiency, prevent costly delays. Call him in today!

OIL IS *Ammunition* - USE IT WISELY

SHELL

SHELL

Automotive and Industrial

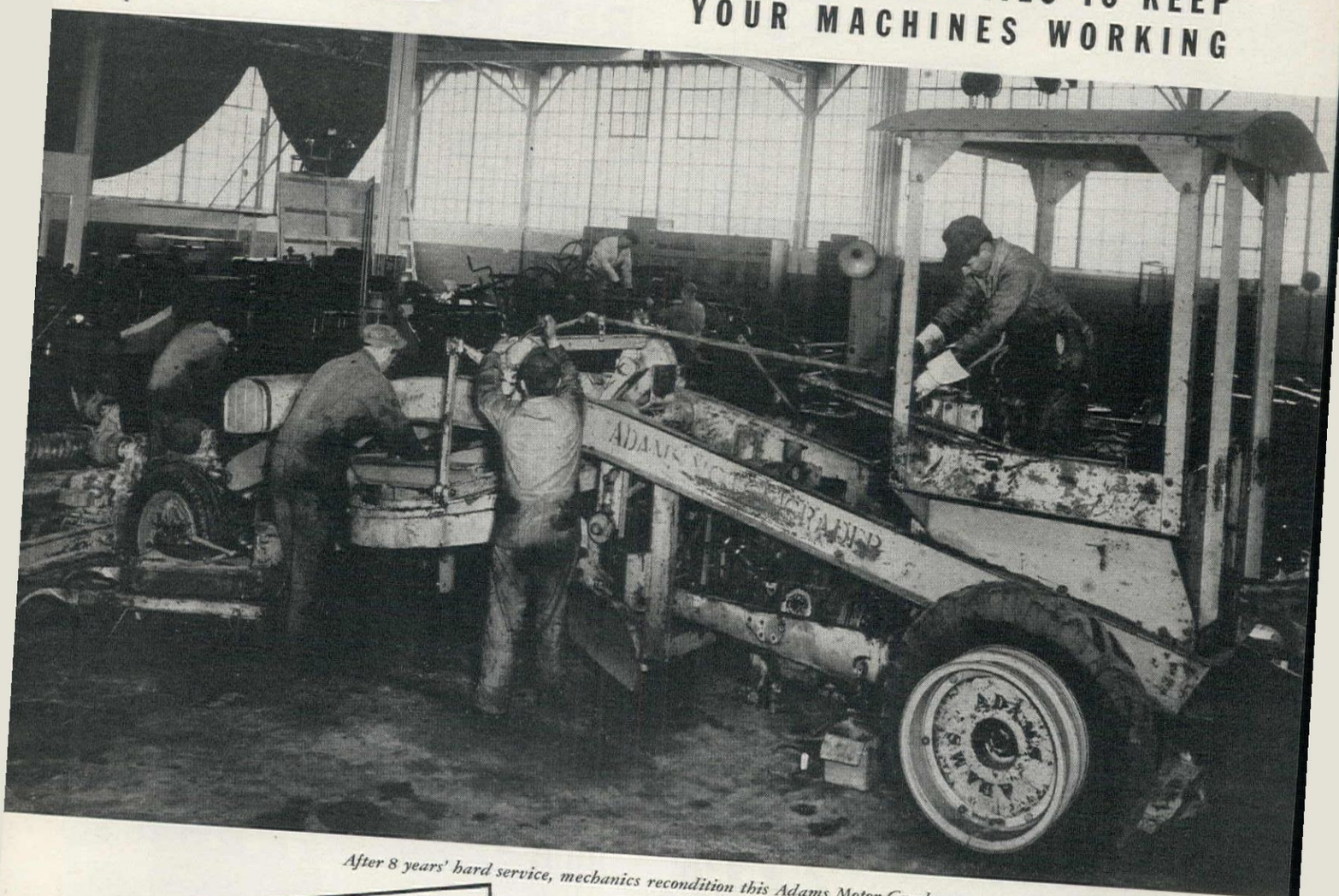
LUBRICANTS

For Heavy Duty

SEE YOUR **ADAMS** DEALER

for the "KNOW HOW"

AND THE FACILITIES TO KEEP YOUR MACHINES WORKING



After 8 years' hard service, mechanics recondition this Adams Motor Grader to resume vital wartime road work

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

★★THE ABILITY to stand long, hard service with minimum attention is an outstanding feature of Adams machines but neglect or makeshift repairs may cause irreparable damage to any machine . . . To avoid trouble and to keep your Adams machines ever ready to carry out your road program enlist the services of your nearest Adams dealer listed at left. His mechanics have the "know how" and experience to keep your machines in tip-top shape or to completely overhaul them. His shop has the equipment to enable them to do their best work. His entire facilities are constantly at your service to keep your machines rolling for Victory!

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

NOTHING LIKE IT FOR TOUGH V DRIVES!

The New GOODYEAR STEEL CABLE V-BELT

tackles forbidden fields on "belt eater" drives

SCORE another first for Goodyear—a revolutionary improvement in V-belt construction that obsoletes previous conceptions of V-drive design limitations.

The higher power capacity of steel cables now makes it possible to employ Multi-V drives where engineering limitations formerly denied their use. You can now pull heavier loads or get longer life on your present drives. It makes it practical for you to go to slower speeds or design a more compact drive, often eliminating outboard bearings.

In addition practically zero stretch means a new absolute minimum in adjustment and maintenance shutdowns. This freedom from stretch insures truly uniform performance from every belt in the drive. Once matched, always matched—there can be no loafers. This means far longer belt life.

Proved In Action

An endless steel cable replaces conventional cotton cord as the load carrying member in this remarkable new V-belt recently perfected by Goodyear after years of experimental work. In checking hundreds of thousands of drives for E-C Cotton Cord V-Belts the G.T.M.—Goodyear Technical Man—found many drives incapable of being handled by conventional belts. Many of these drives now may enjoy wire V-belt advantages.

On fan and pump drives of U. S. Army tanks and combat cars where ordinary V-belts "burn out" in a few hours, the new Goodyear Endless Steel Cable V-Belt takes the grueling punishment with a margin of safety. In industry, handling "belt eater" drives, it is proved that this new belt is far superior to any belt ever designed.

Goodyear Steel Cable V-Belts are now available to war industries holding top priority. Present emergency naturally limits the quantity and type, but if you have a troublesome drive, consult the G.T.M. or write the complete story to Goodyear, Akron, Ohio, for information.

E-C Cord—T. M. The Goodyear Tire & Rubber Company

FOR UNCLE SAM'S

War Birds in Alaska

TELSMITH

Portable Crushing-Screening Plants

★ Uncle Sam never leaves his war birds out on a limb — his planes must have bases—flying fields with runways, taxi strips and aprons.

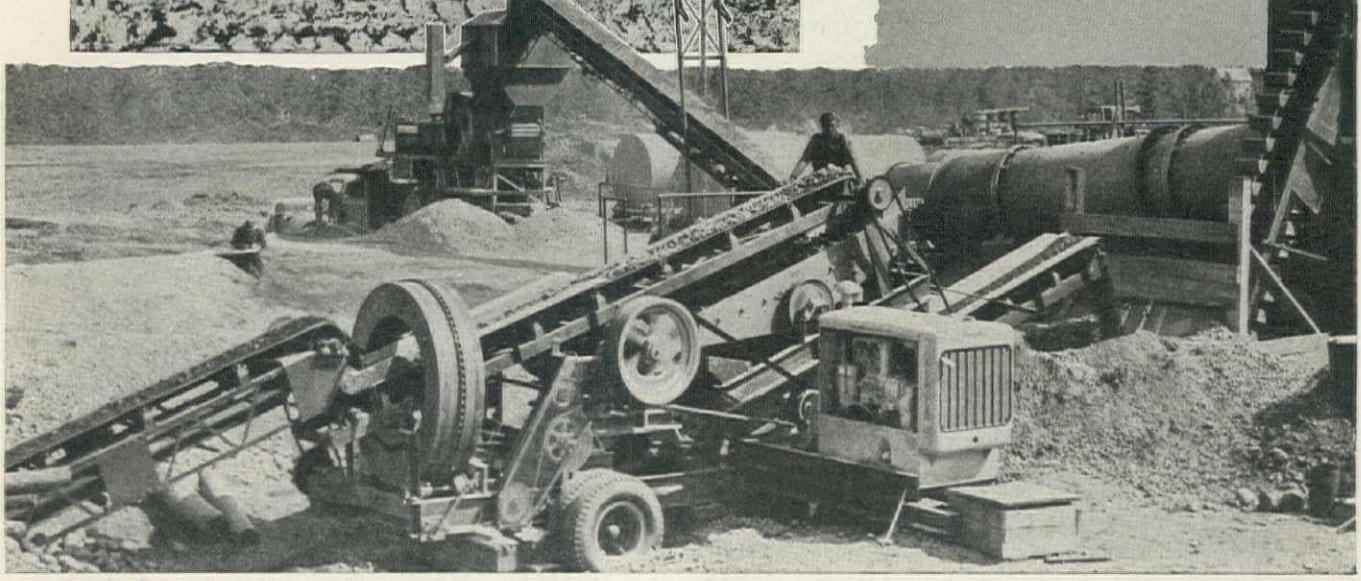
They're being built — for defense in Alaska, for offense in Africa—all over the world. And much of the equipment that produces the aggregate for them is Telsmith built. And Telsmith knows how to build it. That's Telsmith's regular business, and has been *for years.*

Look at this Telsmith 36-A Portable Crushing-Screening Plant shown here in active service—helping to build flying fields for Uncle Sam's war birds in Alaska. You'd know the contractors, if we could mention the name.

It can be told, however, that this portable, like all Telsmith plants, is doing a consistently good job and doing it fast.

Although almost all current production of Telsmith Portable Plants, Telsmith Crushers and other equipment are going to Uncle Sam for use by the armed forces overseas—Telsmith Equipment is available for contractors doing war work. *Write for Catalog 265.* P-6

SOMEWHERE IN ALASKA — Handling hard, abrasive, volcanic gravel, this Telsmith 36-A Portable Crushing-Screening Plant is shown (*top*) making sand for airplane runways and landing strips. Sand capacity: 50 cu. yds. an hour; (*bottom*) producing 1¼" aggregate for base coarse at average rate of 100 cu. yds. hourly.



SMITH ENGINEERING WORKS, 4010 N. 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.

WARTIME HELP

..to Lengthen Tractor Life...Reduce Upkeep

As America goes "all-out" . . . more and more tractors are needed by our armed forces. This means you have to take better care of your present machines than ever. Every one "kept rolling" means one more for Uncle Sam. To help you make 'em last . . . Allis-Chalmers suggests these wartime helps on tractor care and maintenance.

1 TRAIN YOUR OPERATORS... All your tractor operators should know how to take care of your tractors. Start your own service school. Call your tractor operators together at the most convenient times and let your head mechanic or seasoned operators instruct them. Or try to arrange with your Allis-Chalmers dealer to send over one of his mechanics to conduct your service school. If it is at all possible, he will be glad to cooperate. Have everyone attend that has even the remotest connection with your tractors. The operator's job will be made easier . . . and it will be easier on your machine and pocketbook! Use this preventive maintenance plan!

2 CHECK TRACTORS FREQUENTLY Inspect and overhaul your tractors at frequent intervals. Keep tracks at proper tension, make wear take-up adjustments as necessary, replace worn parts before they can damage the surrounding mechanism, lubricate according to instructions. You'll not only save your machine . . . you will save critical material . . . save plenty of grief, time and money. Call in the skilled help of your Allis-Chalmers dealer for inspections, overhauls, rebuilds, repairs. He will do the work right, at lowest cost and with genuine parts. His knowledge and experience are always at your command!

Start your wartime training and maintenance program now! Regardless of how soundly constructed, a tractor will produce with high efficiency only if it is carefully operated, well lubricated, properly serviced!

ALLIS-CHALMERS
TRACTOR DIVISION · MILWAUKEE · U. S. A.

★ WARTIME SERVICE FROM YOUR ALLIS-CHALMERS DEALER

1 PARTS ASSISTANCE—Information on how to get parts and who can 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.

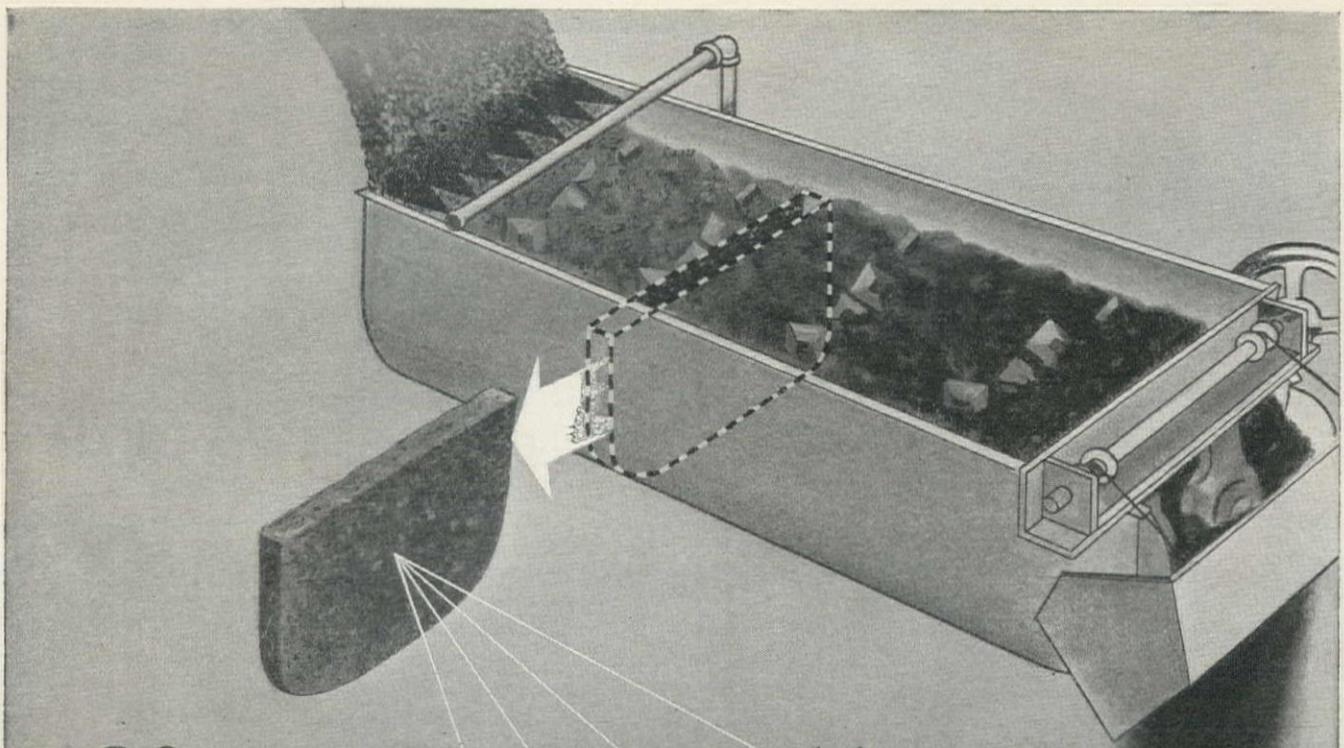
6 SERVICE EDUCATION — Instructions on how to operate and service equipment correctly. Provides service school instructors.

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 — A-1 equipment rented at nominal charge.

10 EQUIPMENT EXCHANGE—Serves as information center on used equipment available in territory.



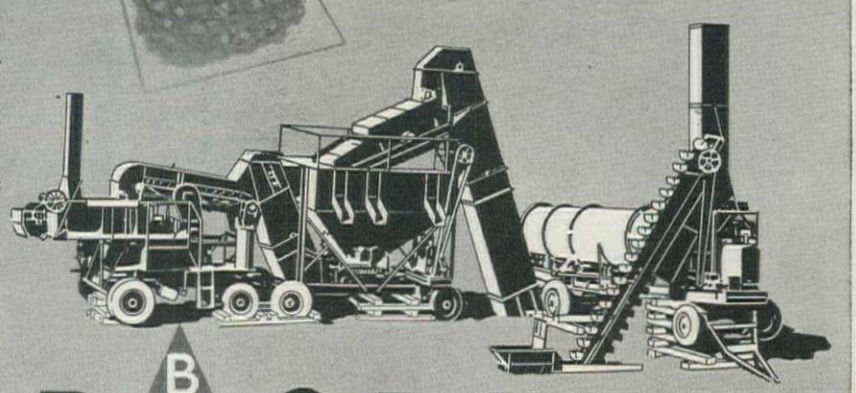
Continuous Mixing

Why did Barber-Greene build a continuous mixer instead of the conventional intermittent batch type? The answer is in the diagram of the Barber-Greene shown above. At the upper left, the graded, and accurately measured aggregate continuously enters the pugmill in a small stream. In entering, it falls through the spray chamber where it is continuously sprayed with a small stream of metered bitumen. The combining process has started, even before the materials enter the pugmill. The need for preliminary dry mixing is completely eliminated. The Barber-Greene does not have to undo the segregation caused by dumping batches into the mill. In fact a cross section of the mix extracted just a few inches beyond the charging end of the pugmill contains the correct amount of each size of aggregate with the correct ratio of bitumen.

Here the propelling and retarding paddles work the material through the pugmill under pressure, using friction to take the excess from the fines and evenly coat the coarse material.

As the mix is constantly worked through (from left to right in diagram) there can be no dead material, even at the very bottom.

The Barber-Greene uses more horse-sense, and less horse-power. It attains complete homogeneity the easiest, most logical way. It has not only established new standards for accuracy and uniformity, — but has changed moving and erection from a major project to a simple low-cost maneuver. Barber-Greene Company, Aurora, Illinois. 42-1



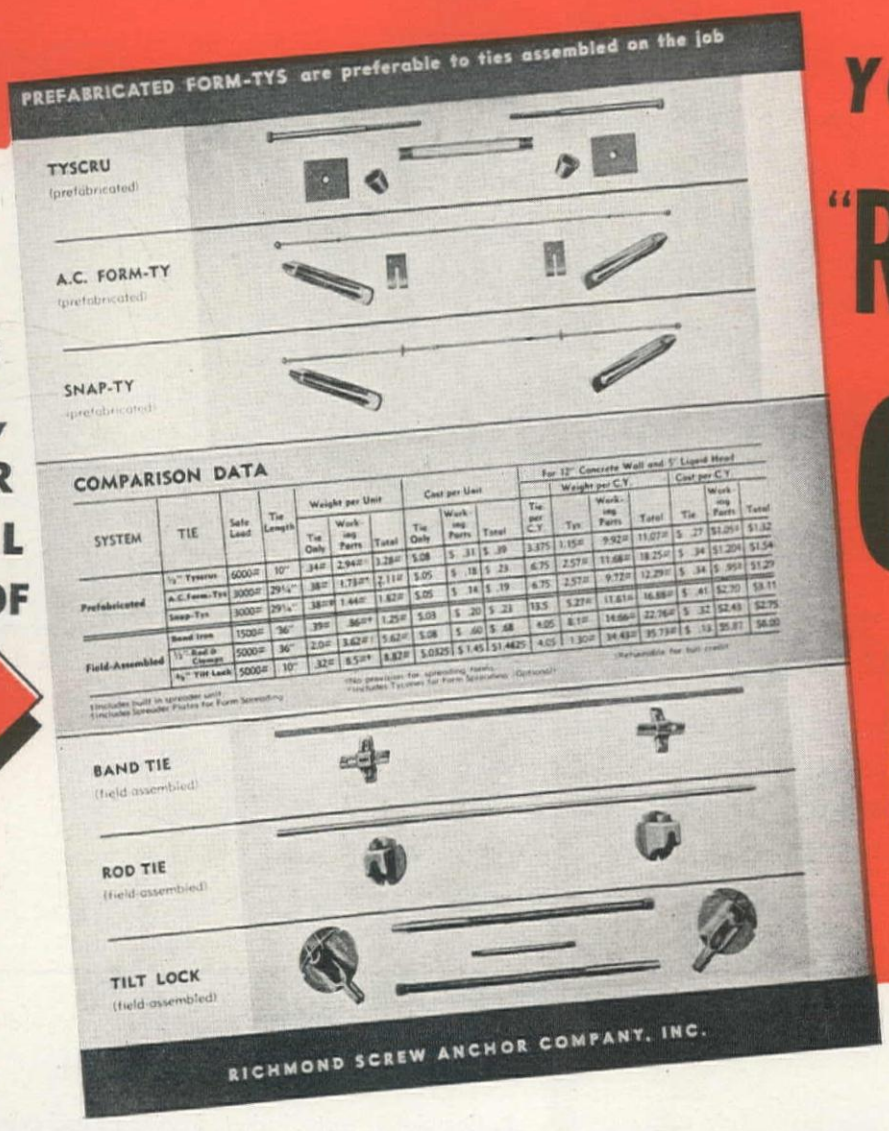
BARBER B G GREENE

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.

COMPARED WITH ANY OTHER FORM-TYING METHODS

YOU'LL FIND "RICHMOND" COSTS LESS!

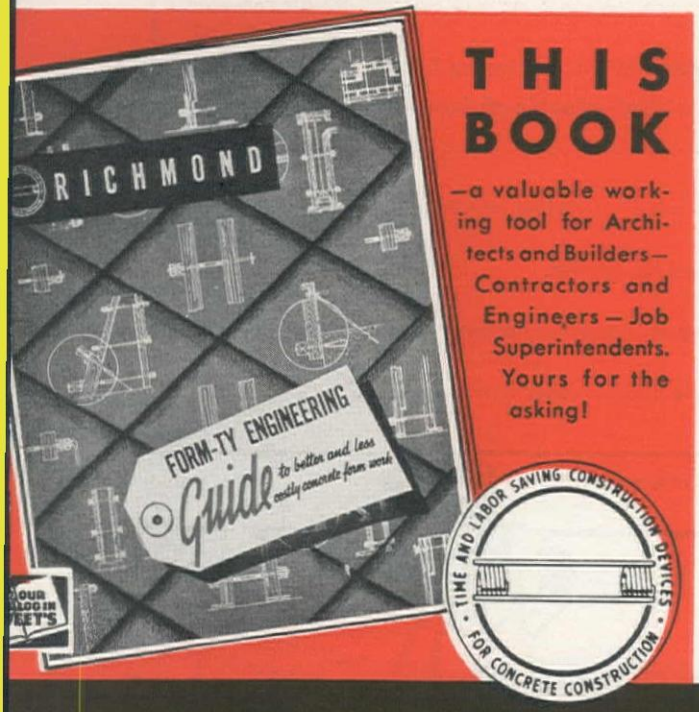
ECAUSE WE
ELL ALL TYPES,
VE CAN OFFER
HIS HELPFUL
ACTUAL PROOF



SYSTEM	TIE	Safe Load	Tie Length	Weight per Unit: Tie Only	Weight per Unit: Working Parts	Weight per Unit: Total	Cost per Unit: Tie Only	Cost per Unit: Working Parts	Cost per Unit: Total	For 12" Concrete Wall and 5' Liquid Head: Weight per C.Y.: Tie per C.Y.	Weight per C.Y.: Tys	Weight per C.Y.: Working Parts	Weight per C.Y.: Total	Cost per C.Y.: Tie	Cost per C.Y.: Working Parts	Cost per C.Y.: Total
Prefabricated	½" Tyscru	6000#	10"	.34#	2.94#†	3.28#	$.08	$ .31	$ .39	3.375	1.15#	9.92#	11.07#	$ .27	$1.05†	$1.32
	A.C. Form-Tys	3000#	29½"	.38#	1.73#†	2.11#	$.05	$ .18	$ .23	6.75	2.57#	11.68#	18.25#	$ .34	$1.20†	$1.54
	Snap-Tys	3000#	29½"	.38#	1.44#	1.82#	$.05	$ .14	$ .19	6.75	2.57#	9.72#	12.29#	$ .34	$ .95†	$1.29
Field-Assembled	Band Iron	1500#	36"	.39#	.86#†	1.25#	$.03	$ .20	$ .23	13.5	5.27#	11.61#	16.88#	$ .41	$2.70	$3.11
	½" Rod & Clamps	5000#	36"	2.0#	3.62#†	5.62#	$.08	$ .60	$ .68	4.05	8.1#	14.66#	22.76#	$ .32	$2.43	$2.75
	⅝" Tilt Lock	5000#	10"	.32#	8.5#†	8.82#	$.0525	$ 1.45	$1.4625	4.05	1.30#	34.43#	35.73#	$ .16	$5.87	$6.00

†Includes built in spreader sets
‡Includes Spreader Plates for Form Spreading
*No provision for spreading rods.
**Includes Tycones for Form Spreading. (Optional)
Retrievable for full cone

COSTS LESS THAN ANY KIND OF FIELD-ASSEMBLED DEVICES!



THIS BOOK

—a valuable working tool for Architects and Builders—Contractors and Engineers—Job Superintendents. Yours for the asking!

These are no times to monkey around with the cumbersome, slow, time-eating, dollar-wasting methods of putting together on the job makeshift Form-Tying devices. "Richmond's" prefabricated Form-Tying devices, accessories and methods cost you less every time, no matter what sort of job you're up against, no matter what the conditions may be.

"The Richmond Way" is your best profit-making way, best because you do a better, faster, less costly job by using fewer ties; erecting and stripping forms in less time; less ruined lumber. Again, best because our free technical and estimating service provides, for your men, working blueprints of your job sections scheduling the quantity, spacing and location of ties needed, thereby eliminating costly hours of work and worry. And again, best because you don't tie up your money in Tylags, Tycones, Flat Washers, Tywrenches, etc. "Richmond" loans you these working parts! Talk about a complete "package"! That's exactly what you get from "Richmond"—and only from "Richmond." A complete package containing many an extra dollar of profit for you. Prove all this? Yes, just ask us.

RICHMOND SCREW ANCHOR CO., INC.

816-838 LIBERTY AVENUE • BROOKLYN, N Y

How to Judge a Portable Compressor

How do your portable compressors measure up to today's demands for full air output under rigorous operating schedules—regardless of weather, season or altitude? If your compressors are Gardner-Denver *Water-Cooled* Portables, your check-up will reveal advantages such as these:

Gardner-Denver WBH-365 Diesel Powered Portable Air Compressor.

1. Sustained air output day after day, regardless of temperature, altitude or weather extremes.
2. Completely water jacketed cylinders and cylinder heads.
3. Lower discharge temperatures from both the low and high pressure cylinders, as well as from the air receiver.
4. Cooler compressed air means less oil consumed—less deterioration of valuable air hose—lower air tool maintenance.
5. "Air-cushioned" noiseless automatic plate type valves.
6. Force feed lubrication.
7. Drop-forged, accurately counterbalanced crankshaft.
8. Adjustable Timken roller main bearings.

Exceptionally strong blowing capacity and powerful rotation make the Gardner-Denver S-55 Sinker a popular drill among contractors.

Gardner-Denver S-73 Sinker—67 pounds of speed and power for faster footage where the going is tough.

For full information on Gardner-Denver Water-Cooled Compressors and Sinking Drills, write Gardner-Denver Company, Quincy, Illinois.

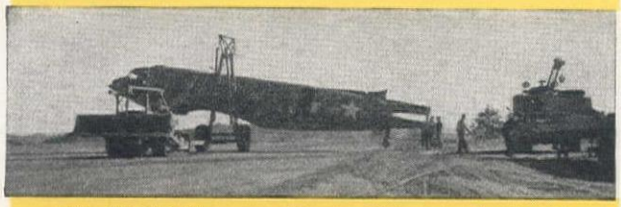
Western Branch Offices: Butte, Mont.; Denver, Colo.; Los Angeles, Cal.; Portland, Ore.; Salt Lake City, Utah; San Francisco, Cal.; Seattle, Wash.; Wallace, Idaho
Fee Naughty Machine Co., 112 S. E. Belmont St., Portland, Ore.
The Sawtooth Co., 710 Front-715 Grove Sts., Boise, Idaho

GARDNER-DENVER *Since 1859*

"..for accomplishing more than seemed reasonable or possible a year ago"

—*Robert P. Patterson, Under Sec'y of War*

Rugged LeTourneau Dozers, Carryalls and Cranes, used by U. S. Army Engineers and contractors, help punch out 1650-mile Alcan Highway in record breaking time.



The M-20 LeTourneau Tractor Crane was developed for Marines and Engineers primarily for lifting heavy, compact loads, but this one was quickly put to use picking up, hauling and loading a crashed bomber onto truck at a large air base.

Fleet of 22 LeTourneau units, Tournapulls, Carryalls, Dozers, Cranes, Rooters and Sheep's Foot Rollers, build airports and supply roads in Africa.

LeTourneau B-30 Bomber Crane built especially for Army Air Force to quickly lift and haul crashed bombers to keep runways clear. Lifting capacity 60,000 lbs., 35 ft. from wheels; travels 18 m.p.h.; giant tires permit travel on runways.

Employees Triple Production

January 6 the Army-Navy "E" unfurled alongside the National Colors and the Minute Man Flag above our factory. It was awarded to the Men and Women of R. G. LeTourneau, Inc., because they have tripled production since 1940, because they have quickly designed and put in production many special Cranes, Carryalls and Dozers for land, air and sea forces . . . because they accomplished "more than seemed reasonable or possible."

You Have Helped

You and LeTourneau - "Caterpillar" dealers have helped us, too. We've been able to deliver more to the Armed Forces because you've been reasonable and patient in your demands for new equipment and parts, because you've kept your old equipment in fighting shape at a time when war has made impossible our usual peacetime deliveries to you. We and our dealers have done our best to get as much equipment and parts to you as possible, and we'll continue to do so . . . but, the Armed Forces must come first. They need so much equipment there just isn't enough for everyone, even with our tripled "E" production record.

You, on thousands of peacetime jobs, have helped us develop this tough, cost-cutting equipment which "has what it takes" to step right into the toughest jobs of combat service. When peace comes again, our increased war production capacity and new war-proved models will mean even better service and better equipment than you've had before . . . probably "better than has ever seemed possible." Meanwhile, LeTourneau-"Caterpillar" dealers stand ready to provide you with parts and repair service 24 hours a day, 7 days a week. Use them for Victory.

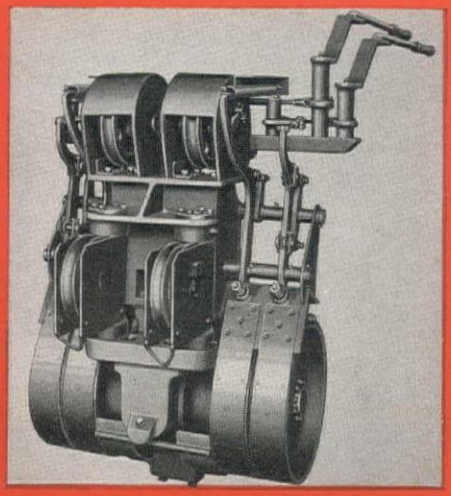
LETOURNEAU

PEORIA, ILLINOIS • STOCKTON, CALIFORNIA

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

**Name Reg. U. S. Pat. Off.*

GOOD NEWS *for tomorrow's*



BUCKEYE POWER CONTROL WINCHES

These fast, rugged winches step-up output from all cable-controlled equipment. Made in medium and heavy-duty types, single and double drum models to fit all makes of crawler tractors. To get the *most* out of tractors and equipment, get the facts about these output-builders . . . write for information now!

BUCKEYE BULLDOZERS & TRAILBUILDERS

Every practical feature to make tractor power produce the *most* is provided in these modern dirt-movers.

Balanced weight maintains full crawler contact with the ground for better traction; engineered blade curvature steps up dirt moving ability and saves power. You'll find many other time and money-saving features — write for complete data.

equipment users from today's BATTLEFIELDS

IN this mechanized war, Buckeye tractor equipment has become *battle-front* equipment . . . serving under every conceivable condition, undergoing punishment that puts every part, every feature to the most gruelling test — punishment that no peacetime construction job could possibly equal. The invaluable experience of this world-wide "field test" has not only helped create the better "fighting tools" we need for victory, but also holds the promise of more efficient, faster-working, longer-lasting equipment that will make the building of our new peacetime world facilities an easier, faster and cheaper job.

BUCKEYE TRACTION DITCHER CO.

Findlay • Ohio

For real help in meeting today's problems, in planning for tomorrow's big job — *keep in touch with your Buckeye distributor!*

50 YEARS OF PROGRESS BUCKEYE 1892 1943

Built by Buckeye

Convertible Shovels

Trenchers

Tractor Equipment

R-B Finegraders

Road Wideners

Spreaders

WHERE SPEED IS ESSENTIAL

Specify WOOLDRIDGE SCRAPERS

In the construction of airports, landing fields, advance bases, etc., *time* is just as important a factor as in actual military operations. Delays often prove extremely costly. In leveling and filling of uneven ground, speed, therefore, is a prime prerequisite for heavy duty earthmoving equipment. Backed by a world of job-proven performance, Wooldridge Scrapers have been noted for their speed in handling larger heaping loads in less time, at a lower yardage cost. This is because Wooldridge Scrapers load faster, and dump faster with less cable wear---less down-time for repair, over longer periods of constant use. Therefore, when you buy, always specify Wooldridge Scrapers.

WOOLDRIDGE SCRAPERS ARE AVAILABLE IN SIZES RANGING FROM 9 TO 30 CU. YARD CAPACITIES. WOOLDRIDGE SCRAPERS ARE SUPPLIED TO THE UNITED STATES GOVERNMENT FOR TWO LINE OPERATION, PERMITTING TWO DRUM POWER UNITS TO BE USED. WOOLDRIDGE SCRAPERS OPERATE ON THE PIVOT-TILT FORCED LOAD EJECTION PRINCIPLE.

SPECIFY WOOLDRIDGE WHEN YOU BUY

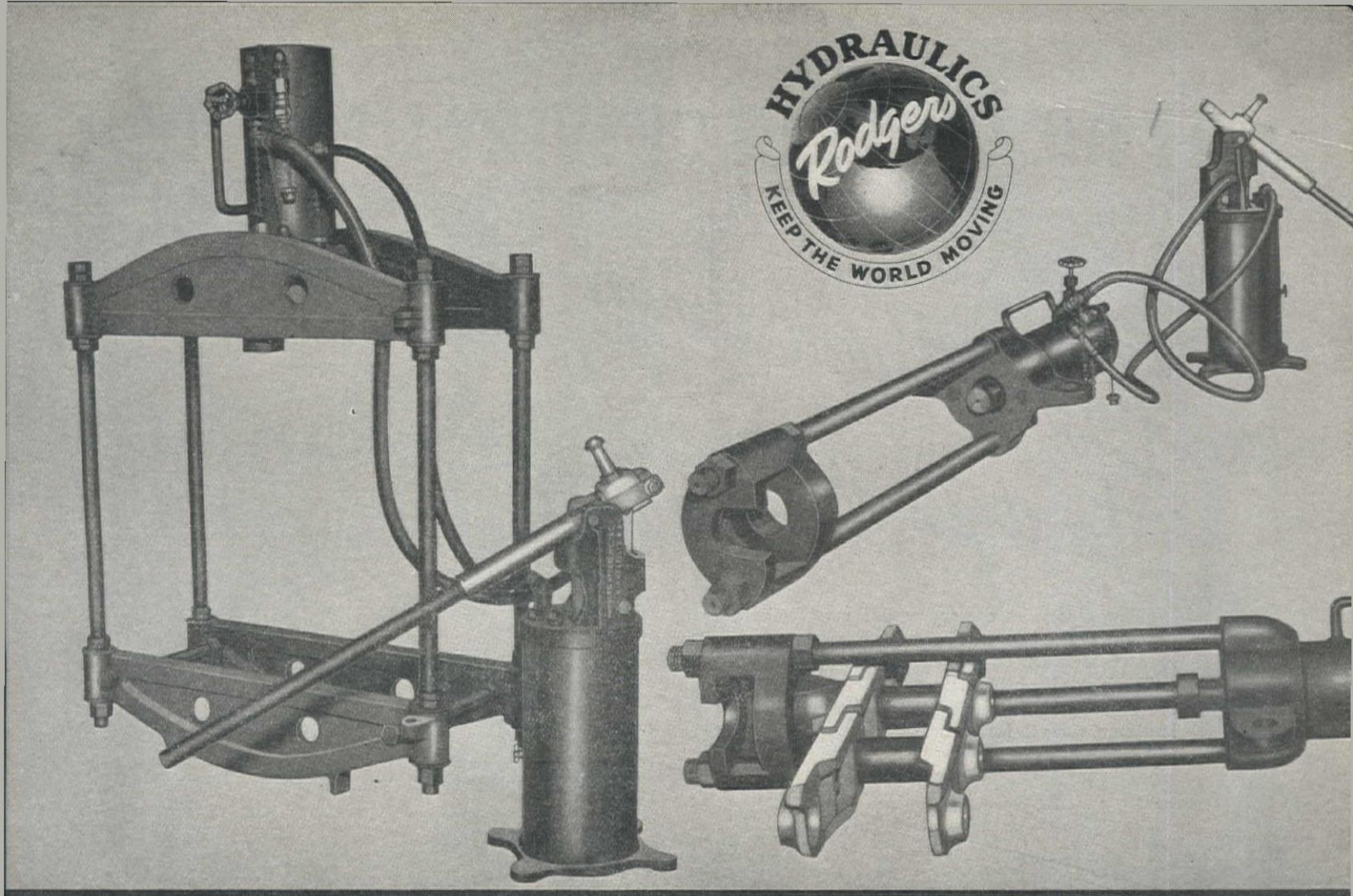
WOOLDRIDGE

MANUFACTURING COMPANY • SUNNYVALE, CALIFORNIA

SCRAPERS • POWER UNITS • BULLDOZERS • RIPPERS • TRAIL BUILDERS

BOILING BOWL TERRA CLIPPER PRINCIPLE

SCRAPERS



FOR *Heavy Duty* REPAIR

RODGERS UNIVERSAL PRESS

AND TRACK SERVICING EQUIPMENT is on the job with contractors and engineers everywhere, who have important construction contracts to complete on schedule. With precious time and expense an important factor in our all-out effort for a speedy victory, these men know the equipment that is best on general overhaul work. ★ Rodgers Universal Hydraulic Presses can be used in any place and in any position where pulling, pressing or lifting power is needed. Rodgers Universal Press is portable and can be carried to the job and assembled around the work, where the frame can be used in any position convenient for the operator. An important feaure is the 4-speed pump, weighing only 73 pounds. On low speed one man can produce more than 100 tons pressure with press illustrated above. ★ Contractors and engineers throughout the country heartily recommend Rodgers Universal Hydraulic Presses with Track Servicing attachment as essential to their equipment. ★ Rodgers Hydraulic Inc., St. Louis Park, Minneapolis, Minnesota.

Manufacturers of

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

Rodgers HYDRAULIC Inc.

GET THE MOST OUT OF EVERY ELECTRODE

Burn them down to a 2" stub

Welding electrodes are scarce and must be conserved. By burning every electrode down to a 2" stub you can save up to 5 lbs. of electrodes from every 50 lb. box. This is one important way that good welding operators are helping to meet the electrode shortage. Some other important rules to follow are:

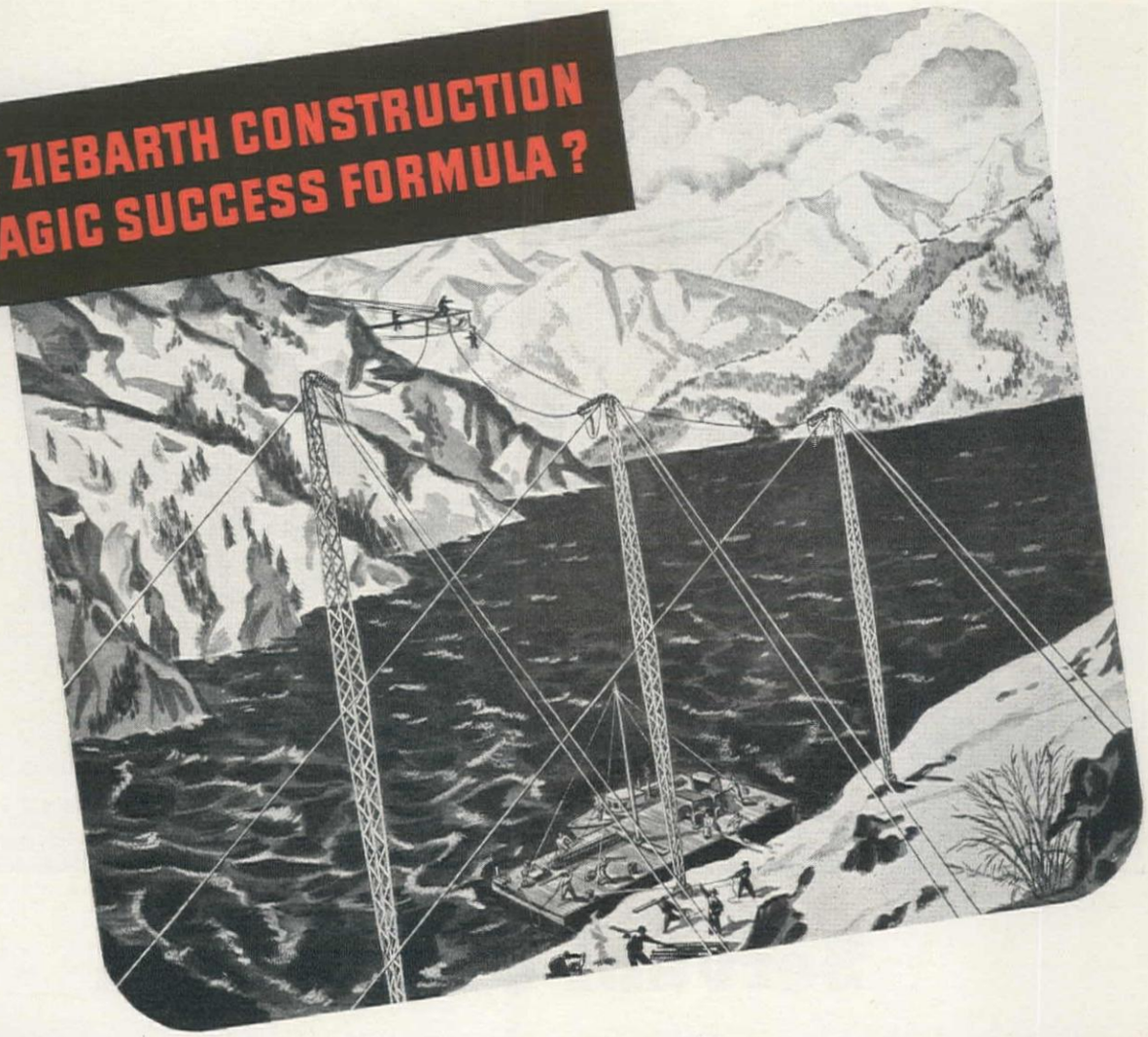
1. Choose the proper welding current for the size of electrode being used. Excessive welding current may break down the coating before the electrode is consumed.

2. Select largest diameter electrodes to get faster deposition of metal. Using an 18" length instead of 14" reduces the number of times it is necessary to change an electrode for a given length of weld. This increases welding speed 25-30% and saves 3-4% stub loss.

3. Make legs of fillet welds equal and make face of fillet welds flat. Convexity of fillet weld faces should never exceed 10%.

Follow these suggestions to get the maximum work out of every electrode. In this way you can help prevent waste of the vital materials that are needed for victory production.

HAS ZIEBARTH CONSTRUCTION A MAGIC SUCCESS FORMULA?



LONG MAN HOURS + NIGHT & DAY BRAIN WORK = END PRODUCT AHEAD OF SCHEDULE !!!

Ziebarth Construction superintendents and crews, numbering today over 1,700, were weaned on insulators and grew to their present stature on an electrical diet of nothing less than 230 Kv.! Construction over terrain that sometimes could be surveyed only by plane, and making transmission towers grow on rocky cliffs where nothing else would—is a feat that is easily surmounted through the application of engineering knowledge.

Out of such gruelling tasks in the past have come hard, tough brain muscles, as well as high-tempered bodies. "Get the job done—fast!" has resulted in Ziebarth Construction being called in on an ever-widening list of heavy-construction jobs at different points in the United States; high-tension steel power lines, electrical sub-stations, airport lighting, personnel shelters, railroad signal installations, telegraph lines, sewage plants, water supply, pumping plants.

Want to read "The Story of Ziebarth Construction"? Want to know how this fast-moving, versatile crew of experts grew into one of America's leading construction firms—and how they can help you? If you're an executive whose job is related to the engineering, buying or building of heavy construction, write on your letterhead for a complimentary copy—no obligation.

Ziebarth has plenty of heavy-duty construction equipment. If you need proven-in-the-crucible-of-experience contracting work, please contact

ZIEBARTH CONSTRUCTION

FRITZ ZIEBARTH—810 WEST ESTHER STREET, LONG BEACH, CALIFORNIA
RENO, NEVADA

Enlarged reproduction free on request

Servant of Freedom

Mighty servant of all America is the great Construction Industry. Now during the war it is helping to crush our enemies. With victory Construction will again serve the peace-time progress of free men.

Already America's vast network of highways, bridges and airports is helping to free men from barriers of distance, time and transportation costs . . . massive dams are making low-cost electricity available to more and more millions, lifting old burdens . . . vast aqua-ducts and sanitation systems are contributing to our people's health.

With the return of peace, Construction will bring in its train ever new and greater contributions toward the better life for all.

★ ★ ★

Wickwire Rope is proud of the privilege of helping the Construction Industry in its engineering accomplishments . . . in quarries, on highways, in the building of dams, bridges, and structures of all kinds.

A CHALLENGE

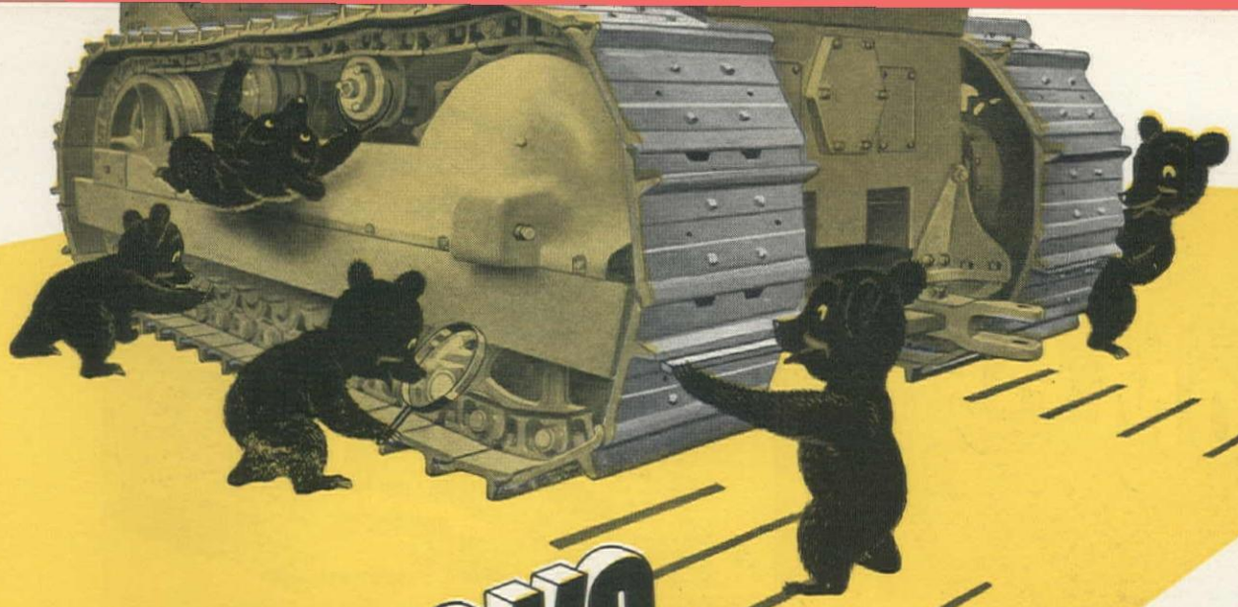
The present shortage of steel, and of wire rope, challenges each member of the Construction Industry to make each length of wire rope now in service last longer than ever before. Every man who uses or handles wire rope can help.

We will be glad to furnish free copies of the helpful book "Know Your Ropes," which pictures the right and wrong ways to use wire rope. TAKE UP THE CHALLENGE—WRITE FOR YOUR COPY—AND MAKE SURE ANY NEW MEN KNOW THE *RIGHT* WAYS. . . . Address Wickwire Spencer Steel Company, 500 Fifth Ave., New York, N. Y.

WICKWIRE ROPE

Sales Offices and Warehouses: Worcester, New York, Chicago, Buffalo, San Francisco, Los Angeles, Tulsa, Chattanooga, Houston, Abilene, Texas, Seattle. Export Sales Department: New York City

WISSCO PRODUCTS



TRACKS—

BEAR THEM IN MIND

Cutting off a worn sprocket rim with acetylene torch

YOUR "Caterpillar" track-type Tractor gets much of its pulling power from the tracks on which it runs.

So in these days when every ounce of machine power counts for victory, you'll want to give special care and attention to tracks. There are many things you can do to prolong track life. Here are some:

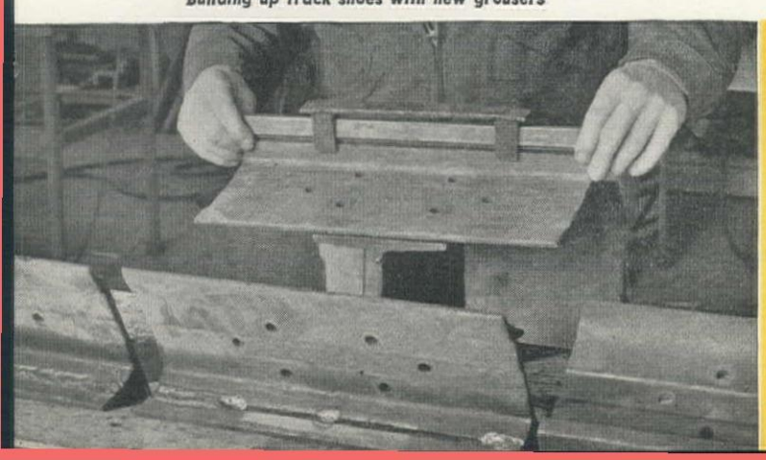
1. Keep the rollers, idlers and diagonal brace bearings lubricated. This should be done more frequently if your tractor operates in mud or water.
2. Keep the track tension correct, and the front idlers in alignment, so that wear will be evenly distributed.
3. Don't abuse the machine. A "Caterpillar" track-type Tractor is built to take a lot of punishment, but it will run longer and more efficiently if you avoid undue shocks and overloading.
4. Go over the nuts and bolts periodically to be sure they're tight. Look — and listen — for signs of wear.

When tracks are worn to the point of needing repair, your "Caterpillar" dealer's excellent service facilities are available night and day, ready to:

1. Turn track pins and bushings. In some cases this will actually double track life.
2. Cut off worn sprocket rims and weld on new rims.
3. Build up the rail side of worn track links.
4. Build up worn rollers by welding.
5. Weld new grousers on track shoes.
6. Switch rollers, especially if your equipment puts extra load on the front, rear or one side of the tractor.

All these types of track service save metal—vital in today's war effort. Your "Caterpillar" dealer is pledged to keep your "Caterpillar" equipment working with the least possible expenditure of war-needed materials. Call on him for counsel, service and repairs, and ask him for a copy of the useful new booklet, "Keep 'em Working."

Building up track shoes with new grousers



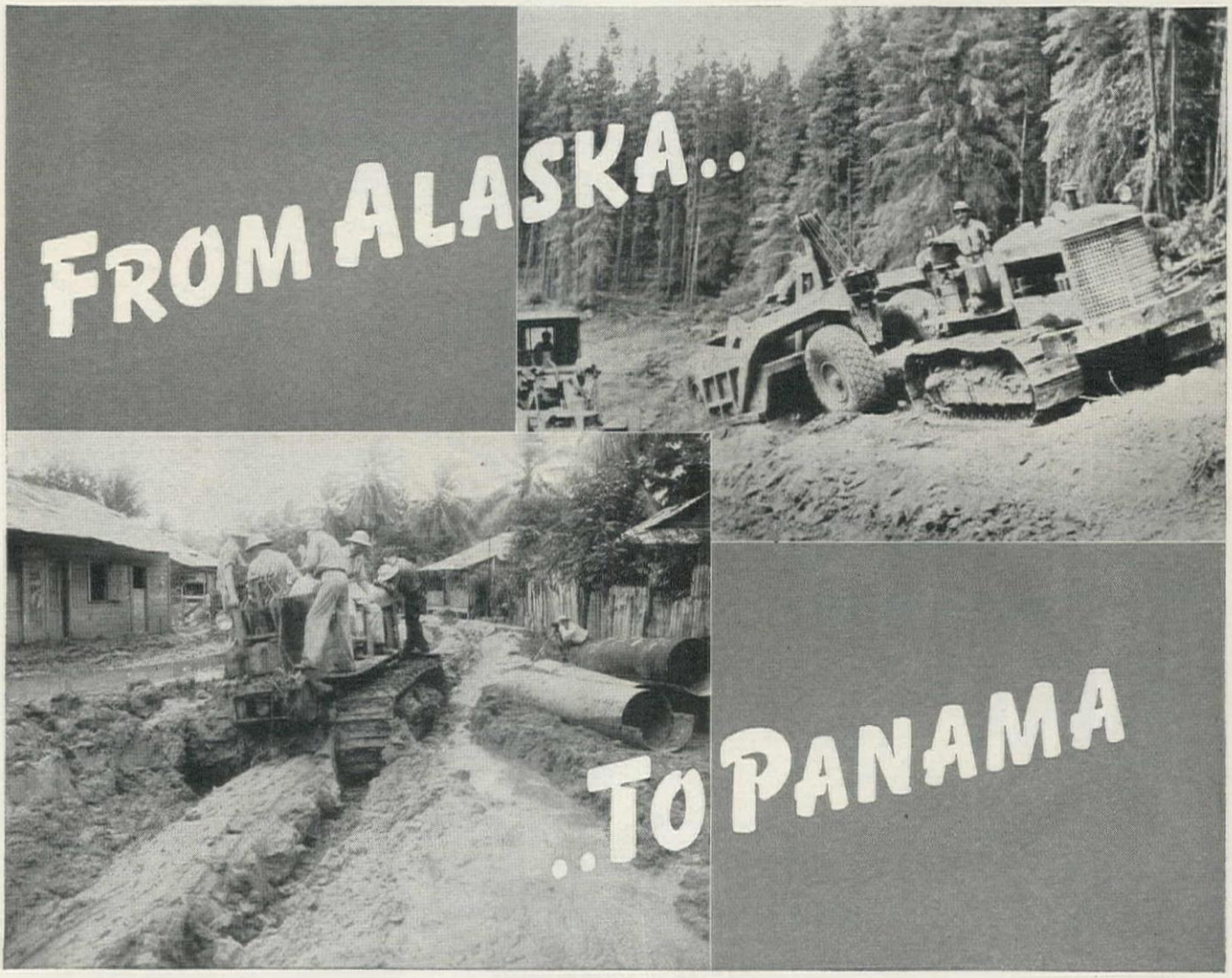
CATERPILLAR

REG. U.S. PAT. OFF.

DIESEL

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

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



CLETRACS DO THE *TOUGH* JOBS

★ Bulldozing, hauling, earthmoving, road building—whatever the job, whatever the climate—Cletracs do the *tough* jobs.

Tough going or easy going—the dependability and enduring qualities built into Cletracs are doubly appreciated when equipment is difficult to replace.

You can keep *your* Cletracs ready for any kind of going with frequent inspection, proper lubrication, and replacement of worn parts promptly. Consult your Cletrac dealer . . . use his experience, facilities, and personnel to keep your Cletracs in top-notch condition.

THE CLEVELAND TRACTOR CO., Cleveland, Ohio

NO PRIORITIES ON WAR BONDS

Next to the Stars and Stripes, Cletrac is proud to be flying the Minute Man flag. Over 95 per cent of Cletrac employees are purchasing War Bonds by pay roll deduction.

Cletrac Crawler Tractors

GASOLINE AND DIESEL

FOR VICTORY BUY UNITED STATES WAR BONDS AND STAMPS

ROEBLING "Blue Center" gives them all they ask for!

They're carpenters and blacksmiths and gravediggers. Ready to build a railroad, or blow it up... spin a river-crossing for tanks, or set a trap to stop them.

And when the Corps of Engineers set out to trap a tank, watch them roll up this mechanical gravedigger, and *work to specifications.* Straight down and just wide and deep enough so the tank buries its nose helplessly against the opposite wall. And when they rope-rig this or any other equipment, they select a rope they know won't let them down.

In fact, wherever the going is toughest ...you'll find Roebling "Blue Center" Steel Wire Rope. Built into every foot of it is the knowledge of Roebling engineers, gained in the field... in the Roebling mills... in Roebling development engineering. Each adds its part to the extra values in "Blue Center" Rope... each helps it meet conditions unfailingly wherever wire rope has a routine or unusual job to do for Victory.

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

ROEBLING
"Blue Center"
STEEL WIRE ROPE
ARMY E NAVY
PREFORMED OR
NON-PREFORMED

ARE YOUR ROPES DOING FULL DUTY?

You can make sure that they are... and save steel for war in the bargain... by taking proper care of wire rope *on the job.* To help you, Roebling has assembled a wealth of conservation data and boiled it down to fit on a 5 x 4 inch tag that operating men can fasten right to the equipment. It's a simple, convenient way to remind and instruct them about such vital precautions as these:—

1. ***INSTALL PROPERLY***
2. ***SPOOL CORRECTLY***
3. ***USE ENOUGH CLIPS***
4. ***LUBRICATE REGULARLY***
5. ***INSPECT FREQUENTLY***
6. ***OPERATE CAREFULLY***

Copies of this tag are yours for the asking. Our nearest office will furnish as many as you need. ASK FOR TAG "A".

SAFE WAYS IN WAR PRODUCTION

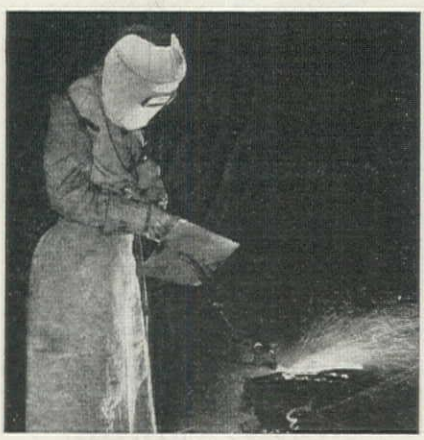
NEW WORKER—Every new employee in a Bethlehem Plant wears this button. It helps to fix his attention on safety. It signals to more experienced employees that he is new to the plant, and they keep an eye on him, and do not hesitate to offer friendly guidance in case he forgets instructions and unknowingly breaks any safety regulation.

Industrial accidents, bad enough because of the human distress they cause, are also a grievous drag on production. Every day that injury lays up a worker means lowered output of the materials our armed forces are asking for.

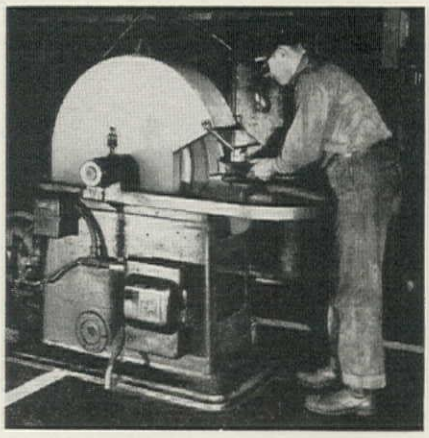
Safety engineers know they must be more than ever on guard as pressure for production intensifies and men work against time. When war came, Bethlehem Steel Company expanded its accident-prevention program to meet the new conditions. Special efforts were addressed to the new employee to make him safety-conscious from the moment he walked into the plant. And by posters, group meetings and individual instruction, the safe way of doing his job was ground into the subconscious of new Bethlehem employee and veteran alike.

Significant are the results of a current study, showing that of all disabling accidents to Bethlehem employees less than one-third occur in the course of their work. Even with employment rolls upped by the tens of thousands and plant operations at top speed to meet the demands of the war program, the Bethlehem employee is safest, best protected against injury, during the hours he spends on the job.

AUTOMATIC HAND GUARD—This man is operating a trimming press. If he should absent-mindedly let his hands move too near the danger zone, the two cables will automatically whisk them back to safety, before the ram of the press descends.



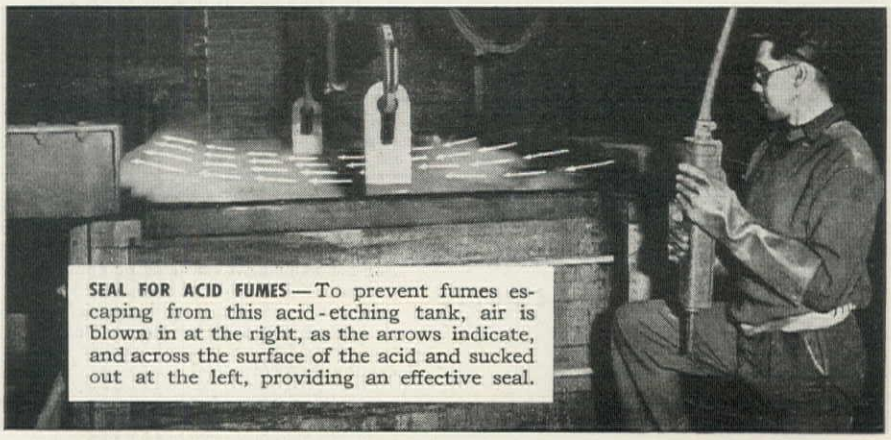
100% HEAT-INSULATED—Asbestos-covered hood, chrome-leather full-length apron, chrome-leather gloves, chrome-leather full-length sleeves and asbestos guard on torch handle give this worker complete protection against heat and flying sparks.



EYES DOUBLY GUARDED—Even though this grinder is equipped with a heavy glass shield, the eyes of the man who is operating it are given further protection against sparks or flying bits of abrasive by the cup goggles that he is wearing.

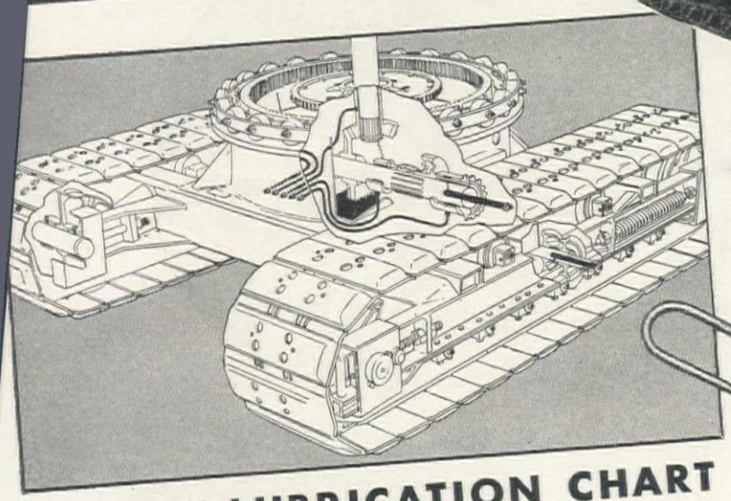
BETHLEHEM STEEL

Bethlehem Steel Company is actively supporting the National Safety Council in its campaign against accidents in war production, through the War Production Fund to Conserve Manpower.



SEAL FOR ACID FUMES—To prevent fumes escaping from this acid-etching tank, air is blown in at the right, as the arrows indicate, and across the surface of the acid and sucked out at the left, providing an effective seal.

P&H



HANDY LUBRICATION CHART
for Complete Lower Assembly

You can greatly reduce wear and tear — avoid time losses — by giving your crawlers the simple and regular care they deserve.

To make it easier for you, we have just prepared a timely War Service Bulletin with helpful instructions on the proper lubrication of crawler rollers, idler and drive sprockets, chains, shafts, etc., for all P&H Excavators. It will help you keep your machines in fighting trim.

Don't take chances with trouble while Uncle Sam counts so heavily on all available shovel equipment!

☆ *Make War on Wear With Proper Care* ☆

SEND TODAY FOR FOLDER, FORM NO. D-48

Advantages like these help keep the P&H's on the job, producing steadily:

WELDED ONE-PIECE CONSTRUCTION OF ROLLED ALLOY STEELS provides greater strength and rigidity.

TRUE ROLLING CRAWLERS mean easier travel, less trouble.

P&H HYDRAULIC CONTROL — easier, faster, more positive.

ARMY E NAVY

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

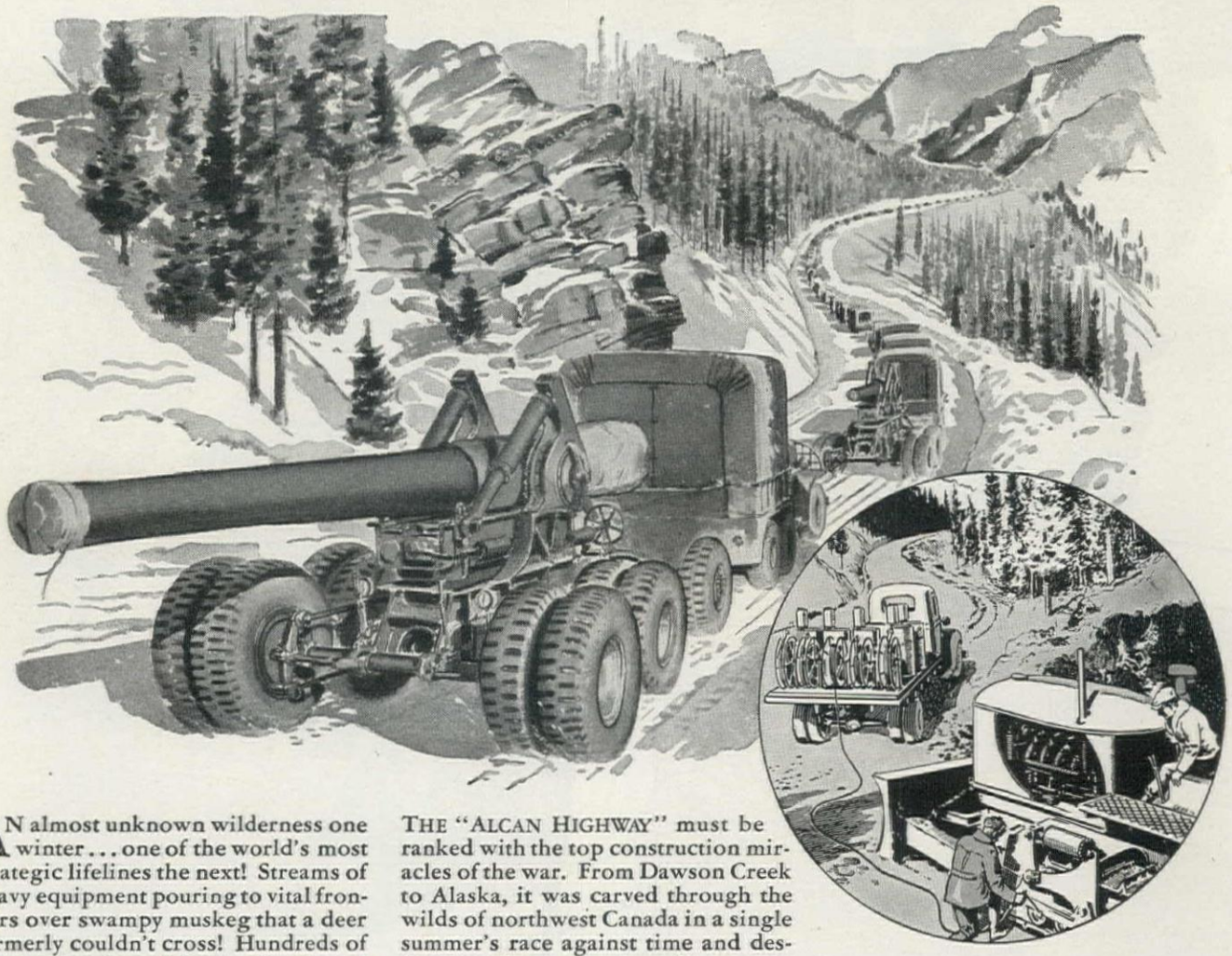
General Offices:
4490 W. National Avenue, Milwaukee, Wisconsin

HARNISCHFEGER CORPORATION

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

The BIG GUNS ARE MOVING

on "the Lifeline that *Couldn't Be Built*"...



AN almost unknown wilderness one winter... one of the world's most strategic lifelines the next! Streams of heavy equipment pouring to vital frontiers over swampy muskeg that a deer formerly couldn't cross! Hundreds of miles of rock and dust and grit and water—tamed in months instead of the years it would normally take!

THE "ALCAN HIGHWAY" must be ranked with the top construction miracles of the war. From Dawson Creek to Alaska, it was carved through the wilds of northwest Canada in a single summer's race against time and destiny—to shorten our supply route to Alaska from weeks to days. Heavy machinery, flown to airports hand-hewn in the wilderness, thundered where only animal noises had been heard before. And before the last leaves fell, the "lifeline that couldn't be built" shook under the treads of guns and tanks on their way to our farthest-north frontier.

AS USUAL, where the going is tough and machine breakdowns must be avoided, Alemite went along to help build the "Alcan Highway". On bull-dozers, graders, tractors that had to work three shifts a day *or else*—Alemite Lubrication Systems stood guard against wear. And Alemite Portable Service Stations developed for this job fed those Alemite Systems the special lubricants each part required.

Ask Anyone in Industry!

ON COUNTLESS construction jobs, large and small, Alemite Portable Service Stations *on the job have paid for themselves in days*—in time saved on lubrication of equipment. Less "time out" for lubrication means more time for moving dirt each day—more yards moved every day at a definite per-day cost.

What's equally important, the Alemite Portable Service Station *on the job* means that every machine is getting the kind of protection the manufacturer intended. Protection against friction—against dust penetration and undue wear—means longer life for every machine!

Write today for your FREE copy of the new Catalog of "Alemite Portable Service Stations", showing various set-ups available, and the many ways in which they can speed operations for you. This book is just off the press. It's crowded with photographs and facts. Send for your copy NOW!

ALEMITE

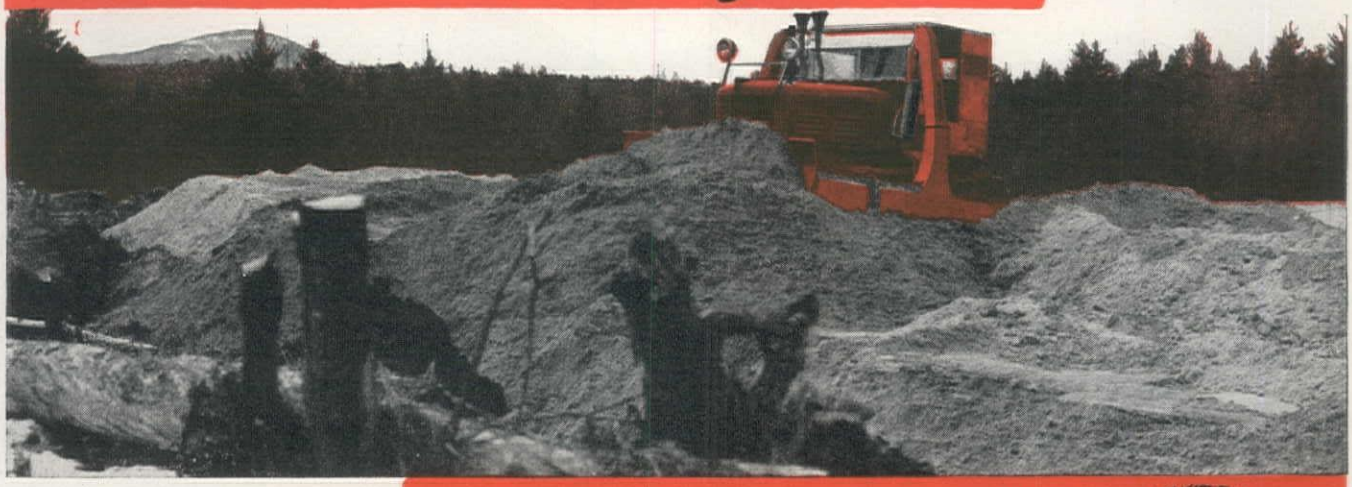
REG. U.S. PAT. OFF.

Industrial **LUBRICATION**

1839 Diversey Parkway, Chicago, Ill. • Belleville, Ontario

Another Product of STEWART WARNER

Takes to Muskeg like a Musk-Ox



Too bad they didn't have Baker Hydraulic Bulldozers during the Klondike Gold Rush. The way they performed on the Alaska-Canada Highway, and Airbase and Supply Depot construction up there, you would think they were first cousins to a Malemute sled dog. Bakers are tireless workers.

They helped to carve roads through spongy muskeg swamps—like eating soup with a fork—but they did it. They bowled over enough trees to keep a hundred pulp mills busy; made cuts in tough shale and heavy gravel; spread, graded and leveled; pushed mired dirt-buggies; rolled logs for bridges, and what-not. Bakers are versatile.

When the freeze set in, Baker's direct hydraulic down pressure—which puts the full weight of the tractor front end on the blade—was just what was needed to get the finishing touches done.

Bakers keep delivering, even in the frigid zone—use plain fuel oil in the hydraulic system. Ask Comrade Ivan! Bakers took to the Russian tundra like a Siberian musk-ox. On every front, Bakers are bringing *hydraulic pressure* to bear on the enemy!

THE BAKER MFG. CO.
542 Stanford Ave. Springfield, Ill.

May we send a copy of "Unsung Heroes of War"?

BAKER

The Modern Tractor Equipment Line for
EARTH MOVING
LEVELING AND GRADE BUILDING
SNOW REMOVAL
ROAD MAINTENANCE

TO **increase** OUTPUT

AND **conserve** EQUIPMENT

THE country expects our miners to produce more ore, and at the same time to make mining machinery last as long as possible—to avoid breakdowns at any cost.

This calls for blasting with Hercomite* or Gelamite*, the *modern* explosives that give maximum breakage for every dollar, explosives that lay the material down so that shovels or mucking machines can load speedily and without strain.

These explosives come in strengths and grades for almost all kinds of blasting. Many everyday users are obtaining satisfactory results with Hercomites and Gelamites for both surface and underground work.

The mining industry recognizes the extra efficiency and economy of these high-cartridge-count explosives, purchasing more of them than of any others.

In your own interest; in the interest of increased output; and to conserve equipment that is hard to replace; we urge you to consult us about Hercomite and Gelamite for your work.

HERCULES POWDER COMPANY
INCORPORATED

*REG. U. S. PAT. OFF.

932 King Street · · Wilmington, Delaware

A-01

TIPS to Help You Make Your ATHEY FORGED-TRAK TRAILERS LAST LONGER

Follow These Simple Rules

Grease and lubricate wheels after each 8 hours' operation

Check wheels regularly—oil seals; alignment; bearing cages

Keep track plate bolts tight

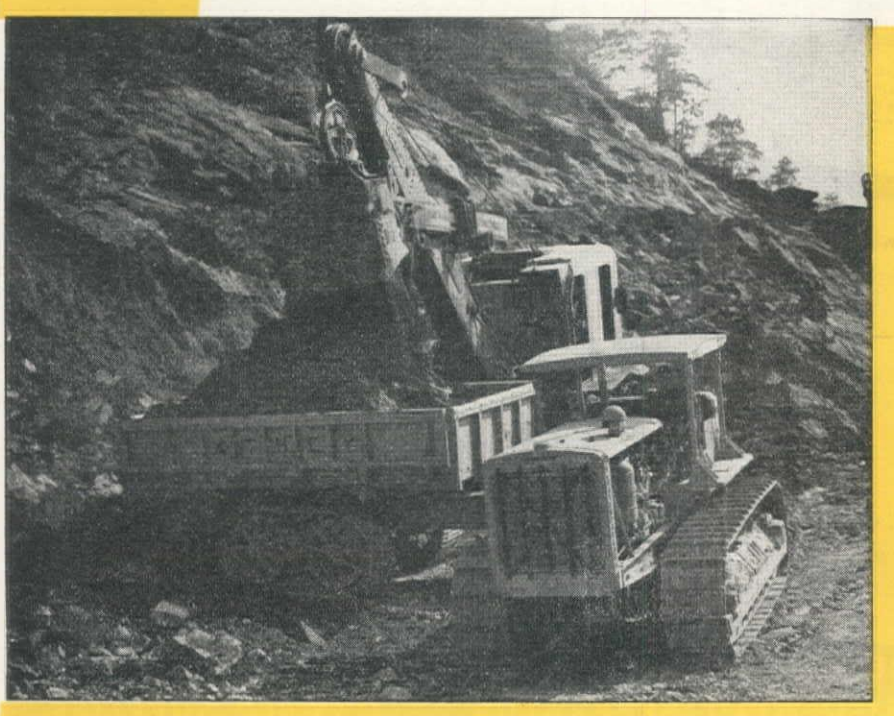
Track rails can be built up by welding

Wheels can be rebuilt by welding material on rims

Track hooks and pads can be built up, thus restoring arch in track assembly

MAINTAIN STEADY PRODUCTION, CONSERVE CRITICAL WAR MATERIALS BY BETTER CARE OF PRESENT ATHEY EQUIPMENT

To make your construction equipment serve as long as you can is one of today's chief problems. Because of its part in essential Victory construction work, your equipment is vital to winning the War. That's why good care today is more important than ever before. You can extend the life of your Athey Trailers by following a few simple rules. (1) Inspect and lubricate them as recommended in your instruction book, (2) recondition them promptly when they show signs of wear. Let your Athey-"Caterpillar" Dealer help you take better care of your Athey Trailers. He is well equipped to serve you. For more detailed facts on field repairs send for our bulletin "Field Reconditioning of Forged-Trak Wheels". Write Athey Truss Wheel Co., 5631 West 65th Street, Chicago, Illinois.

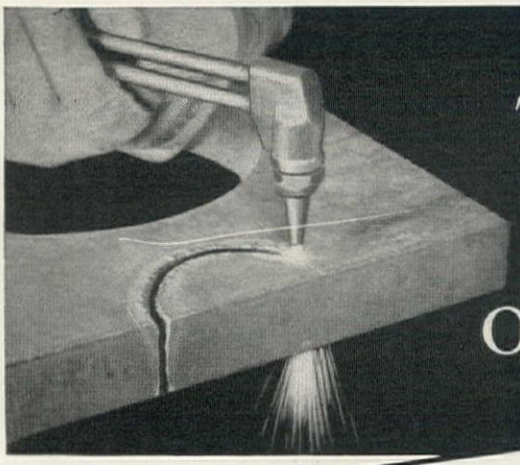


Serving the Allied Nations On Every Essential Front

Athey products are busily engaged, in this country and abroad, building airports, military and access roads, landing fields, other war construction projects. They're hauling heavy machinery in the oilfields—moving unprecedented loads of logs to the mill—toting material and supplies through untamed underbrush in isolated outposts—speeding iron ore for steel production—serving with the combat engineers.

Athey

FORGED-TRAK TRAILERS



This chart helps operators to do better Oxy-Acetylene Hand-Cutting

Refer to Form 5144 when writing for copies of this chart

Good results in oxy-acetylene hand-cutting depend not only upon the use of efficient equipment, but also upon flame adjustments, oxygen and acetylene pressures, cutting speeds, and the handling of the blowpipe. The chart illustrated is a convenient reference for oxy-acetylene operators. It shows them the results of some of the most common faults of cutting procedures and thus helps operators to keep their work at a high level. *This chart, which is printed on heavy stock 9 by 11½ inches, is available from any Linde office, without charge.* Also available upon request is the helpful booklet, "How to Increase Efficiency in Hand-Cutting Operations."

Operating Instructions

For information on correct gas pressures, nozzle sizes, and cutting speeds, refer to the Instructions furnished with your Oxweld, Prest-O-Weld, or Purox blowpipe. Duplicate copies of these Instructions are available from any Linde office.

THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation

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

In Canada: Dominion Oxygen Company, Limited, Toronto

LINDE OXYGEN . . . PREST-O-LITE ACETYLENE . . . UNION CARBIDE
OXWELD, PUROX, PREST-O-WELD APPARATUS . . . OXWELD SUPPLIES

The words "Linde," "Prest-O-Lite," "Union," "Oxweld," "Purox," and "Prest-O-Weld" are trade-marks of Units of Union Carbide and Carbon Corporation.

Why PREforming Conserves Steel, Makes Wire Rope Last Longer

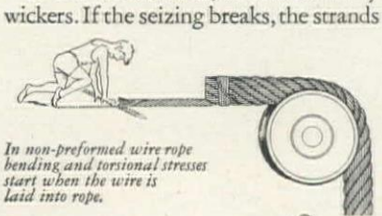
(Note: More and more wire rope users change to PREformed rope each year. During peacetime the reasons for changing from ordinary to PREformed wire rope were primarily two: the cost is lower; PREformed is easier to handle.

Today, with our nation at war and with steel at a premium, there is another and most important reason for using PREformed. It lasts much longer under high speed, severe bending and continuous operation. PREforming thus conserves steel. It conserves workmen's time; rope changes are less frequent. It reduces the accident potential; there is no wickering to harm hands or damage sheaves.)

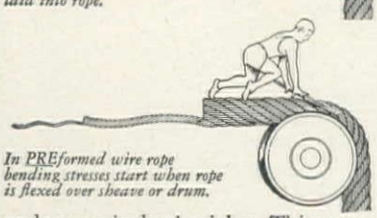
There are two kinds of wire rope. One is called Regular, or ordinary, wire rope. The other is known as PREformed.

In ordinary rope wires are held together under tension. The wires are laid into the rope by bending them to the desired shape. Bending and torsional stresses thus remain in the rope . . . are kept under control by seizing the ends of the rope.

If the wire breaks, it immediately wickers. If the seizing breaks, the strands



In non-preformed wire rope bending and torsional stresses start when the wire is laid into rope.

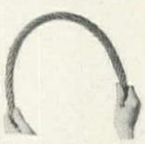


In PREformed wire rope bending stresses start when rope is flexed over sheave or drum.

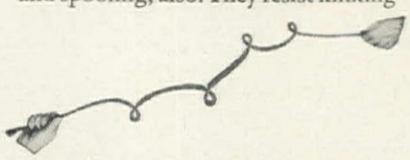
and rope wire both wicker. This causes damage and delay. In PREformed wire rope, the strands and wires are preshaped to the exact curvature they will take in the finished rope. Bending and torsional stresses are eliminated (except of course when the rope bends over a sheave). If a wire breaks, it does not wicker but remains relaxed, thus causing no delay or damage.

Advantages of PREforming

PREformed wire ropes are like shoes that have been broken in. Instead of being stiff and unwieldy, they are flexible, easier to handle.



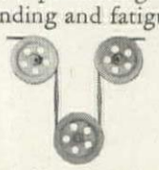
They are better adapted to bending and spooling, also. They resist kinking



when the rope is not under load.

PREformed wire ropes are easier to handle also because broken wires lay flat.

And finally, most important, PREformed wire ropes have greater resistance to bending and fatigue. This is



another way of saying that they last much longer, do a better job when the pressure is on, as it is today in war production.

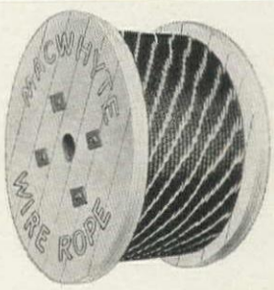
When next you need wire rope, consider seriously the purchase of PREformed wire rope. Today the job we must all do is the "best" job possible. When it comes to wire rope there is no question as to which does the "best" job. It's PREformed.

Consult with Macwhyte

Don't overlook the help that Macwhyte engineers will gladly give you on any wire rope problem. Their advice gained from many years' work on all kinds of jobs is yours for the asking. Let us know the kind of work to be done; we will tell you the rope best suited for the job.

And this we urge you to do: take extra care of your present ropes. Inspect them regularly; lubricate them often. By so doing you can make them last longer and thus aid the war effort. That's what you want; that's what your country asks of you.

This is Number 13 in a series of informative articles prepared by the Macwhyte Company to help wire rope users obtain better and longer service from ropes on the job. All articles in this series are available on request.



MONARCH Whyte Strand PRE-FORMED WIRE ROPE

. . . Macwhyte premier wire rope, famous for its strength, toughness, and internal lubrication.

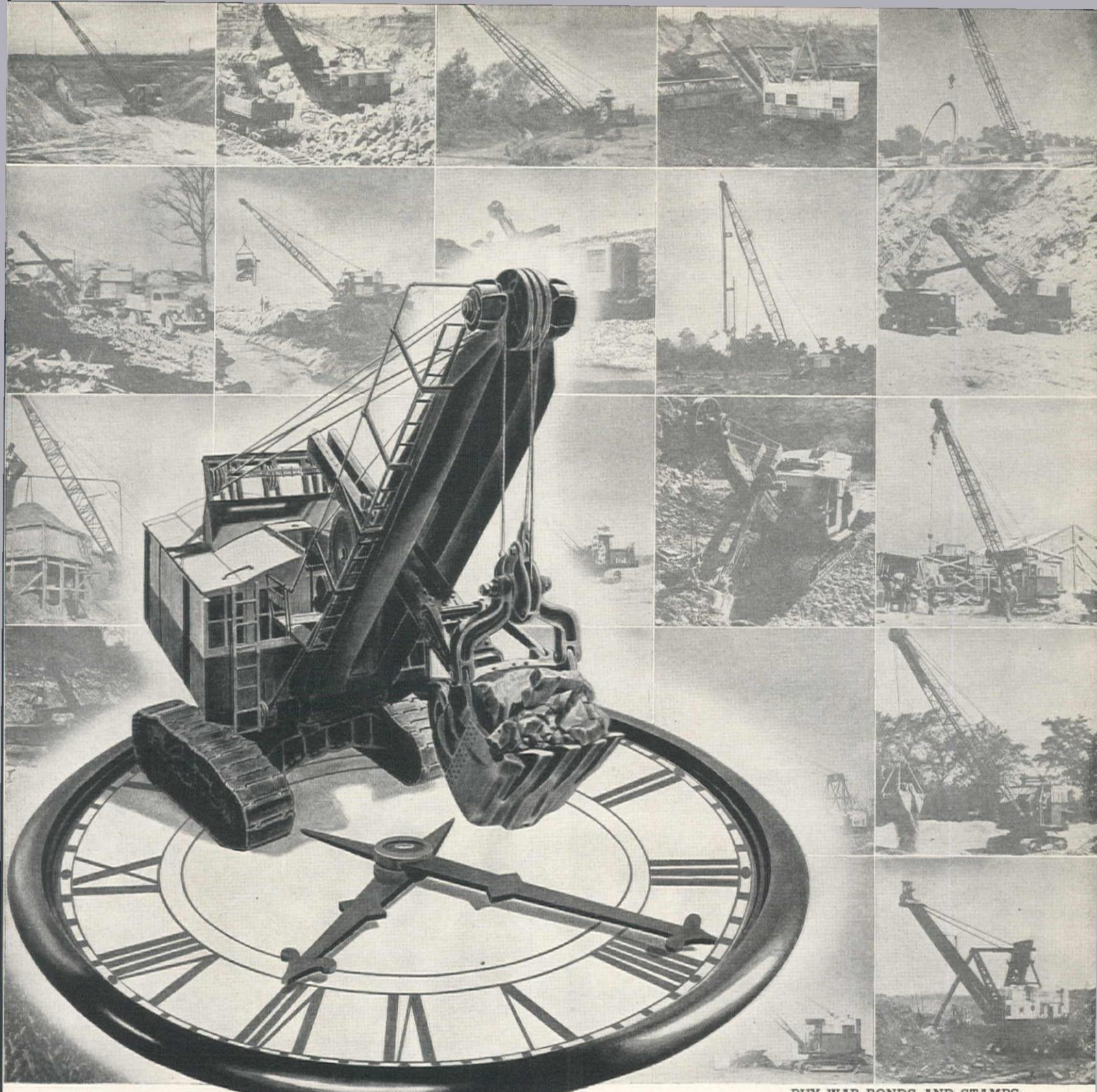
NO. 652

MACWHYTE COMPANY

WIRE ROPE

2940 FOURTEENTH AVE. KENOSHA, WISCONSIN

Manufacturers of MACWHYTE PREformed and Internally Lubricated Wire Rope MONARCH WHYTE STRAND Wire Rope
MACWHYTE Special Traction Elevator Cable MACWHYTE Braided Wire Rope Slings MACWHYTE Aircraft Cables and Tie-Rods



BUY WAR BONDS AND STAMPS

Every Time The Clock Ticks . . .
Hundreds of MARIONS Swing Into Action

Fighting fronts are geared to the home front where hundreds of MARIONS make every second count, digging and handling thousands of tons of critical raw materials for our mighty war machine. When the first shot was fired, MARIONS accepted this production challenge and have been on the offensive ever since. It is upon such dependable performance and tireless effort that second fronts and Victory are built.

THE MARION STEAM SHOVEL COMPANY, 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 & Equipment Corporation, 1033 S. E. Main St., Portland, Ore.

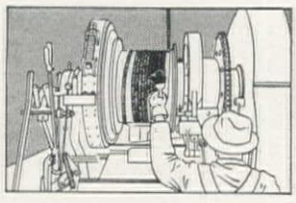
GOOD LUBRICATION WILL SMOOTH YOUR WAY TO VICTORY

Proper lubrication can do more than any other single thing to keep your shovel stepping at top wartime speed. As a general rule, a little lubricant applied often is better than a lot used spasmodically. Follow your manufacturer's complete lubrication instructions carefully, and you'll keep your shovel digging for Uncle Sam.

HERE ARE A FEW SPECIAL POINTS TO WATCH:

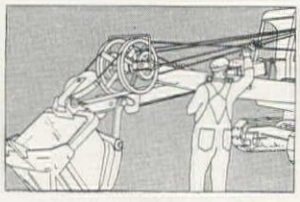
1

Ropes and drums should be lubricated regularly. Put a thin layer on often so the lubricant doesn't splatter in operation.



2

Be sure to lubricate suspension ropes. They'll rust their strength away if you don't.

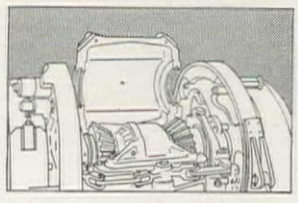


3

Lubricate cats even though your machine is not propelling much. Normal digging reactions shift the belts back and forth and cause wear.

4

Keep the proper amount of oil in your gear enclosures at all times.



Remember . . . **YOU NEED LUBRICATION TO LAST THE DURATION**

Bucyrus-Erie employees have accepted the award of the Army-Navy "E" as a challenge to keep production rising. ★ ★

Bucyrus-Erie

SOUTH MILWAUKEE • WISCONSIN • U. S. A.

WASHINGTON: Bucyrus-Erie Co., 3408 First Ave. So., Seattle; Clyde Equipment Co., 3410 First Ave. So., Seattle; Construction Equipment Co., 1118 Ide Ave., Spokane. OREGON: Clyde Equipment Co., 17th and Thurman Sts., Portland. CALIFORNIA: Bucyrus-Erie Co., 390 Bayshore Blvd., San Francisco; Crook Co., 2900 Santa Fe Ave., Los Angeles. UTAH: The Lang Co., 267 W. First So., Salt Lake City. COLORADO: Ray Corson Machy. Co., 1646 Wazee St., Denver. IDAHO: Intermountain Equipment Co., Broadway at Myrtle, Boise. NEW MEXICO: R. L. Harrison Co., 209 Fourth St., Albuquerque. ARIZONA: O. S. Stapley Co., 723 Grand Ave., Phoenix. MONTANA: Westmount Tractor & Equipment Co., 150 E. Spruce St., Missoula.

A BOY COMES HOME

REMEMBER how he used to come home?

There'd be the slam of a car door in the dusk. "So long, Joe, see you tomorrow." Then the swift, light footfalls brushing the leaves on the walk, the thud as 160 pounds of wiry muscle hit the porch in an easy bound that ignored the existence of steps . . . the crash of the front door, rattling every picture in the house, and the newly baritone voice calling, "Hey, Mom, when do we eat?"

Remember?

Now, a Marine flyer, he comes thundering in to Guadalcanal in the last light, the wind howling through the new hole in the fuselage where a chunk of shell just missed. The bomb racks are empty and, miles away on the darkening water, a Jap officer volleys desperate orders from the bridge of a destroyer that will never see Yokohama again.

Below, as his plane circles, American guns are still pounding away, winking and flashing in the twilight. On the flying field the crawling tractors and their sweaty drivers are at their endless task, filling fresh shell holes and bomb craters, making a safe surface for him. Back and forth the tractors go, up and down, looking from this height like friendly beetles, each rolling a ball of earth ahead of it. He is conscious of relief. That strip hadn't looked too good when he took off.

He loses altitude now, the ground comes up with a rush and the wheels touch and cling. He climbs stiffly down and a voice says from the gloom, "You're late, pal. Nothing minor, I hope?" He grins. Bill must have waited around, the worry-wart. What he says is, "Okay, here. Did you wolves by some mischance leave anything to eat?"

He's back at his home port again—and safe!

★ ★ ★

To make his homecoming safe, the rugged International tractors which the Marines took to Guadalcanal have worked unceasingly throughout that wild fight. Under every adverse condition, the tractors have kept going, their performance a tribute to the determined men and women who built them.

We take it to be our job, and the only job of the many machines and weapons we make for Army, Navy, and Marines, to do our best to see that every American fighting man comes home—AND COMES VICTORIOUS.

INTERNATIONAL HARVESTER COMPANY
180 NORTH MICHIGAN AVENUE, CHICAGO, ILLINOIS

INTERNATIONAL HARVESTER

BUY MORE WAR BONDS

International Industrial Power Dealers: Smith Booth Usher Co., Los Angeles; Butte Tractor & Equipment Co., Sacrametno; Valley Equipment Co., San Francisco; O. S. Stapley Co., Phoenix; Howard-Cooper Corp., Portland, Seattle, Spokane; Intermountain Equipment Co., Boise; Industrial Equipment Co., Billings; The Lang Co., Salt Lake City; Harry Cornelius Co., Albuquerque; Clark County Wholesale Mercantile Co., Inc., Las Vegas; H. W. Moore Equipment Co., Denver; Allied Equipment, Inc., Reno; Wilson Equipment & Supply Co., Cheyenne. *International Harvester Branches at* San Francisco, Los Angeles, Portland, Seattle, Spokane, Salt Lake City, Cheyenne.

BUY MORE WAR BONDS

BETTER THAN EVER...

—this improved cast iron pipe based on a new Law of Design

EXCEPT for those who have bought and installed cast iron pipe recently, in connection with a war project or war industry, few pipe users have laid the improved pipe now being made by our members—cast iron pipe that is not only *better* than ever but more *economical* than ever.

You may ask—"How can there be room for a major improvement in a product which is almost universally accepted as the standard—which is known to serve for centuries—and which is used in more than 95 per cent of the water and gas distribution mains in America?"

The answer is that cast iron pipe is now *specifically designed for specific laying conditions*—and is made in accordance with the recently adopted A. S. A. Law of Design for cast iron pipe in underground service. An answer that has been worked out by consultants who *specify* pipe, by engineers who *install* pipe, and by the metallurgists and production experts of our members who *make* pipe. Far from an overnight achievement, it is the result of ten years of cooperative study and scientific research under the auspices of the American Standards Association.

The advantages are obvious. No more under-guessing or over-guessing as to weights and thicknesses required. No longer need you specify, for *all* conditions, pipe that is designed for *worst* conditions. The potential aggregate saving in extra metal, and resultant economies for the utilities using cast iron pipe will be considerable.

But the cast iron pipe you buy today, as priorities and allocation of raw materials permit, is still further improved. Under the pressure of wartime urgencies, our members have crowded into months, engineering and production developments that might otherwise have taken years. Improvements in test technique and in laboratory controls from raw materials to finished product. Improvements in facilities made necessary by the wide range of war materiel we are producing or machining in our foundries and machine shops—guns, shells, tank and plane parts, propeller shafts, machine tool parts—to mention a few.

So when you get cast iron pipe for civilian uses it will be better than ever—scientifically designed for specific laying conditions—pipe that you will say was worth waiting for. Cast Iron Pipe Research Association, Thomas F. Wolfe, Engineer, Peoples Gas Bldg., Chicago, Ill.

NO. 1 TAX SAVER

Pipe bearing the above mark is cast iron pipe.
Made in sizes from 1¼ to 84 inches.

CAST IRON PIPE
RESEARCH ASSOCIATION, CHICAGO

EVERY working day since 1929—when Bruning first introduced BW (black line) Prints—has been a stepping stone to progress.

Progress in the research behind these easier-to-read prints. Progress in uses and application. Progress as expressed in constantly increasing user-acceptance.

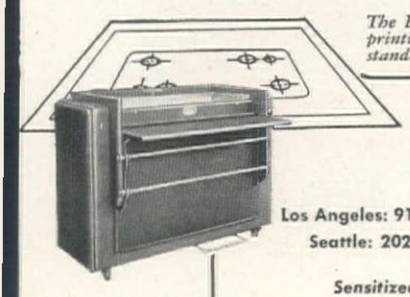
When you use BW Prints you can be confident, then, of these things:

BW Prints save you time—they are made in seconds, not minutes. They are made without washing—are delivered dry, ready for use—require no time-wasting trimming.

BW Prints save you money—they need no plumbing connections, no bulky tanks or driers. They bring you the advantage of big-volume cut-sheet production—impossible with a continuous blue print machine.

Bruning BW Prints are easier to read and to check than blue prints. They help you avoid the penalty of misreading and mistakes.

For your rush work today—and for your postwar planning—see a Bruning representative about producing Bruning Black and White Prints in your own plant. Charles Bruning Company, Inc.



The Bruning Model 55 Printer is just one of the many Bruning printing and developing machines which have established a new standard of fast, efficient print production.

BRUNING

SINCE 1897

Los Angeles: 919 S. Maple Avenue — San Francisco: 16 Fremont Street
Seattle: 2025 Third Avenue — Chicago: 4700 Montrose Avenue

Sensitized Papers and Cloths . . . Drafting and Engineering Supplies and Equipment

CHARLES BRUNING CO., INC. 2139-278A

Los Angeles: 919 S. Maple Ave. — Seattle: 2025 Third Avenue
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Please send me a copy of your free illustrated booklet on the BW direct printing process.

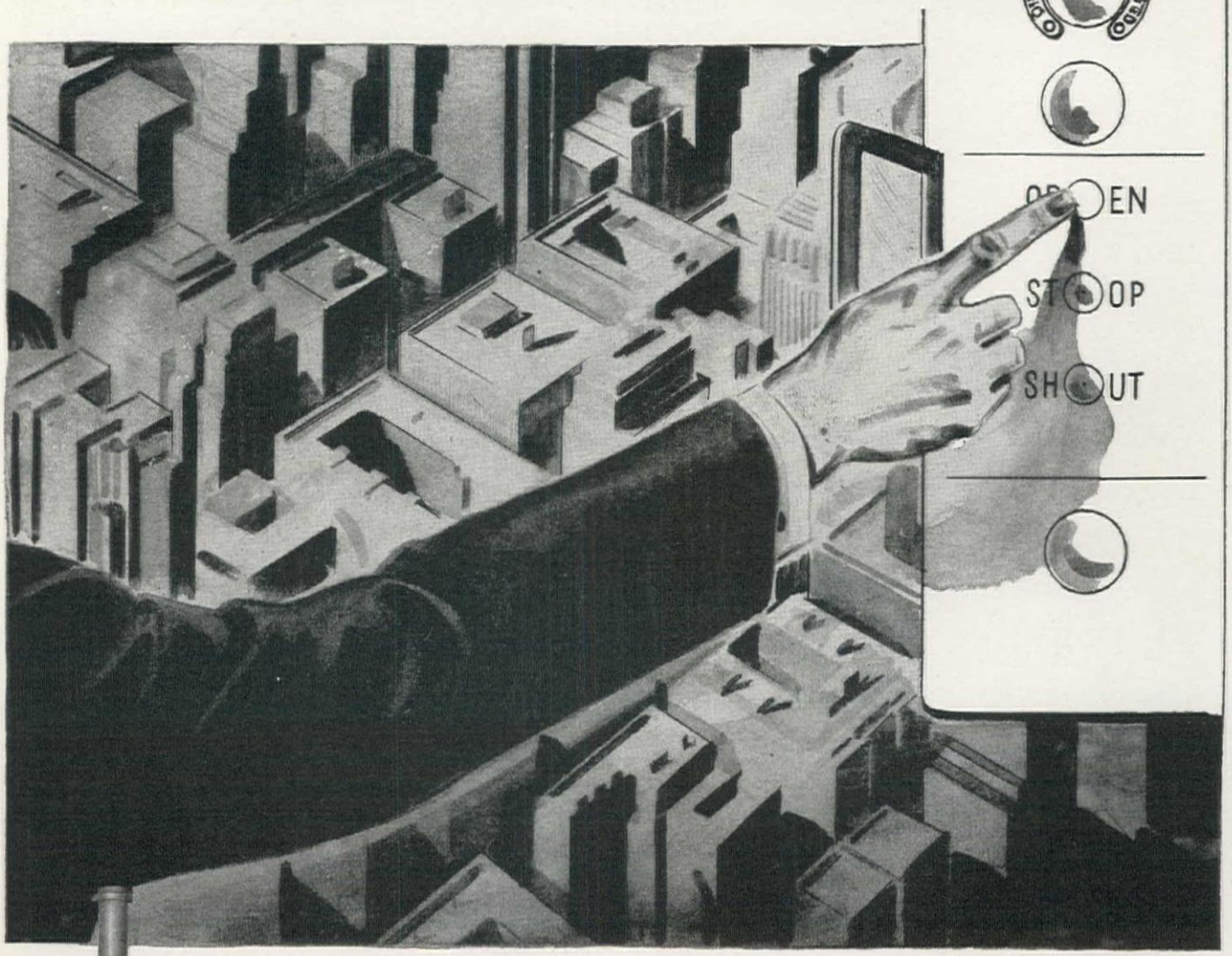
*Name*_____

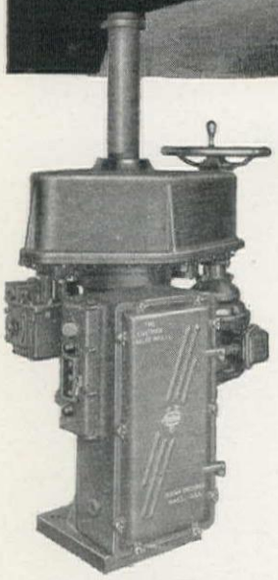
*Company*_____

*Address*_____

*City*_____ *State*_____

The Long Arm of CHAPMAN Motorized Valve-Control





Helps out when you're Short-Handed

One finger does the work of many men . . . when it pushes the buttons of Chapman Motor Units. A whole citywide system of valves, sluice gates and floorstands can be controlled with far greater ease and speed than was ever possible with individual manual operations.

Chapman Motor Units command instant, unfailing response . . . no matter in what position they are located . . . on what kind of equipment . . . indoors, outdoors or completely submerged. These units seat all valves without jamming, protect them against damage in operation, and may be shifted to hand-operation in case of power failure.

If you have a serious labor problem, find out how much you can do to ease it with Chapman Motor Units. Write.

ARMY E NAVY

THE CHAPMAN VALVE MFG. CO.

INDIAN ORCHARD, MASS.

then I said to myself—

EVERY WELDING INCH IS A "BIG INCH"

It's "BIG INCH" or Blockade for Your Business

"Big Inch" didn't just happen — Nazi subs FORCED it — by sinking tankers right and left —just when war industries and armed forces had zoomed demands on the East Coast. We had to do something BIG and QUICK.

ALTER EGO: Right! Our torpedo-firing "competition" forced our hand — forced us to build "Big Inch"—world's largest pipe line — 24" diameter, 1500 miles of it—big enough to pour 300,000 bbl. East Texas oil daily to the East Coast—equal to *150* 10,000-ton tankers.

And the record speed for building this record pipe line is made possible by welding.

ALTER EGO: Well, it's just the same story of competition with ships, planes, tanks, guns and all the other SPEED RECORDS made possible by welding. Competition forces progress.

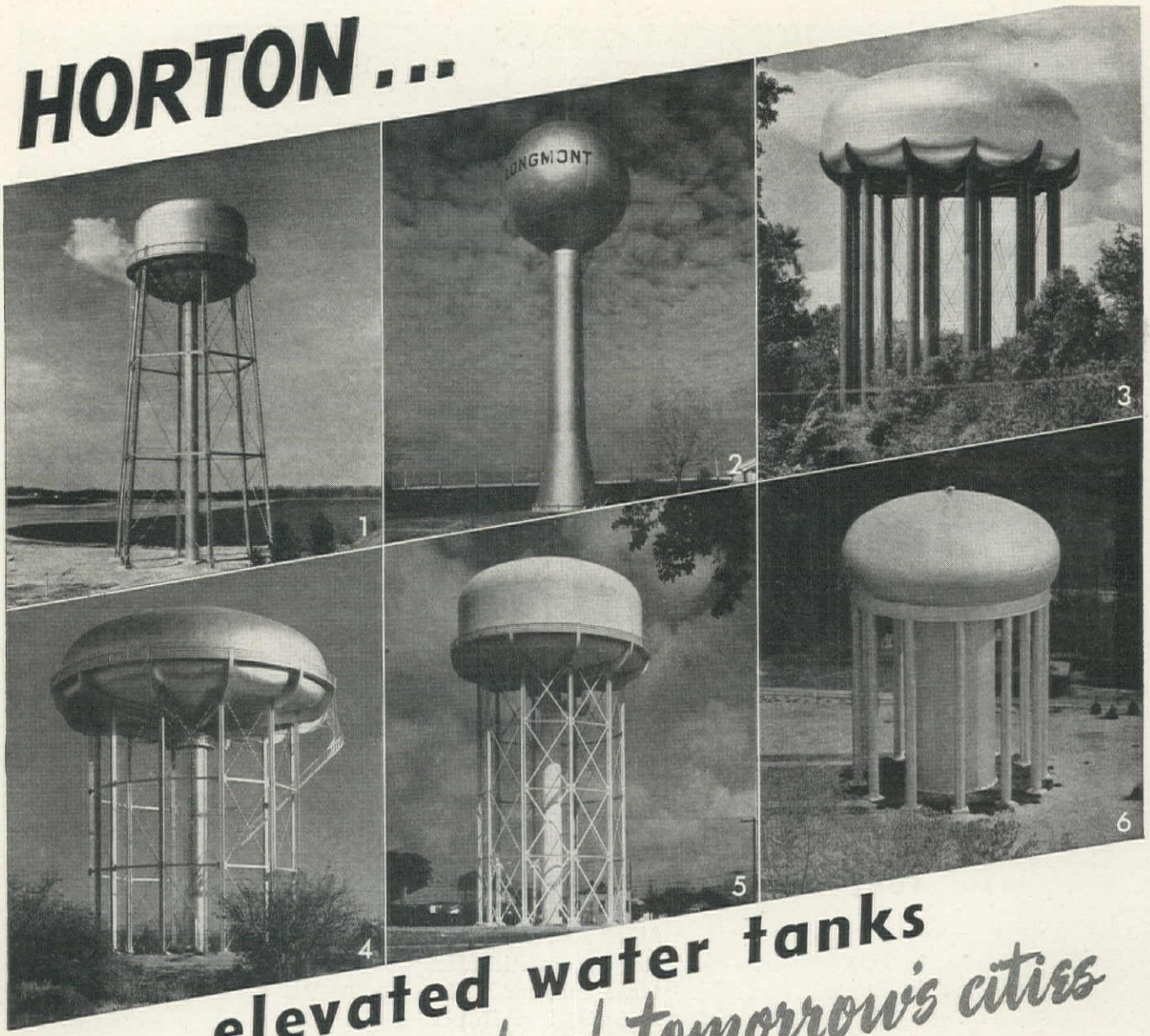
But, what will take the place of present "competition" to FORCE the same records in speed, lower costs and improved designs in the post war Battle for Business?

ALTER EGO: Just plain sales competition will force change-over to the "Big Inch" method of construction. We'll change or we'll face business "blockade"! So we should start NOW on the right-of-way in welding knowledge if we ever *expect* profit in post-war business.

Ask your inner self whether it would be smart to get welding guidance, of "big inch" caliber, right NOW from

THE LINCOLN ELECTRIC COMPANY · CLEVELAND, OHIO

HORTON . . .



. . . elevated water tanks *to meet the needs of tomorrow's cities*

1. This Horton elevated tank provides gravity pressure in the water supply system at Mansfield, Ohio.

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5. Attractive 1,000,000-gal. Horton radial-cone bottom tank at Beaumont, Texas.

6. 1,000,000-gal. spheroidal design elevated tank at Jonesboro, Arkansas.

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WESTERN CONSTRUCTION NEWS
WITH WHICH IS CONSOLIDATED WESTERN HIGHWAYS BUILDER

February, 1943 Vol. 18, No. 2

Planning As a Public Service

THERE IS an old adage, attributed to Benjamin Franklin, with which all are familiar that runs, "God helps them that help themselves." In some respects the sense of this maxim of Poor Richard is a trifle unfortunate when applied as the text of this sermon on public service for it implies the spirit of selfishness just a shade too strongly to suit the purpose. It probably would not be coining a phrase to rewrite this something in the manner of "They help themselves who help others," and it will express much more accurately the thought to follow, at the same time gaining the same end result. Besides, it can be granted that it is just as pointed.

Some western contractors and engineers have gained for themselves eminent positions in their home communities as public spirited citizens by maintaining an active interest in community affairs and occasionally holding public office, but the number who have attained such a position is far too small. They can almost be counted on the fingers of two hands. It has been suggested by others, and is roundly applauded here, that there is no one better qualified for public office than a professional engineer. The same qualification can be applied to the majority of successful contractors for those who are not engineers by education are so by experience and in addition are frequently better versed in practical business affairs than is the engineer.

It is surprising, therefore, but not unaccountable, that so few contractors and engineers do take an active part in the government of their city, state and nation. Take, for instance, the planning commissions of cities and states throughout the West. One will find represented on those bodies architects, lawyers, union officials, and business men of various followings, but rarely a civil engineer or an engineering contractor who would be far and away better suited to understand the problems of planning and to arrive at logical and sound solutions to those problems.

Here then is an excellent opportunity for those contractors and engineers who have a genuine interest in the welfare of their communities to utilize their abilities in public service. During this year there is going to be an increasing public interest in planning for the post-war period. The development of this interest is going to depend to a large degree upon the effectiveness of the leaders who take the first interest in planning, and it is a public welfare subject that should by all means have the full attention of engineers and contractors.

There should be little difficulty for individual engineers and contractors in gaining a position of usefulness in a local, state, or regional planning effort. Attendance at a few meetings on the subject, personal conversations with others interested in planning, and similar contacts will go far in indicating an active interest. Participation in chamber of commerce committee activities is another opening. Chapters of the Associated General Contractors, sections of the American Society of Civil Engineers, and other local groups of engineers and contractors can readily take steps that will make known their interest in planning to public officials and can thereby almost assure their representation at the conference table by men of their own choosing.

With a new field of public service opening immediately there exists an excellent opportunity for technically trained and successful business and professional men to improve the caliber of community operation, something that is badly needed in many localities. A challenge is offered to show that contractors and engineers can do a better job of management in public affairs than has been done in the past. Is it necessary to point out the personal advantages that can accrue as a result of some time and effort being honestly given to advancing the best interests of your own community?

Belated and Incomplete Recognition

UNTIL TWO MONTHS AGO there was not an engineering contractor in the West who had been awarded the Army-Navy E, signifying excellence in production for the war effort, in spite of the fact that western contractors had been performing outstanding work for both the Army and the Navy for more than two years. Since the first of December last year only five western contractors have been granted the award despite the fact that several thousand contractors have been engaged in construction of military and naval facilities in the West during the past year or more.

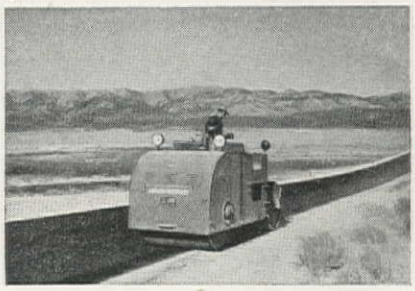
The joint Army-Navy award was instituted some eight months ago and has since been awarded to hundreds and perhaps thousands of manufacturing firms, many of whom had barely considered the possibilities of producing military articles at the time when western contractors were already devoting a large percentage of their efforts toward the setting of unprecedented records for speedy and efficient completion of cantonments, airports, piers, and drydocks.

If the five western contractors which have received these awards were the only ones which had established remarkable production records, there would be little reason for criticism, but there are admittedly many other construction organizations whose accomplishments have been outstanding and who have received official commendation in one way or another. Contractors should recognize that the award of an Army-Navy E is valuable to them in many ways in addition to the honor bestowed and could well point some effort toward the procuring of an award. The Associated General Contractors, through its headquarters in Washington, D. C., and with the cooperation of the local chapter managers, could perform a useful service for its individual members and for the construction industry as a whole, by making a special effort to see that all contractors whose records have been good and whose accomplishments are worthy receive the proper recognition from the Federal Government.

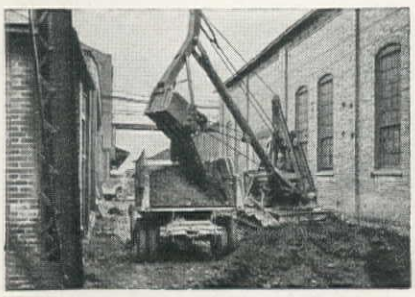
IMPOSSIBLE!

Building a big airfield for a Big Job with a 99-M Power Grader.

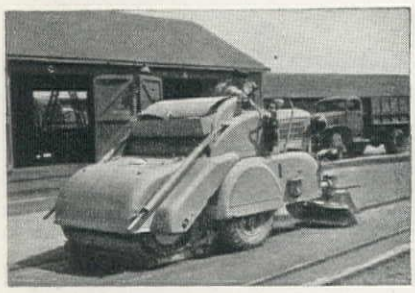
To get from "here to there fast," miles of vital roads are being completed with Austin-Western Rollers.



A fast moving production line turning out tons of crushed rock for Uncle Sam; it's an Austin-Western.



Excavating area between two buildings that will soon be roofed to increase war production. Unit is an A-W Badger.



This A-W Air Corps Sweeper cleans runways and hangars and also driveways flanking storage and supply areas.

THAT IS WHAT HITLER and the Axis thought when initial war plans were announced and unheard-of quotas were demanded by our President. One factor was overlooked: The American way of *meeting impossible schedules on time*—even beating them. . . . Our enemies have already felt the impact—their time tables are now off schedule—and we are only beginning.

Back of these accomplishments lie some of the hardest work and smartest planning, mixed with the finest examples of whole-hearted cooperation and sacrifice, ever witnessed. To those responsible for these accomplishments—especially the engineering, construction and maintenance of vital roads and streets, essential airfields, depots, camps, seabases and munition plants—we salute with admiration. To be of assistance in supplying the equipment or service needed has been and will continue to be a privilege. THE AUSTIN-WESTERN ROAD MACHINERY CO., Aurora, Illinois, U.S.A., Distributors in Principal Cities; Cable Address: AWCO, Aurora.

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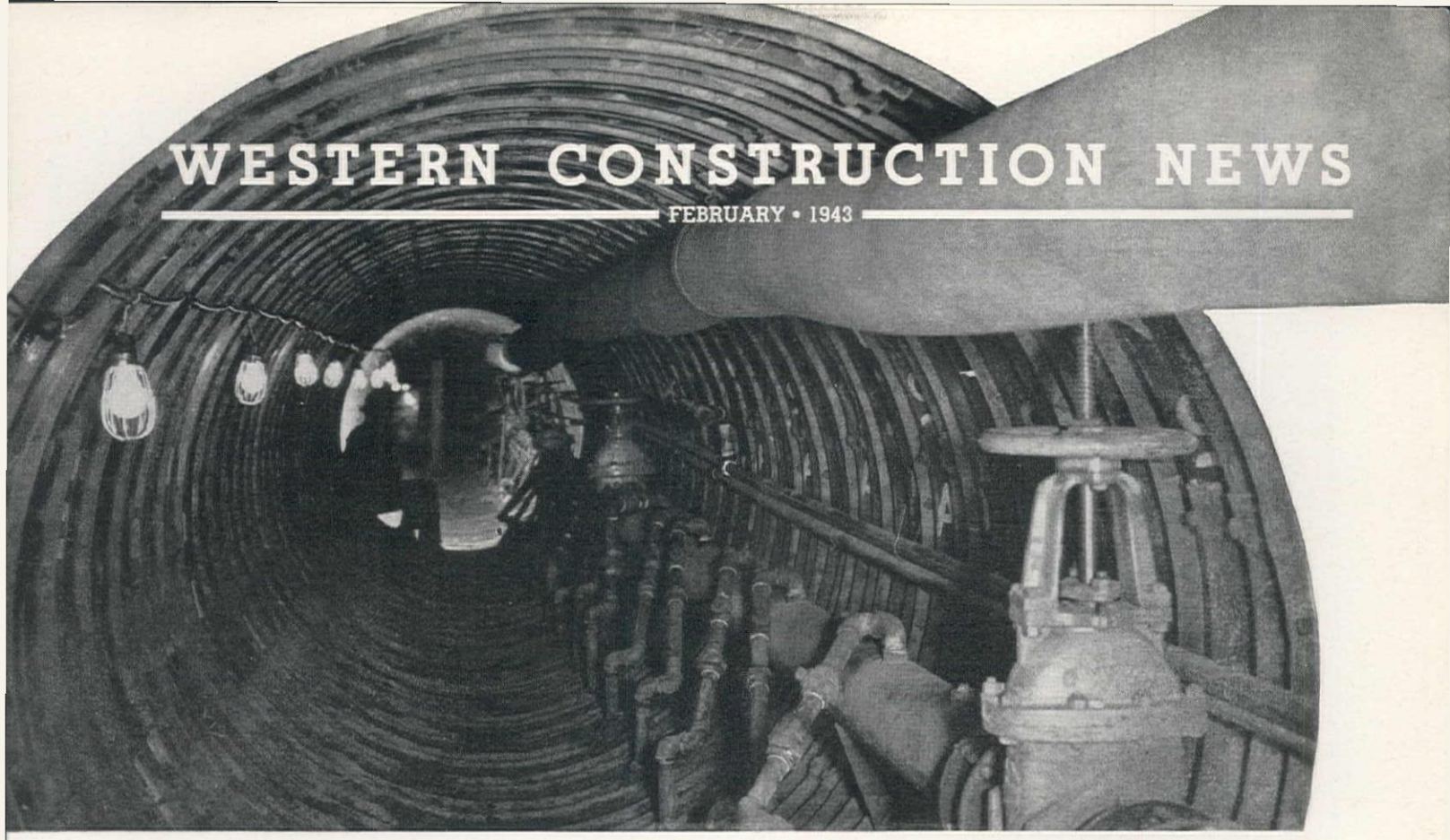


Wellpoints De-water Tunnel

Driving of an open tunnel through water bearing sand, in connection with a sea water pumping project in southern California, was simplified by the use of wellpoints jetted below the tunnel line through pre-cut holes in steel liner plates

By J. F. GEARY
General Superintendent and Engineer
C. C. Moore & Co.
San Francisco, Calif.

IN CONNECTION with a sea water pumping project at Wilmington, Calif., built during the summer months of last year, a tunnel was driven below sea level, open to atmosphere and kept dry by means of well points, the discharge header being installed in the tunnel, additional header sections and additional well points being added as the face of the tunnel advanced.

The seaward portal, from which opening the major part of the tunnel was driven, lies 200 ft. from tide water in Los Angeles Harbor. Low tide in this locality sinks to about El. —2.0, and high tide rises to about El. +7.0. However, due to a strata of impervious blue clay, which probably acted as a protective dike against infiltration of high tides, normal ground water level along the length of the tunnel stood at El. —1.5 during the progress of the job and was not materially affected by the rise and fall of tides. The elevation of the tunnel floor was —10.5; the overlying ground surface along its route varied from El. +13.0 to +23.0.

Consideration of methods

The tunnel, lined with reinforced concrete, will be used to carry water from the West Basin of Los Angeles Harbor to an oil refinery to serve as cooling water therein. The first 184 ft. of the bore, which was driven from the seaward end, is circular in cross section and 84 in. in diameter, and was timbered with 10-ga. steel liner plates in a standard pattern. To gain time, after the first 184-ft. section was well advanced and no major difficulty had been experienced with its dewatering system, another heading was opened up at the landward end. Due to a lack of sufficient steel liner plates, caused by a change in the location of the pump house after the steel liner plates were ordered, the latter tunnel section, 108 ft. in length, was timbered with wood, the usual soft ground spiling methods being used in driving. Well points for dewatering were used in this section also.

The greater part of the tunnel route lies underneath Wilmington-San Pedro road, a main highway through the Los Angeles Harbor district. Under former peace-time conditions it might have been possible to have open cut the highway, a section at a time, to install pipe, but present-day traffic conditions made this impossible and a tunnel necessary. Consideration was given to various methods of dewatering the tunnel during construction, such as deep wells near each tunnel portal, or groups of well points sunk from the surface in the same location (the only location possible because of the highway) but topography and space limitations were unfavorable at these points also.

Pneumatic methods were considered, but rejected in favor of a plan to drive the tunnel open to atmosphere, dewatering the opening by means of well points sunk within the tunnel, the well point system to be installed as the tunnel progressed. A careful study brought out no reason why such a method would not be feasible in view of the uniformly sandy nature of the ground through which the tunnel was to be driven, and in spite of the fact that no prior experience was found for guidance, this plan was decided upon, since it seemed to have favorable speed and cost possibilities.

Liner positions standardized

Before beginning work underground, a section of tunnel liner plates 12 ft. long was erected on surface, the object being to standardize the arrangement of individual plates so as to break joints most effectively as well as to work out other construction details and methods of assembly. This resulted in the adoption of two standard "rings," or circular sections of liner plate, one called the "A Ring" the other the "B ring." The position of each plate in each ring was determined as well as the relative circumferential position of one ring with respect to the other.

A certain plate in one ring, such as Plate No. A-6 in Ring A, was selected through which to insert the well point, and a hole was burned through each of these plates prior to the start of underground work. The hole was located to one side of the invert center line to allow room for a working runway, and a 3-in. pipe coupling was welded in each hole so that each hole could be plugged off later if so desired—an unnecessary precaution as it turned out.

The tunnel liner plates being 1½ ft. wide and the "A Ring" and "B Ring" being erected alternately, the well points were therefore spaced 3 ft. center to center longitudinally of the tunnel. This worked out satisfactorily in that it permitted the installation of well points to follow the face of the tunnel closely as it advanced. It would have been desirable from a dewatering standpoint to have inserted one or more well points obliquely through the face into the ground beyond, but piping through the face interfered too much with mining operations at that point. The best all around results were obtained by sinking well points vertically downward back of the face as soon as the heading had been advanced far enough to permit installation of a point without interfering with work in the tunnel heading.

Well point installation

Depth of well points below the floor of the tunnel was determined by the length of well point assembly, in one piece, that could be handled in a tunnel 7 ft. high. An over-all length of 8 ft. from tip of well point to top of riser pipe was the longest length that could be handled in this case and to install these required a bit of juggling. Some shorter lengths were used, with not unsatisfactory results, but it seemed logical to sink each point to the maximum economic depth permitted by the height of the tunnel, since the primary purpose of each point, when it was sunk, was to keep the heading dry, not only at its existing location but for 3 ft. beyond, and it was never possble to foresee water conditions beyond the tunnel face. Even though the heading was quite dry in many cases when points were sunk, before the face had advanced 3 ft., or far enough to permit sinking another point, much water was encountered which justified the depth of point.

Well points were jetted into place by the usual method, which resulted in a few inches of water on the tunnel floor around the point. This seldom remained more than a few minutes, however; it soon disappeared into the well point discharge system.

Header pipe installation

Header piping was supplied in the usual 20 ft. lengths, suitable for surface installations. Due to the obvious impossibility, in a tunnel, of installing header piping in 20-ft. lengths concurrently with well points which had to be put in separately, from time to time, as the lengthening tunnel made space for them, an intermediate member had to be developed to operate between the installed main discharge header and the well points beyond it. This worked out to be a short manifold, the same diameter, 8 in., as the discharge header, but only 3½ ft. long. It contained as many connections for well points as a standard 20-ft. header section, the connections being as close together as it was possible to put them. The manifold was installed on the end of the discharge header with a gate valve between the two. After a well point was installed it was piped back with 1¼-in. pipe to one of the openings in the manifold, those not yet put to use being plugged.

After the tunnel had advanced far enough to allow space for a 20-ft. length of header pipe the gate valve was closed, permitting all other well points in the tunnel to remain in operation but shutting off all the advanced points connected to the manifold. Connections between manifold and well points attached to it were then broken, the manifold was removed, a 20-ft. length of header pipe installed and connected up by the usual swing joint method to the well points in place below it. The valve was then opened, connecting this section of header and well points to those previously installed. The manifold was then moved forward to the end of the last 20-ft. pipe section and the operation repeated as the tunnel advanced.

Incidentally, the choice of a driving method open to atmosphere proved fortunate for a reason not foreseen when the method was decided upon. After the tunnel had been driven in only a few feet, sands were encountered saturated with gasoline, evidently caused by leakage from gasoline pipe lines near by. Without adequate ventilation, fumes from these sands would have been both toxic and explosive, but the tunnel being open to atmosphere it was a simple matter to install a blower and flexible tubing, through which sufficient fresh air was delivered to keep the tunnel air conditions safe.

Organization

Driving of the tunnel was handled by the C. C. Moore Co., of San Francisco, Calif., with the author as general superintendent and engineer. Dames & Moore, foundation engineers of Los Angeles and San Francisco, served as consultants on the project. The complete wellpoint system was supplied by the John W. Stang Corp., which also advised on its installation and operation. The steel tunnel liner plates were supplied by the California Corrugated Culvert Co., Berkeley, Calif.

SUPERINTENDENT of the job and author of the accompanying article is James F. Geary (center) of the C. C. Moore Co. Standing at Geary's right is John W. Stang, president of the John W. Stang Corp., and at his left, O'Brien, tunnel foreman. Kneeling below are the Swift brothers, also tunnel foremen on the job.

Alaska Highway—Organizing $30,000,000 Job

Route reconnaissance, spotting of construction contractors along a 1,480 mi. line, and transportation of heavy equipment into areas without transportation facilities of any sort provided unprecedented problems for engineers of the Public Roads Administration

By

THOS. H. MacDONALD
Commissioner of Public Roads

L. I. HEWES
Chief, Western Region
Public Roads Administration

J. S. BRIGHT
Alaska Highway District
Public Roads Administration, Edmonton, Canada

THE ALASKA HIGHWAY extends approximately 1,480 mi. from the railhead of Dawson Creek in British Columbia to the Richardson Highway at Big Delta, 90 mi. south of Fairbanks. At Fairbanks the extended route meets the Alaska railroad. There is a branch in Alaska extending 135 mi. from the junction of the Tok and Tanana Rivers to Gulkana on the Richardson Highway. There also later was added approximately 150 mi. to connect the port of Haines on the Lynn Canal with the main route at a point west of Champagne in Yukon Territory. There results a grand total of 1,765 mi.

The main route was determined by the existing line of airports in Canada and Alaska. These airports are at Fort St. John, Fort Nelson, Watson Lake and Whitehorse in Canada, and at Boundary, Big Delta and Fairbanks in Alaska. They are positioned away from the unfavorable weather areas that are associated with the continental mountain ranges nearer the Pacific Coast. The main road runs in a direction generally westerly by north with approximately 224 mi. inside Alaska and the remainder in Yukon Territory and the Province of British Columbia in Canada.

The nearest considerable population centers in the United States are Spokane, Wash., and Great Falls, Mont. From both these cities highways extend northward to Edmonton in Alberta. Edmonton is a modern city of 100,000 population and about 350 air miles east and south of the little village of Dawson Creek where the Alaska Highway starts. The position of the route is thus extremely favorable for connections in the United States from the heavily populated areas northwest from Chicago, St. Paul, Minneapolis, and other points. Ultimately there could be a connection between Prince George in British Columbia and Fort St. John, and thus join the American highways south of British Columbia.

Obviously, the interests of Canada in this route are considerable. The two countries exchanged notes last March consummating full understanding that the United States Corps of Engineers would proceed to construct a pioneer road, and that the Public Roads Administration would follow with American and Canadian contractors to build the pioneer road into a modern standard highway. The original schedule of operations was to finish the standard road in two years.

Reconnaissance of route

With distances of from 250 to 350 mi. between major control airports and through almost totally unknown terrain, the first task was to reconnoiter the snow-covered country. This job was done jointly by Army and Public Roads engineers. The work began early in March and proceeded by airplane, dog train and other ground parties. Available maps were sketchy. Lakes were out of position and critical elevations almost wholly useless. Indicated mountain passes in one area proved to be in error as much as 3,000 ft. The indicated courses of many considerable rivers were largely schematic. However, there was a corresponding degree of freedom of choice in this wilderness location once the main features of the land began to take form. Right-of-way was not a problem.

While reconnaissance proceeded with temperatures still as low as —35 deg. F., Army Engineer regiments moved into position at control points. In this land, the so-called spring "breakup" in April is a formidable obstacle. The ground becomes awash and mud depths are indefinite. For weeks, all ground traffic ceases. One pioneer road construction regiment had to beat this wet period by moving in over any available winter trail to Fort Nelson. Other regiments later moved to Fort St. John, Lake Kluane, Teslin Lake and other points.

And they accomplished these maneuvers in spite of enormous physical obstacles.

Organization and establishment

The Public Roads Administration began simultaneously to assemble its engineers and to canvass available construction contractors. First, 148 engineers were transferred from our western districts, where our National Forest and National Park work largely has been concentrated for many years. Afterward we drew upon our eastern districts, and for field service recruited temporary engineers in considerable number from the far West and Canada. Many of the younger men came from engineering colleges in the United States and Canada. Ultimately, including accountants, purchasing agents and others, 823 Government employees were regularly assigned to the work, and at one period the number increased to 1,118. The list included U. S. Public Health Service men who generously and effectively took over the important responsibility of health and sanitation. Their physicians and nurses cared for over 13,000 out-patient treatments, and the doctors performed more than 250 operations.

A district office was scarcely established at Seattle when major problems of transportation of men, equipment and material immediately became evident. Field headquarters were set up at Whitehorse in Yukon Territory, at Fort St. John, 48 mi. north of the railhead at Dawson Creek, and at Gulkana near the Richardson Highway in Alaska. Whitehorse is reached by a narrow-gauge railway 111 mi. long from Skagway at the head of the Lynn Canal. Vessels from the ports of Seattle, Wash., and Prince Rupert, Canada, reached Skagway by the so-called inland passage route, which is available to vessels that cannot be exposed to the open waters of the Gulf of Alaska to reach Valdez at the southern terminal of the Richardson Highway.

We secured a transportation and camp building construction management contractor at Seattle. Owing to the war conditions on the West Coast it was extremely difficult for him to obtain vessels. Progressively, however, we secured through him 10 tugs and a fleet of towing barges. Later four power cargo vessels were added with a total combined cargo capacity of about 5,000 net tons. In addition we chartered in the same manner five power yachts for handling personnel. They had a combined carrying capacity of 137 passengers. It is about 480 mi. from Prince Rupert in Canada to Skagway, and about 980 mi. to Seattle. We also had to land men and cargoes at Valdez by a voyage of about 1,500 mi. across the Gulf of Alaska. All of these vessels and also United States Army transports and commercial vessels were used to move in personnel and equipment. In addition men were flown directly to Fort St. John, Whitehorse and Fairbanks by the Yukon, Southern and Pan-American Airways, and by the United States Ferry Command. The shuttle service of the ocean-going and coastwise fleet still continues.

Management contractors engaged

The canvass of contractors interested in the Alaska Highway construction immediately revealed insufficient equipment in the control of any one or any small number of available contractors. Therefore, it was decided to engage the services of management contractors, who in turn would recruit contractors to sign construction contracts with the Government. In the absence of surveys, unit price contracts were not possible. The four management contractors that were engaged to cover the total mileage were instructed to recruit contractors on a cost-plus-a-fixed-fee basis. A total of 47 construction contractors were thus engaged.

Their men and equipment were moved in by every available means of transport. One Canadian management contractor was obtained, and 10 Canadian construction contractors immediately began the grading of the most southerly 48-mi. section between Dawson Creek and Fort St. John, where existing local roads made accessible points on the revised alignment which was immediately staked out for grading.

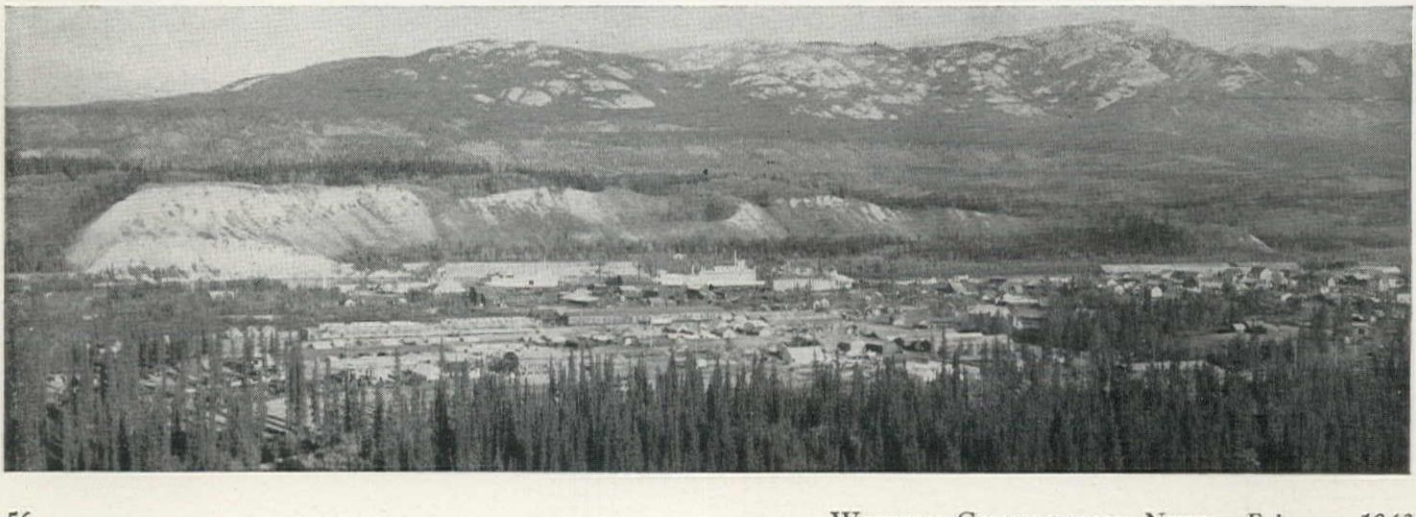
Another management contractor with 14 Iowa highway construction contractors undertook all the work in Alaska. Many of their 1,400 men were flown into Alaska by the Ferry Command. They set up headquarters at Gulkana on the Richardson Highway. Another management contractor from St. Paul took the section from Fort St. John to Fort Nelson, 256 mi. north. From that point to Watson Lake, a distance of 360 mi., the work was assigned to the contractors of the Canadian management contractor. A Seattle contractor took a large part of the 600-mi. section between the Alaska-Canadian boundary and Watson Lake.

Equipment transportation

It will be readily understood that the job of "spotting" the construction contractors along these wilderness miles and moving in their equipment was a difficult one under the best conditions. In this operation it was expected that the Army pioneer road would be helpful. Under war conditions the operation assumed formidable aspects. The situation can be realized from a single example, namely, the need of bringing into Skagway immediately about 20,000 net tons of freight and shipping from there to Whitehorse over 111 mi. of narrow-gauge railway, at the time capable of hauling not over 15,000 tons per month, and already overloaded with Army equipment continually arriving at Skagway by transport, where the docks scarcely can accommodate simultaneously two larger vessels.

Before the season was over the various contractors had an aggregate of approximately 7,500 men, all of whom of course had to be housed and fed, and their equipment supplied with gasoline, fuel oil and lubricants. During a period of approximately five weeks, over 600 carloads of equipment and supplies arrived at the railhead at Dawson Creek. At one time nearly 200 carloads of equipment and supplies were accumulated at Prince Rupert.

Quite early in the season the work of the Civilian Conservation Corps was terminated and its vast supply of unit construction camp houses and equipment became largely available for use



CONSTRUCTION contractors working under the 5 management contractors on various sections of the highway, operate from central bases such as this one spread out in a valley in northern Canada.

on the Alaska Highway. The transportation problem was thus extended to include demolition and loading at numerous points. Before the season closed, in addition to a large quantity of construction equipment, several hundred demountable buildings were taken down and re-erected all the way from Dawson Creek to Whitehorse and from Gulkana to the Alaska-Canada boundary. This work is continuing through the winter.

As reconnaissance proceeded, two major problems arose about the routes between the airport controls in the section respectively between Fort Nelson and Watson Lake, and between Watson Lake and Whitehorse. It is to be observed here that the Alaska Highway extends across and along the tributaries of both the Mackenzie and Yukon drainage systems. These rivers flow respectively into the Arctic Ocean and Bering Sea.

Selection of route

In the first case it was finally decided to follow from Fort Nelson a branch of the Liard River called the Muskwa to another tributary, the Tetsa River, thence up the Toad River to Muncho Lake, and then down the Trout River to the Liard itself, where the road crosses and follows the north bank to Lower Post near the Watson Lake airport. This portion of the route goes through the northerly extension of the Rocky Mountain Range and reaches the highest point of the entire highway at an elevation of 4,350 ft. The alternate route would have gone considerably to the north from Fort Nelson.

Although the two routes were not much different in length the chosen route was considered to afford the better soil and ground conditions for road construction. In much of the reconnaissance work air photographs were most helpful.

In the second case, between Watson Lake and Whitehorse it was necessary to scout out the lowest summit which available maps indicated had a prohibitive elevation. The route finally crossed the divide between the Mackenzie and Yukon drainages over a pass of approximately 3,250 ft. elevation. This pass was spotted from the air with the help of a local pilot. The route selected follows up the Rancharia River from the Liard, then crosses Cook's Pass to the Swift River, which flows into the Yukon drainage.

Between Whitehorse and Kluane Lake, 150 mi. west and north, an old trail sufficiently defined a feasible route. Northwest of Lake Kluane ground reconnaissance on foot was necessary to develop reasonably sure footing and feasible crossings of the Donjek and White Rivers. Here is a section which apparently will unavoidably cross several areas of the permanently frozen underground zone that extends downward from the North Pole. Some 56 mi. beyond Lower Canyon on the White River the route enters Alaska and follows along the Tanana River to Big Delta (Buffalo Center) on the Richardson Highway, some 90 mi. south of Fairbanks.

TRACTOR CRANE is used by Army engineer troops to construct a bridge from nearby standing timber across a small creek on the pioneer road. Army construction will be improved and more permanent structures built under Public Roads Administration direction.

Surveying difficulties

As the various reconnoitered sections of the Highway were mutually agreed on by the Army Engineers and Public Roads, survey crews were sent in to locate the line. The organization and dispatching of the many survey crews of about ten men each, necessarily continued for several weeks. The accommodations for men at both Fort St. John and Whitehorse at first were so limited that it became necessary, as the flow of men continued, to hustle them out of town on to the line positions as rapidly as possible. They and their supplies went by pack train and by airplane to positions spotted at intervals along the route. Many of these parties had no communication whatever with their headquarters. Some of them that proceeded in airplanes which landed on frozen water later could not be reached directly by airplane, but at intervals their food supplies were dropped from the air and their Indian guides could make contact by painful journeys back to other parties or Army camps.

Standard bridge designs

As fast as the survey notes developed they were returned to headquarters for design. The first sections designed necessarily were those that could be started near headquarters. It was, of course, not necessary immediately to work up quantities since the construction contracts did not involve unit prices. The spotting of culverts and the adjustment of the profile went on relentlessly. Standard through-truss and deck-truss timber bridge designs were developed in the San Francisco office. Just as designs for 1,600-lb. structural grade timber were completed for various standard span lengths, complete re-design was necessary for 1,200-lb. timber owing to an unexpected shortage in the higher grade. As approximate lengths for various sized pipe culverts were developed by design, they were used as the basis for placing orders, and many thousands of feet of culvert, including mostly wood stave pipe culvert, were ordered and shipped in to Dawson Creek, Whitehorse and Gulkana.

It is to be observed here that during the 1942 season the entire location line survey finally was run. The survey is not yet quite complete, however, on the 160-mi. extension to Haines. As the second phase of the construction work developed it also was necessary to re-run all those portions of the Army pioneer road that are not adjacent to or coincidental with the "L" line previously run. This work also has been developed. The remaining portions of the design work, principally the adjustment of profiles, curvature and drainage to the Army pioneer road are proceeding this winter in our Western District Offices as well as at Whitehorse and Fort St. John.

Up until the first week in August this initial phase of the Alaska Highway, namely, reconnaissance and survey and pioneer truck road construction by the Army and full standard construction of sections near the Fort St. John, Whitehorse and Gulkana headquarters by Public Roads, proceeded as previously arranged. On Aug. 8, however, this phase of the Alaska Highway work was substantially modified.

This change was caused by a joint directive to use all forces to complete a usable truck road throughout the entire length of the route before winter freezing. As a result construction contractors under the direction of the management contractors of the Public Roads Administration had their work almost completely rearranged. They were thrown in behind the Army operations on the pioneer road to widen it and otherwise better the roadbed and above all to place gravel surfacing on the improved roadbed.

Subgrade and surfacing

It is to be remarked here that the subgrade soil for practically the entire distance between Dawson Creek and the Sikinni River north of Fort St. John is of our A-7 or A-8 classification, or even

worse. This is roughly a distance of 175 mi. Tests showed that for this mileage the subgrade contained generally from 80 to 100 per cent of material passing a 200-mesh screen. In combination with flat swampy areas, a worse subgrade soil could scarcely be conceived. The need for surfacing the pioneer road in such areas will easily be apparent to all highway engineers.

To add to the difficulties of the situation at this southern end of the job, it is to be observed further that soil survey parties were unable to discover any usable surfacing material for a hundred miles north of Fort St. John after many weeks of unremitting search. However, after the pioneer road had been put through by the Army and travel here became possible, sandstone ledges were discovered. By crushing this material, the threatened long hauls for all forms of surfacing for this 100 mi. can be reduced greatly.

To provide surfacing for the pioneer road built by the Army, it was necessary to set up crushing plants as rapidly as possible along sections of the route where other material failed to develop. It was also necessary to enlarge greatly the number of dump trucks, but deliveries were not prompt.

Except for part of the force of Canadian contractors left on the section south of Fort St. John, practically all of the remainder of the 47 construction contractors during August began to improve and gravel the Army pioneer road. This road now was widened to approximately 20 to 24 ft. to provide a two-way passing condition. A lift of gravel or other surfacing material then was applied. This surfacing varied in thickness from 4 in. to two or three times that amount, depending on the need and the availability of gravel or its equivalent.

Erection of bridges

Not only was it necessary to expedite the completion of the Army pioneer road, it also was necessary for the construction contractors to apply themselves to the construction of temporary bridges over larger streams where the Army crossing had been made either by ferry, pontoon bridges, or other temporary structures. Almost without exception, all of the new bridges are of the pile trestle type, and the construction contractors with the Army's help finally have finished them.

It is not expected that many of these pile bridges finished last fall and early in the winter will stand up under the spring breakup in April. A number of the rivers, especially on the northern portion of the highway, freeze from the banks inward toward the thread of the stream and along the bottom. The channel thus choked is unable to carry the flow, which in turn spreads over the banks and tends to inundate the approaches to the bridge. In the spring there are ice jams and, of course, always a hazard of drifting material.

A further word should be included here about the 100 or more streams that cross this highway. Several of the rivers like the Tanana, Lewes (Yukon), Liard, Muskwa, and the Peace River are streams comparable to the Missouri and the Mississippi. Others flow more directly from glaciers and their action is unpredictable. Summer rains may form lakes on the glaciers that suddenly find outlets and flow under the glacial ice, bringing down volumes of debris. Many streams are very broad and shallow with "braided" channels. When these rivers begin freezing in their lower reaches at the bottom, the water fans out again and again, piling up ice in a shingle-like pattern across their wide beds.

Wild tales of 150-ft. ice piles are not, however, corroborated by the 30-ft. forest growth along their banks. Surveys of bridge sites now show that this highway ultimately will need about 23,000 lin. ft. of bridges and the indicated cost runs to about $11,000,000. We are designing some of these spans and building others this winter. We are stockpiling material for spring construction at still other sites. The longest bridge of all will be an 1,800-ft. suspension bridge across the Peace River south of Fort St. John. It is hoped to finish this bridge early in the spring.

Next season's work planned

With the first phase of the Alaska Highway now practically completed, it is possible to return to the standard-design construction during the coming season. Under the controlled materials priority plan to be operated in the second quarter of this year, there may be an improvement in the delivery of materials to the highway. In the past the scarcity of spare parts for trucks and other equipment has been an annoying handicap.

Construction during 1943 will have the benefit of a going setup of repair shops, camp facilities, and overhauled equipment on the ground ready to go. The working season in 1942 was partly consumed in establishing the contractors' forces. The working season of 1943 ought to double the working season of 1942. The designed route following the Army pioneer road also will be ready for staking. Seasoned engineering crews will be on the ground as the snow melts. Transportation along the truck road may be somewhat interrupted during the breakup, but will be available during the construction season. The days of isolated parties and hazardous conditions are largely behind us.

Our experience with cost-plus-a-fixed-fee contracts has been favorable. The construction contractors have been uniformly efficient. Their agreed wage scales were patterned after the established scales in other going Alaska work for the United States Government. Similarly in Canada, the Canadian contractors used only Canadians, and we paid their established scale in Canadian dollars. The 47 contractors utilized equipment with a new value of about $10,750,000, of which the Government owned 35 per cent. The basic Federal Works Agency rental rate was about 27 per cent of new value plus a 50 per cent rate on second shift time actually in use.

The Government pays freight, fuel and repairs, and basic rent from the day of loading to return to the United States on all equipment accepted as ready and available to work. The average work hours per day varied among the four groups of construction contractors from 10.3 low to a high of 11.4. Thus, the overtime above 8 hr. ran from 2.3 to 3.4 hr. On this kind of work, men seemed willing to work 12 hr. a day every day in the week. From June 1 to Oct. 1, practically all the contractors worked from 20 to 22 hr. daily, in two shifts. During much of this period sunlight was sufficient.

Cost undetermined

The cost of the Alaska Highway has not yet been fully developed. The cash outlay by Public Roads to Nov. 30, 1942, was about $14,000,000, and a somewhat larger amount of encumbrances are on the books. Much of the latter amount is applicable to future construction. Fairly close estimates should be available before the construction season begins.

Before closing this report, it is particularly desirable to emphasize the fine spirit of the Army officers who commanded engineer troops in the field in the various Engineer regiments. Their co-operation was conspicuous and their persistent efforts against any odds truly inspiring. The co-operative spirit of the Canadian officials throughout the past year also must be recorded. Canada's part in the undertaking included the furnishing of all rights-of-way, the remission of all taxes and duties, and the permission to use all local roadbuilding material. The provincial and national government officials of Canada have co-operated most kindly, and the Royal Canadian Mounted Police also has been alert and forehanded in aiding in many ways the Alaska Highway construction.

Nowhere else on the North American Continent is there an area comparable in size where a highway could be projected into such a wilderness area, or where comparable transportation difficulties would be met. Perhaps there never has been a unit of highway construction of comparable length planned for completion in so short a time. With a reasonable amount of favorable breaks it is hoped that a standard design road completed at least to a dry gravel surface condition throughout the Highway and its two branches may be available before another New Year comes around.

* * *

Note: The foregoing article describing the construction activities of the Public Roads Administration and its contractors in co-operation with the Corps of Engineers on the Canadian-Alaska military highway was presented by the authors before the members of the American Society of Civil Engineers attending the Ninetieth Annual Meeting of the Society in New York on Jan. 20. In the March issue of *Western Construction News* will be presented a discussion of the design problems presented by soil and climatic conditions on the highway by A. C. Clark, which was also a part of the program of the Am. Soc. C. E. meeting.

Airport Paved During Winter

Site relocation and land acquisition delay start of Northwest airport until after advent of freezing weather, necessitating special subgrade preparation and aggregate, mixing, and curing techniques

WINTER is not preventing the Seattle District of the United States Army Engineers from fulfilling all War Department assignments, including the paving of runways for an airbase in the Pacific Northwest. Construction of this airbase has gone forward under a winter paving program which will enable the Engineers to turn over the completed project to the Air Corps on schedule.

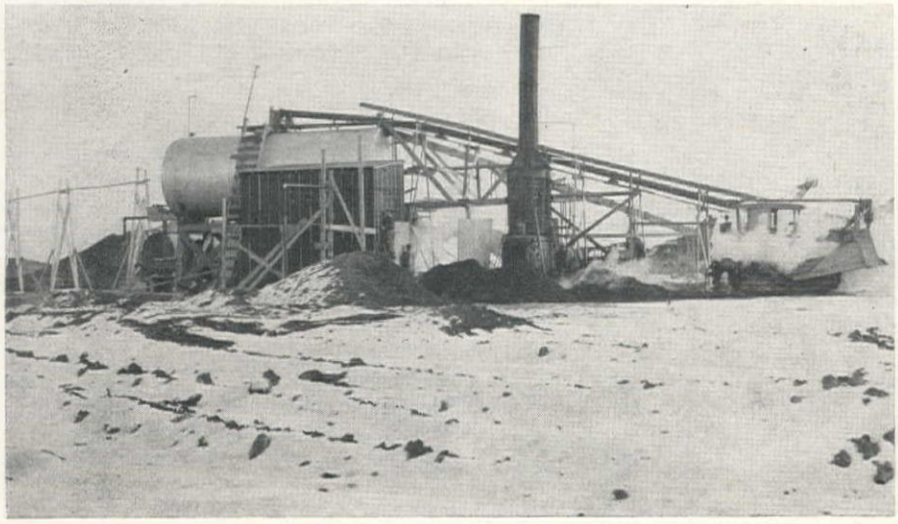
Winter paving is not unusual in the national construction picture, but it is unusual in the mild Pacific Northwest and for that reason *Western Construction News* presents on these pages a brief outline of the steps taken on this airbase assignment.

Construction started late

This airbase was completed as to specifications in the early fall and went into construction in the late fall with two delays: Relocation by the Air Force, and land acquisition. These delays brought early paving operations close to the time when low winter temperatures might be expected. As cold weather came and snow and low temperatures slowed normal paving, military necessity created a heavy pressure for completion that over-ruled all obstacles. Two courses faced the Seattle Engineer District in meeting the airbase completion date: First, an intermittent paving schedule which included a 90-day shut-down followed by frantic paving to meet the completion date, and second, continuous paving throughout the winter. Upon recommendation of the Chief of Engineers, construction was prosecuted on the continuous paving schedule.

As a background to this brief outline of winter paving measures taken by the Engineers and contractor, paving of the two runways at this airbase is part of a project calling for some 17 separate construction items. These items include: clearing and grubbing of site, site grading, railroads, roads, parking areas, sewerage system, water system, runways and taxiways, troop housing, instruction buildings, operation buildings, hangars, hospital, storage facilities, protective facilities and miscellaneous buildings.

HOT WATER heating plant operated by contractor to prepare water for mixing. After heating, the water was transported to the paving machines in insulated tank trucks. At the right of the picture, a bulldozer is being de-iced with a steam hose.

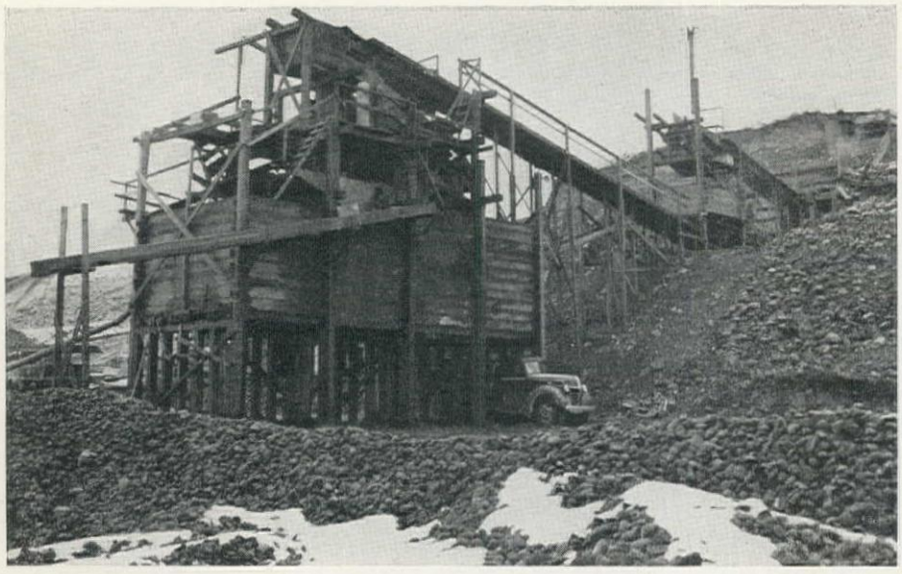


Preliminary preparations

The terrain of the site of this airbase is a plateau country, rather level with a few gullies eroded through the plateau. Soil is a glacial outwash of coarse sand and gravel, covered by a more silty soil, some of the latter windblown. The soil was found to provide an excellent foundation for any type of construction.

Excavation at the site amounted to 1,500,000 cu. yd., and paving totals will amount to 1,500,000 sq. yds. of concrete. Operating three shifts on the grading the contractor found a relatively simple job in this step with the only boulders of a size easily picked up by the scrapers. Grading was a balanced cut and fill job, and two-wheeled tractors with coupled scrapers and tractor drawn cable-operated scrapers were used to dispose of this material.

After grading, if silt or other unsuit-



SCREENING PLANT and rock crusher at the aggregate source, only a short distance from the airbase. The aggregate was heated by steam coils installed in the bins.

able material was found close to the surface, the contractor excavated to a depth of 9 in. and backfilled with gravel, as assurance against frost difficulties in the future.

Subgrade preparation

When the recommendation for winter paving came in, about Dec. 1, snow and a freezing subgrade faced the Area Engineer supervising the project. The winter paving schedule called for approximating normal paving temperature of 70 deg. for the concrete being laid down. In addition to raising the aggregate temperature, it was necessary to provide for getting the freezing subgrade in shape and for paving 8 to 10 hours daily.

Allowing for paving two lanes each 25 ft. wide, with four 27-E pavers at work, the winter paving schedule was planned to accommodate an aggregate demand of 1300 cu. yd. per day. The cement demand was planned to average 1500 bbl. per day with a possible maximum demand of 2400 bbl. per day.

The winter assignment meant constructing housing for the aggregate plant, housing for the batching plant, installation of boilers for heating water and aggregates, and special stoves for machine operators on the project.

To correct the frozen subgrade, the frozen ground was scarified, using grading equipment to remove frozen sections and then going into spoil banks and replacing that frozen material with dry sand for the runway foundation. The completed subgrade was protected from frost action with baled wheat straw and hay, some 3,000 tons of which were purchased from farmers in the vicinity.

Plant protection

Heating the aggregate involved a number of steps to raise the temperature sufficiently. The aggregate was heated in the bins by steam coils to increase the temperature; a hot water heating plant was set up by the contractor and insulated tank trucks delivered hot water to the paving machines; 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.

Once laid and finished by self-propelled mechanical finishing machines, the Hunt process curing membrane was sprayed on. The green concrete was covered with a layer of Sisalkraft paper, then with a layer of straw and hay in a blanket ten to twelve inches thick and then with a second layer of Sisalkraft paper. Wooden frames hold the protective coverings in place. These coverings are left 10 to 14 days and removed gradually. Sisalkraft purchases have amounted to 1,500,000 sq. ft.

It is estimated that the cost of the winter paving measures will add 10 per cent, if spread over the total paving requirements of the job as figured for normal paving weather.

Temperature records

These measures for winter paving are proving satisfactory, by all tests, for turning out concrete at the proper temperature onto the subgrade. A typical temperature check taken Jan. 15 by measuring the surface temperature on concrete in place 24 hours, showed that with surrounding temperature at 5 deg. above zero, concrete temperature under the hay and Sisalkraft blankets was 50 deg. F., due to the heat of hydration and the protective coverings.

Next month, *Western Construction News* will continue this account of winter paving in the Pacific Northwest with a description of the equipment and some special methods used on this project.

FOUR PROTECTIVE coverings were applied to the green concrete to prevent freezing. A curing membrane was sprayed on, and covered by a layer of paper curing mat. Next was a 12-in. blanket of wheat straw, which was covered by another layer of paper.

Army Asks Employers to Seek Non-Draft Workers

THE POLICY that labor requirements must be met as far as possible by the employment of workers not subject to induction is the basis of a series of manpower recommendations that have been issued to War Department contractors, subcontractors and suppliers, the War Department announced recently.

All employing units are asked to make the fullest possible use of men not fit for military duty, and of women. Further recommendations are the employment of suitable aliens, and the upgrading of employees in accordance with their maximum skill.

Stringent rules should be applied to hold to a necessary minimum the requests made for occupational deferment of employees, it is stated. Such employees must be engaged in production that is definitely essential to the war effort. Their individual tasks must also be of a nature that is essential to war production, or to the training of necessary replacements.

Preliminary Design Chart VI

Cross-Sections of Draft Tubes

By A. E. NIEDERHOFF
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and
LT. F. L. B. MILLER
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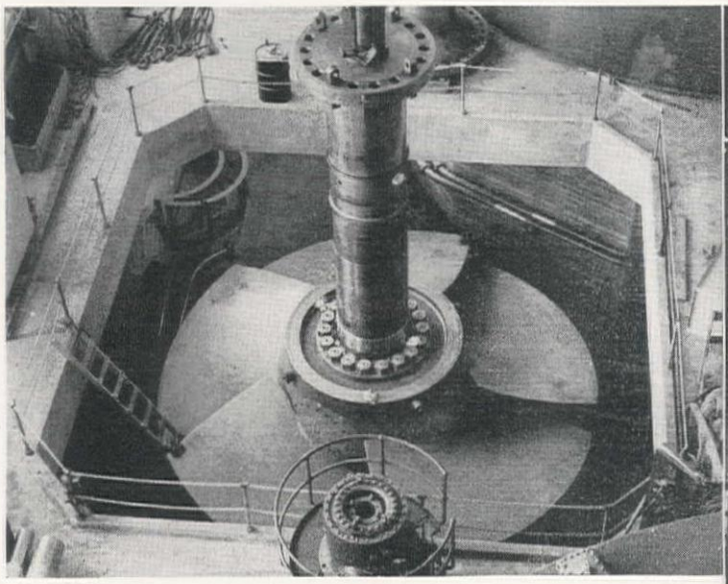
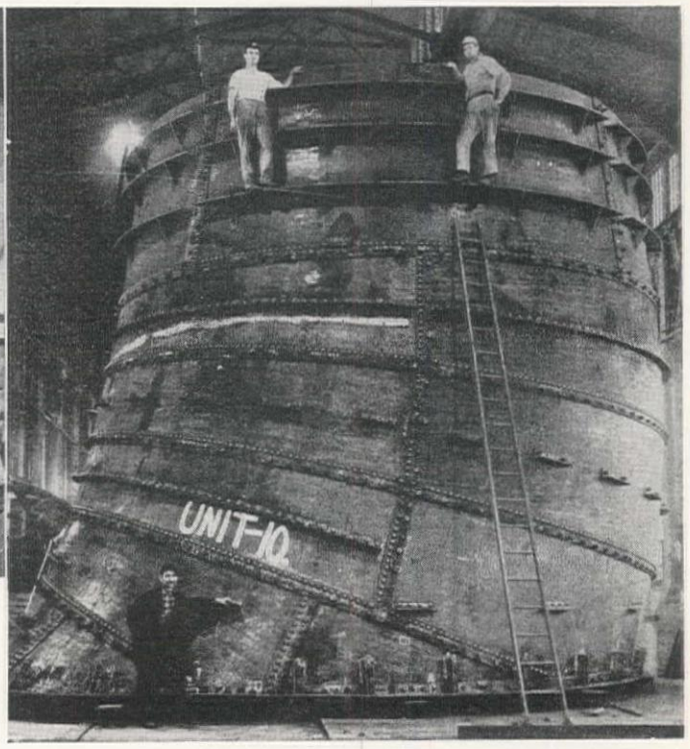
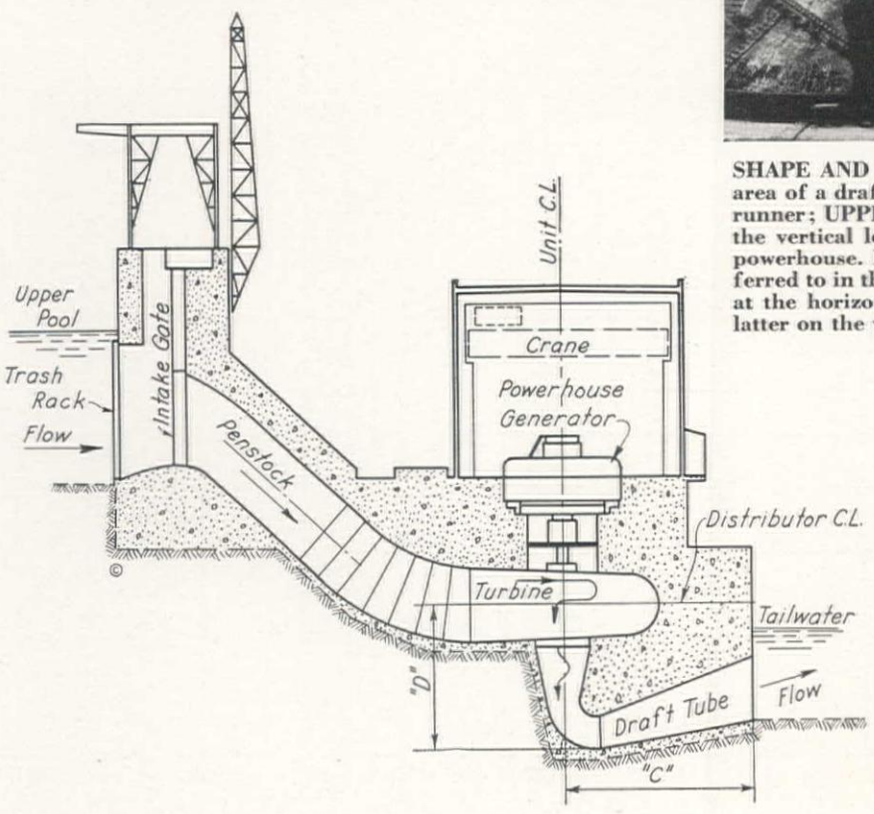
QUICKLY PROPORTIONING the cross-sectional areas of an elbow draft tube for a hydraulic turbine is important to a planning engineer who is concerned with arriving expeditiously at the quantities of substructure concrete and total cost for a hydro-electric project. It is also important to a designer in his preliminary work where plant efficiency and construction costs must be consistently balanced. These cross-sectional areas at the entrance and exit of the draft tube have been plotted on the attached charts, and can be obtained if the horsepower and head on the turbine are known.

An investigation of statistical data on modern hydroelectric plants and correlation of the results of several recent hydraulic model studies on draft tubes is the basis for the two charts. Entrance and exit areas, it is found, can be adequately expressed in terms of rated head and horsepower of the turbines.







SHAPE AND SIZE of the turbine runner governs the entrance area of a draft tube. UPPER LEFT, field assembly of a Kaplan runner; UPPER RIGHT, shop assembly of draft tube liner for the vertical leg of an elbow draft tube. DRAWING, a typical powerhouse. Entrance and exit areas of the draft tube, as referred to in the text, are not shown, but the former is measured at the horizontal surface where water leaves the turbine, the latter on the vertical surface where the flow enters the tailrace.

Smooth flow for efficiency

The higher specific speed of Kaplan propeller type turbines and higher whirling velocities of discharged water from the wheel makes draft tube design for this runner more critical than a design for a Francis type wheel. Because of exclusive use of propeller wheels for low head developments where any loss in the draft tube, or elsewhere, represents a large part of the total static head, the correct proportioning of the draft tube must of necessity be based upon this type of runner. Recovery of the

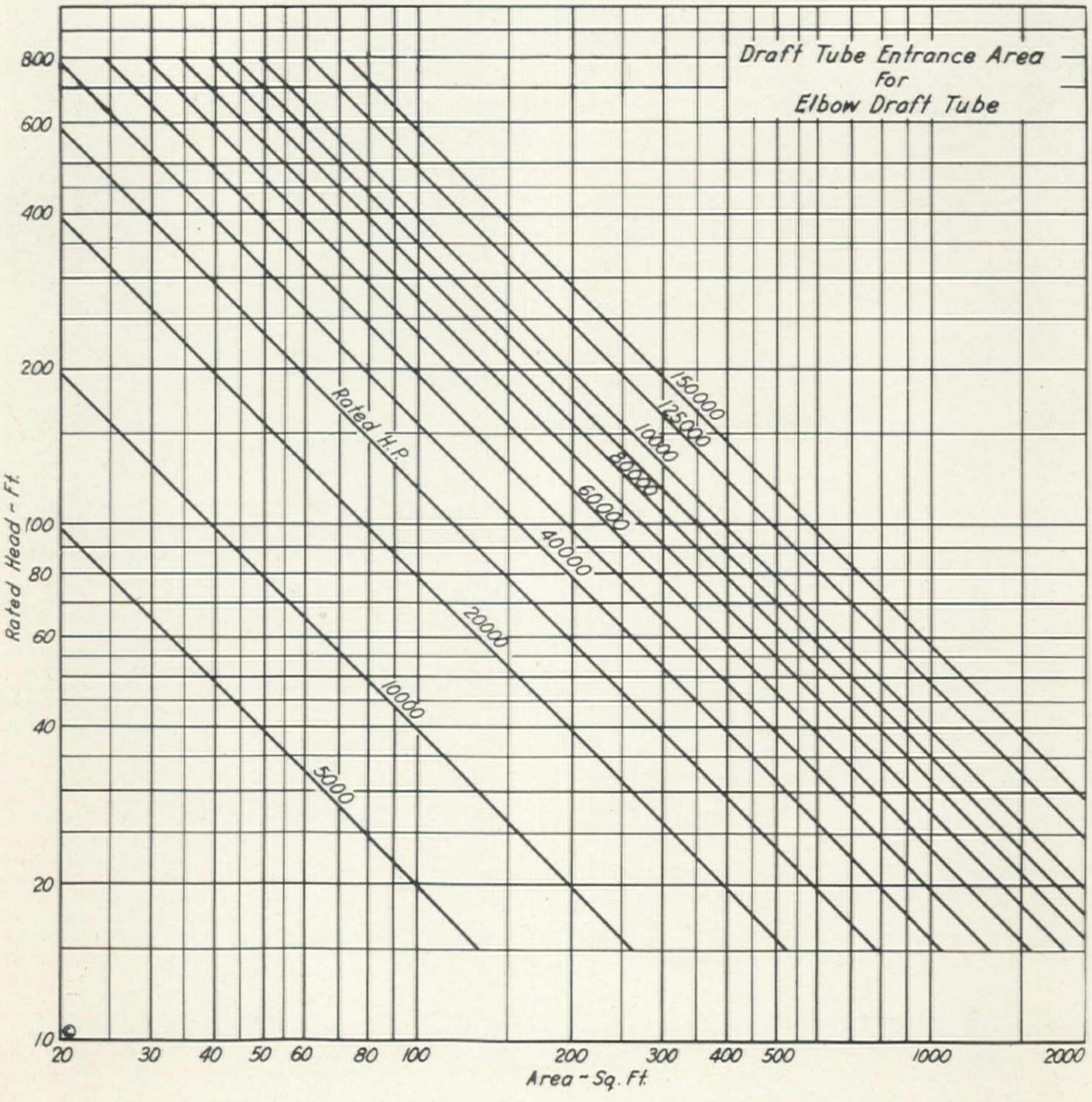
maximum amount of energy from the mixed flow emanating from the wheel is one of the functions of a correctly proportioned tube.

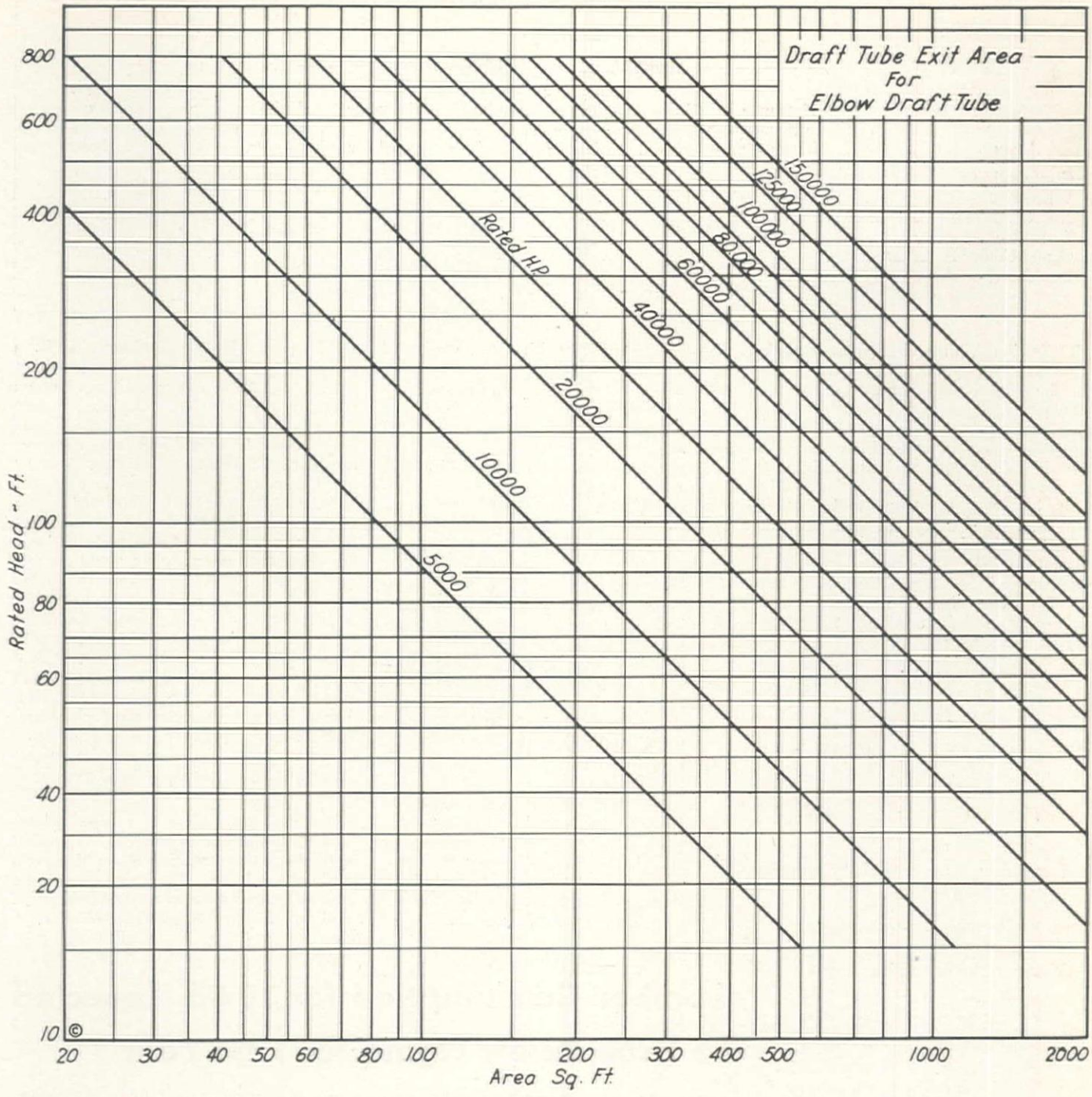
For best efficiency the water must enter the wheel with smooth flow and should leave the runner with a low velocity. Since it is not possible to reduce the velocity satisfactorily at the draft tube entrance, the prime objective of a draft tube is to convert the velocity head into pressure head. It is important that this conversion take place with the least possible amount of turbulence of whirl. It is also apparent that the water in flowing through the closed conduit from the scroll case to the tailrace will encounter losses due to friction, whirling, etc., which will influence the efficiency of the unit. Turbulence at the draft tube entrance, due to varied operating conditions, improper blade design and other factors which cannot be eliminated, is accompanied by a condition of low pressure which is less than the vapor pressure of the water. The oxygen which is liberated at these points and cavitation cause rapid deterioration of the wheel and when a liner is used in the throat of the draft tube this part also suffers oxidation.

Steel liners necessary

Whirling water at the draft tube entrance renders unavoidable the use of steel liners on large installations to prevent erosion and cavitation. Practice varies as to the length of structural steel liner but as an example to be cited, both 66,000-hp. Francis wheels at Norris powerhouse under a rated head of 165 ft. have a liner a little more than 9 ft. long. A Kaplan unit installed in the Pacific Northwest, on the other hand, uses a 25-ft. liner for the 74,000-hp. propeller turbine having a head of 60 ft. The higher specific speed of 122 r.p.m. in the latter case over 48.8 r.p.m. for Norris accounts for the difference.

The importance of a correct design as far as areas and proportions are concerned has been brought out by model tests. Incorrect draft tubes have been proven less efficient than no draft tube at all! More recent tests reported in T.V.A. Technical Report No. 2 on the Wheeler Project show that a simply designed elbow tube without a horizontal splitter and with an upward sloping invert of the horizontal leg amounting to





13 deg. gives good efficiencies. In fact, these rugged, non-complex designs approach within one per cent the efficiency of a vertical, concentric or hydrocone tube.

Making the charts

The entrance to a draft tube is circular and the area is fixed by the diameter of the turbine wheel as determined by the head, horsepower and type of wheel. Therefore, the fundamental expression for entrance area is

$$A_E = \frac{\pi D^2}{4} \quad \text{.....(1)}$$

where A_E is area in square feet for entrance to draft tube D is the discharge diameter of runner in feet.

The diameter of the runner for the same horsepower and head will be slightly different for each manufacturer of turbines depending upon the design of the runners. Further than this, the several models by the same manufacturer will show separate diameters depending upon the specific speed of the wheel. There is a definite relationship between specific speed and head for both Kaplan and Francis wheels of high efficiency that is directly reflected in the runner diameter. A survey of large modern propeller turbines indicates that Equation (1) can be expressed as

$$A_E = .39 \frac{HP.}{H} \quad \text{.....(2)}$$

where $HP.$ is rated horsepower of turbine H is rated head in feet.

This signifies that increasing the head while holding other factors constant will decrease the entrance area to the draft tube.

Engineers are always interested in average velocities through conduits especially where flow conditions are as disturbed and as fast as at the entrance to a draft tube. The usual interdependence between discharge, speed, specific speed, power and head leads to the surprisingly simple expression that contains none of the above factors except as they influence the numerical constant of

$$V_E = \frac{22.2}{\text{Eff.}} \quad \text{.....(3)}$$

where V_E is average water velocity in feet per second at draft tube entrance

Eff. is efficiency at rated head and full gate of Kaplan turbine.

TABLE I

Plant	Actual Values: Entrance velocity ft. per sec.	Actual Values: Exit velocity ft. per sec.	Actual Values: Entrance $\frac{v}{(2gh)^{1/2}}$	Actual Values: Exit $\frac{v}{(2gh)^{1/2}}$	Chart Values: Entrance velocity ft. per sec.	Chart Values: Exit velocity ft. per sec.	Chart Values: Entrance $\frac{v}{(2gh)^{1/2}}$	Chart Values: Exit $\frac{v}{(2gh)^{1/2}}$
Guntersville	25	7.0	.517	.145	25	6.3	.529	.130
Wheeler	27	6.8	.491	.121	28	6.9	.501	.125
Norris	29	6.6	.282	.064	29	6.8	.278	.066
Hiwassee	33	7.2	.302	.065	29	7.0	.262	.064
Grand Coulee	27	6.5	.189	.045	26	6.1	.175	.042
Boulder (55000 HP.—467 H)	26	4.7	.148	.027	26	6.1	.153	.035

Transition from a circular area at the wheel to a rectangular opening at the exit into the tailrace requires a total distance of horizontal and vertical legs of an elbow draft tube that has been previously explained in an earlier issue of *Western Construction News*. It is obvious that increasing the length of transition section will increase both efficiency of unit and construction cost. The larger the exit area the greater the efficiency provided transitions are not too abrupt. Assuming good, modern practice in this regard the area and the velocity at exit, obtained in a similar manner to that used for arriving at equations (2) and (3), are:

$$A_T = 1.67 \frac{HP.}{H} \quad \text{.....(4)}$$

where A_T is total area of exit in square feet and

$$V_T = \frac{14}{H^{.167}} \quad \text{.....(5)}$$

Both expressions apply to either propellor or Francis type wheels.

Comparison with existing plants

Velocity ratios or coefficient of $\frac{v}{(2gh)^{1/2}}$ at the entrance and exit for several plants have been tabulated and compared in Table I with chart values. These actual ratios at entrance and exit to the tube are larger for lower heads and for the engineer who finds solace in plotting graphs, will give a fairly satisfactory parabola if ratios are plotted against head. Actual velocities are about 27 ft. per sec. at entrance and about 6 ft. per sec. at exit. Agreement between chart values and actual values for velocities and coefficients is good with the exception of the 55,000 hp. turbine for Boulder Dam. Here an opportunity was present to gain efficiency by spending materials and energy to make the draft tube longer and with ample exit area.

Actual areas at Guntersville for 34,000 hp. propeller turbines under a head of 36 ft. are 377 and 1350 sq. ft., respectively, at entrance and exit. Chart values show 370 and 1500 sq. ft. for this installation which would have the effect of increasing efficiency fractionally.

At Wheeler powerhouse the agreement is better for areas where an actual 381 sq. ft. compares closely with a curve value of 375 sq. ft. at the entrance. Similarly at exit, these 45,000 hp. Kaplan turbines acting under a rated head of 48 ft. have 1540 sq. ft. compared to a chart value of 1500 sq. ft.

Large propeller type turbines of 74,000 hp. under a rated head of 60 ft. have entrance and exit areas of 429 and 2070 sq. ft. respectively. Chart values yield 475 and 2100 sq. ft. of area for these two points in the draft tube.

Norris powerhouse draft tubes have 149.7 sq. ft. at entrance and 665 sq. ft. at exit. This is in fair agreement with chart values at 152 sq. ft. and 645 sq. ft.

Hiwassee powerhouse has a draft tube having 142 sq. ft. at entrance and 660 sq. ft. at exit. For an 80,000 hp. Francis unit acting under a rated head of 190 ft. the areas at entrance and exit of the draft tube furnished by the chart are 165 sq. ft. and 680 sq. ft. respectively.

Grand Coulee turbines, the most powerful in the world, have a draft tube exit area of 686 sq. ft. which is 8 per cent smaller than the chart value of 740 sq. ft. These 150,000 hp. units acting under a rated head of 330 ft., discharge directly into the entrance of a draft tube having an area of 162.5 sq. ft. The comparable value from the chart is 175 sq. ft.

From the above examples it can be seen that the charts are in fair agreement with efficient, modern plants having a head range from 36 to 467.5 ft. and a power range from 34,000 to 150,000 hp.

To compute the mass concrete in any hydroelectric powerhouse substructure the gross volume can be obtained from the outside dimensions. These outside dimensions are dependent upon number and size of units, spacing center to center, height of generator floor above tailwater and depth of foundation below the centerline of the distributor. All of these factors are usually known for each site and many of them are obtainable by means of charts previously published in *Western Construction News*. The voids to be deducted are for the turbine pit and the water passages. One of these passages is the draft tube the volume of which can be computed with the aid of these charts.

Note: This is the sixth in a series of preliminary design charts which have appeared in *Western Construction News* bi-monthly since April, 1942. The next chart, to be devoted to the selection of steel penstocks, will appear in the April issue.—Editor.

Lumber Consumption for 1943 Expected to Drop Below Figure for Last Year

LUMBER CONSUMPTION for 1943 is estimated at approximately 31,100,000,000 f.b.m. as compared with 40,200,000,000 f.b.m. for all purposes in 1942, according to a bulletin of the Lumber and Lumber Products Division of WPB, addressed to members of the Softwood Loggers and Lumber Manufacturers Advisory Committee, and producers and distributors of softwood lumber. Military and essential civilian requirements for construction lumber are estimated at 13.0 billion feet for 1943 as compared with 22.4 billion feet for 1942.

Requirements for special war items, such as aircraft lumber, ship-decking, pontoon lumber, ship and boat timber and structural timbers are expected to increase substantially. Increased production of these items is essential to the war program. The lumber production goal for 1943 is 32 billion board feet. Attainment of this goal, however, depends upon maintenance of present levels of manpower, tractors, trucks and flow of repair parts to the industry. Production of lumber is expected to decline temporarily during the winter months because of early, unseasonable weather conditions and shortages of labor.

The Softwood Loggers and Lumber Manufacturers Advisory Committee, at its last meeting in Washington, November 19, reported that retail lumber dealers' stocks are depleted and recommended that Limitation Order L-41 be liberalized. Committee members asked the War Production Board to ease restrictions on the movement of all lumber not required for war and essential civilian needs. They emphasized the fact that maximum production of lumber for war cannot be obtained unless outlets for non-war lumber are permitted.

Welded Double Steel Skating Floor

Continuous steel plate floor 90x224 ft. has freedom of movement under wide temperature changes by bolt connections to supporting beams allowing limited horizontal but no vertical movement—Brine is distributed through flumes supported on rollers to facilitate floor movement

By HERMAN VETTER
Consulting Mechanical Engineer
Los Angeles, Calif.

DEVELOPMENT of a welded steel plate floor which allows ice rinks to be frozen and maintained out of doors during summer weather conditions has been proven practical by the construction of three such rinks since 1938. The first rink was constructed in 1938 at Westwood, Calif., the second at Philadelphia, Pa., and the third at Riverside, Calif., was completed less than two years ago. The first two of these floors have been in operation for several years, during which time observations have been made to show that the structural parts moved readily in response to temperature changes, and no noticeable stresses have been observed.

The rinks at Philadelphia and at Riverside are radically different in design from the one built at Westwood in 1938. Improvements were made on each successive rink. The subject of this article is the steel plate floor with special reference to the rink built most recently at Riverside.

The problem

In the development of a floor which would allow water to be frozen and ice maintained out of doors during summer weather conditions, it was quite evident that the pipe type of floor would not meet these requirements as pipe surfaces do not give a uniform heat absorbing surface. When water is frozen by mechanical means the ice forms in the shape of the heat absorbing surface, and in the case of pipes the ice forms in cylindrical shapes which gives a washboard surface that must be smoothed out by additional freezing until the space between the pipes is filled.

When an ice surface so frozen is subjected to a warm wind or sun rays the spaces between the pipes melt, resulting in an unsatisfactory skating surface. Consequently, the only suitable freezing surface would be one that is flat and smooth.

The solution, as it appeared, was to design a double steel floor. To arrive at a satisfactory design many problems had to be solved, including those of expansion and contraction under wide temperature ranges without buckling, and cost.

PLACING the top deck of the double steel floor is done after flow tests have shown the floor permits even distribution. Note the separating strips welded to the lower plate.

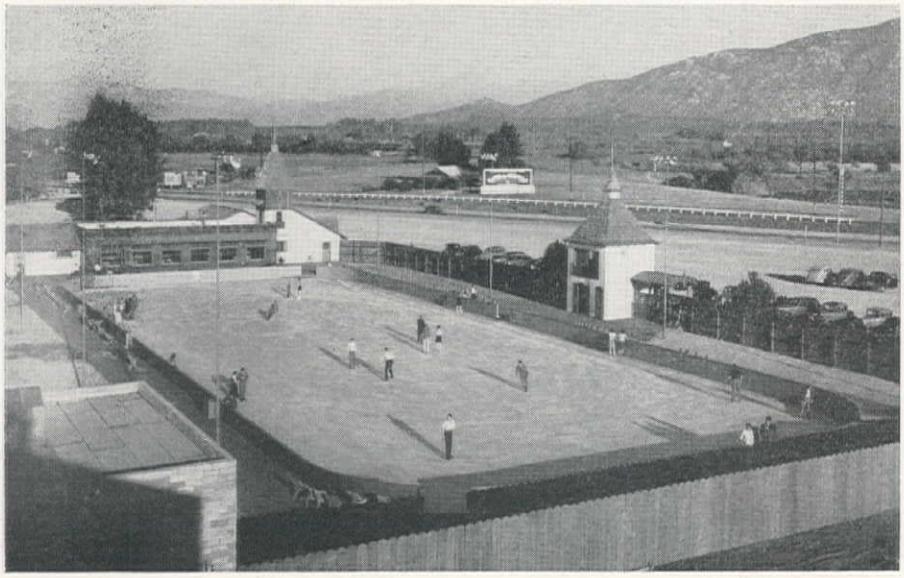
Double steel floor

The floor which was finally adopted consists of two 3/16-in. steel plates spaced ¾-in. apart (see accompanying drawing) which forms the channel for circulating a low temperature brine. The rink floors now in operation are 90 ft. wide by 224 ft. long which gives about 20,000 sq. ft. of skating surface. Along both sides of the rink floor and running its full length are large brine distributing flumes built of ¼-in. steel plates. These flumes are attached to the floor as shown on the drawing.

All plates used in the floor are rerolled and planed to size. The top plates are drilled with ½-in. holes on 6-in. centers laterally and on 12-in. centers longitudinally for the plug welds. The plates were drilled instead of punched as it was proved that drilling them on a multiple drill press was cheaper than punching. All work on the plates was done at the mill and when delivered at the site of erection no work was required except placing and welding.

The floor plates are held to the steel beams supporting the floor by means of bolts so arranged as to allow free limited horizontal movement but preventing vertical movement of the plates. These bolts are also useful during the welding period following which the nuts are loosened to allow free plate movement while cooling.

ICE RINK at Riverside, Calif., maintains a good skating surface even though no protection is provided from the sun. This characteristic is made possible by the use of the double-deck floor which provides a uniform freezing surface under the ice.



Expansion and contraction

The flumes, which, when full of brine, carry the greatest load, are supported on steel rollers to facilitate movement of the floor due to temperature changes. Expansion and contraction of the floor is a vital problem as the steel is exposed to the full rays of the sun during construction, and when placed in operation for ice skating is chilled to a temperature of about 18 deg. F. During the freezing process the floor contracts almost 1½ in. in length and about ¾ in. in width.

Shrinkage of the plates is not uniform as the exact center of the floor is the neutral point at which no shrinkage occurs. The shrinkage movement will be in the direction of both lateral and longitudinal center lines with diverging movements in the remainder.

Steel frame and floor construction

The entire floor is elevated about 7 ft. above the ground to permit inspection of the under side of the floor and flumes

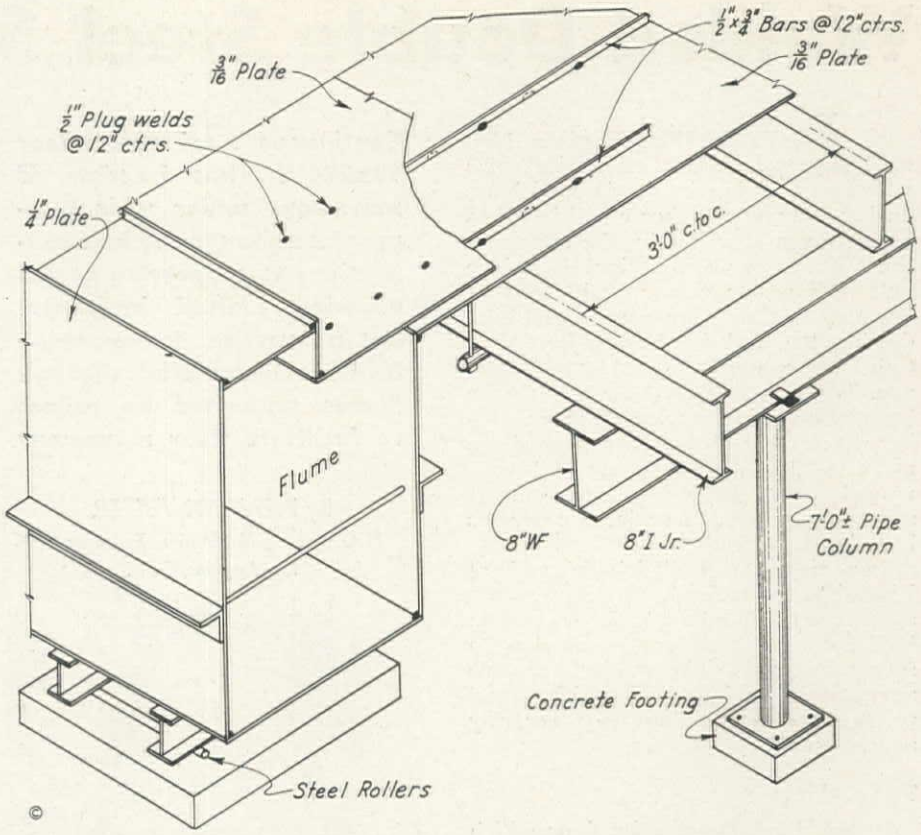
at any time, and to facilitate repairs when required without stopping rink operations.

Main beams, which are 8-in. wide flange, are placed on 10-ft. centers. The joists are 8-in. junior beams placed on 3-ft. centers. Main beams are fastened to the columns by beam clamps. Joists are spot welded to the main beams. All beams are butt welded to provide continuous stringers.

The plates for the lower floor are placed ready for welding. Hold-down bolts are welded in place and the bolts drawn down where necessary. Since the plates have been sized previously at the mill, very little cutting or fitting is necessary except at the corners which are rounded to a 20-ft. radius. The plate size selected as being the most economical for this purpose was 72 by 144 in. All welding of the plates was down welding thus holding welding costs to a minimum. The seam welds of the lower plates were tested with a vacuum type seam tester. As the floor was designed for 5-lb. pressure the vacuum test provided an adequate margin of safety.

After the lower floor plates were completely welded a series of ½ by ¾-in. steel strips were placed on 12-in. centers running laterally of the floor. These strips were placed on the ½-in. edge and securely tack welded to the lower plates, alternately on 6-in. centers.

The top plates were then placed ready for welding. These plates were welded to the steel strips previously placed on the lower floor by means of plug welds in the ½-in. holes which had been drilled in the top plates and which coincided with the separating strips. Seams in the top plate were placed free of the separating strips.



PERSPECTIVE DRAWING of the double steel plate ice rink floor, supporting members, and brine flume is best suited to show the main points of design and construction. Freedom of horizontal movement in the floor, which is the prime requisite of the design, is provided by the floor clamps around the 8-in. junior beams and the roller nest under the flume which carries heaviest load of any member in structure.

Flume construction and testing

After completion of the floor the flume plates were then fitted and placed ready for welding. The flumes were built in accordance with typical tank design.

After the floor, including the flumes, was completely welded except the top cover plates of the flumes, the floor was tested for hydraulic flow to determine whether the distribution of flow was uniform. Incidentally, construction of the floor was carried out with a tolerance of .01 ft. to assure uniform flow over the entire floor area. After this test the flume plates were welded in place and the floor given a hydrostatic pressure test of 5 lb. per sq. in.

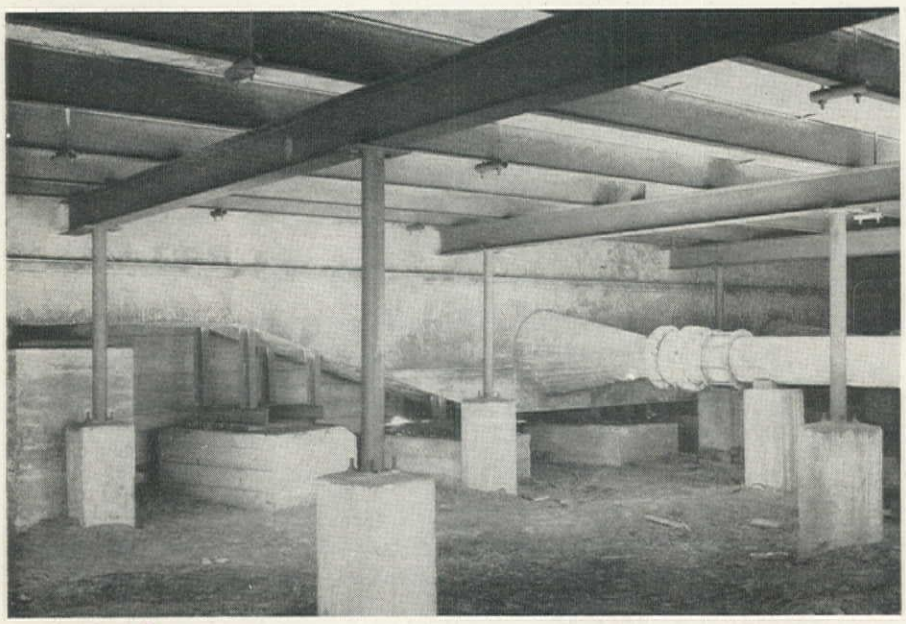
The final test of the flow is the chilling test. Before the floor is given this test all hold-down bolts except those near the neutral center are released sufficiently to permit the floor to contract when the floor is chilled. The chilling test consists of cooling the floor to at least a temperature of 15 deg. F. Observations are made during the chilling period to check the freedom of floor movement.

After this test has been made successfully the chilled floor is sprayed with water and an ice surface about ½ in. thick formed. Two of the floors which have been in operation for the past two years have been observed to see that the floor and fumes moved readily during temperature changes and no noticeable stresses have been observed.

The U. S. Patent Office has granted the writer seven claims on the design and freezing process employed in the construction and operation of these rinks, and has indicated that eleven additional claims are to be allowed on a patent now pending.

NOTE: Data and illustrations are from a study submitted by the author 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.

AMPLE ROOM is left under the rink to provide for frequent inspection and observation of movement as well as repair work when necessary. Note the roller nest under the flume support and floor clamps around the 8-in. junior beams serving as joists.



Willamette Floods in Oregon

Nearly double rainfall during December raised the Willamette River to a 20-yr. high causing an estimated $5,000,000 in damage—Debris damaged a timber pile trestle, two dams washed out—Fern Ridge and Cottage Grove dams retarded some flow

RAMPAGING FLOOD waters of the Willamette River late in December and early in January damaged and seriously threatened dams, bridges and highways, and played havoc with railroad lines and industries along its banks. Reaching its highest level in two decades, caused by a series of heavy rainfall periods, the river destroyed between five and ten million dollars worth of farm and urban property in western Oregon's fertile Willamette Basin, and took a toll of ten lives.

The Willamette River, heading some 35 mi. south of Eugene, Ore., drains the valley formed between the Coast Range and the Cascade Mountains in western Oregon. With a total drainage area of about 11,200 sq. mi. the river flows generally north to a junction with the Columbia some distance above Portland.

—*Portland Oregonian Photo.*

EUGENE-COBURG road was inundated when the Willamette reached a 16.7-ft. gauge reading, the highest stage on record for some 20 years.

Tributaries heading in the Coast Range on the west, the Cascade Mountains on the east, and the Calapooya Mountains on the south, all flow into the Willamette. Many of the most important towns in Oregon are situated on the banks of the Willamette, including in addition to Portland and Eugene, Corvallis, Albany, Salem and Oregon City.

The flood brought into bold relief the need for completion of the remaining five of the seven dams proposed by the Portland District Engineer Office in its coordinated plan embraced in the $80,000,000 Willamette Valley Project, which was approved by the War Department in March 1938. (See January, 1937, and April, 1938, issues of *Western Construction News* for descriptive details of the project.) The Fern Ridge and Cottage Grove dams, completed since that time, contributed materially to control of the flood waters, and operated successfully as expected with the result that there was a negligible loss, if any, immediately below their locations. There was a spillover at the Fern Ridge Dam without damage, but the Cottage Grove Dam took care of its part of the situation.

High rainfall occurs

The U. S. Weather Bureau at Portland recorded an average rainfall of 36 in., or 187 per cent, during November and December 1942 throughout the Willamette Valley drainage area. Readings of the river stages from Eugene to Portland between Dec. 30, 1942, and Jan. 3, 1943, showed, at some points, the highest crests on record since 1923. High water was reached at Eugene on Jan. 1, with 16.7 ft.; at Albany on Jan. 2, with 30.6 ft.; at Salem on Jan. 2, with 30.5 ft.; at Oregon City on Jan. 3, with 18.2 ft.; and at Portland between Jan. 3 and 4, with 20.2 ft.

Flood stage of 40.9 ft. was reached by the Yamhill River—an important Willamette tributary—at Whiteson on Jan. 1. At Jefferson, ten miles from the confluence of the Santiam and the Willamette, the highest crest in twenty years was reported on Jan. 1 at 21.3 ft. The Salem area was materially affected by the Santiam. The most disastrous flood in Willamette Valley history was safely passed on Jan. 5, when a drop of .2 ft. per hr. was recorded at Portland, and as much as 4.5 ft. at upriver points.

Highways damaged

Recordings proved that for a brief period the Willamette was the third largest river on the continent with a flow more than twice that of the Columbia. According to weather bureau estimates, the flow at Oregon City on Jan. 2 reached about 400,000 sec. ft., compared to an estimated 175,000 in the Columbia at Celilo on the same day.

R. H. Baldock, Oregon State Highway Engineer, estimated damage to highways and bridges at $65,000. Flood waters surged over highways at Eugene, Salem, Oregon City, and other communities in the flood-stricken region. Two timber pile bents went out from under the Marion-Polk County bridge at Salem, caused by the impact of a skating rink which was swept down the river from its foundations at Salem. Repairs

WING DAM of the Hawley Pulp & Paper Co. at Oregon City was damaged when the rock foundation was washed out and the log cribbing gave way.

—*Portland Oregonian Photo.*

—*Portland Oregonian Photo.*

TIMBER PILE TRESTLE bridge across the Willamette at Salem between Marion and Polk Counties lost two bents when it was struck by a skating rink washed off its foundations at Salem. Repairs to the bridge were made within a week. Some damage to bridges at Portland was done by floating logs hitting piers.

to the bridge commenced immediately, and traffic was resumed within a week.

At Oregon City, the Portland General Electric Co. wing dam at the Hawley Pulp & Paper Co. plant broke through, its old log cribbing giving way when its rock support was washed out. Piers under the Pacific Highway bridge at Oregon City were tested when escaping boom logs, carried by the torrential current, smashed into them. These knocked gunite from the piers, but otherwise there was no damage to the bridge. Runaway logs totaling millions of feet tore out several wooden dolphins protecting Portland bridges, but further damage was slight on the city's waterfront, aside from a few houseboats and boathouses breaking away from their moorings, to be later recovered without serious consequences. Careening logs upriver also caused concern during the high point of the flood for fear they might damage bridge piers.

Railroad flooded

C. C. Mongold, resident United States army engineer at Eugene, estimated that 45,000 ac. in Lane County were flooded. Hopyards were washed out, much livestock lost, and havoc was raised by the high swirling waters with logging operations along the lower reaches of the river.

At Independence on Jan. 1, the river was rising at the rate of 3 in. an hr., its flood running through hopyards with an estimated 12-mi. current. Just north of Independence, more than 500 ft. of river revetment installed by army engineers last summer was washed out.

Some slides of minor character interrupted highway traffic, but Southern Pacific tracks in the flooded area were under water at several points, its main line out of Portland being blocked for a day between Park Place and Oregon City. Water covered the tracks for three-quarters of a mile at a depth from 4 to 6 ft., necessitating re-routing of trains. Flooded tracks required repairs and new ballast on roadbeds.

Flood damage of last November to Silverton's Abiqua Dam—source of the community's water supply—weakened it with the result that it went out entirely on Dec. 30. In some communities, water supply lines were broken and wells were polluted by flood water. Hundreds of lowland homes and farm houses were evacuated.

Operations at the Hawley Pulp & Paper Co. at Oregon City were halted by high water, and at Salem the Oregon Pulp & Paper Co. reported loss of about 1,600 tons of finished paper, caused by flood conditions at its warehouse and main plant. Both mills lost many logs.

Control needs emphasized

By Saturday evening, Jan. 2, flood conditions were considered well in hand between Eugene and Corvallis, according to the Portland Office of the U. S. Engineer Department, with approximately 1,000 persons evacuated from their homes. The army had sent 326 officers and men into the Corvallis area for evacuation and rescue work, and 77 officers and men to Eugene.

Because the Cottage Grove and Fern Ridge dams impounded approximately 130,000 ac. ft. of water, they were largely instrumental in averting a more serious flood, the engineer's office reported. Had all seven of the proposed dams of the Willamette Valley Project been complete, an aggregate of 1,435,000 ac. ft. of water could have been impounded.

Members of the Willamette Basin Commission, meeting at Salem following the first week of the flood's high point, said that every effort toward a resumption of work on the flood control project will be made immediately after the close of the war, but that no request would be made at the 1943 legislative session which opened January 11.

Reinforcing Steel Standard

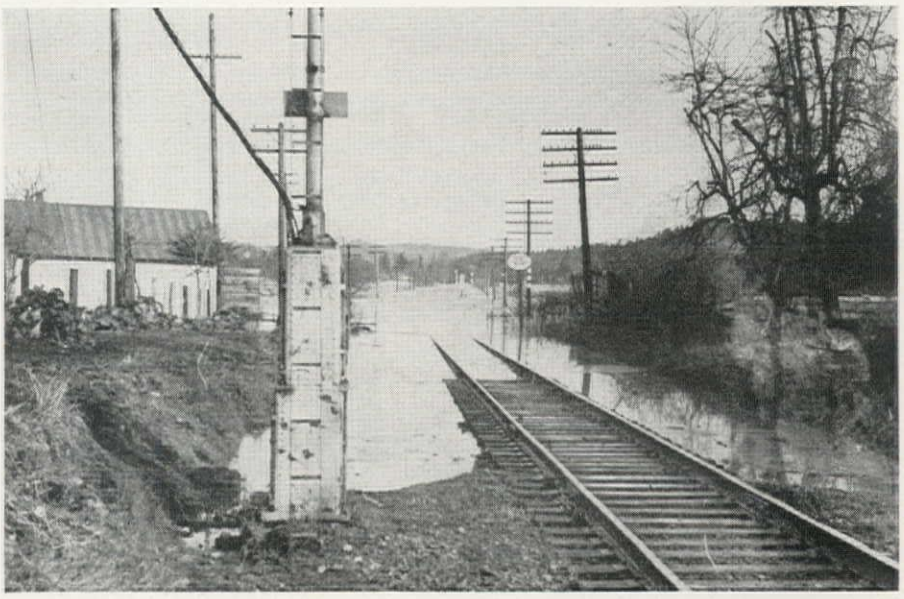
THE DIVISION of Simplified Practice of the National Bureau of Standards has announced that Simplified Practice Recommendation R53-32, Steel Reinforcing Spirals, has been reviewed by the sponsoring organization, the Concrete Reinforcing Steel Institute, and reaffirmed without change.

The recommendation was established in 1927, reaffirmed in 1930, and revised in 1932. This issue was reaffirmed once before in 1938. The simplified list of four sizes of steel spiral rods, representing a variety reduction of about 43 per cent, are the sizes permitted by Schedule I of Limitation Order 211, issued by the War Production Board.

Copies of the recommendation may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 5 cents each.

RAILROAD TRACKS of the Southern Pacific Co. along the Willamette were under water at several points to depths as great as 6 ft. No serious damage occurred on the railroad although minor repairs and re-ballasting were required in flooded sections.

—*Portland Oregonian Photo.*



Independent Highway Dept. Recommended for Idaho

Growing importance of highway construction as a function of the department of public works is the basis of recommendation made by retiring director Matt Hally in annual report—Merit system and new headquarters buildings are also recommended

THE INCREASING IMPORTANCE of highway construction as the prime function of the department of public works brought from T. Matt Hally, retiring Idaho director of highways, the recommendation that other subsidiary functions of the Idaho department of public works be divorced from the highway bureau, which should become a separate and coordinate department, under a full-ranking commissioner, responsible either to the governor or the state highway commission.

As at present constituted, the department of public works includes not only the bureau of highways, but the bureau of building construction, care of the statehouse, the director of state parks and the bureau of aeronautics.

"Back in 1919," says Mr. Hally, "when highways and motor cars were in the making, highway functions formed a much smaller and far less exacting part of the department functions. Today, however, highways are the major function and the other parts have become unrelated accessories foreign to highways.

"Since bureau of highway operations have become the chief function of the department of public works . . . it is felt that a more direct and effective administration can be obtained through the creation of a department of highways, with a director or commissioner directly responsible either to the governor or a highway commission.

"Where once the construction of a section of highway almost anywhere on the state system was beneficial and so justified, it is now necessary to establish the relative economic value of projects.

"It is further suggested that the proposed state highway department be housed outside the state capitol building.

"The pronounced policy of the federal government is to make surveys and prepare plans for after the war highway projects. Funds have already been appropriated to prepare for highway cooperative road construction under the name of advanced engineering projects. It is possible by the time materials and labor are available it will be feasible to secure federal financial assistance for an office building."

(Note: In connection with Mr. Hally's recommendation for a commissioner of highways, it is to be noted that Joe D. Wood, appointed as commissioner of public works, also has been named acting director of highways.)

"The bureau of highways," Mr. Hally adds, lacks adequate housing throughout the state for district and maintenance operations.

". . . There is also recommended a merit system as a means of continuity of service, to exempt men of special talent from the biennial uncertainties of service."

The departmental report shows expenditure of $5,560,528 on construction of roads and bridges during the biennium. Maintenance of state highways cost $1,819,000. Overhead amounted to $258,000. Control of traffic accounted for $20,765. There was spent $201,717 on purchase of machinery, and $47,101 to buy lands and buildings.

The bureau of highways received, during the past biennium, $7,002,518 from the gasoline tax, and $192,805 from motor vehicle registrations. In addition, the state had to dispose of $2,395,000 of federal funds and $75,296 of local government funds.

A complication in the accounting of the department is introduced in the change of the beginning of the fiscal year from January 1 to July 1.

A wartime development has been the designation of some 1,215 miles of Idaho highways as strategic roads, to have preference in allocation of funds. In addition there are so-called access roads, giving access to air fields, cantonments, other military establishments, and the sources of strategic minerals. On the regular federal aid system the federal government bears 61.83 per cent of the cost, but on strategic and military roads the federal government bears 80.95 per cent of the cost. These roads on the strategic network must be 24 ft. wide of oiled surface, and 44 ft. from shoulder to shoulder to permit shoulder parking of convoys.

Lumber, Rope, Hardware, in WPB Rulings

CONSTRUCTION necessary to the production operations of the logging industry has been removed from the provisions of Conservation Order No. L-41 limiting civilian construction by the War Production Board. Supplementary Order L-41-c releases any constuction directly related to changing the site of logging operations, tapping new stumpage, removal of camps, or the combining of two or more camps. Other construction permitted under the new amendment includes the moving of railway track, building of rail extensions, building of main truck routes and access roads, and construction of branch and stump roads.

Cordage use extended

An amendment to Order M-84 extends the usage permitted for agave fiber and cordage, and included its use as catlines, spinning lines, bullropes and drilling cables in the operation of drilling of oil or gas wells; as drilling cables or scaling ropes in mines, quarries, and in drilling water wells; in power transmission between driver and driven grooved pulleys; for the construction, maintenance or repair of any machinery, equipment or structure carrying a preference rating of A-1-a or higher, and including public utility power lines, governor rope on elevators; as drop hammer rope on purchase orders carrying a preference rating of A-1-a or higher; and in the manufacture of wire rope in sizes of 13/64 inch or larger.

Hardware Simplification

NEW STANDARDS for builders' hardware lines, recently announced in a WPB simplification program, reduce the number of items from the present total of 27,000 to about 3,500. Effective Jan. 15, 1943, the provisions of Schedule 1 of Limitation Order L-236 prohibit the processing of any builders' finishing hardware which does not conform to the permitted sizes, types, grades, finishes, weights, and standards. After Mar. 1, 1943, producers' inventories of finished parts for non-standard types, sizes and styles will be frozen.

Laboratory equipment

Materials, instruments, tools and operating supplies for laboratories have been further controlled by the War Production Board with the issuance of Limitation Order L-144 and amendments. The amended order provides that no purchaser of laboratory equipment may acquire an item valued at more than $50.00, or any quantity of the same item to the value of more than $50.00 without securing an authorization.

War housing manual

A war housing manual, setting forth an extensive list of critical materials and procedures for processing, has just been issued by the Housing Branch, Construction Bureau, War Production Board. The manual presents a digest of procedures and requirements covering the filing and processing of applications for war housing. It clarifies procedures for those sponsoring, financing, constructing and furnishing materials for projects that qualify under the war-housing program. The manual includes the directive for war-time construction, a summary of the basis for war housing construction, a brief review of War Production Board orders affecting war housing, discussions of applications for priority ratings, utility allowances and standards for war housing construction.

Post-War Planning—State Highway Plans

Nevada

FOLLOWING THE recommendations of the National Resources Planning Board and the Public Works Reserve, the Nevada State Highway Department last year prepared a 6-year program of highway improvements including in individual prospectuses some 116 projects estimated to cost about $30,786,000 together with another 36 projects contemplated for future construction at a cost of about $12,754,000.

Nevada has at present 5,517 mi. in the state highway system of which about 2,900 mi. are paved, 400 have a gravel surface, and the remainder are unimproved. The system represents a capital outlay of $58,641,000 since 1917 when the state highway department was first organized. The 6-year improvement program contemplates improvement of 479 mi. of the Nevada highway system at a cost of $10,241,000 during the first biennium; 376 mi. at a cost of $9,629,000 during the second biennium; and 422 mi. at a cost of $10,917,000 during the third biennium. In addition to these improvements the 6-year program includes plans for the improvement, possibly at a later date, of 663 mi. at an estimated cost of $12,754,000.

Largest single improvement project listed in the 6-year program involves U. S. highway 50 from its junction with U. S. 93 to Wendover, a distance of 59.5 mi. for which improvements will cost as estimated $2,400,000. Other major projects include: Eastgate to Austin, 45 mi. on U. S. highway 50, $1,468,000; Magnusson's to U. S. highway 93, 28.7 mi. on U. S. highway 50, $1,148,000; grade separations through Reno including depression of the main line Southern Pacific railroad tracks, $1,000,000 (to be extended through the entire 6-year period); east from Austin 11 mi. on U. S. 50, $660,000; California-Nevada line to Hawthorne, $615,000; Oregon-Nevada line 56.1 mi. south from Denio, $841,600; from Fallon north to U. S. highway 40, 29.7 mi. $594,000; Frenchman's to Eastgate, 23 mi. on U. S. highway 50, $575,000; from Goldfield 16.2 mi. north on U. S. highway 95, $525,000; from California-Nevada line 42 mi. to U. S. highway 95, $504,000; McGill to Magnusson's, 17.6 mi. on U. S. highway 50, $612,500; Moor to Pequop Summit, 12.6 mi. on U. S. highway 40, $700,000; from Round Mt. 35.3 mi. north, $529,500; from Mormon Mesa to Arizona line, 16.8 mi. on U. S. highway 91, $660,000; and from Pershing Co. line to Vya, 68.6 mi., $686,000.

On the program for the later period there are listed a number of major projects including: 67.7 mi. from Wells to Idaho state line on U. S. highway 93, $1,354,000; 12.3 mi. from Minden to Lake Tahoe, $922,500; 43.6 mi. from U. S. highway 93 to Halleck, $872,000; 42.9 mi. from Oreana to Mill City, $858,000; 49.1 mi. from Chrystal to Nye County line, $776,500; 28.5 mi. from Jiggs to Elko, $712,500; 27 mi. from Lovelock to Seven Troughs, $675,000; from 25.1 mi. west to Ely, $640,500; and from Vaughn's to Battle Mt., 59.7 mi., $597,000.

Robert A. Allen is state highway engineer for Nevada.

INCLUDED on this and the next two pages are summaries of the post-war planning activities of several western state highway departments and cities. These were received too late to be included in the January issue which was entirely devoted to that subject, and should be considered as an extension of that discussion.—Editor.

Colorado

By C. D. VAIL
State Highway Engineer, Colorado

THE COLORADO Highway Department has experienced a serious loss of trained personnel and thus at the present time is progressing slowly on plans for future projects. The department's policy has been to make reconnaissance and advance surveys of future routes or desirable projects during seasons or periods when the personnel in the several engineering divisions is not occupied on active construction projects. This information is completed by the field offices to the stage of field plans, showing all data essential to final design in the Denver office. This practice has now built up a backlog of such plans, covering future or desirable work in all sections of the state and the design department in Denver has the information available for immediate preparation of plans for such programs as may be authorized.

At the present time, approximately 50 per cent of the engineering department is engaged either on surveys or plans for post-war projects. This work is handled in the regular manner by regular forces. A Federal Aid program for "advance engineering projects" is being prepared. This program will cover studies and plans in Colorado's principal cities and on several main highway routes.

Under Colorado's practice, the engineering department has selected the various projects which in its judgment require improvement or relocation, and has, as before mentioned, proceeded to obtain preliminary data. The Highway Advisory Board, consisting of seven members each representing a district, meets once each year and recommends a program. As a result, the state's funds are usually allocated equally to each of the seven districts. Projects recommended by the Advisory Board are set up and a budget prepared by the state highway engineer and approved by the governor. In practice, this procedure has resulted in a program of projects desired by the highway engineer and insofar as we have information, at the present time all post-war projects, with the exception of those set up in the Federal Aid "advance engineering project" program, will be set up in the manner indicated above.

Due to curtailment of the 1942 program and to continued design work during the year, the Department has completed plans on the Federal Aid highway systems as follows. Costs are based on pre-war conditions.

Contracts awarded but deferred	$1,080,000
Plans finished	3,570,000
Plans being prepared	2,005,000
Total	$6,665,000

The above represents the backlog of available or nearly completed plans, and represents improvements on approximately 200 mi. of the present highway system. In addition to the above, it is expected that if the department is able to carry out plans resulting from the "advance engineering project" program not yet started, that an additional program approximating $15,000,000 may result. The plans indicated above as completed are ready for advertisement, but no right of way has been obtained for the projects at this date.

Some of the major developments contemplated and covered by advance studies or partially completed plans include:

Approaches to Denver with continued development in traffic arteries within the city. This is a major project and should at this time receive the careful study of State Highway Department, City of Denver and Public Roads Administration officials.

The realignment of U. S. highway 85 through Pueblo and its connections to U. S. highway 50 and highway 96, and its correlation with traffic problems within the city constitute one of the State's difficult problems.

Within the City of Trinidad, plans are underway for realignment of highway 85 and include major grade separations and bridge structures.

North of Denver highway 185 is under development as the main entrance from Wyoming. Several projects have been completed, but approximately 100 mi. of the route will be rebuilt to a high standard.

Southerly from Denver to Colorado Springs, highway 83 is under development as the future main north and south highway, and is being constructed on a very high type of alignment. Over 50 mi. of this project remains to be constructed and heavy construction is involved.

Westerly from Denver a pioneer bore 5400 ft. long is nearly completed through Loveland Pass on U. S. highway 6. The enlargement of this bore and realignment of approach highways constitute one of the department's major projects.

Southwesterly from Denver to Bailey, U. S. highway 285 is being relocated for approximately 25 mi. This work will bring up to modern standards this important route.

Realignment of U. S. highway 85 between Pueblo and Trinidad includes ten-mile projects at Greenhorn and at Aguilar.

On highway 50 between Pueblo and Canon City, a 15-mi. major realignment is planned.

In the southwestern part of the state, major improvements on U. S. highway 160 in the vicinity of Durango are in the preliminary plan state.

North of Durango studies are being continued on improvement on U. S. highway 550 to Ouray, one of Colorado's important scenic highways.

Other major improvements planned are corrections of U. S. highway 50 westerly from Grand Junction; city studies in Greeley and Ft. Morgan; and improvement to higher standards of U. S. highway 287 southerly from Lamar.

Washington

SUPPLEMENTING the $50,000,000 post-war highway construction projects in Washington State is a $100,000,000 program being developed by the Highway Advisory Commission of the state to consume a score of years in its fulfillment. The program has been the subject of intensive study by members of the commission since organization of the commission was authorized by the 1941 session of the legislature. Obviously, the roadway network program is long-range in character and must necessarily await the outcome of the war, but at that time it will fit in to the highway department's plans and definitely advance the state's ambitions to have a highway system second to none.

The long-range program has been prepared by the commission with regard to the probable development of the state itself, involving a general coverage of it and including fifty projects definitely laid down at the present time. Puget Sound and Portland areas, and a tie-in with the states of Idaho, Oregon and the Province of British Columbia are important phases of the development. Included as an important adjunct to the overall project is the hook-up with Grand Coulee's vast fund of electrical energy.

The commission is progressing with its future plans and at present is summarizing the highway situation in the State of Washington as it now exists and projecting the developments for the highway system on a map. This map will show needed additions or improvements now, war or no war, in one color and the long-range program in another color, with the various projects spotted on it. First considerations of the commission will be given to new roads, the rehabilitation of old roads and the construction of lots of new bridges. Highway 99, crossing the western portion of the state from north to south, will be a focal point in the whole planning picture.

The five members of the Highway Advisory Commission include Tom W. Holman, Seattle, chairman; Clinton S. Reynolds, Tacoma; Ed Anderson, Ellensburg; Charles T. Pedersen, Bellingham, and Fred L. Wolf, Newport. State Highway Director Burwell Bantz is an ex-officio member of the commission.

Oregon

THE OREGON STATE HIGHWAY Commission is at present working on post-war plans for a 3-year highway construction program comprehending the expenditure of up to $50,000,000 if such amount be available. In the main funds for such a major program must come from the Federal government, since state funds will by that time barely maintain the system.

No one can foresee at this time what funds will be available from the Federal government and under what conditions such funds can be utilized in the Oregon highway program. The Highway Commission is taking advantage of Federal funds that have been made available for surveys and plans for the reconstruction of certain roads included in the so-called inter-regional system of highways. Included in such plans are the reconstruction of sections of U. S. highway 30, the Columbia River highway and the Old Oregon Trail, particularly the section between Troutdale and The Dalles (see *Western Construction News*, February, 1938, for a description of the improvement program and September, 1941, for work done to date), and the reconstruction of U. S. highway 99, the Pacific Highway, particularly the section in the southern Oregon mountains.

From such information as is available at the present time, indications are that the Federal government will require that the bulk of such expenditures be used to improve heavy-traffic arterials, and to provide better routes through cities, particularly large metropolitan centers such as Portland. As fast as more information is known about the type and character of projects that the Federal government will require, changes in the plans will be made in accordance therewith.

In addition to this the Highway Commission will complete surveys and plans for many other roads which are not on the inter-regional system, but which are manifestly needed to provide better transportation facilities to encourage the economic development of the state.

When the war is won this problem will be immediately at hand, and there will be no time then to make orderly plans. The Oregon Highway Commission readily appreciates the fact that plans must be made now. Preparation of detailed plans for the contracting of a large program of public works, including highways, to give employment in the readjustment period requires considerable time and should have immediate attention. The Oregon Highway Commission is making plans accordingly.

R. H. Baldock is chief engineer for the Oregon State Highway Commission.

Utah

UTAH STATE Road Department has undertaken no post-war planning activities except preliminary consideration of the problem. No surveys, plans or estimates have been made up to the present time. The department is under the direction of the State Road Commission of which John S. Evans is chairman.

Six-Year City Programs

Los Angeles, Calif.

LONG RANGE planning of public works construction in the City of Los Angeles has been carried on continuously by the Bureau of Engineering for several years. In October, 1939, the city engineer submitted to the Board of Public Works, a proposed public works program. This was a voluminous study of the historical background of public works construction in Los Angeles as related to population growth, commercial and industrial development, and numerous other factors. The purpose of these studies was to assist in making an intelligent estimate of future requirements in public works construction. This report also listed 861 projects for construction at some future time. The total estimated cost of these projects, based on 1939 prices, was about $218,000,000.

On April 1, 1940, the city engineer submitted to the Board of Public Works a report on the advantages of adopting a long-range public works program for the City of Los Angeles, pointing out the value of setting up a 6-year program of construction as advocated by the National Resources Planning Board, the program to be kept current by annual revision. The Board of Public Works adopted this report, and authorized continuation of the studies and submission of a 6-year program of construction.

In conformity with that authorization a report entitled "A Proposed Six-Year Program of Public Works Construction, Fiscal Years 1941-1942 to 1946-1947, Inclusive," was submitted to the Board of Public Works on June 9, 1941. The Board adopted this report and transmitted it to the City Council for its approval. On May 27, 1942, the City Council referred the report to the city engineer for further study and the submission of revised program. In the meantime the Public Works Reserve, a

Federal agency, began compiling inventories of public works projects throughout the country in order to build up a reservoir of possible post-war construction. An engineer from the Public Works Reserve was assigned to the Bureau of Engineering to assist in listing all future construction work in Los Angeles.

Accordingly, in August, 1942, the city engineer again submitted a report on this subject. The report consists of two parts. Part I is a proposed 6-year program of public works construction for the Bureau of Engineering. Part II is entitled "Public Works Reserve Projects," and consists of a complete public work reservoir of the Bureau of Engineering, together with estimated costs, PWR priorities, and justifications of projects submitted by bureaus and departments of the city and filed with the Public Works Reserve. The total estimated cost of this complete reservoir of public work is $670,000,000.

The 6-year program of the Bureau of Engineering projects is divided into a list of improvements proposed for construction during the first fiscal year, and a second list suggested for the succeeding 5 years. The estimated costs of these programs are as follows:

First Fiscal Year

City-State Highways	$18,032,488
Outfall Sewer	1,616,500
Normal Improvements	16,118,149

Succeeding 5 Fiscal Years

City-State Highways	$52,248,201
Outfall Sewer	8,082,400
Normal Improvements	45,741,573

Normal improvement projects include street improvements other than on state highways, bridges, grade separations, pedestrian subways, storm drains and sanitary sewers.

Although this long range planning of public works construction was begun long before the war and was designed for permanent peace-time procedure, it is, of course, equally valuable for post-war planning. The projects listed in Los Angeles' 6-year program are those which appear now to be most urgently needed. If necessary to provide a large volume of construction work on short notice, the entire 6-year program could be telescoped into one or two years, and many additional projects could be selected from the reservoir of the Public Works Reserve on a basis of priority of need.

The only additional step necessary to make these projects immediately available for construction is the preparation of complete and detailed plans and specifications. On some of the projects plans have been partially completed; on others only preliminary studies and estimates have been made. Unfortunately, it has been difficult to convince legislative bodies, commissions, and other authorities of the importance of preparing complete plans now, instead of waiting until after the war.

Lloyd Aldrich is city engineer of Los Angeles and has been in charge of the preparation of the reports listed above.

Stockton, Calif.

IN FEBRUARY, 1942, the Stockton, Calif., City Council designated the City Planning Commission as the agency to prepare a program of post-war improvements in connection with the Public Works Reserve. This log of projects has been prepared by the Planning Commission and includes development of all municipal facilities.

The increase in the growth of the community due to war activities has accentuated the necessity for the development of portions of the major street system, and an increase in school facilities. Preliminary estimates of the cost of the various projects have been made, and a priority list has been prepared. This work is now being carried on in conjunction with the National Resources Planning Board.

The Planning Commission has scheduled one extra meeting each month devoted exclusively to the work of post-war planning. The work has now reached a stage where consideration of definite detailed plans and estimates are the subject of discussion.

Lyle Payton is city engineer of Stockton.

New Federal Commercial Standards

Small Hand Tools

PRINTED COPIES of several recently revised Simplified Practice Recommendations are now available, according to an announcement of the Division of Simplified Practice, National Bureau of Standards. They are:

R48-42—Shovels, Spades, Scoops, and Telegraph Spoons.
R158-42—Forged Axes.
R159-42—Forged Light Hammers.
R160-42—Forged Hatchets.

These recommendations were revised at the suggestion of and in co-operation with the War Production Board for the purpose of conserving critical materials, to make the available supply go as far as possible; also to conserve labor and machine-time, and otherwise enable this industry to contribute to the war effort. The simplified lists of items as given in these recommendations are incorporated in Limitation Order L-157, Hand Tools Simplification, issued by WPB.

As now revised, Recommendation R48 permits the manufacture of approximately 370 varieties of shovels, spades, scoops, and spoons, or approximately 34 per cent of the 1,100 items which, it is estimated, the industry has been producing. Recommendation R158 lists 150 sizes of axes, or 39 per cent of the 384 varieties formerly offered for sale. The number of sizes of forged light hammers shown in the current revision of Recommendation R159 is 141 as compared with 180 in the previous edition, a reduction of about 22 per cent; and the number of sizes of hatchets, broad axes, and adzes has been reduced from 89 to 57 in the new edition of Recommendation R160.

Copies of the new recommendations may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 5 cents each.

Mineral Wool Insulation

MINERAL WOOL and auxiliary materials used in insulating low temperature areas are the subject of a new Recommended Commercial Standard recently issued by the National Bureau of Standards of the U. S. Department of Commerce. The recommended standard covers mineral wool in loose, granulated or felted form, manufactured from rock, slag or glass, and auxiliary materials including asphalt, asphalt primer, building paper, cement, hydaulic lime, metal, and wood. The recommendations also include instructions in the proper installation of mineral wool in various types of supporting construction. Copies of the proposed standard have been submitted to more than 120 interested organizations, and are now being distributed to producers, distributors and users of mineral wool for their criticisms and approval.

Screw Threads—Tap Drills

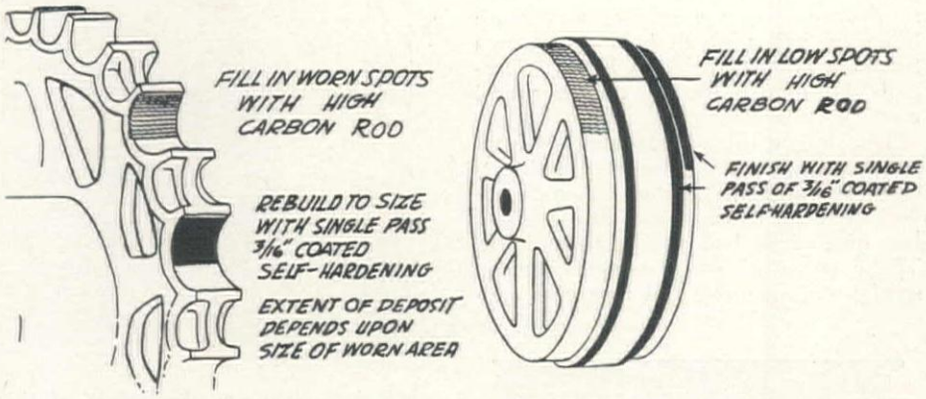
A NEW Commercial Standard for Screw Threads and Tap Drill Sizes has been made a recorded standard of the industry for new production after Feb. 10, 1943, by the National Bureau of Standards, following acceptance of the standard by a majority of the manufacturers, distributors and users. Identified as Commercial Standard CS24-43, the new standard represents a revision and consolidation of CS24-30 and CS25-30, covering the predominating sizes of American National Screw Threads, with corresponding tap drill sizes. Mimeographed copies of the Standard may be secured from the National Bureau of Standards, Washington, D. C.

Reclamation Hydro Power Up 43 Per Cent Last Year

HYDROELECTRIC power capacity of Bureau of Reclamation plants was increased 43 per cent during 1942. In 28 plants on 17 projects in the eleven western states, the installed capacity was raised to nearly 1,500,000 kw. The largest installation was three 108,000 kw. generators at Grand Coulee, and the tenth generator was placed in service at Boulder Dam. The Bureau of Reclamation also reported an increase in storage capacity of 13,845,680 ac. ft., or a total storage capacity of 61,610,283 ac. ft. in 81 reservoirs. During the year, three resettlement centers were established for 36,000 Japanese evacuees on the Klamath project in Oregon, the Minidoka project in Idaho and the Shoshone project in Wyoming.

HOW IT WAS DONE

JOB AND SHOP TIPS FROM THE FIELD EDITOR'S NOTEBOOK



Re-face Tractor Sprockets And Idlers at Little Cost

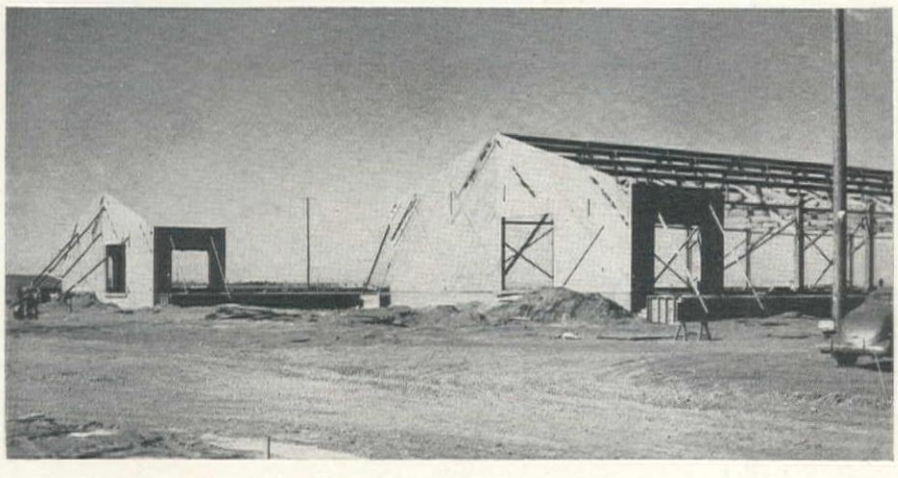
DRIVE SPROCKETS and idler wheels from tractors frequently become worn to the point where operation is dangerous, and it has been found that these can be successfully rebuilt, so that an amount of wear equal to or in excess of that obtainable in new equipment may be secured, and at a cost much smaller than would be required for purchase of a new part.

The technique used in renewing a sprocket is to run a shaft through the hub, and place the ends on saw horses, allowing the wheel to turn during the operation. Worn spots are filled in with high carbon rod, using reverse polarity and the welding machine set at 150 amp. Self-hardening rod is then used to rebuild to finished size, again using reverse polarity, but with amperage set at about 175.

The beads should be applied transversely, and the deposit peened while it is still red hot, to improve impact resistance and relieve internal stresses. Welding time and quantity of rod required will of course vary with the amount of wear and size of the equipment, but generally from 2½ to 5 hr. is sufficient time, and 7 to 10 lb. of self-hardening rod will be used.

Re-facing of idler wheels is similar to that for drive sprockets. The wheel should be mounted on a shaft, and the low spots filled in with high carbon deposit. A single layer of self-hardening material and adequate peening will complete the operation. Welding time for an idler wheel from a large tractor will vary from 3 to 6 hr. and usually not more than 15 lb. of self-hardening facing material will be required.

The welding process on both pieces of equipment is illustrated in the drawing above and a typical sprocket job is shown in the photo. Both the sketch and photo are from the Stoody Co., Whittier, Calif. This is the third in a series of "How It Was Done" articles on restoration of worn tractor parts. Another will appear next month.



Building Erected By Panel Methods

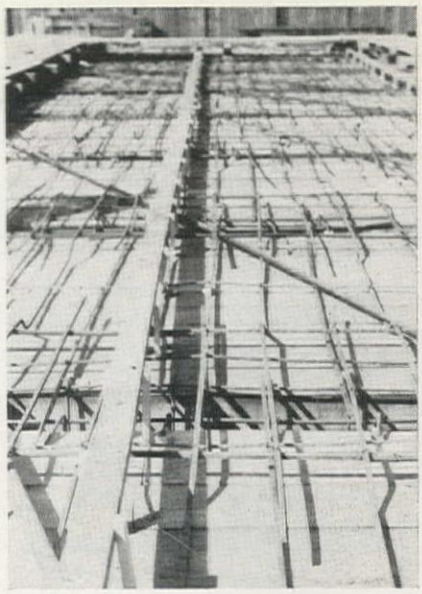
TYPICAL HIGH-SPEED building erection now in use for construction of cantonments, air depots, and other emergency war work, is illustrated in the accompanying photograph of panel-by-panel construction at an ordnance depot in northeastern Oregon.

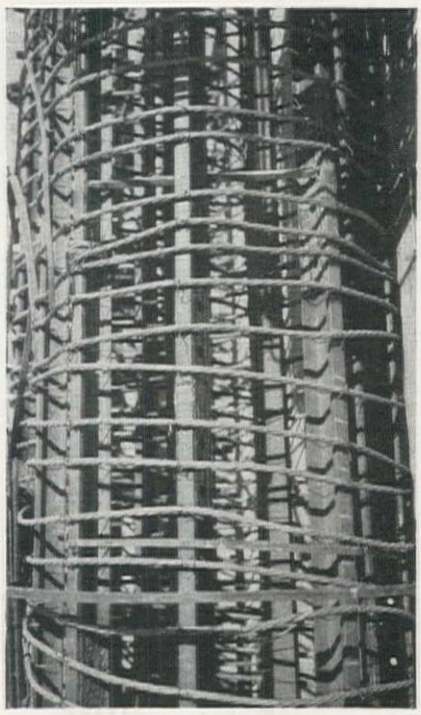
The panels of siding are fabricated entirely away from the building site by a large staff of carpenters, this work being done while footings and foundations are being poured and are setting. Roof trusses are also being built separately at another place.

When the foundations are ready, simple framing is erected, and the already completed trusses and siding panels are quickly fastened into place. Doors, windows, flooring, roof, and accessories are next installed and in a remarkably short period of time the building is ready for occupation. Records of complete erection of cantonment barracks buildings in 7 or 8 hr. have been made in some camps.

Paul N. Odegard & Associates, contractors of Portland, Ore., were awarded the building contract for this big ordnance depot, and the buildings shown in the photo were part of their project. Howard H. Spence and Herbert Dunham were the construction superintendents on the job.

Ship Scrap Used in Erection Of Spokane Garage Building





SCRAP STEEL used in the erection of a reinforced concrete garage building in Spokane, Wash. TOP LEFT, ship shearings as delivered to the site. TOP RIGHT, floor slab reinforcing in place, with straightened ship cuttings used instead of regular reinforcing bars and cables being used as ties. CENTER, column using small gauge mining railroad rails for vertical rods, and old cable used as continuous circular band. BOTTOM LEFT, Charles Mairet, steel foreman, standing beside column in which ship cuttings are used as circular reinforcing. Dowels of standard reinforcing bar and salvaged fish plate welded in place to join two sections of rail can be seen in this picture. LOWER RIGHT, pile of stirrups to be used in construction of large beams, made from straightened and formed ship plate shearings.

STEEL SCRAP sheared from ship plates has been used in erection of a reinforced concrete garage and store building being erected in downtown Spokane for the Citizen's Realty Company by Henry Georg, engineer and contractor of that city.

The ship cuttings were delivered from Seattle shipyards to the site in different lengths and in widths varying from ⅜-in. to 1-in. It was sometimes straight, but often had bends and kinks in it. The contractor's steel workers had to straighten, assemble and form this miscellaneous mass into stirrups, anchors, and bars.

The rods were used in all sorts of reinforcement situations after being thus formed. In floor slabs, the reinforcing was generally of these straightened and formed ship plate cuttings and the transverse tie rods were also made of this scrap steel. In some cases, alternate ties were of scrap cable.

Cable and 2-in. mining rails were other scrap items used in the construction. In large girders and beams, all the longitudinal reinforcing was composed of such rails, while ship steel was used for the stirrups.

In columns, the mining railroad rails, joined by salvaged fish plates welded in place, are used for the vertical members, and continuous spiral bands of old ½-in. and ⅝-in. cable are placed around them. In others, the circular ties are of the ship shearings. In every case, the column steel is secured in place by tying to regular deformed reinforcing bars left protruding several feet from the basement column to act as dowels.

Archibald Rigg, architect - engineer for the owner, made careful calculations of stresses to insure that the strength and safety of the structural members were not impaired by the use of this varied reinforcement, but were at all times equivalent to the use of standard bars. These calculations were also checked by city building authorities, and W. L. Maloney, consulting engineer.

The building, to be three stories in height, is designed to accommodate 400 autos, and is located at the corner of Post and Main Streets. E. R. Haynes is general foreman for Henry Georg, contractor.

NEWS OF WESTERN CONSTRUCTION

FEBRUARY, 1943

Austin Company Is Awarded Army-Navy E at Nine Jobs

FORTY-SIX HUNDRED engineers and construction workers associated with The Austin Co., Seattle, Wash., on Navy engineering and construction work aggregating $70,000,000 received the Army-Navy "E" award on Jan. 20, at simultaneous ceremonies in nine widely separated locations in the states of Washington and Oregon. It was the first award for construction in the Pacific Northwest.

Captain Henry F. Bruns (CEC) U.S.N., superintending civil engineer for the Western States and Alaska, in presenting the "E" pennant at a central ceremony to George A. Bryant, Austin president, commended the company for furnishing "all that it takes to make a complete job — engineering, management, construction."

"The projects already completed under this contract include four air stations, two air dromes, two radio stations, a fuel depot, a supply depot, an ammunition depot, a hospital, also a number of section bases, airfields and schools, plus still other structures for the Army and the Coast Guard," Captain Bruns said. "Your company has always enjoyed a reputation for fast construction. Under this Navy contract that reputation has been even more firmly established."

As Captain Bruns concluded his talk, which was broadcast from the Naval Supply Depot, Naval Station, Seattle, over a special hookup to eight outlying locations 500 miles along the coast and 300 miles inland, the "E" pennant was raised over the Austin field office at each location, where the commanding officer made the presentation direct to the ranking Austin man in the field there.

In the course of its work on these projects, Austin built the first prestressed concrete tanks ever used for fuel storage and developed a new type of construction for seaplane ramps which uses beams and slabs of pre-cast concrete. This eliminated the need for cofferdam construction, which would have been particularly costly and would have required a great amount of steel, due to the 18-foot tidal range in the region where these ramps are located. The saving of steel in the original design was later extended by the substitution of laminated wood reinforcing for steel in the slabs.

Colonel Richard Park, district engineer of the U. S. Army Engineers in Seattle, who presented the "E" emblem to sub-contractors' and employees' representatives, reviewed the company's work with the Army on four huge inland bomber plants, runways, a new air base, and a huge pier for the Army in the Northwest. Rear Admiral Luther E. Gregory (CEC) U.S.N. (Retired), former chief of the Bureau of Yards and Docks, presided at the central ceremonies. W. R. Engstrom of Seattle, newly elected Austin vice-president, and general manager of the projects covered by the "E" award, presided at the dinner following the ceremonies honoring officers of the Army and Navy.

PRESENTATION OF THE AWARD was made by Capt. Henry F. Bruns, Pacific Coast supervising civil engineer, U.S.N. (right), and Col. Richard Park, Seattle district engineer, U.S.E.D. (left). George A. Bryant, president of the Austin Co. (center), accepted the award. Others in the picture are George W. Plaisted, vice-president of the Austin Co. (left), and W. R. Engstrom, Seattle manager for Austin.

Atkinson-Pollock Given Army-Navy E

GUY F. ATKINSON CO., San Francisco, and George Pollock Co., Sacramento, Calif., were jointly awarded the Army-Navy E for excellence in war production in recognition of the accomplishments of the two firms operating as a joint venture in construction of the naval base in Los Angeles Harbor, another at Hueneme, Calif., and a navy hospital at Corona, Calif. The award was presented to Guy F. Atkinson and George Pollock, heads of the two construction firms, by Capt. Schuyler F. Heim, commandant of the naval operating base. Token presentation of the E lapel pins was made by Col. Rufus W. Putnam, Los Angeles district engineer.

Western Housing Units To Be Built for Miners

FEDERAL FUNDS have been made available for construction of 2,000 dwelling units for nonferrous metal miners in seven western states and the War Production Board has granted a blanket priority for the housing, John B. Blandford, Jr., Administrator of the National Housing Agency, announced recently. To cover construction costs, the admin-

istrator has allocated $6,000,000 to the Federal Public Housing Authority, a unit of the NHA, which will build the new accommodations.

This emergency program was decided on by the War Manpower Commission, the War Department and the National Housing Agency to alleviate conditions in certain mining communities where critical housing shortages threaten to interfere with production of essential nonferrous metals. The War Production Board, the War Manpower Commission, the National Housing Agency and the Federal Public Housing Authority each have assigned a representative to cooperate in deciding in the field where the dwelling units will be located and what type of structures will be built. The states covered by the order are Arizona, Colorado, Idaho, New Mexico, Nevada, Utah and Wyoming.

Navy Civil Engineer Officer Reports On Seabee Activities in the Pacific

STATING THAT the success of our naval operations in the Pacific, Alaska, and elsewhere is in a large measure dependent upon the work of the Navy's "Seabee" construction battalions, Capt. R. E. Thomas, newly-appointed head of the Navy's Bureau of Yards and Docks in the Pacific area, says: "We need more officers and we need more men to carry on this essential work. We want to roll those Japs back to their own home town and then mop them up there. And we want to do it quickly. To do so means that engineers and constructors, the men who know how to get things done, must join us in force."

In San Francisco to confer with Capt. Thomas on the need for more officers is Lieut. Cmdr. W. L. Painter, who has been four months with the "Seabees" in the Solomons. Describing the work of the "Seabees," Lieut. Cmdr. Painter says: "We moved into the Solomons just after the Marines and 'secured' the beach. We built bridges, water systems, airfields, docks, roads, and helped unload ships." The work of the "Seabees," Lieut. Cmdr. Painter says, might be described as building a "chain of miniature Pearl Harbors" across the Pacific. He will return shortly to advance base activity in the South Pacific.

He states that the work is "hard but healthy." "Men serving as officers with the 'Seabees' are doing largely just what they would do at home in the civil engineering profession — laying pipelines, building tanks, mapping highways, and laying out airfields."

Lieut. Cmdr. Painter is urging construction men who want to help fight the Axis by practicing their own profession to contact the Office of Naval Officer Procurement at 703 Market Street in San Francisco. There are openings in both the commissioned and warrant ranks. Age limits are 19 to 50 years. Field experience and a college degree in civil engineering are required in most cases, but the degree may be waived in the cases of men of outstanding supervisory experience.

LT. COMMANDER W. L. PAINTER, seated, Navy Seabee officer who has just returned from the Solomon Islands, confers with LT. D. E. CARBERRY, of the Naval Officer Procurement office, who is seeking more construction engineers to enroll in the Civil Engineer Corps.

General—M-K—Shea Get Ross Dam Raise Project

BIDS FOR the construction of the ten-million-dollar addition to Ross dam owned by the City Light Department, Seattle, Wash., were opened by the city's board of public works on January 21 with the lowest bid totaling $7,144,922. It was submitted jointly by the General Construction Co., Seattle; J. F. Shea Co., Los Angeles, and Morrison-Knudsen Co., Boise, Idaho. Other bidders were the Guy F. Atkinson Co., San Francisco, which submitted a price of $8,018,632, and the S. A. Healy Co., of White Plains, N. Y., with a bid of $10,011,806.

The City Light estimate for construction of the dam was $10,225,000. Most of the funds for the project will be provided through a bond issue of $7,900,000, the issue to be opened for bids in the near future. Federal funds in an amount of $1,864,760 already have been allotted to aid with the cost of the dam, through an outright grant, and $400,000 from the current operating surplus of City Light also will be available to complete the financing.

The joint bid of General-M.K.-Shea for second-stage construction of Ross dam was accepted by the Seattle Board of Public Works following recommendation of E. R. Hoffman, superintendent of the City Light Department. The contract is still subject to the approval of the Federal Power Commission under whose direction the work is to be done. For a brief description of the work to be done see *Western Construction News*, June, 1942, page 270.

It was reported that award of the contract was made following a conference between engineers representing the Federal Power Commission, the Bureau of Reclamation and the Seattle City Light Department during which minor modifications of the dam design were discussed.

Pit No. 5 Tunnel Heading Holed Through by Connolly

A 7,000-FT. section of the tunnel being driven across the Big Bend of the Pit River, 50 mi. east of Redding, was holed through about the middle of December, and the tunnel is now more than 70 per cent complete. The 21-ft. tunnel will be 28,000 ft. long when completed, and will extend from a diversion dam to a powerhouse, both of which are now under construction. The work is a part of the Pit 5 development which was begun by the Pacific Gas & Electric Co. about a year and a half ago. Driving of the tunnel is being done by T. E. Connolly, Inc., with W. D. Connolly as project manager.

Building Firms in So. Calif. Penalized on WPB Violation

TWO SOUTHERN CALIFORNIA building firms, Estates, Inc., and the J. F. Wadkins Corp., operating in the vicinity of Los Angeles, were penalized last month for violation of War Production Board regulations. The penalty order states that the two firms, without waiting for authorization to begin construction, started work on thirty-six of eighty dwellings which they were planning to erect. At the time this violation of Conservation Order L-41 was acted upon, 16 of the houses were completed and twenty were from 75 to 80 per cent complete. Because of local need, completion of these latter is permitted, but the suspension order provides that no authorization to begin any other construction shall be granted the offending firms for the next six months.

New Coal Plant Planned By British Columbia Co.

OPENING up of the new Elk River colliery will be undertaken by the Crow's Nest Pass Coal Company of Fernie, B. C., at a cost of $1,258,000, according to William Whittaker, engineer in charge of the project. A new concrete steel-framed preparation plant will be installed at a cost of $350,000 and a ma-

chine shop, office, warehouse and lamphouse at a cost of $115,000.

The mine, the tenth in the area to be opened by the company since it began operations in 1888, is located on the south side of the valley three and a half miles from Fernie, Mr. Whittaker said. Output of 4000 tons per 16-hour day is planned and 4000 horsepower of electricity will be used in the operations. Retarding conveyors of 1000-unit capacity will be used to let the coal down inch and a quarter cable at a speed of 125 feet per minute.

Five-Block Section of Seattle Viaduct Opened

A FIVE-BLOCK section of Spokane Street Viaduct, in Seattle, Wash., was opened to traffic on Jan. 17, concluding more than twelve months of interrupted construction accounted for by reduction of the original plans for the structure, delays in steel deliveries and priority difficulties. The newly opened span extends between Sixth Avenue S.W. and First Avenue South and overpasses two "slow freight" railroad lines and relieves the busy Marginal Way traffic bottleneck. The viaduct provides four traffic lanes in addition to those on the road level below.

The Washington State Highway Department received official notice from Washington, D. C., on Jan. 22, that an AA-3 priority had been granted for the completion of the entire project which would extend between Sixth Avenue South to Sixth Avenue S.W. The department recently made application for the higher priority in view of possible availability of more steel to complete the job.

Just when work can be resumed toward completing the viaduct is uncertain because of legal technicalities involved in the contract with McRae Brothers to whom the construction contract was let on Dec. 24, 1941. With legal counsel clearing up this point and providing the new priority is sufficient to insure delivery of the required steel, work on the entire viaduct will go forward.

California May Operate The Golden Gate Bridge

GOLDEN GATE BRIDGE operation by the California Department of Public Works was proposed by Frank W. Clark, director of the department, as a means of relieving the Golden Gate Bridge and Highway District from a financial loss and improving the efficiency of operation methods. Officials of the joint highway district indicated that the district will face a comparative loss of $803,000 for the present fiscal year, and may be required to impose a tax on real estate in the counties comprising the district in order to meet its obligations to bondholders.

IRRIGATION FACILITIES NEEDED TO GROW RUBBER IN THE WEST

Advantages of irrigation facilities in guayule rubber producing areas of the West is demonstrated in the photograph above which gives a graphic comparison of the difference in second-year growth of transplanted seedlings on irrigated and non-irrigated land in central California. Guayule must be grown on light, fairly arid soils of which the West has an abundance, but irrigation permits much more rapid growth and consequently an earlier harvesting date with resulting increase in rubber harvest.

Second Alaska Highway Proposed in Congress

A SECOND Alaska highway connecting Seattle and the Pacific Northwest with the northern territory by construction of a connecting link from existing highways at Prince George, British Columbia, to the Alaska highway now under construction at Whitehorse, Yukon Territory, would be authorized by a bill presented before Congress last month. Construction of the 600-mi. extension might cost as much as $25,000,000, according to the terms of the bill which was presented by Anthony J. Dimond, Congressional Delegate from Alaska, and approved by the Secretary of the Interior. Further discussion of the Alaska highway project in Washington developed suggestions that the road be extended from its present northern terminus at Fairbanks to Teller, which is north of Nome and about 54 mi. east of the Siberian Coast.

In the meantime the Corps of Engineers has completed the survey of a proposed trans-Canadian railroad which would provide supplementary transportation facilities between the United States and Alaska. The War Department announced that it does not consider that a military necessity exists at the present time for construction of the proposed railroad, and details of the survey have been filed for possible future wartime use. The railroad survey follows in general the "B" route proposed by the Alaskan international highway commission, and extends 1,300 mi. from Prince George to the Alaskan railroad, being sheltered on the west by the Coast Range and on the east by the Rocky Mountains.

Harry Hilp Donates Two Engineering Fellowships

HARRY HILP, partner in the construction firm of Barrett & Hilp, San Francisco, Calif., recently donated $10,000 to the University of California at Berkeley. The money is to be used to establish two engineering research fellowships at the university.

Construction Camps in Utah Must Be Approved by State

CONTRACTORS establishing and operating camps in Utah have been warned by the Utah State Department of Public Health that reports must be made concerning the location of camps, and rules and regulations of the department must be carried out. The regulations require that permits be applied for and secured for the maintenance of construction camps. Applications should be addressed to the Division of Public Health Engineering and Sanitation, State Department of Health, 120 State Capitol, Salt Lake City, Utah.

Employment on Construction Expected to Drop by 50%

EMPLOYMENT on new construction is expected to drop about 50 per cent over the whole country during 1943, according to estimates of the Department of Labor. During 1942 the monthly average of employment on construction projects was 1,999,000, but 1943 estimates indicate that this will drop to about 1,040,000 this year. A large part of the one million workers who will become available for other employment is expected to go into the shipbuilding industry.

WASHINGTON NEWS

. . . for the Construction West

By ARNOLD KRUCKMAN

Washington, D. C.—As we have already forecast, there now is solid ground for anticipating the Pacific West slope will have a rapid development of large numbers of acres of irrigated lands. In all probability some announcement will come from the Federal Government within the next month concerning a "sample" program which will involve 6,000,000 ac. of new lands to be brought to full production within 5 years. This program is regarded chiefly as a trail-breaker. Thereafter swiftly will come programs for irrigation of far greater numbers of acres in the West.

Reclamation Association leads

The enterprise is the joint work of the Bureau of Reclamation, the Secretary and Undersecretary of the Interior, the Department of Agriculture - U. S. Food Administration, the White House, and the Congress. The actual steering and prodding was accomplished by the National Reclamation Association. The War Production Board simply has accepted the leadership of the other agencies, and is expected to supply the absolutely essential materials because the logic of the need is inevitable.

It has been increasingly clear that Washington was almost completely unaware of the big food problems ahead, and that the existing acreage in the traditional farm areas would not be able to supply the food and fibres that are needed now and in the years ahead. When Commissioner Page negotiated with the Bureau of the Budget, one of the Executive agencies, he found that the Bureau's ideas of the need for development of more irrigated lands were so wide of the mark that it seemed better to abandon any program rather than accept the tiny fund proffered. (To make absolutely certain there is no misunderstanding it should be made clear that the information transmitted here did not come from Commissioner Page.) Commissioner Page quite logically came to the conclusion that it would be better to have no appropriation for new enterprises than to have the small change the Bureau of the Budget offered. He apparently foresaw it would be easier in due time to secure an adequate fund from Congress. For this reason you will find absolutely no new money for reclamation in the recent Budget submitted to Congress. The funds suggested are to be provided solely for repairs, maintenance and unavoidable corollary expenses.

It is anticipated WPB will find the materials necessary to build dams and canals and all the other works and facilities essential to maintain irrigated farm systems with their homes and communities. The same reasoning is expected to apply to War Manpower Commission, and to the armed services, when it becomes necessary to find the labor.

The armed services are reported to be ready to concede some sort of arrangement under Congressional pressure by which more labor will be available for the huge irrigation program to be developed in the West. We have even been told that when transportation clogs, by reason of the enormous burden of loads that must come with the inevitable speeding up of the War on the Pacific, the Army itself may build a new railroad on the West slope.

Power to be incidental

As this great program for irrigation of new lands, and expansion of areas already irrigated, develops, you will find that there will be very little sympathy for expansion of public power projects. The general feeling is that much reclamation in the immediate past has been used as a cloak to make power plants. Administrator Krug, the new WPB Power Czar, is reported to have had a showdown with Secretary Ickes in the White House, and Krug convinced the President that there is now enough power in the West. It apparently is the policy now to rely upon present developments for added needs, and to depend upon the power developed purely as incidental to new irrigation projects to take care of the new requirements created by the new farm communities.

Apparently the advance preparations for the impending irrigation program have started. Further lands have been formally withdrawn under the Beaver reservoir site at Paoni, Colorado; and under the Haystack Reservoir Site at West Side, Colorado; also at the Collbran project in Colorado. Other lands have been withdrawn on the American River, in California; lands under the State Line reservoir site at La Plata, near the State Line of New Mexico and Colorado; and lands in the Vale, Oregon, area. More lands are withdrawn under the McPhee Reservoir Site, near Dolores, Colo. (For an outline of these projects see "Reclamation Investigations," page 13, *Western Construction News*, January, 1943.)

Budget allocations

The Budget apparently has been as sparing with rivers and harbors and flood control as it was with Reclamation. Items provided in the budget under this head are solely for maintenance and administrative expenses. It is pointed out, however, that there may be items of considerable size buried in some of the Army and Navy appropriations, which are very large and are undefined and difficult to analyze. The same reasoning applies to probable items that will be expended for heavy construction of various kinds. Only $100,000,000 can be identified for the purpose, but it is generally assumed the Service appropriations include construction items substantially larger.

The Budget allocations for Public Roads cover only projects previously authorized and now well under way. The total requested from Congress is $173,000,000. (PRA has accumulated $76,000,000 in carry-over funds.) This covers $80,000,000 for access roads; $40,000,000 for Federal aid; $10,000,000 for the strategic network roads; $5,000,000 for the Inter-American Highway; and $3,000,000 for post-war planning. Again it is generally understood that Service appropriations include allocation of funds for flight strips, and for airfields, and similar undertakings that fall under Public Roads Administration.

Construction stop orders

WPB Orders, stopping construction on highways and streets in the West, included a project from Tabernash to Granby (Colo.); Sprague River Road (Ore.); Bonner-Ovando, Hardin-Melville (Mont.); projects at Monterey, Chula Vista, and Coronado (Calif.); Litchfield (Ariz.); Grand Junction-Fruita (Colo.); Alameda County, Campo, Garvey, Sacramento, and Oceanside (Calif.); U. S. Highway 30 (Idaho); unidentified projects in California and Idaho; Burley-Paul (Idaho); Tucson-Florence (Ariz.); Glenns Ferry-King Hill (Idaho); Primary State Highway 1 and U. S. Highway 99, ½ mi. north of Woodland, Wash.; Maricopa Co.-Hillside (Ariz.); U. S. Highway 18 (Ariz.); FLH 18-B (1), FAGM 18-B (1) (Nev.); SN-FAP 91-A (2), SN-FAP 3-B (1), SN-FAGH 91-C (3), Ft. Sumner (N. Mex.); Montrose, Durango, and Gunnison, Elk Springs (Colo.); Roswell (N. Mex.); Aquilar (Colo.); Elko (Nev.).

Projects other than highway jobs in the West stopped by WPB include the Roza Division, Yakima project (Wash.); Gila project (Ariz.); Deschutes project (Ore.); Grand Canyon National Park (Ariz.); Mt. Rainier National Park (Wash.); Owens Valley (Calif.); Pyramid Lake (Nev.); Wapato (Wash); Wind River, Yellowstone National Park (Wyo.); Zion-Bryce National Park (Utah); Hart Mountain (Ore.); Charles Sheldon (Nev.); Medicine Lake (Mont.); Malheur Lake (Ore.); All-American Canal (Imperial Co., Calif.); Twin Falls airport (Idaho); school, Lerdo, two schools, San Luis Obispo Co., school, Long Beach (Calif.); Boulder Canyon housing (Nev.); Provo River project (Utah); Eden project, Kendrick project, Riverton project (Wyo.).

Second Alaska highway

Rep. Wilbur Cartwright, Oklahoma, long Chairman of the House Roads Committee, was defeated in the elections and has become a major in the Army, specializing in military government. He is succeeded as Chairman of the Roads

Committee by Rep. J. W. Robinson of Utah. Robinson comes from Coalville, was a school teacher, and has been a member of the Roads Committee for ten years.

Delegate Dimond, Alaska, introduced HR 331, to authorize the building of a permanent Alaska Highway up through Seattle, Vaucouver, between Prince George, B. C., and White Horse, Y. T., along route A, originally designated by the Alaskan International Highway Commission under the Act of Congress of May 31, 1938. After the recent survey was completed by the Corps of Engineers, the War Department announced there is no need for a railroad along the same general route. The War Department announced simultaneously that it has established the Northwest Division of the Corps of Engineers with headquarters at Edmonton, Alberta, Canada, in charge of repair and maintenance for the Northwest Service Command. Col. Theodore Wyman is in command

Renegotiation modification

Renegotiation of contracts is the subject of many complaints coming in the mail to members of Congress. A sample was a letter from a western contractor who had a job that totalled $750,000. He asserted he had been checked and counterchecked by so many inspectors and auditors, and pared by so many experts, that when they finally got through his total net profit would have been $1,800. He finally came to Washington and had a vigorous debate with the agency for whom the job was constructed. The various renegotiating processes were modified so that the contractor felt he could finish with a reasonable return for his work.

Congress plans to make a very minute study of the whole renegotiation process, and it is expected the examination will help contractors to proceed with more assurance.

Controlled materials plan

WPB Facilities Bureau, headed by Fred Searls, Jr., is the "claimant" agency through which the construction industry must place its requisitions for metals to be secured through the Controlled Materials Plan. The projects are reviewed by Facilities Clearance Board or Facilities Review Committee. Applications must be made each quarter on Form CMP-3C. No deliveries of metals may be obtained that at any time exceed an accumulation 60-day inventory.

The person or corporation or agency for whom the job is performed makes the combined application for materials, based on requisitions from the prime contractors and their sub-contractors. Upon allocation of materials, the prime contractors and sub-contractors distribute the materials to those who are their sub-contractors. At this writing the exact relation of the construction industry to the CMP processes has not been clearly defined. It does not appear that present buying practices will be much different. The Construction Branch of the Facilities Bureau of WPB urges that those in charge of large construction projects work through the Materials Control Section of the Bureau.

Architects and contractors are expected to discuss drawings and lists of materials with the Section before beginning construction in order to be assured that all designs and specifications conform to the latest regulations. Strictly military and navy work is not included in this program. Federal, State, County, Municipal or other Government agencies work through Maury Maverick, Director, Governmental Division, WPB, Temporary Building E, Washington, D. C.; others through the Materials Control Section, Construction Bureau, WPB, 54th Floor, Empire State Building, New York City.

New housing plans

Upwards of 750,000 additional dwelling units for war workers are planned to be built this year. They come under the general supervision of the National Housing Agency. Congress is expected to supply the required funds within the next 60 days. The Navy has announced it will build a series of barracks for the WAVES, modified, but similar to military barracks built for Navy men. Over 25 barracks for the women have already been planned. Officers' barracks will each house 58 women, single and double rooms. Each floor of the two-story buildings has a small lobby and recreation room. Barracks for enlisted women will house 230 each.

The week the President sent his Budget message to Congress, WPB announced it had stopped, during the previous year, non-war construction of a total cost of $1,214,850,897. This included work on highways, bridges and tunnels totalling $104,968,736; irrigation and power, $348,412,577; airports, $23,585,056; reclamation, $129,400,000.

WPB has forbidden (L-196) export of used construction equipment beyond the limits of continental U. S. No rubber tires may be purchased for industrial power trucks except on priorities rated A-1-a or higher on PD-1A certificates. Alloy steel must not be used in angledozers or trailbuilders after February 1.

Miscellaneous

Webb Shadle, formerly counselor to the Director of Finance of the State of California, has been appointed General Counsel of the Civil Aeronautics Administration. . . . F. O. Hagie, managing secretary, National Reclamation Association, has been elected president of the Washington State and Alaska Society in Washington, D. C. He succeeded former Representative Knute Hill of Washington.

In place of the annual convention, members of the Associated General Contractors of America voted overwhelmingly to confine this year's conference to a meeting of the Governing and Advisory Boards in Chicago, at the Drake Hotel, February 15 and 16. . . . H. E. Woodruff, Associate Editor of "The Contractor," published by the Associated General Contractors of America, is expected to go into the Army during February.

Lyle F. Watts, former regional Forester at Portland, Ore., has been appointed Chief of the Forest Service of the Department of Agriculture. U. S. Civil Service advertised recently for Engineers, salaries $2,600 to $8,000; junior Engineers, $2,000 (women particularly are wanted); engineering draftsmen, $1,440 to $2,600, high school training being sufficient.

OBITUARIES . . .

Sherman A. Jubb, pioneer engineer in the development of Los Angeles harbor, died Dec. 16, at Los Angeles. He was 72 years old. He was assistant harbor engineer from 1913 to 1917, at which time he enlisted in the navy for the first world war. Following discharge, he engaged in private civil engineering practice. In the last few months he was employed as an engineer with the Federal Works Agency.

* * *

Otto Jabelmann, vice-president in charge of research and mechanical standards for the Union Pacific railroad, died suddenly in Victoria Station, London, England, on Jan. 6, while on duty for the government of the United States in that country.

* * *

Neil H. Ness, mechanical engineer of Los Angeles, Calif., died in Hollywood on Jan. 9, at the age of 44. He had specialized in the installation of air conditioning systems in large buildings.

William Robbins, aged 59, a retired civil engineer of Pasadena, Calif., died recently in that city. He was a native of Russia, but had practiced in this country for 35 years.

* * *

William F. Winn, civil engineer of Arcadia, Calif., died Jan. 4, at the age of 50, as the result of injuries sustained when a horse he was riding stumbled and fell.

* * *

George Stewart, engineer in the employ of the San Francisco, Calif., board of public works, died Dec. 30 in that city, at the age of 60.

* * *

Thomas Tonkin, Sr., retired civil engineer, died recently at San Jose, Calif. He was 86 years of age.

* * *

John F. Minter, a retired contractor, died at the age of 86, in Los Angeles, Calif., on Jan. 3.

Service Charges on Rented Equipment Must Be Submitted for OPA Approval

SERVICE CHARGES for the operation and maintenance of construction equipment rented by contractors must be submitted to the Office of Price Administration for approval, according to an announcement by that organization. This is construed as applying to wages of the operating crew supplied with the machine, cost of fuel and lubrication, and charges for maintenance of the machine which may be furnished by the owner who rents the machine.

Under no circumstances, OPA officials stated, can a contractor or dealer charge more than the rental for the bare machine plus transportation charges provided for in Maximum Price Regulation No. 134, unless the additional service charges have been approved by OPA. It was definitely stated that contractors cannot compute their own service charges and add them to the maximum rental rates listed in the schedule (see *Western Construction News*, December, 1942). The regulation provides a method for determining a proposed service charge, but clearly sets forth that such proposed service charges must be filed with OPA for approval.

To determine a proposed service charge, equipment lessors must compute what their rates for all or a group of such services would have been on March 31, 1942, using labor and material prices which prevailed at that date. Maximum service rates may not be determined by subtracting OPA bare rental rates from fully operated rates which lessors had in effect on March 31, 1942.

All persons renting equipment on a fully maintained basis, or charging for operating services, are required to submit to OPA a complete breakdown of the services rendered and the cost of each service. Thus, the cost for fuel, lubrication, field repairs, breakage, and operator must be shown at the time a proposed rate is submitted for approval.

MPR 134 was published in the December, 1942 issue of *Western Construction News*, or copies may be obtained from the nearest OPA offices as listed: Portland, Ore., 520 S.W. 6th Ave.; Reno, Nev., Sanford Bldg., 285 S. Virginia St.; Phoenix, Ariz., WPA Administration Bldg., 17 W. Van Buren; Seattle, Wash., 3312 White-Henry Stuart Bldg.; Los Angeles, Calif., 1037 S. Broadway; San Francisco, Calif., 1355 Market St.

Alaska Superintendent Found After Plane Crash

R. R. GEBO, general Alaska superintendent for Morrison-Knudsen Co., Boise, Idaho, was rescued more than a month after a Morrison-Knudsen transport plane was reported lost on a flight from Seattle, Wash., to Ketchikan, Alaska, and after two passengers of the plane had been rescued by the U. S. Coast Guard. The two rescued passengers, who had made their way to an isolated beach, reported that Gebo and one other passenger had been left in the plane alive, although in a weakened condition. The plane had made a crash landing about 40 mi. southeast of Ketchikan after apparently running out of gasoline. Search for the missing plane had been given up about a week before two of the survivors were found.

New Mexico Highway Dept. Personnel Down 25 Per Cent

EMPLOYMENT in the New Mexico Highway Department has reached the lowest point in the past 15 years, with only 675 employees on a payroll amounting to $93,600. Since August of 1942 employment has declined almost 25 per cent, with 863 persons on the payroll during that month. Decreasing income available for highway uses is held responsible for the reduction.

NEW BOOKS...

THE NATIONAL PAINT DICTIONARY—By Jeffrey R. Stewart, F.A.I.C., Consulting and Analytical Chemist, and editor and publisher of the National Paint Bulletin, assisted by Frances E. Spicer and Mary R. Brookfield. Published by the Stewart Research Laboratory, 1340 New York Ave., N.W., Washington, D. C. 224 pages, 9x12. Price $7.50.

Defining both generic terms and proprietary products, this volume represents a comprehensive coverage of paint materials, paint manufacturing, and paint testing, which should be useful to the engineer concerned with protection problems. Physical characteristics of raw paint materials are included, together with the names of the manufacturers. Testing equipment is described and illustrated, and uses are outlined briefly. A 70-page supplement provides a wide variety of useful information, ranging from analyses of commercial asphalt to viscosity and volume conversion charts. Extra pages have been provided in the volume to permit the inclusion of additional terms which will be issued as supplementary listings by the publisher.

* * *

CONCRETE MANUAL—Published by U. S. Bureau of Reclamation, Denver, Colo. 476 pages, 4½x7. Price $1.00. Copies will not be supplied to foreign countries except under specified conditions.

A fourth edition of this manual on mixing, handling, placing and curing of concrete has been published due to the many requests for the previous edition from war construction agencies and from private firms engaged in war work. Typography and illustrations have been improved and the text amplified and altered in accordance with the latest practice and technical progress. Information in the book is based on nearly 40 years of field experience in concrete construction combined with intensive scientific laboratory research.

* * *

MODERN SANITARY ENGINEERING—By G. Eric Mitchell. Published by Chemical Publishing Co., Inc., Brooklyn, New York. 169 pages 5½x8½. Price $5.00.

Intended for use by sanitary engineers and students, this volume presents a survey of present-day practice in sanitary engineering, including drainage, sanitation, ventilation and heating of buildings, and water supply. It is based on practice in that field in Great Britain and includes interpretations of By-Laws and British Standard Specifications which affect fittings and appliances used by the sanitary engineers.

* * *

WARTIME BUILDING CONSTRUCTION—Reprinted by permission of the Controller of His Brittanic Majesty's Stationery Office and published by the Chemical Publishing Company, Inc., Brooklyn, New York. 151 pages, 5½x8½. Price $4.00.

Based on present-day British experiences, this volume reviews the general principles of wartime building and stresses the degree of fire protection required, as well as the best procedures in carrying out the work. A special section is devoted to the construction of single story buildings to provide living quarters for armed forces and temporary office and hospital accommodations. The greater part of the volume is devoted to a discussion of reinforced concrete, including possible economies in materials, type designs, and construction procedures.

* * *

SHIPBUILDING BLUEPRINT READING—By Joseph L. Tomlinson. Published by the American Technical Society, Chicago, Ill. 208 pages, 8½x11. Price $3.00.

Intended to teach the reading of blueprints used in shipbuilding without requiring students to burden themselves with principles not closely associated with shipbuilding, this volume presents a simple explanation chiefly concerned with developing skill in visualization, together with an understanding of the commonly used symbols and abbreviations. Preliminary essentials of the book present the basic information necessary to read a ship print, including arithmetic, glossary, abbreviations of terms, methods of projection, and scales of symbols. Test sheets are included following each section. Detailed explanations of typical drawings are presented following the basic information, and the final portion of the book is devoted to typical ship drawings and question sheets to provide practical training.

Letters to the Editor . . .

Post-War Aid Promised

Sir:

The Construction Industry is the second largest industry of our nation and the first one to be called to war. We were given the tremendous task of constructing cantonments, airports, military highways and far-flung military bases under almost impossible conditions. It has been a great race against time. Despite the fact that the armed forces have necessarily depleted our ranks of skilled workmen and limited our usual sources of materials and equipment, we have completed practically all of these war projects far ahead of schedule—even faster than was ever considered possible. There will be no let-down until the task has been completed.

The ranks of labor have cooperated to the fullest extent in the apprentice training and developing of new workmen. Manufacturers have aided in developing new products as substitutes for those taken by our armed forces. Designing engineers and architects have developed and adopted new ideas in construction practice, eliminating the use of many vital materials and substituting other materials less necessary to the war effort. The contractors and their personnel have discovered new methods and shortcuts which have increased production far beyond our previous conception of efficient operation.

Altogether, we feel that this experience is going to be of the greatest value to our country in the post-war period of construction. We will no doubt be confronted with new and more difficult problems. We are confident, however, that we can again accept the challenge of our nation to do our part in re-establishing peace-time employment; and aiding in the stimulation of the normal industrial activities of the country and perpetuating construction — America's great peace-time industry.

Very truly yours,
Carl Erickson, President
Mountain Pacific Chapter
The Associated General Contractors of America
Seattle, Washington
January 15, 1943

Army Engineers Commended

Sir:

Your article in the December issue entitled "Army Sets Work Output Mark" has a great interest to me; particularly, the statement regarding the average rate of $6.39 per man-hour, compared with the national average of $4.30; and also the statement, on Page 531, that an average of $3.30 worth of material was placed per dollar cost of labor. Undoubtedly, a large proportion of the material used was prefabricated, and I am curious to know whether or not the man-hours of labor required to prefabricate material such as timber trusses, building sections, and structural members is included in the total man-hours used in determining the $6.39 figure.

I would also like to know the average hourly rate of pay of all labor on the work done by North Pacific Division, if such a figure is available. I think the North Pacific Division is to be congratulated on their splendid showing.

Yours very truly,
Russell G. Cone
Administrative Assistant
Silas Mason Co., Inc.
Shreveport, La.
January 6, 1943

Efficiency Lowers Costs

Sir:

In connection with the cost of work placed per man-hour and materials placed per dollar cost of labor being higher than the national average, this is largely the result of the efficiency of the contractors. The work placed per man-hour included the total cost of work for all types of construction placed during the month at the sites of construction. The average hourly rate of pay of all labor on the work done by the North Pacific Division must of necessity be a weighed figure, and is not available for public use.

The splendid co-operation and handling of this article by *Western Construction News* is to be commended.

Very truly yours,
R. Park,
Colonel, Corps of Engineers,
District Engineer.
United States Engineer Office,
Seattle, Wash.
Jan. 20, 1943.

Mountain-Pacific Chapter

Sir:

On Aug. 20, 1930, at the request of a small group of contractors banded together with the purpose in mind to promote better relations between public bodies requiring construction services and the contracting firms, to carry on a constructive educational program with other contractors and the public at large in this area, a charter was granted to the Mountain Pacific Chapter by the Executive Board of the Associated General Contractors of America, Inc.

In the past twelve years, the Mountain Pacific Chapter each year has realized a marked gain in membership which now totals forty-eight construction firms in this area and Alaska. The requirements of an A. G. C. member are: namely skill, integrity and responsibility. These having been adhered to by the members, an enviable reputation has been established.

During the period since Dec. 7, 1941, we have been in the midst of a vital and strategic military era in this locale which has necessitated the best and most out of each contractor, his personnel and equipment to speed the war effort in defense construction for the Army, Navy and Maritime Commission. This has been accomplished in record breaking time at minimum cost to the government.

The Mountain Pacific Chapter cooperated fully and has been commended for the same by the U. S. Army Engineers in locating the construction firms best suited in doing a particular job, securing vital machinery and placing supervisory personnel in the right channels where best suited.

The labor agreements consummated during 1941 and 1942 with the various crafts have promoted harmonious relations and stabilized the industry to a position that was most beneficial in the war effort.

The numerous legislative orders issued by governmental authorities have been closely followed by the Washington staff of the Associated General Contractors, and in turn relayed to the various chapters, 96 in number, throughout the United States. The Mountain Pacific Chapter issued to its members during 1942, 11,400 individual reports and news items affecting the industry, thus keeping them posted and equally informed as to the trend of government policies. All in all, the Mountain Pacific Chapter has had its most successful year, and we are anticipating even greater gains in the year of 1943.

Very truly yours,
Associated General Contractors
Mountain Pacific Chapter
W. D. Shaw, Manager
Seattle, Washington
January 15, 1943

An Omission Corrected

Sir:

We would like to call your attention to an error appearing on page 567 of the December issue of *Western Construction News*.

Figure 15, as you have noted regarding photos, states "Caterpillar Tractor Co., Peoria, Illinois, has not yet received a special award and production accomplishments cannot be mentioned because of censorship requirements. Employees working vigorously on War Bond drives gained recognition by award (Fig. 15) of the Minuteman Flag by the Treasury Department."

This photo shows from left to right, Joe Kloss, G. E. Spain, of Caterpillar Tractor Co., San Leandro, California, and Ray Shurtleff of the Treasury Department, San Francisco. This award was made to us at San Leandro, on Sept. 24, 1942.

At the present time, we have successfully achieved the goal of 10 per cent payroll deduction for War Bonds from the employees of Caterpillar Tractor Co., San Leandro, Calif.

Yours very truly,
Caterpillar Tractor Co.
Employees' Victory Committee,
Joe Kloss, Chairman.
San Leandro, Calif.
Jan. 16, 1943.

PERSONALLY SPEAKING

COL. BENJAMIN B. TALLEY, engineer officer in charge of all Army construction in Alaska under the Alaska defense command, has been awarded the Distinguished Service medal, the Army's highest non-combatant award, for "exceptionally meritorious and distinguished services in charge of Alaska construction." He has been on Alaska work since September, 1940.

Thomas R. Agg, dean of engineering at Iowa State College, was elected vice-president of the American Society of Civil Engineers, representing Zone III, which includes Montana, Wyoming, Colorado, North and South Dakota, Nebraska, Kansas, Oklahoma and several other mid-western states. **Fred C. Scobey,** Berkeley, Calif., prominent hydraulic engineer of the San Francisco Bay area, was elected director, to represent northern California, Nevada, Utah, and a portion of Idaho. A certificate of honorary membership in the society was awarded to **Lawrence M. Lawson,** of El Paso, Tex., American commissioner on the International Boundary Commission. Other honorary memberships were given to **Admiral Ben Moreell,** chief of the Navy Civil Engineer Corps, and **Gen. Brehon Somervell,** chief of the Army Service of Supply.

* * *

J. S. Bright, district engineer, and his staff of engineers in the Alaska Highway district, Public Roads Administration, have been transferred from Seattle, Wash., to Edmonton, Alberta, Canada, which will be the headquarters of the district. **Levant Brown,** senior highway engineer, will remain in charge of the Seattle office, which will be a branch of the Edmonton headquarters. He came to the Seattle office in Nov., 1942, after serving as construction engineer in charge of the Watson Lake-Dawson Creek section of the Alaska highway.

George W. Howson, civil engineer of Fresno, Calif., has been appointed by John C. Page, commissioner of the Bureau of Reclamation, to be field coordinator of the Central Valley project studies, and will be full-time assistant to **Dr. Harlan H. Barrows,** director of the studies. They will investigate 24 basic problems designed to determine how the project may best contribute to preservation and further development of agriculture, industry, and commerce in California.

* * *

W. R. Hutchins, state highway engineer of Arizona since 1940, has resigned the position, and **Bernard Touhey** has been appointed as his successor. Employees of the department recently removed by the Highway Commission were, **J. R. Van Horn,** district engineer, who is being replaced by Hutchins; **Joe De Arozena,** district engineer; **Percy Jones,** locating engineer; **Sidney Smyth,** personnel and purchasing executive; **Fred Norton,** motor vehicle superintendent, replaced by **Maurice Goodwin; Harry Duberstein,** right-of-way division chief, who is succeeded in office by **Hardy Long;** and **M. C. Hankins,** secretary of the commission. New appointments include **Tim Underwood,** superintendent of equipment, and **Justin Herman,** foreman of the Phoenix shops.

* * *

J. P. Gibbons will head the Salt Lake City, Utah, chapter of Associated General Contractors as president during 1943. To work with him, **Clarence Waterfall** was elected vice-president, and **J. H. Tempest,** secretary-treasurer. Directors for the year are **Joseph H. Grant** and **Ellis W. Barker. Mark H. Tuttle** was continued as manager of the chapter.

* * *

Walter C. Smith, of General Electric Co., was installed Jan. 15, as president of the Engineers' Club of San Francisco. Other officers installed at the same time were: secretary, **Edward W. Englebright,** of the Western Pacific Railroad; treasurer, **James W. Mahoney,** of General Electric Co.; and directors, **Frank C. Angle, Frederick S. Cook, Robert A. Hudson** and **Dennistoun Wood.**

W. R. ENGSTROM, has been made a vice-president of the Austin Co., engineers and builders of Seattle, Wash., and Cleveland, Ohio. He has been with the firm since 1925, and for 2½ years has been in charge of the more than one hundred million dollars of naval construction done by the firm in the Northwest.

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Rear Admiral Norman M. Smith, who from 1933 to 1937 was chief of the Bureau of Yards and Docks of the Navy, and who retired from active duty in 1937, has been recalled, and has been assigned as officer in charge of the Seabee Replacement and Recuperation center now under construction at Pleas-

OFFICERS of the Salt Lake City, Utah, chapter of Associated General Contractors of America: Left, J. P. GIBBONS, newly elected 1943 president; Right, J. H. TEMPEST, re-elected secretary-treasurer; and Center, PAUL PAULSEN, retiring president.

anton, Calif., by McNeil Construction Co., of Los Angeles, Calif. Before reporting to his post, he is making a tour of eastern Seabee camps to study training methods.

* * *

George T. McCoy, for ten years assistant California state highway engineer, has been advanced to the position of chief engineer of the highway division, succeeding **Charles H. Purcell,** now director of Public Works in the state. **Fred J. Grumm,** formerly surveys and plans engineer, will take over McCoy's old position.

* * *

C. H. Powers, Frank Thunberg and **O. B. Wilt,** San Francisco, Calif., engineers, have been transferred to Washington, D. C., where they are affiliated with the War Relocation Authority, working on construction and maintenance problems in the 10 relocation centers. Powers is principal engineer, Thunberg is senior engineer on construction, and Wilt is working on refrigeration problems.

* * *

J. R. Wininger has been elected 1943 president of the Portland, Ore., chapter of the Associated General Contractors of America. He is associated with the contracting firm of Warren Northwest, Inc. Other officers elected were: **Jack McDougall,** of Natt McDougall Co., first vice-president; **Frank Penepacker,** of the firm of the same name, second vice-president; and **M. J. Lynch,** of United Contracting Co., secretary-treasurer.

* * *

J. H. Obermuller is the new president of the Sacramento, Calif., section of the American Society of Civil Engineers, and elected to serve with him are **Leonard C. Hollister,** first vice-president, **Fred H. Paget,** second vice-president, and **R. Robinson Rowe,** secretary-treasurer. **Asa G. Proctor** is leaving office as president.

* * *

Prof. G. W. Holcomb of Oregon State College, was elected president of the Portland section of the American Society of Civil Engineers for the year 1943. **Roy Clarke** was named first vice-president, **R. E. Hickson** second vice-president, and **A. O. Brown** secretary. All of the latter three are from the Portland office of the U. S. E. D., where Hickson is principal engineer.

* * *

New officers of the southern California chapter, Associated General Contractors of America, include **Lyman D. Wilbur,** Los Angeles district engineer for Morrison-Knudsen Co., Inc., president; **E. S. McKittrick,** president of the firm bearing his own name, vice-president; **A. S. Vinnell,** who is likewise a contractor in his own name, vice-president. **Frank J. Connolly** will continue as manager of the chapter.

CARL ERICKSON

Carl Erickson has been re-elected president of the Mountain-Pacific chapter of the Associated General Contractors, as were the other officers of the group, **Elmer White,** vice-president and **L. Paul Fiorito,** treasurer. **Don Shaw** will continue to serve as manager of the organization. Executive board members also were continued in office.

* * *

Richard Stevens, formerly office engineer at Banning, Calif., for the Metropolitan Water District, and more lately in a similar position with the International Boundary Commission at El Paso, Tex., is now in Puerto Rico, associated with **J. L. Burkholder** on naval construction in the Caribbean area.

* * *

Maj. Joseph K. Carson, formerly executive assistant to the Portland, Ore., district engineer of the U. S. E. D., has been assigned to study at the army school of military government at Charlottesville, Va., where former civil authorities are prepared to take over administrative duties in occupied zones. Carson was mayor of Portland for seven years.

* * *

Charles H. Carter, formerly office engineer in charge of Utah projects of the Bureau of Reclamation, has been appointed a captain in the Corps of Engineers and is now assistant post engineer at the quartermaster sub-depot at Tracy, Calif., being in charge of construction and maintenance of utilities at that place.

* * *

Gerald Marsac, Los Angeles structural engineer, who has been chief structural designer for W. A. Bechtel Co., on a copper development project at Miami, Ariz., has been transferred to Birmingham, Ala., where the company is to build a huge manufacturing plant.

* * *

Henry M. Shank has received the appointment as assistant regional forester in charge of engineering for the intermountain region. From 1936 until 1940 he was supervisor of the Idaho national forest, and since 1940 has been regional fire control chief in the division of operations.

* * *

J. Bertrand Wells was elected president of the Structural Engineers Association of Northern California for the year 1943. Other officers are **M. C. Poulsen,** vice-president; **Franklin P. Ulrich,** secretary-treasurer; **Theo P. Dresser, Jr., S. S. Gorman,** and **Mac D. Perkins,** directors.

* * *

Fred J. Klaus, city engineer of Sacramento, Calif., has been appointed temporarily to the post of city manager to fill the vacancy left when **James S. Dean** resigned to become deputy director of finance in the California state government.

* * *

Lars Langloe, engineer of the Washington State Department of Conservation, has been re-elected president of the Washington Irrigation Institute. **W. P. Stapleton** and **E. J. Brand** will serve as vice-presidents, and **N. D. Thorp** and **Lyle Neff** as directors. **Harold O. Belknap** is to be secretary, and **E. Y. Robinson** treasurer.

* * *

North H. Plunkett, field engineer for H. A. Nichols, contractor on the Maravilla housing project in Los Angeles, Calif., is now office engineer for Con-

MAJ. JAMES D. LANG, executive officer on construction matters pertaining to Alaska in the Seattle, Wash., office of the U. S. Engineering Department, has been promoted to Lt. colonel.

tractors Pacific Naval Air Bases at Port Hueneme, Calif., working on plans for advanced bases. He expects to be called soon to active service in the Seabees.

* * *

Martin Moran, superintendent of roads for the city of Vancouver, B. C., has retired after 34 years of service with the city. **R. G. MacKenzie**, of the city engineering department, has been appointed his successor, and **Neil MacCallum,** formerly testing engineer, has been made superintendent of the pavement and bridge section.

* * *

W. E. Christison, assistant chief design engineer of the Los Angeles County Flood Control District, has resigned that position to become chief engineer of the Case Construction Co., San Pedro, Calif. The company is now engaged in several large war construction projects.

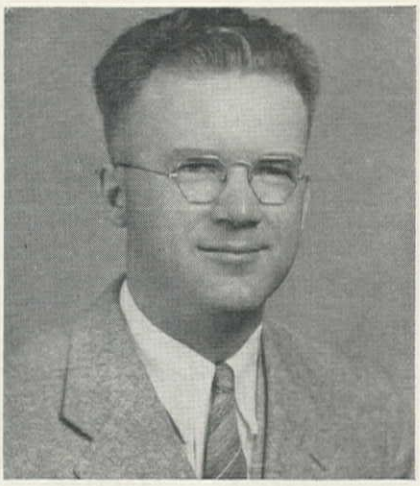
* * *

R. B. McKenzie has transferred from the Public Buildings Administration to the Federal Public Housing Authority, with the title of construction engineer, being stationed at Rosiclare, Ill., where he is expediting construction on a Federal housing project.

* * *

Col. Theodore Wyman, Jr., once U. S. E. D. district engineer at Los Angeles, Calif., and more recently at Honolulu, Hawaii, is now division engineer of the newly-organized Northwest division, with headquarters at Edmonton, Alberta, Canada.

H. H. SISLER, consulting engineer on water and sewers for the city of Kirkland, Wash., currently engaged in an important expansion of both of these facilities.



A. E. NIEDERHOFF, senior engineer in the Portland, Ore., office of the U. S. E. D., and frequent writer in *Western Construction News*, is heading a party of engineers on special foreign service in South America. His mission will require about three months to complete.

Capt. Robert V. Labarre, consulting foundation engineer of Los Angeles, Calif., has been appointed to the American Standards Association's subcommittee on building code requirements for excavations and foundations.

* * *

N. E. Fordham, employee of the Bureau of Reclamation since 1907, who was inspector of butterfly tube-valves on Boulder and Shasta dams, is now at Birmingham, Ala., on work of a similar type.

* * *

H. W. Clarke, who recently resigned as vice-president of McGraw-Hill Publishing Co., Inc., and publisher of several mining publications, has established offices in the Newsweek Bldg., New York City, and will announce new plans in the near future.

* * *

J. L. McBride, city engineer of Santa Ana, Calif., has resigned that post to become engineer of the Joint Outfall Sewer District, which serves the cities of Santa Ana, Garden Grove, Anaheim, Orange, Placentia, Buena Park, and La Habra.

* * *

L. D. Robbins, member of the firm of Quinn-Robbins, Inc., of Boise, has been appointed a member of the Public Works Contractors' Licensing Board of Idaho, for a two-year term. He succeeds **Harold Quinn,** a member of the same firm.

* * *

A. S. Blake, formerly with the Bureau of Reclamation at Shasta dam, has become safety engineer with the California State Industrial Accident Commission, located in San Francisco, working particularly on defense projects.

Hugh Jones, formerly an engineer with the Metropolitan Water District, and later associated with Macco-Robertson Construction Co., of Los Angeles, Calif., is now a captain in the Corps of Engineers, stationed at Salt Lake City, Utah.

* * *

William R. Jacobsen, assistant engineer with the Denver & Rio Grande Western Railroad, located at Alamoso, Colo., has joined the Corps of Engineers, and is now stationed at Camp Claiborne, La., with the rank of lieutenant.

* * *

John R. Jago, resident plant engineer for the U. S. Maritime Commission at Richmond, Calif., shipyards, has been transferred to a similar position at the yard of California Shipbuilding Co., at Wilmington, Calif.

* * *

Maj. William D. Alexander, formerly area engineer for the U. S. E. D. in southern Idaho, has been appointed resident engineer on construction of a large air force installation at Mountain Home, Ida. **Lt. Sam Guess** will be his assistant.

* * *

Don C. McMillan, for several years city manager of Ventura, Calif., has been appointed to a similar position at Alameda, Calif., to fill the position left vacant when **Charles R. Schwanenberg** became city manager of Oakland, Calif.

* * *

Donald MacDonald, who has been practicing civil engineering in Alaska since 1914, has become affiliated with the Seattle, Wash., district office of the U. S. E. D., to work in the trans-Canadian Alaska railway section.

* * *

F. K. Mittry, manager of Mittry Bros. Construction Co., Los Angeles, Calif., and a member of the board of directors of the southern California chapter of the A. G. C., has been commissioned a captain in Corps of Engineers.

* * *

Clarence Creel, formerly assistant city engineer of Emeryville, Calif., and more recently a detective in the Alameda County sheriff's office, has become a chief petty officer in the Navy Seabee unit.

* * *

John Beakey, traffic engineer in the Oregon State Highway Commission, has been given leave of absence to accept a commission as captain in the army transportation division, with headquarters at Portland.

* * *

John W. Robison, formerly an associate engineer with the Bureau of Reclamation on the California Central Valley Project, resigned this position in December, 1942, to enter the cattle business in southern Arizona.

CYRUS D. SMITH, formerly field engineer for Morrison-Knudsen Co., Inc., and lately resident engineer on construction of the Permanente Co. magnesium reduction plant at Los Altos, Calif., has been commissioned an ensign in the Civil Engineer Corps, U. S. N.

S. T. Brown, concrete mixing plant foreman and superintendent, has changed his occupation to that of steam shipfitter, and is following that vocation at the Kaiser shipyards at Swan Island, near Portland, Ore.

* * *

G. N. Ball, formerly an instrument man with the Bureau of Reclamation, has entered the Navy Seabee battalion, and is rated a chief carpenter's mate. He is temporarily located in Rhode Island.

* * *

Clifford Meacham is construction supervisor for the Corps of Engineers at Madras, Ore., where runways, taxiways and aprons are being built for the Madras operational training base.

* * *

Morley H. Golden is the new president of the San Diego, Calif., chapter of Associated General Contractors of America. Elected with him are **F. E. Young,** vice-president, and **E. F. Bryans** and **Bruce E. Hazard,** directors.

* * *

E. L. Slevin has been given a temporary appointment as sanitary inspector of New Westminster, British Columbia. He had been with the department for 28 years, retiring in 1939.

* * *

Bert N. Paxton has been made road engineer of Butte County, Calif., succeeding **J. A. Bumgarner.** His appointment is for a two year period.

* * *

Warren A. Gallup, for 14 years with the Wyoming State Highway Department, and lately manager of a state-wide planning survey, has been commissioned a first lieutenant in the Corps of Engineers.

* * *

Loren S. Bush, chief engineer of the Board of Underwriters on the Pacific Coast, has been named assistant regional director of the Ninth Regional office of Civilian Defense, in charge of fire prevention, replacing **Jay Stevens,** now California state fire marshall.

* * *

Charles L. Senn, assistant sanitary chief of the Milwaukee, Wis., health department, has been appointed public health engineer of the City of Los Angeles, Calif.

* * *

R. Emmett Donohoe has been named city engineer of Ukiah, Calif., filling the position left vacant when **Guss Wallach** entered the Corps of Engineers.

* * *

W. S. Kingsbury, Jr., reinforcing steel engineer with Soule Steel Co., has been commissioned a captain in the Corps of Engineers, and is now stationed at Camp Claiborne, La.

* * *

Richard H. Taylor, formerly assistant county engineer of Whitman Co., Wash., is now cost engineer for the Pacific Bridge Co., on drydock and other construction at Pearl Harbor, Hawaii.

* * *

M. O. Kelley is chief inspector for the U. S. E. D. on construction of the Salt Lake army airbase.

* * *

Donald F. Shaw, general contractor of Los Angeles, Calif., has been commissioned a lieutenant in the Seabees, and has reported for active duty on the east coast.

* * *

D. M. Faires has been named district engineer for Idaho Highway region No. 5, succeeding **E. W. Swan,** assigned to maintenance work in the northern part of the state.

* * *

Robert W. Mead has been appointed city manager of Redwood City, Calif.

* * *

Thomas N. Moore is a reinforcing steel detailer with Haddock-Engineers Ltd., on construction of Camp Pendleton, near Oceanside, Calif.

* * *

Harold J. Flannery of the City Engineer's office in San Jose, Calif., has been made Engineer to fill the vacancy left by the death of **William L. Popp.**

* * *

Frank Kelso, superintendent of Wyoming State Highway Department for the past four years, resigned Jan. 18, and no successor has yet been appointed.

* * *

George W. Melville, city planning engineer of the City of San Francisco, has resigned that post, and thus far no successor has been named.

* * *

J. R. Griffith, assistant public works officer of the 13th Naval District, has been promoted to the rank of commander.

* * *

L. Cedric Macabee has been appointed city engineer of Los Gatos, Calif.

MAJ. ROBERT C. MOFFITT, right, area engineer for the U. S. Engineer Department at Edmonton, Alberta, conferring with MAJ. CARL A. ANDERSON, chief of the Seattle engineer district control division, on telephone and transport problems growing out of expanding facilities in the Edmonton area.

SUPERVISING THE JOBS

Jess W. Hoopes, superintendent for Utah Construction Co., Salt Lake City, Utah, on many of its large contracts, is in charge as general superintendent of the company's contract to construct the Deseret chemical warfare depot at St. John, Utah. **M. E. (Barney) Apgar** is his assistant. Others handling various phases of the job are: **Earl Caldwell** and **Chas. Wehmeyer,** superintendents of railroad construction. **John Stonecipher,** master mechanic, and **Ormond E. Cox,** field office manager. The job is being handled from the Ogden, Utah, office of the company, of which **Allen D. Christensen** is manager.

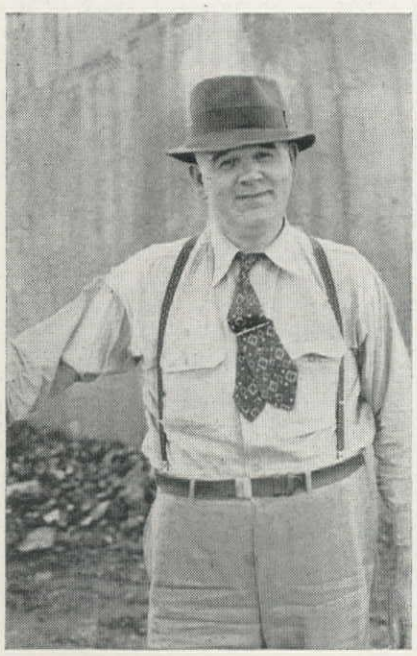
* * *

Fred B. Dudley and **James D. Cave** will be the superintendents on a large housing project for which the contract was awarded to Dudley-Anderson Co., of Great Falls, Mont., at $306,254. Construction foremen on the job will be **Elmer Ackerman, F. C. Hanson, F. R. Anderson,** and **Gordon Gens.** This contract is for 100 family-type dwellings in Great Falls, and brings to a total of $800,000 in housing contracts that this company has handled.

* * *

Al O. Erickson is general superintendent for Macco Construction Co., Clearwater and Oakland, Calif., on its $5,380,000 contract to construct a naval fuel depot at Point Molate, near Richmond, Calif. **Ben Wells** is project manager. General foreman is **Walter Phillips,** and **Ross Phillips, Henry Meiner,** and **Ed Wintz** are foremen on different portions of the work. Other key men on the job are **Henry Fischer,** shovel foreman; **R. W. Rout,** master mechanic; **Walter O'Hara,** warehouse foreman; **Cliff Jennings,** chief timekeeper; and **Walter J. Bloch,** excavation foreman. **Lt. W. E. Norcross** is in charge for the Navy, and **Allen Bowers** is resident engineer. **Al Taylor** is engineer for the Macco Co. on the job.

AL O. ERICKSON



* * *

Charles Fredrickson is project manager on airport construction in Solano Co., Calif., for Fredrickson & Watson and Fredrickson Bros., Oakland, Calif., who secured the contract jointly. **John W. Fry** is general superintendent. Grade superintendent is **Jack Hurley,** and foreman of grading is **P. J. McHugh. Bill Covington, H. L. Farris,** and **O. H. Whitney** are other foremen. **W. H. McNutt** is in charge of the rock plant, and **Fred Huntington** is hot plant superintendent. **Rube Mayer** is handling lubrication. The office staff is composed of **Clifford Hipes,** manager, **Arthur Cole,** paymaster, and **J. H. O'Donald,** chief timekeeper. **Joe O'Neil** is job engineer for the contractor. The airport is a U. S. Engineer Department job, and **E. J. Tearink** is their resident engineer.

* * *

Ben Cook is project manager on construction of the 1,000x400-ft. north pier at the Connecticut St. terminal of the Port of Seattle, a contract valued at $1,794,150 for the project having been secured by General Construction Co., of Seattle. General superintendent on the job is **Richard W. Jones,** and **F. H. Jones** and **Lawrence Warner** are foremen. The office manager is **C. W. Ayerst.** Resident engineer for the Port of Seattle is **Ed Lindstrom,** and engineering representative for the Federal Works Agency is **Harold Judd.** It is expected that the work will be completed about August, 1943.

* * *

William Curlett has been appointed general manager for McNeil Construction Co., of Los Angeles, Calif., on its $4,000,000 contract to construct a replacement center at Pleasanton, Calif. **John Summerfield** is superintendent of utilities on the job, and others in charge of portions of the work are: **Bob Miller,** construction superintendent; **John Mamer,** maintenance superintendent; **Earl Stoner,** transportation superintendent; **Tom Johnson,** in charge of stores; and **Ted Bankston,** expediter. **Wm. R. Harvey** and **F. C. Timberlake** are general foremen.

* * *

Martin Green, Jr. is supervising construction of concrete aprons at the Fairfield-Suisun airport in Solano Co., Calif., for A. Teichert & Son, contractors of Sacramento, Calif. **T. S. Willey** is office manager on the job. General foreman is **Harold B. Shannon,** and **Martin Green, Sr.,** is in charge of construction of the sewage disposal plant. **Charles O. Johnson** is master mechanic. The resident engineer is **Ed Tearink.** Foremen on different parts of the work are: **Al Kingwell, Chet Raymond, Larry McDonald, George Adair, Bill Clayton, Frank Ahlgren, J. W. Turner,** and **Oscar Greeton.**

* * *

L. T. Grider, formerly with Bent Bros., has been made project manager on the West Construction Co.'s contract to build the powerhouse and about 6500 ft. of 17-ft. tunnel on the City of Tacoma, Wash., Second Nisqually Project. **Fred D. Hudkins** is general superintendent, **Ernie Enyart** is in charge of powerhouse construction, and **Pete Bresbois** is head tunnel walker. This is a $1,604,218 contract.

* * *

Jim Alexander, who has just completed excavation on a $2,000,000 air depot job in southern California, has been made superintendent for Minnis & Moody, Johnson, Inc., and Vista Construction and Financing Co., California

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HERBERT DUNHAM, assistant superintendent for Paul N. Odegard and associates, building contractors at a large ordnance depot in northeastern Oregon.

—Official U. S. Navy Photograph

In fulfilling its destiny, steel wire rope is now called upon to withstand the wear, tear, stress and strain of war time production. Its fields of service are the "hot spots" of industry. Shipyards, oil fields, mines, mills, steel plants, construction jobs . . . are a few of its important battle stations.

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contractors who jointly were awarded the $2,418,744 contract to build the Seattle-Tacoma airport at Bow Lake, Wash. **Garn L. Moody** will be project manager, **Clyde Andrews,** office manager, **Bill Palmer,** master mechanic, and **Robert A. Tenbrook,** purchasing agent. This is a Civil Aeronautics Administration airport.

* * *

Ray G. Whinery has been appointed project manager for Macco Construction Co. and E. S. McKittrick Co., Los Angeles contractors, who jointly were awarded the contract at over $2,000,000 to build a naval air base at Holtville, Calif. On the construction, **Frank Mahan** will be runway superintendent, and **Dale Litsinger** will be building superintendent. **Ed Springer** is purchasing agent. Until a building is erected on the site, the contractor's office will be in the Barbara Worth Hotel, in El Centro.

* * *

C. J. Mapes has been appointed superintendent for C. E. Poland, contractor of Grand Junction, Colo., on the contract awarded the latter to construct a 44-unit frame housing project at Rifle, Colo. The electric work is being handled by **John Kendall,** of Kendall Electric Co., the brickwork by **Dan Baker,** and the plumbing and heating by Lane & Co., all of Grand Junction.

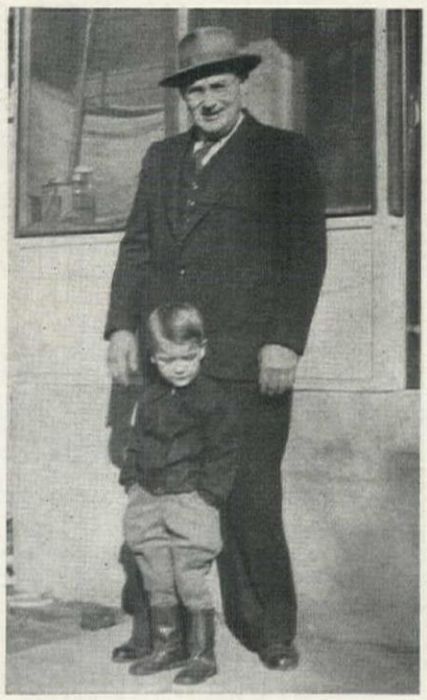
* * *

Fred L. Burrows is general superintendent for MacDonald and Kahn, of San Francisco, Calif., contractors on an airfield being constructed at Fairfield, Calif. **H. Lotter** is area superintendent, while **F. Moser** and **W. Jones** are the general foremen. Building erection is being supervised by **C. M. Allen,** and mill foreman is **Ed Kramer.**

HARRY B. CROW, superintendent of water and sewage at the city of Kirkland, Wash., now engaged in a large expansion project for these facilities.

IN REPLY to a letter from the editor to a certain contractor concerning his job, in which letter the names of "key men" were requested, this statement was received: "....., union business agent has the job locked at present, will not let men work on it at Union scale. He is the only key man at present."

Stanley A. Ball, partner in the firm of N. M. Ball Sons, Berkeley, Calif., is project manager on the firm's contract to construct a navy airport at Fairfield, Calif., and **R. H. Hapgood** is general superintendent. **Dan Morgan** is equipment superintendent, and **Charles Underhill** is grading foreman. Master mechanics on the big job are **Louis Maehler** and **Clarence Ryker. James S. Hanks** is office manager.



C. J. MAPES, construction superintendent for C. E. Poland, contractor of Grand Junction, Colo., on a housing project at Rifle, Colo., and his small son.

Ted Atherton is general superintendent for Radich & Brown, contractors of Burbank, Calif., on construction of a shop and equipment yard, also some office buildings, at San Leandro, Calif. **Bob Dixon** is general foreman, and **Peter Mellado** is carpenter foreman. **H. N. DeVarney** is operating the crane, and **D. A. Eckart** is master mechanic. **Floyd Potter** is doing the welding on the job.

* * *

Ray O'Conner has been named job superintendent on erection of 135 family housing units at Garfield, Utah, a $460,000 contract secured by Ford J. Twaits Co., Los Angeles, Calif. **Hal McGrew** is office engineer at the company's Salt Lake City district office.

A. W. SCHOOLMASTER is project manager for Ford J. Twaits Co., of Los Angeles, Calif., on that company's contract to build the buildings required by the army at a large northwest air depot.

C. H. Ohl is project manager, and **S. O. Claggett** is his assistant, on the construction of the Midcontinental naval ammunition depot at Hastings, Nebr., on which job Maxon Construction Co., of Dayton, Ohio, was awarded a $26,290,466 contract. **W. R. Pierson** is field superintendent.

* * *

E. L. Causey, who was engineer for Griffith Co. and Bent Co., contractors on

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C. W. SEEGER, general foreman on construction of a concrete and steel storage garage and store building job in downtown Spokane, Wash., for which Henry Georg, of Spokane, has the building contract.

FREE! HARD-FACING WALL CHART

for maintenance welders

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STOODY COMPANY *Hard Facing Alloys*

Friant Dam, and has more recently been on naval construction work at Tutuila, American Samoa, has been made general superintendent for the Utah Construction Co. at Davis Dam on the Colorado River, west of Kingman, Ariz.

* * *

S. McClellan is general foreman and **C. T. Dicus** is foreman on construction of Pier D at the Port of Seattle, Wash., for the Austin Co., contractors. **C. A. Prout** is chief clerk, and **Howard Carlton** is purchasing agent. **Gene Royle** is resident engineer for the U. S. Engineer Department on the project.

* * *

R. E. Lee will be job superintendent for A. R. Liner, Merced, Calif., contractor, on his contract to build additions to the Solano County general hospital at Fairfield, Calif. **A. Roddins** will be foreman, and **M. Paulsen,** bookkeeper. It is a $77,176 job.

* * *

Frank Keely has been appointed by Layne Texas Co., Ltd., of Houston, Tex., to superintend construction of water wells and well houses at a site in Coryell Co., Tex., a project for which they received a "more than $100,000" contract.

* * *

A. C. Hon is in charge of construction of more than $100,000 worth of buildings, civilian war housing, and utilities at a depot in Arizona, for Bailey & McCoy, Tucson, Ariz., who secured the contract. **Lew McCoy** is office manager for the job.

* * *

V. Killmaster is superintendent of construction for Poole Construction Co. of Edmonton, Alberta, Canada, on a contract valued at $300,000 to build additional facilities at a naval base in British Columbia. **J. H. McLean** is the job office manager.

* * *

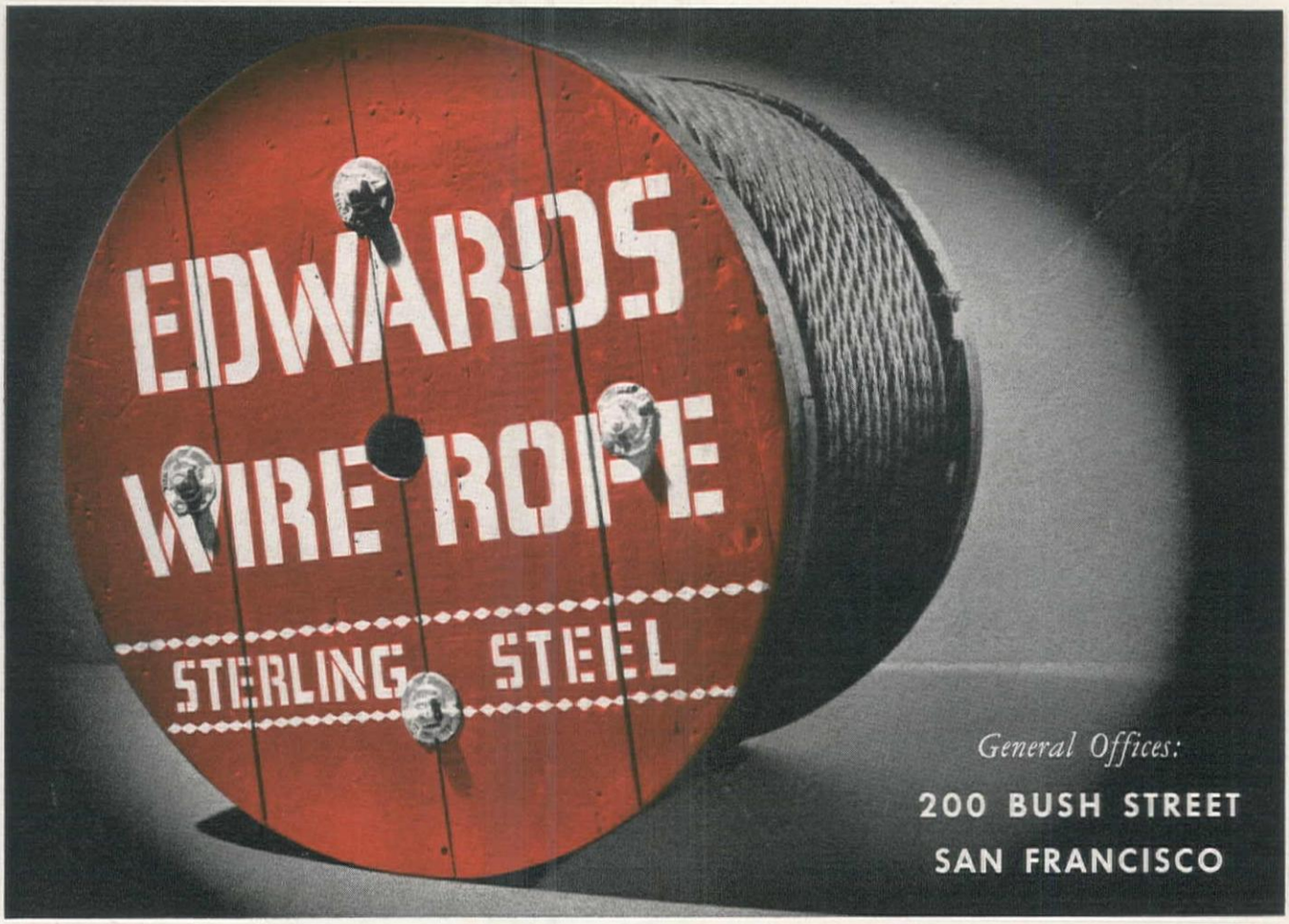
C. A. Naumann has been appointed job superintendent on construction of a sewage treatment plant in Wichita Co., Texas, by Reid-Naylor, contractors of Wichita Falls, to whom the "over $50,000" contract was awarded. **Russell Seyler** is field manager for the company.

* * *

C. F. Van Sise, construction superintendent at the Lewiston, Idaho, headquarters of the State Highway Bureau, has been promoted to shop foreman. **George O'Connor** has been made maintenance foreman at the Lewiston shops, succeeding **Ray Graham. John Walker** has been named maintenance foreman at Spalding.

* * *

C. D. Jeske has been named superintendent for Werner & Webb, Los An-

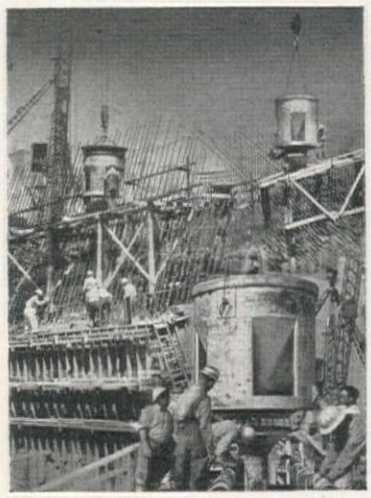


Put It Where You Want It!

The biggest problem in Concrete Placing is to "put it where you want it." GAR-BRO Equipment has solved this problem for you.

Regardless of whether it is a simple maintenance problem or the largest dam, there is a standard product for the job. The GAR-BRO attachments for standard equipment permit placing of concrete into the most inaccessible places.

Catalog No. 55 illustrates and describes GAR-BRO Concrete Buckets and their attachments.



Hung from the bucket, the big steel sub-hopper transfers discharge of bucket into the GAR-BRO seamless drop chute without waste.

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Garlinghouse Brothers . . . . . Los Angeles, California
Loggers & Contractors Machinery Co. . . Portland, Oregon
A. H. Cox & Company . . . . . Seattle, Washington
Construction Equipment Company . . Spokane, Washington
Intermountain Equipment Company . . . . Boise, Idaho
Arnold Machinery Company . . . . Salt Lake City, Utah
Contractors Equipment & Supply Co. Albuquerque, New Mexico

EQUIPMENT GAR-BRO ENGINEERING SERVICE

CONCRETE PLACING EQUIPMENT

Concrete
Buckets
Batchers
Hoppers
Skips
Chutes
Carts
Wheelbarrows

INDUSTRIAL EQUIPMENT

Foundry Carts
Acetylene Carts
Material Carts
Wheelbarrows

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geles, Calif., on their contracts for construction of the 4th and 5th sections of the Lockheed storm drain in Burbank, Calif., valued respectively at $54,417 and $27,290. **C. M. Kemp** is foreman on the job, and **George Crawford** is tractor operator. The channel will drain the site of the Lockheed Aircraft Co.

* * *

DOUGLAS F. GIESSEN, master mechanic at a Pacific Northwest airport, for Erickson & Goulter, Seattle contractors.

S. T. Corfield, until recently at Santa Rosa, Calif., as superintendent for Macco Construction Co., of Clearwater, Calif., has been transferred to San Diego, Calif., to act as superintendent of aggregate production and paving on a large navy contract obtained by the company.

* * *

W. C. Swenson is acting as general superintendent for the Carl N. Swenson Co., of San Jose, Calif., on construction of a foundry at San Leandro, Calif. Assisting him are **C. Anderson, Arnold Swenson, H. H. Kehoe** and **G. Sandell,** foremen.

* * *

Roscoe Vance has been named by Tru-Mix Concrete Co., of Medford, Ore., to direct construction on its contract valued at $133,416, to grade and surface 8.3 mi. of the Evans Creek-Sams Valley access road in Jackson Co., Ore.

* * *

Joseph Romano, head of the Seattle, Wash., contracting firm of Romano Engineering Co., has received a commission as first lieutenant in the Corps of Engineers, and is now at Camp Claiborne, La., for training.

* * *

Jack E. Douglass, formerly maintenance superintendent with Utah Construction Co. at Davis Dam, is now general foreman in charge of equipment

(Continued on page 96)

UNIT BID SUMMARY

Highway and Street . . .

Utah—Salt Lake Co.—State—Surf.

Gibbons & Reed, Salt Lake City, was low bidder at $280,912 to the Utah State Road Commission, Salt Lake City, and received the award, for construction of a plantmix surfaced road along 21st South St., between Main St. and the Utah ordnance plant. The total length of road involved in this contract is 3.1 mi. The low bid was considerably below the engineer's estimate. The same contractor was simultaneously awarded the contract for a bridge on the road. Bids on the road work were submitted as follows:

(1) Gibbons & Reed $280,912
(2) W. W. Clyde & Co. 293,164
(3) A. O. Thorn & Sons Construction Co. 381,815
(4) Reynolds Ely Construction Co. $452,429
(5) Engineer's Estimate 376,126

		(1)	(2)	(3)	(4)	(5)
97,000	gal. bitum. material, 200 to 300 penetration	.10	.10	.12	.15	.11
15,900	gal. bitum. material, type RC-3	.13	.12	.14	.15	.12
31,800	gal. bitum. material, type MC-1	.13	.12	.14	.15	.13
8,800	tons plant-mixed bitum. surfacing	3.00	2.25	2.75	4.50	3.00
20,400	ton cr. rock or cr. gravel surf. crse.	.93	.92	1.25	1.25	1.25
30,300	ton gravel or cr. rock base course	.88	.90	1.25	1.25	1.20
800	ton cover material	2.75	3.00	4.00	4.00	2.50
200,100	cu. yd. unclassified excavation	.29	.25	.35	.40	.35
1,375,000	st. yd. overhaul, class "A"	.01	.015	.02	.03	.02
497,300	yd. mi. overhaul, class "B"	.10	.15	.20	.20	.20
3,000	hr. rolling	5.50	3.50	4.00	6.00	4.00
3,604,000	gal. watering (per 1,000 gallon)	1.40	1.50	2.00	2.00	1.50
9,000	cu. yd. channel excavation	.35	.35	.75	1.00	.70
730	lin. ft. 15-in. concrete pipe	2.15	2.25	3.00	2.30	2.95
186	lin. ft. 18-in. concrete pipe	2.65	3.00	4.00	3.00	3.60
180	lin. ft. 30-in. concrete pipe	4.75	5.25	6.00	5.00	5.35
772	lin. ft. 36-in. concrete pipe	6.75	7.25	7.00	7.00	7.50
117	lin. ft. 48-in. concrete pipe	9.50	10.00	12.00	10.00	9.50
76	lin. ft. relaying 12-in. C.G.M. pipe	1.20	1.00	1.50	1.00	.50
106	lin. ft. relaying 12-in. concrete pipe	1.30	1.00	1.50	1.00	.50
34	lin. ft. relaying 15-in. concrete pipe	1.50	1.50	1.50	1.50	.75
101	lin. ft. relaying 18-in. concrete pipe	1.60	2.00	2.00	2.00	1.00
1,500	cu. yd. excavation for structures	1.40	1.50	5.00	2.00	2.00
35	cu. yd. concrete, class "A"	45.00	35.00	42.00	50.00	37.00
168	cu. yd. concrete, class "B"	40.00	30.00	40.00	40.00	35.00
300	lb. reinforcing steel	.10	.10	.10	.10	.09
16.6	M.F.B.M. lumber (native red pine) untreated	110.00	100.00	200.00	200.00	130.00
220	sq. yd. waterproofing	1.75	1.00	1.00	5.00	1.00
2,650	lin. ft. concrete curb No. 1-C	1.00	1.00	1.50	3.00	1.75
110	lin. ft. concrete curb and gutter No. 3-F	1.60	1.50	1.50	3.00	2.00
3,550	lin. ft. concrete curb and gutter No. 3-H	1.60	1.50	1.50	3.00	2.00
220	lin. ft. concrete curb and gutter No. 3-I	1.60	2.00	1.50	3.00	2.00
1,300	sq. yd. 4-in. concrete sidewalk	1.80	2.20	.60	3.00	2.50
80	sq. yd. 6-in. concrete sidewalk	2.75	3.30	.90	4.00	3.00
640	lin. ft. concrete driveway and driveway curb	7.50	5.50	2.00	10.00	5.00
1,400	sq. yd. removal of existing sidewalk	.45	.30	.50	1.00	.75
10	ea. reconstruct cleanout boxes, manhole and monu...	15.00	100.00	100.00	200.00	15.00
14,200	lin. ft. moving fence	.10	.10	.10	.25	.15
253	ea. removal of trees	15.00	25.00	10.00	25.00	10.00
2	ea. F.A.P. markers	20.00	20.00	20.00	20.00	10.00

Oregon—Jackson County—State—Grade and Surf.

Tru-Mix Concrete Co., Medford, with a figure of $133,416, was the lone bidder to the Oregon State Highway Department, Portland, for construction of the Evans Creek-Sams Valley access road, and were awarded the contract to do the work. The length of the project is about 8.1 mi. The unit bids were as follows:

Lump sum, clearing and grubbing		$21,000
550	cu. yds. trench excavation, common	2.00
100	cu. yds. trench excavation, solid rock	10.00
86,500	cu. yds. general excavation, common	.48
5,000	cu. yds. general excavation, solid rock	.48
27,000	yd. stas. short haul	.03
40	C-yd. stas. long overhaul	.40
8.08	miles finishing roadbed and slopes	265.00
100	lin. ft. 6-in. concrete drain pipe	.90
3,300	lin. ft. 18-in. concrete pipe	3.60
400	lin. ft. 24-in. concrete pipe	5.50
140	lin. ft. 30-in. concrete pipe	8.00
120	lin. ft. 36-in. concrete pipe	10.00
10	cu. yds. rock or gravel backfill in drains	1.00
12,000	cu. yds. 1¼-in. - 0 material in surfacing	2.50
5,800	cu. yds. ¾-in. - 0 material in surfacing	2.60
1,700	cu. yds. filler	.35
1,700	yd. mi. hauling filler	.12
350	M-gals. sprinkling	3.00

California—San Diego Co.—State—Grade and Surf.

Basich Bros., Torrance, submitting a bid of $126,301, were low to the California Division of Highways, Los Angeles, and received the contract to grade and place bitum. surf. treatment on 4.3 mi. of highway betw. San Luis Rey and Santa Margarita Ranch. A priority rating of AA-5 has been assigned to the project, being an important defense highway. The following submitted bids:

(1) Basich Bros. $126,301
(2) Denni Investment Corp. 128,388
(3) Griffith Co. 140,230
(4) J. E. Haddock, Ltd. $175,546
(5) Oswald Bros. 182,079
(6) Clyde W. Wood, Inc. 191,491

		(1)	(2)	(3)	(4)	(5)	(6)
Lump sum, clearing and grubbing		$1,500	$1,150	$2,750	$6,500	$10,000	$3,500
85,000	cu. yd. roadway excavation	.40	.42	.32	.64	.53	.90
2,500	cu. yd. structure excavation	.70	3.10	2.35	2.00	2.50	2.50
2,400	cu. yd. ditch and channel excavation	.60	.60	.95	1.00	1.25	1.50
169,000	sta. yds. overhaul	.005	.01	.01	.01	.005	.005
18,000	cu. yd. imported borrow (type "A")	.60	.57	.64	.65	.92	.90
30,000	cu. yd. imported borrow (type "B")	1.00	.57	1.33	1.25	1.26	.90
Lump sum, dvlpg. water supply and furn. wtg. equip.		$1,000	$7,250	$3,000	$2,900	$5,000	$1,000
2,600	M. gals. applying water	1.50	1.00	1.20	1.25	2.25	1.25
230	stas. finishing roadway	4.00	5.00	5.00	12.50	10.00	10.00
91,000	sq. yd. preparing, mixing and shaping surface	.10	.11	.09	.15	.13	.12
930	tons liq. asph., MC-2 or 3 (B.S.T.)	15.00	12.00	15.50	14.00	14.00	17.80
3	tons asphaltic emulsion (pr. ct. & pt. bdr.)	30.00	50.00	85.00	40.00	90.00	40.00
600	tons mineral aggregate (P.M.S.)	4.00	4.30	4.65	5.50	8.50	5.00

(Continued on page 96)

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DISPLAY THIS FREE EMBLEM

(Actual size 5″ in diameter)

● It's only a red, white and blue sticker but it means a lot to Uncle Sam's war effort because it shows that these operators are conserving their particular construction equipment—making it last longer and work faster, with all the means and experience at their control.

Doesn't make any difference what you run—shovel, bulldozer, tractor, scraper or truck—there's one of these colorful 5″ emblems for you. Just send your name and address and say that you want to show others that you are conserving.

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Want some practical ideas on how to make quick, emergency repairs; on how to temporarily substitute for critical, hard-to-get parts and materials? Then write for this new Fix-It Handbook. It will help you salvage and conserve worn parts and will save you time and money, too.

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The equal of a 20ft. highway from

San Francisco

HERE is a record to shoot at —3,140,000 tons for the year 1942! This is the production of six Cedarapids Crushing plants operated by the Concrete Materials and Construction Co. of Cedar Rapids, Iowa. Here's the equivalent of 3055 miles of 20 ft. highway from San Francisco to New York, 2½ in. thick — enough stone to pave four Alcan Highways!

Getting things done is what counts today, and out of today's performance comes the guidance to the selection of machinery that is going to assure a successful business tomorrow. Cedarapids Equipment brings you the advantages that will help you meet competition after the "Duration."

Cedarapids plants can be engineered for your aggregate producing needs. From the great Morok Plant (the only plant giving Big Production at low cost that is completely portable) to the smallest screen or crusher, there is Cedarapids equipment that will fit your future plans. Learn about Cedarapids equipment now. Come to Headquarters for aggregate producing equipment.

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Coast to Coast 2½ in. thick

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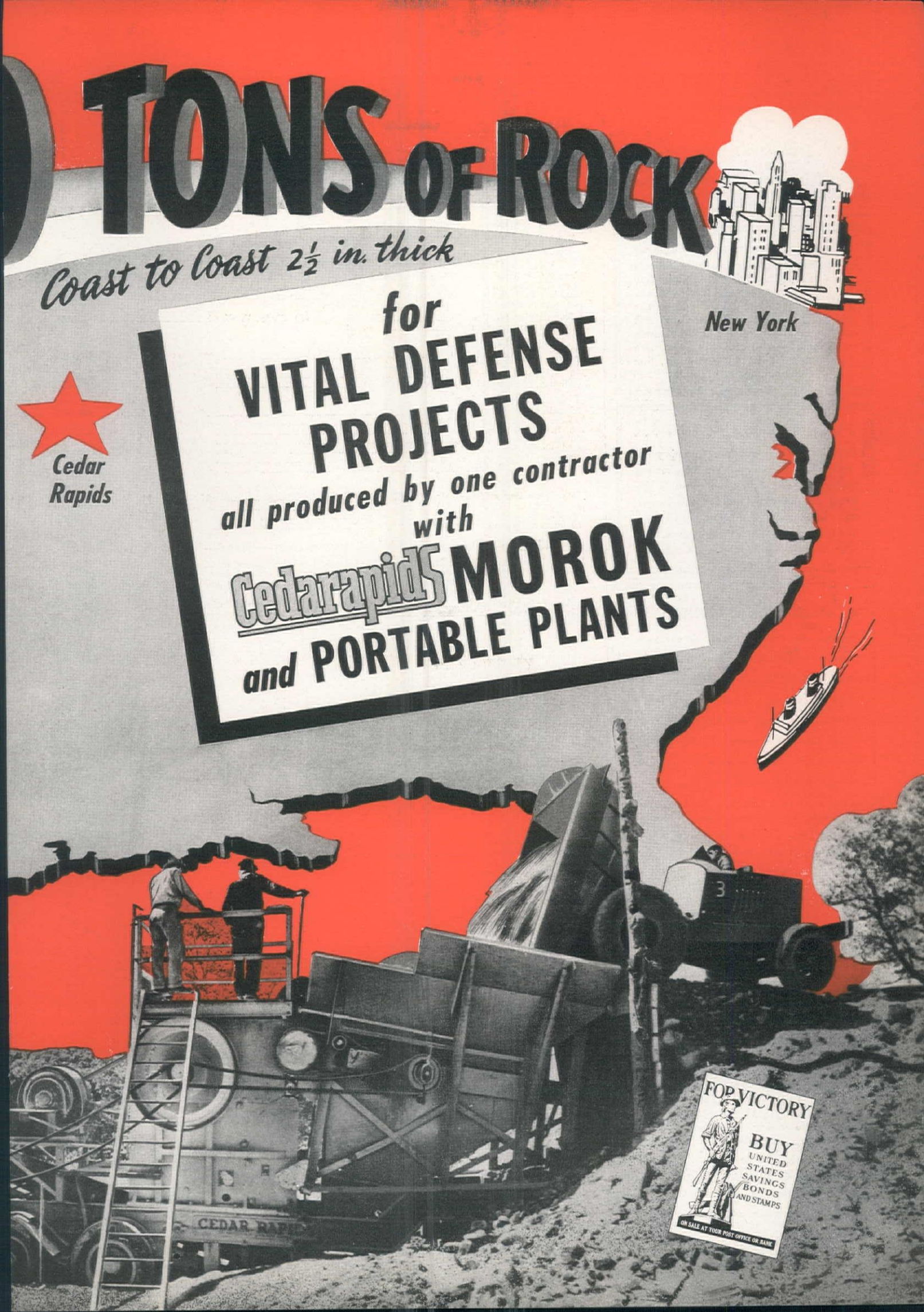

maintenance at W. A. Bechtel Co.'s Marinship division, Sausalito, Calif.

* * *

Buell Jones, grader and machinery operator of Sedro Woolley, Wash., has received the appointment as street superintendent of that city.

30 tons liq. asph., MC-3 or 5 (P.M.S.)	18.00	17.00	15.50	14.50	14.00	18.00
5 ea. timber spillways	10.00	33.00	25.00	25.00	50.00	30.00
144 lin. ft. timber down drains	1.00	1.50	1.85	1.50	3.00	2.00
80 cu. yd. Cl. "A" P.C.C. (structures)	25.00	36.00	31.50	33.00	50.00	50.00
62 ea. monuments	3.00	6.00	3.50	3.75	5.00	5.00
52 ea. culvert markers	3.00	4.00	3.00	3.00	5.00	5.00
24 lin. ft. 12-in. V.C.P. (2000-D)	2.00	2.80	2.15	2.40	2.35	2.50
1,068 lin. ft. 18-in. V.C.P. (2000-D)	2.50	3.50	3.15	3.40	3.25	3.80
592 lin. ft. 24-in. V.C.P. (2000-D)	3.50	4.55	3.95	4.40	4.25	4.75
164 lin. ft. 36-in. R.C.P. (std. str.)	7.00	7.70	6.85	7.40	7.50	8.25
116 lin. ft. 60-in. R.C.P. (std. str.)	13.00	16.10	13.60	15.00	15.00	16.75
140 lin. ft. 84-in. R.C.P. (std. str.)	25.00	28.00	23.50	25.00	25.00	30.00
108 lin. ft. salvaging pipe culverts	.75	2.00	.75	1.25	.75	1.00
30 lin. ft. relaying salvaged pipe	.50	2.00	.75	1.00	1.50	.50
620 sq. ft. placing plant-mixed down drains	.40	.10	.35	.20	.15	.25
800 ea. willow cuttings	.30	.20	.35	.50	1.00	.25

Arizona—Yuma County—State—Grade & Surf.

Tanner Construction Co., Phoenix, submitted the low bid at $23,847, to the Arizona State Highway Commission, Phoenix, and has been awarded the contract, to grade, sprinkle, roll and surface three access roads to auxiliary fields of the Yuma Airport. One cattle guard is also to be constructed. The work is located about 11 mi. south of Yuma. Bids submitted were as follows:

(1) Tanner Construction Co. $23,847
(2) Martin Construction Co. 36,592
(3) Clyde W. Wood $45,479

UNIT A	(1)	(2)	(3)
5.5 mile grading roadway to section	$250.00	$1,000	$895.00
7,500 cu. yd. surfacing (gravel)	1.00	1.00	1.45
350 M. gal. sprinkling	2.50	2.50	1.75
80 hour rolling (steel or pneumatic wheeled)	4.00	4.50	5.00
UNIT B			
6.25 mile grading roadway to section	250.00	$1,000	895.00
5,000 cu. yd. surfacing (clay)	1.00	1.50	1.75
5,000 cu. yd. surfacing (gravel)	1.00	1.25	2.35
400 M. gal. sprinkling	2.50	2.50	2.00
50 hour rolling (sheepsfoot)	4.00	4.50	8.00
50 hour rolling (steel or pneumatic wheeled)	4.00	4.50	4.00
1 Lump sum, timber cattle guard (20-ft. wooden)	400.00	300.00	200.00
UNIT C			
0.25 mile grading roadway to section	250.00	$1,000	$1,000
250 cu. yd. surfacing (gravel)	1.00	1.00	2.50
25 M. gal. sprinkling	2.50	2.50	2.00
10 hours rolling (steel or pneumatic wheeled)	4.00	4.50	5.00

Idaho—Payette and Washington Cos.—State—Stockpiling

Hoops Construction Co., Twin Falls, at $42,675, submitted the lowest bid to the Idaho Bureau of Highways and was awarded the contract at that figure, for furnishing crushed gravel and cover coat material in stockpiles between Payette and Weiser, adjacent to the Old Oregon Trail, and the North-South Highway. The bids submitted were as follows:

(1) Hoops Construction Co. $42,675
(2) Lobnitz Bros. 43,900
(3) Engineer's Estimate $38,425

	(1)	(2)	(3)
2,500 tons crushed gravel ¾-in. max. in stockpile at site No. 1	1.65	2.00	1.75
4,000 tons crushed gravel ¾-in. max. in stockpile at site No. 2	1.70	1.90	1.75
5,000 tons crushed gravel ¾-in. max. in stockpile at site No. 3	1.60	1.90	1.65
5,000 tons crushed gravel ¾-in. max. in stockpile at site No. 4	1.75	1.90	1.50
1,000 tons cover coat material type "X" in stockpile at site No. 1	2.50	2.30	2.00
1,000 tons cover coat material type "X" in stockpile at site No. 2	2.50	2.00	2.00
2,000 tons cover coat material type "X" in stockpile at site No. 3	2.50	2.00	1.90
2,000 tons cover coat material type "X" in stockpile at site No. 4	2.50	2.00	1.75

Washington—Kitsap Co.—State—Pave

N. Fiorito, Inc., Seattle, bid low at $424,063 to the Washington Director of Highawys, Olympia, and has been awarded the contract to clear, grade, drain, and pave with Portland cement concrete and asphaltic concrete, primary State highway No. 21 between Bremerton and Kitsap Lake, and a connection to Wycoff Ave. in Bremerton, the total working length being 3.1 mi. A preference rating of A-1-e was assigned by the WPB to cover purchase of materials and repair parts. The following bids were submitted:

(1) N. Fiorito, Inc. $424,063
(2) Northwest Construction Co. 456,444
(3) Guy J. Norris & Goodfellow Bros., Inc. $485,288
(4) Kuckenberg Construction Co. 625,886

	(1)	(2)	(3)	(4)
Lump sum, clearing and grubbing	500.00	3000.00	1000.00	1000.00
29.7 acres clearing	250.00	250.00	350.00	400.00
16.6 acres grubbing	250.00	275.00	350.00	300.00
172,010 cu. yds. unclassified excavation, incl. haul of 600 ft.	.30	.40	.50	.45
160 cu. yds. common trench excavation, incl. haul of 600 ft.	2.00	1.50	2.00	2.00
93,120 cu. yd. stas. overhaul on above materials	.02	.03	.02	.01
1234.60 cu. yd. stas. overhaul on above materials	5.00	5.00	5.00	10.00
2,940 cu. yds. structure excavation	1.50	2.00	1.75	2.00
12,090 lin. ft. slope treatment	.10	.10	.12	.20
176.6 stas. (100-ft.) finishing roadway	15.00	10.00	10.00	20.00
34,680 cu. yds. selected roadway borrow	.50	.40	.80	.90
665 cu. yds. crushed stone surfacing—top course	2.50	3.50	3.50	3.00
300 M. gals. water	2.00	2.50	3.00	2.00
7,126 tons type I-1 asph. conc. pav't, Cl. "C" wearing course	8.75	9.25	7.00	8.50
91.671 sq. yds. cem. conc. pav't (std. 14 day 5 sack mix)	2.25	2.36	2.40	3.30
2,766 sq. yds. cem. conc. pav't (high early str., 5 sack mix)	2.45	2.50	2.75	3.50
151 sq. yds. cem. conc. driveways (std. 14 days 5 sack mix)	2.25	2.40	2.50	3.00
3,117 sq. yds. one course conc. sidewalk (std. 14 days 5 sack mix)	1.50	2.00	1.75	2.25
16,233 lin. ft. plain concrete gutter (5 sack mix)	.65	.45	.60	1.75
201 lin. ft. pavement header No. 3	1.00	1.50	1.25	1.50
5,359 lin. ft. integral concrete curb (std. 14 day 5 sack mix)	.25	.25	.40	1.00
222 lin. ft. integral concrete curb (high early str. 5 sack mix)	.30	.30	.45	1.20
3,555 lin. ft. integral conc. curb and gutter (std. 14 day 5 sack mix)	1.10	1.25	1.25	2.75
214 lin. ft. special wood spillway complete	1.00	1.50	.50	2.00
7.3 cu. yds. concrete class "C"	55.00	50.00	45.00	45.00
70.0 cu. yds. concrete class "F"	40.00	45.00	40.00	45.00
116.2 cu. yds. concrete class "G"	35.00	35.00	40.00	45.00
18 only temporary bridges across pav't (takedown type)	50.00	50.00	125.00	562.50
2,890 lin. ft. asphaltic concrete traffic bars	.75	1.00	.75	1.00
72 only asphaltic concrete traffic buttons	1.50	2.00	1.50	6.00
1 only spec. brick of conc. block manhole with new cast iron ring and cover	150.00	160.00	200.00	200.00
2 only special brick or conc. block manholes with reclaimed cast iron ring and cover	130.00	150.00	175.00	200.00
3 only special conc. inlets	75.00	60.00	50.00	50.00
67 only special conc. inlets	50.00	35.00	45.00	50.00
2 only special catch basins with new cast iron ring and cover	125.00	85.00	200.00	150.00
3 only special catch basins with reclaimed cast iron ring and cover	100.00	75.00	180.00	150.00
34 only special conc. catch basins	90.00	50.00	75.00	100.00

(Continued on next page)

Guard Against "Time Out"!

EVEN A CHAMPION NEEDS THE RIGHT KIND OF CARE TO KEEP IN TOP CONDITION *for the* TOUGH JOBS AHEAD

Here's a way to keep your Link-Belt Speeder hammering away at the important production goals that lie ahead . . . First, if you have not already done so—establish a regular inspection routine, scheduled at definite intervals that will prevent the occurrence of a maintenance mishap or oversight. Keep the machine clean and properly lubricated at all times; check the treads, chains, brakes, clutches; tighten bolts and nuts.

Remember—today, more than ever, proper maintenance of essential machinery is vital, and *all* machinery is essential!

2001

LINK-BELT SPEEDER

BUILDERS OF THE MOST COMPLETE LINE OF

SHOVELS—
CRANES—
DRAGLINES

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

198	only concrete right-of-way markers	2.50	3.00	3.50	6.00
209	lin. ft. wood handrail complete	1.00	1.00	.50	2.00
10	only removing and resetting existing cast iron inlets	20.00	20.00	25.00	25.00
7	only adjusting existing catch basins and manholes to grade	15.00	50.00	20.00	50.00
670	sq. yds. removing existing concrete pavement	1.00	1.00	.75	2.00
1,643	sq. yds. removing existing concrete sidewalk	.50	.35	.50	1.00
3,000	lin. ft. removing existing timber guard rail	.25	.30	.25	.50
3	only removing existing conc. or brk. manholes and catch basins	25.00	50.00	25.00	75.00
Lump sum,	removing existing culvert wingwalls and aprons (2 culverts)	250.00	300.00	150.00	100.00
90	lin. ft. relaying pl. conc. or V.C. sewer pipe 6-in. diam.	.50	.40	.60	2.00
666	lin. ft. relaying pl. conc. or V.C. pipe 12-in. diam.	.75	.60	.60	2.50
1,435	lin. ft. pl. conc. or V.C. sewer pipe 6-in. diam.	.45	.60	.75	1.00
1,421	lin. ft. pl. conc. or V.C. sewer pipe 8-in. diam.	.60	.70	1.00	1.25
1,005	lin. ft. pl. conc. or V.C. sewer pipe 12-in. diam.	.85	1.25	1.50	1.75
405	lin. ft. pl. conc. or V.C. culvert pipe 12-in. diam.	1.85	1.50	1.50	1.50
1,296	lin. ft. std. reinf. conc. culvert pipe 18-in. diam.	1.45	2.25	3.00	3.00
144	lin. ft. std. reinf. conc. culvert pipe 24-in. diam.	3.00	4.00	4.00	4.25

Sewerage . . .

Arizona—Pima Co.—City—Sewage Plant

M. M. Sundt Construction Co., Tucson, bid low with a proposal on $131,865, to the City Manager, Tucson, on construction of an addition to the city's sewage works. Both sewer lines and a treatment plant are included in the work. The following bids were submitted:

(1) M. M. Sundt Construction Co. $131,865
(2) Fisher Contracting Co. 157,969
(3) H. B. Nicholson 168,662
(4) Hoagland-Findley Engineering Co. $171,962
(5) G. E. Kerns 173,625

		(1)	(2)	(3)	(4)	(5)
Lump sum,	general grading, sewage treat. plant	$750.00	$1960.50	$2000.00	$1500.00	$1000.00
Lump sum,	general grading, ferrous plant, site No. 1	100.00	392.10	500.00	150.00	300.00
Lump sum,	general grading, ferrous plant, site No. 2	150.00	392.10	300.00	150.00	300.00
4,600	cu. yd. excavation and backfill	1.50	1.31	2.00	1.50	1.50
760	cu. yd. class "A" concrete	28.00	42.61	50.00	42.00	50.00
100	cu. yd. class "B" concrete	26.00	40.52	30.00	30.00	40.00
25	cu. yd. class "C" concrete	18.00	39.21	25.00	24.00	40.00
80,000	lb. reinforcing steel	.07	.072	.08	.083	.09
830	lin. ft. 4-in. cast iron bell and spigot pipe	1.55	2.51	1.86	1.50	2.00
230	lin. ft. 6-in. cast iron bell and spigot pipe	2.25	3.33	2.96	2.40	2.50
25	lin. ft. 8-in. cast iron bell and spigot pipe	3.45	4.51	5.20	4.00	3.50
310	lin. ft. 4-in. cast iron flanged pipe	3.91	9.21	4.20	10.00	10.00
15	lin. ft. 6-in. cast iron flanged pipe	3.59	11.80	3.85	20.00	15.00
15	lin. ft. 8-in. cast iron flanged pipe	5.20	16.10	6.95	30.00	20.00
3,350	lb. cast iron bell and spigot fittings	.17	.29	.20	.25	.15
3,700	lb. cast iron flanged pipe fittings	.25	.39	.20	.35	.30
60	lin. ft. 4-in. cast iron soil pipe	1.35	1.87	.95	1.10	2.00
300	lin. ft. 4-in. vitrified clay pipe	.63	.78	1.00	.70	1.50
635	lin. ft. 6-in. vitrified clay pipe	.76	1.05	1.25	.90	2.00
650	lin. ft. 8-in. vitrified clay pipe	.90	1.28	1.50	1.00	2.50
225	lin. ft. 15-in. vitrified clay pipe	1.06	3.40	3.30	2.50	3.50
1,400	lin. ft. 24-in. vitrified clay pipe	5.25	5.75	6.00	5.50	6.00
4	ea. 4-in. vitrified clay bends	2.00	2.61	3.00	2.00	2.00
10	ea. 6-in. vitrified clay bends	2.50	3.42	4.00	2.50	2.00
2	ea. 8-in. vitrified clay bends	3.23	4.08	5.00	3.00	5.00
6	ea. 15-in. vitrified clay bends	7.43	18.49	20.00	17.50	15.00
3	ea. 24-in. vitrified clay bends	17.00	44.36	46.00	40.00	30.00
2	ea. 8-in. vitrified clay tees	3.95	4.60	6.00	4.00	4.00
6	ea. 8-in. vitrified clay double tees	5.75	6.87	8.50	5.00	6.00
1	ea. 8x8x6-in. vitrified clay wyes	3.95	4.61	6.00	4.00	4.00
1	ea. 6-in. vitrified clay slants	2.58	4.98	5.00	3.00	4.00
1	ea. 8-in. vitrified clay slants	3.65	5.31	6.00	3.00	4.00
2	ea. 4x6-in. vitrified clay increasers, small end bell	2.09	2.61	3.50	2.50	3.00
2	ea. 6-in. vitrified clay hand hole traps	8.75	10.82	7.00	6.00	6.00
75	lin. ft. conc. cradle for 4-in. vitrified clay pipe	.43	.52	1.00	.60	1.00
30	lin. ft. conc. cradle for 6-in. vitrified clay pipe	.53	.65	1.00	.80	1.00
70	lin. ft. conc. encasement for twin barrel 15-in. vitrified clay pipe	5.08	7.25	6.00	4.00	10.00
20	lin. ft. full conc. cradle for 24-in. V.C.P.	3.38	7.84	5.40	2.50	10.00
Lump sum,	18-in. V.C.P. encased in concrete	26.25	274.47	75.00	300.00	250.00
Lump sum,	30-in. V.C.P. encased in concrete	36.25	130.70	125.00	600.00	250.00
200	lin. ft. ½-in. standard wrought steel pipe	.28	.76	.10	.20	1.00
200	lin. ft. ¾-in. standard wrought steel pipe	.30	.91	.15	.25	1.00
200	lin. ft. 1-in. standard wrought steel pipe	.36	1.12	.20	.30	1.00
15	lin. ft. 1¼-in. standard wrought steel pipe	.50	1.31	.26	.40	1.50
130	lin. ft. 1½-in. standard wrought steel pipe	.52	1.48	.32	.50	1.50
1,000	lin. ft. 2-in. standard wrought steel pipe	.76	1.71	.86	.70	1.50
35	lin. ft. 2½-in. standard wrought steel pipe	.87	2.01	1.00	1.00	2.00
550	lin. ft. 3-in. standard wrought steel pipe	1.25	2.18	1.20	1.20	2.00
80	lin. ft. 6-in. standard wrought steel pipe	2.38	3.45	2.40	3.00	3.50
50	lin. ft. remove and reclaim existing 2-in. gas pipe	.63	.52	.50	1.00	1.00
10	lin. ft. relaying existing 2-in. gas pipe	.44	1.31	.50	1.00	1.00
70	ea. ½-in. malleable iron fittings	.31	.33	.10	.25	.50
40	ea. ¾-in. malleable iron fittings	.37	.42	.17	.30	.50
35	ea. 1-in. malleable iron fittings	.51	.54	.27	.45	.50
10	ea. 1¼-in. malleable iron fittings	.68	.78	.33	.75	1.00
20	ea. 1½-in. malleable iron fittings	.70	.91	.35	1.00	1.00
60	ea. 2-in. malleable iron fittings	.78	1.28	.50	1.30	1.50
10	ea. 2½-in. malleable iron fittings	1.65	1.96	1.17	2.25	2.00
40	ea. 3-in. malleable iron fittings	1.90	3.33	1.36	3.50	4.00
1	ea. 2-in. Dresser branch tee, 2-in. connection	35.00	14.38	27.00	15.00	20.00
1	ea. 4-in. Dresser or Dayton couplings	13.75	7.65	8.00	8.00	8.00
1	ea. 8-in. double strap pipe clamp, 2-in. tapping	13.75	19.66	8.00	60.00	30.00
10	ea. 4-in. pipe supports	15.00	15.68	14.00	25.00	5.00
6	ea. redwood gas pipe supports	6.25	12.42	4.00	15.00	3.00
2	ea. 4-in. pipe hangers	7.80	5.23	3.00	25.00	5.00
13	ea. ½-in. screw end gate valves	2.70	3.41	2.50	3.00	5.00
6	ea. ¾-in. screw end gate valves	3.14	3.96	3.00	3.75	5.00
4	ea. 1-in. screw end gate valves	4.38	4.85	4.00	5.00	10.00
2	ea. 1½-in. screw end gate valves	7.56	8.40	7.00	8.00	10.00
3	ea. 2-in. screw end gate valves	8.94	11.48	10.00	12.00	20.00
20	ea. 4-in. flanged gate valves, O. S. & Y.	43.25	47.34	50.00	60.00	40.00
3	ea. 4-in. flanged gate valves, chain operated	68.85	65.35	70.00	75.00	60.00
2	ea. 8-in. flanged gate valves, O. S. & Y.	101.13	102.64	127.00	125.00	100.00
1	ea. 4-in. hub end gate valves	32.00	36.52	40.00	40.00	40.00
2	ea. 6-in. hub end gate valves	49.25	56.49	67.00	65.00	65.00
1	ea. 1¼-in. swing check valves	5.68	9.10	5.00	15.00	15.00
1	ea. 4-in. flanged check valves	77.50	90.18	98.00	45.00	60.00
9	ea. 1-in. hose valves	2.03	7.92	1.50	5.00	5.00
4	ea. 2½-in. fire hose valves	14.88	31.07	16.50	30.00	40.00
4	ea. ¾-in. lubricated plug valves	5.33	2.77	5.50	5.00	10.00
8	ea. 3-in. lubricated plug valves	23.85	22.32	22.00	30.00	50.00
2	ea. 12x30-in. slide head gate	105.63	104.56	117.00	100.00	100.00
2	ea. 24x18-in. slide head gate	105.63	124.17	117.00	120.00	100.00
1	ea. vacuum breaker, 2½-in.	63.19	61.43	26.00	25.00	130.00

(Continued on next page)

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2 ea. valve floor stands	52.50	121.55	83.00	90.00	25.00
8 ea. valve extension stems	52.65	22.22	68.50	10.00	10.00
Lump sum, removal of 2-in. water valve	5.00	7.84	7.84	40.00	5.00
Lump sum, removal and replacement of 6-in. valve	87.50	15.68	40.00	75.00	30.00
Lump sum, hand cleaned bar screen	21.60	98.03	50.00	135.00	150.00
Lump sum, automatic screen cleaning mechanism, bar screen and adjustable baffles	3080.00	4046.21	3388.00	4000.00	3800.00
1 ea. mechanical coagulator	3480.00	4106.59	3827.00	4100.00	4300.00
1 ea. primary sludge collecting mechanism	8481.00	8308.08	7538.00	8500.00	8000.00
1 ea. gas holder cover	.....	6785.45	6240.00	7000.00	6000.00
1 ea. floating cover	6025.00	.....	6240.00	.....	6000.00
2 ea. sludge pumps	1544.00	1688.49	2135.00	1850.00	1750.00
1 ea. water seal pumping unit	352.50	342.11	236.00	250.00	350.00
1 ea. acid pump	825.00	767.21	788.00	600.00	500.00
1 ea. Westco pressure pump	426.25	840.40	530.00	400.00	400.00
2 ea. sump pumps	252.50	163.38	273.00	180.00	150.00
1 ea. chlorinator	3844.00	4273.89	4096.00	4500.00	3500.00
2 ea. chemical solution feeders	444.00	490.13	580.00	500.00	500.00
2 ea. dry feeders	790.00	836.48	1120.00	900.00	800.00
Lump sum, coagulant feeder and chemical piping	1525.00	2055.91	1500.00	4500.00	5000.00
2 ea. wood reaction tanks	1086.50	1083.50	900.00	700.00	1000.00
1 ea. coagulant storage tank	2320.00	2497.68	2910.00	1500.00	3000.00
1 ea. coagulant storage tank support	1190.00	1154.08	1000.00	1500.00	1000.00
1 ea. setting sulphuric acid tank	261.25	196.05	140.00	150.00	250.00
1 ea. hypochlorinator	612.50	682.50	790.00	700.00	600.00
Lump sum, power panel, wiring, etc.	200.00	1892.54	6000.00	4000.00	1600.00
Lump sum, sewage treatment plant lighting panel	400.00	1049.52	1800.00	1000.00	200.00
6 ea. outdoor lights	658.75	135.93	120.00	150.00	100.00
2 ea. ferrous plant dry feeder control panels	300.00	266.89	500.00	400.00	250.00
Lump sum, digester control building	2589.00	2578.27	3200.00	3600.00	3000.00
Lump sum, pump and laboratory building	4147.50	3004.79	4218.00	4200.00	4000.00
Lump sum, chemical building	1843.00	1538.43	1936.00	2000.00	3500.00
2 ea. ferrous plant buildings	2161.50	2727.81	2745.00	3100.00	3000.00
190 lin. ft. baffle guides	2.00	.73	.50	1.50	1.00
2.5 M.F.B.M. baffle boards and board covers	150.00	235.26	160.00	240.00	300.00
4.5 M.F.B.M. redwood boxes and misc. items	150.00	261.40	160.00	240.00	300.00
9,800 sq. ft. concrete paint	.08	.05	.05	.09	.10
8,250 sq. ft. weatherproof concrete paint	.08	.07	.07	.09	.10
2,000 sq. ft. interior mill white concrete paint	.08	.05	.05	.09	.10
1,625 sq. ft. floor concrete paint	.08	.05	.05	.09	.10
Lump sum, alterations to existing digestion tank	386.00	3921.00	2500.00	7000.00	5000.00
Lump sum, gas seal for existing digester	162.50	169.91	260.00	200.00	300.00
130 lin. ft. galvanized iron seal	.63	.26	.70	.75	2.50
1 ea. fire hose	407.00	647.62	624.00	600.00	800.00
1,100 lb. miscellaneous steel and iron	.15	.26	.25	.30	.50
2 ea. gas masks	28.75	30.06	30.00	35.00	35.00
2 ea. gas meters, No. 2½	113.50	136.58	165.00	135.00	250.00
1 ea. gas meters, No. 4	304.00	293.42	390.00	315.00	500.00
Lump sum, gas protective devices	2017.00	772.88	2233.00	2250.00	2000.00
Lump sum, complete laboratory equipment and tools	625.00	703.11	1225.00	1200.00	1500.00
30 ea. manhole steps	1.56	3.27	2.00	1.50	1.50
1 ea. Parshall influent recorder	400.00	423.29	420.00	750.00	900.00
50 lin. ft. premoulded expansion joint	.13	.26	.50	.80	.50
1,700 sq. yd. roads, paths, and parking	.65	.33	.90	1.20	1.00
Lump sum, sludge bed grading	6011.00	4136.66	3300.00	7000.00	1000.00
12 ea. 8-in. test plugs	6.25	7.97	9.00	20.00	40.00
1 ea. ⅝x¾-in. water meter	25.00	23.79	27.00	25.00	50.00
1 ea. 1-in. water meter	35.50	46.27	57.00	50.00	75.00
1 ea. meter box	12.50	11.76	200.00	20.00	10.00
15 cu. yd. gravel fill	1.50	3.27	3.00	5.00	4.00
Lump sum, alterations to existing outlet weir	125.00	130.70	500.00	500.00	600.00

California—Los Angeles County—Federal—Storm Drain

Werner & Webb, Los Angeles, with a bid of $27,289, were the low bidders to the Federal Works Agency, Los Angeles, for construction of the fifth section of the Lockheed storm drain, in Burbank. This is a part of the Burbank Western Flood Control System, through the site of the Lockheed Aircraft Co. The following bids were submitted:

(1) Werner & Webb $27,289
(2) George J. Bock Co. and Byerts & Dunn 32,687
(3) VCK Construction Co. 33,007
(4) Baruch Corp. $35,914
(5) Carlo Bongiovanni 37,678
(6) P. & J. Artukovich 38,798

	(1)	(3)	(3)	(4)	(5)	(6)
Lump sum, remove existing structures	$2,000	900.00	$4,400	$2,154	$5,667	$5,739
Lump sum, barricades and detours	750.00	$3,700	500.00	$1,615	$1,100	$2,350
74 cu. yd. concrete, structures	60.00	60.00	40.00	58.00	55.00	48.50
1,160 sq. ft. conc., local depressions	.60	.50	1.00	.84	.50	.60
325 lin. ft. concrete curb	1.30	1.75	1.50	1.73	1.00	.85
185 cu. yd. concrete pier cradle	20.00	15.00	15.00	15.00	12.00	10.00
1,800 lb. reinforcing steel	.10	.10	.10	.12	.09	.08
86 ton 2-in. asph. concrete base	9.50	6.00	7.00	15.00	7.00	10.00
86 ton 2-in. asph. conc. wearing surface	9.50	6.00	7.00	15.00	7.00	10.00
141 lin. ft. furn. and inst. 18-in. conc. pipe	6.00	5.50	4.00	6.60	6.50	5.50
214 lin. ft. furn. and inst. 21-in. conc. pipe	6.50	6.50	5.00	7.20	7.00	6.25
13 lin. ft. furn. and inst. 24-in. conc. pipe	7.00	8.50	6.00	10.00	7.25	7.50
225 lin. ft. install 30-in. conc. pipe	3.40	4.50	4.50	3.00	5.08	5.00
591 lin. ft. install 42-in. conc. pipe	3.80	5.50	5.00	4.20	6.50	7.00
776 lin. ft. install 54-in. conc. pipe	4.30	6.50	7.00	5.95	9.00	8.00
801 lin. ft. install 60-in. conc. pipe	4.75	7.50	9.00	10.65	8.50	10.00
9 lin. ft. precast conc. manhole shaft	14.00	15.00	25.00	24.00	15.00	13.25
3 ea. precast conc. manhole ring and cover	17.00	20.00	25.00	60.00	40.00	25.00
10 ea. precast conc. catchbasin cover	8.00	10.00	25.00	43.00	8.00	5.00
2,100 lb. miscellaneous metal	.30	.25	.20	.33	.30	.19
2 ea. project signs	50.00	50.00	50.00	160.00	50.00	50.00

Bridge and Grade Separation . . .

Washington—Spokane Co.—State—Steel Girder

Chas. A. Power, Spokane, was low bidder at $42,157, to the Washington Director of Highways, Olympia, for erection of a steel girder undercrossing on Egergreen Road, an access road to the aluminum rolling mill near Spokane, and clearing, grading, draining, and plantmix surf. treatment of the approaches, a total working length of 0.6 mi. He was awarded the contract. The following bids were submitted:

(1) Chas. A. Power $42,157
(2) Roy L. Bair 45,436
(3) Colonial Construction Co. $63,578

	(1)	(2)	(3)
Lump sum, clearing and grubbing	100.00	500.00	500.00
15,860 cu. yds. common excav. incl. haul of 600-ft.	.42	.49	1.25
4,930 yd. sta's overhaul on above material	.02	.02	.04

(Continued on next page)

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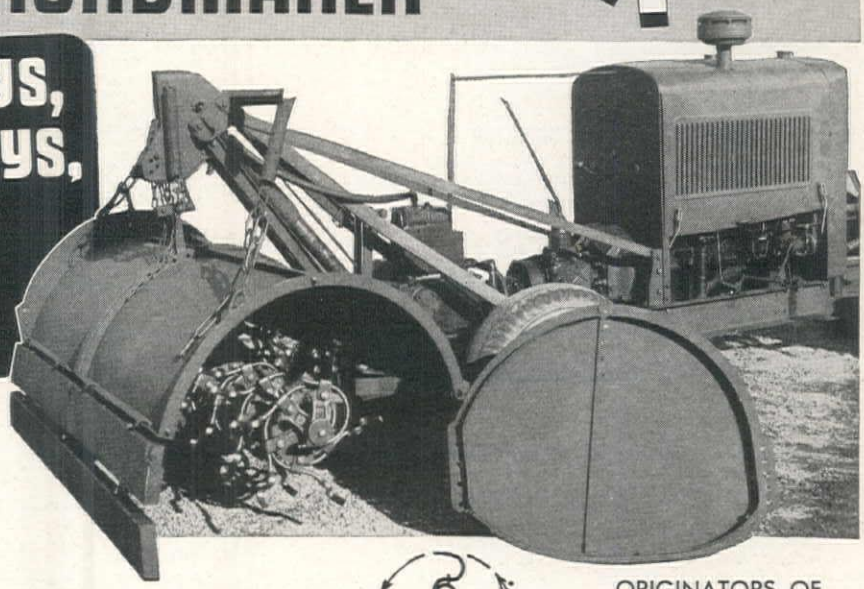
Builds HIGHWAYS, AIRPORT RUNWAYS, LANDING STRIPS faster, better, more economically.



WET or DRY, the 4 speed "3-in-1 Rotary Action" gives a BETTER, MORE UNIFORM PULVERIZED MIX

These are days of fast construction schedules and labor shortages. Roadway contractors and airport construction engineers want road-building machines that give superior performance. In the early days of soil-cement construction, back in '37, the FIRST soil-cement areas and roads constructed were made with ROTOTILLER. One of the first airport runways constructed with this revolutionary "3-in-1 rotary action" machine was praised by pilots as "the smoothest runway we ever came in on". It is noteworthy that these and similar pioneer soil-cement jobs were built with early ROTOTILLER models; 1943 models are even better and incorporate practical improvements suggested by contractors themselves.

Today, more and more soil-cement and stabilzation work on highways, landing strips, airport runways, and landing fields is being done. ROTOTILLER Roadmaker with its patented, perfected "3-in-1 rotary action" assures more accurate control in wet and dry mixing, as well as more thorough pulverization of materials. The scientific, spring-tine rotary action thoroughly mills the earth from top to bottom, resulting in complete pulverization and mixture to any depth up to 10 inches. You get all this in ONE operation—a better job at lower unit cost and with substantial savings in time and labor. Weighs, ready for work, only 3020 pounds—rugged, dependable.

See ROTOTILLER Roadmaker in action and you'll see why road and airport contractors consistently prefer this superior roadbuilder.

AND, AFTER THE WAR . . . *Post war reconstruction plans undoubtedly will include the building of thousands of miles of soil-cement and oil stabilized secondary roads. This work will be fostered as a means of giving employment to returning soldiers. Then, as now,* ROTOTILLER *Roadmakers well be on the job.*

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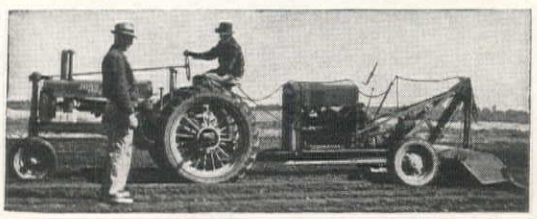
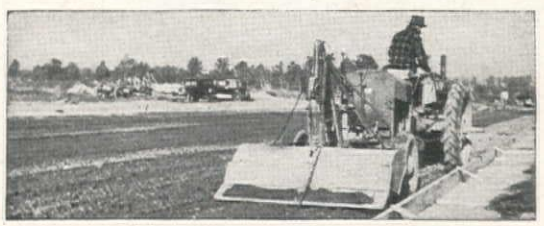
ORIGINATORS OF "3-in-1 ROTARY ACTION" TINES

Only ROTOTILLER *gives you this 4 speed "3-in-1" mixing and scarifying combination.*



Early model ROTOTILLER building one of the first military airports to use soil-cement. After two hard winters, runways are reported still in first class condition.



With ROTOTILLER Roadmaker mixing can be done close to forms as shown in this illustration. ROTOTILLER can be used with almost any type tractor.

On the job ROTOTILLER saves time, speeds construction by making sharp turns without taking tines from the ground or stopping machine.

Western Distributors: 2150 Washington Ave., San Leandro, Calif. — 2103 - 47th Avenue, S. W., Seattle, Wash.

29.6 sta's finishing roadway	10.00	10.00	8.00
1,350 lin. ft. slope treatment	.10	.10	.05
2,350 cu. yds. selected roadway borrow in place incl. haul	.50	.80	1.00
1,260 cu. yds. crushed stone surfacing top course in place	2.00	1.95	2.50
380 cu. yds. shoulder material in place	2.00	2.05	2.50
120 M. gals. water	3.00	3.00	3.00
BITUMINOUS SURFACE TREATMENT "PLANTMIX" TYPE CLASS F			
11 tons bituminous cement MC-2 prime coat in place	30.00	31.50	33.00
31 tons bituminous cement SC-6 plantmix in place	19.00	20.00	20.90
680 tons furnishing, mixing and placing bitum. mixture in place	8.00	8.40	8.80
MISCELLANEOUS ITEMS			
21 only concrete right-of-way markers in place	5.00	5.00	4.00
2 only rock filled sumps complete in place	40.00	50.00	20.00
2 only reflector units complete in place	10.00	5.00	5.00
65 lin. ft. reflecting curb complete in place	5.00	6.50	5.00
UNDERCROSSING			
500 cu. yds. structure excavation	5.00	3.00	3.00
676 cu. yds. concrete class "F" in place	27.00	28.00	35.00
Lump sum, erecting and painting structural steel in place	$2,000	$2,800	$3,000
4.1 M.B.M. timber and lumber (untreated) in place	100.00	150.00	80.00

Montana—Stillwater Co.—State—Untreated Timber

Walter Mackin, Billings, bid low at $25,954 to the Montana State Highway Commission, Helena, on construction of a 576-ft. untreated timber bridge on the access road being built to the Benbow mine and was awarded the contract. The bridge is to be completed in 75 working days. The following bids were submitted:

(1) Walter Mackin $25,954
(2) Portland Bridge Co. 28,981
(3) Utility Builders $34,935
(4) W. P. Roscoe Co. 40,562

	(1)	(2)	(3)	(4)
15.53 M.F.B.M. untreated lumber	$125.00	$300.00	$156.00	$165.00
2 ea. 18-ft. untreated timber piles	25.00	40.00	30.00	32.50
33 ea. 30-ft. untreated timber piles	40.00	60.00	60.00	43.50
42 ea. 35-ft. untreated timber piles	45.00	70.00	72.00	55.00
11 ea. 40-ft. untreated timber piles	50.00	80.00	83.00	65.00
41 cu. yds. gravel ballast	3.00	2.00	7.20	4.00
900 cu. yds. random riprap	3.50	5.00	7.00	2.50
60 cu. yds. hand laid riprap	3.50	6.00	9.00	5.50
All—Lump sum, assemb. & erect superstruct. (state furn. mat'l)	$16,720	$13,500	$19,400	$30,730

Airport . . .

Washington—Okanogan Co.—State—Flight Strip

F. R. Hewett Co., Spokane, with a proposal of $337,029, was low bidder to the Washington Director of Highways, Olympia, for the construction of a flight strip 8,000 ft. in length, together with a 1.1-mi. access road to the same. A plantmix bitum. surf. was applied to the flight strip, but only light bitum. surf. treatment was placed on the access road. The contract was awarded to Hewett. Bids submitted were as follows:

(1) F. R. Hewett Co. $337,029
(2) Goetz & Brennan 422,013
(3) Clifton & Applegate $455,518

SECTION 1—OKANOGAN FLIGHT STRIP	(1)	(2)	(3)
Lump sum, clearing and grubbing	$3,000	$5,300	$15,000
336,940 cu. yds. unclassified excavation in place	.32	.34	.38
1,280 cu. yds. structure excavation	1.80	1.50	1.50
107,070 cu. yds. ballast in place on roadway	.75	.90	1.25
30,790 cu. yds. crushed stone surf. top course in place on rdwy	1.10	1.75	1.60
5,500 cu. yds. sand filler in place including all haul	.40	1.50	.60
MINERAL AGGREGATES FOR BITUMINOUS SURFACE TREATMENT "PLANTMIX" TYPE CLASS F IN STOCKPILES			
4,155 cu. yds. ⅞-in. to ¼-in. in stockpile	1.10	1.60	1.60
4,155 cu. yds. ¼-in. to 0 in stockpile	1.10	1.60	1.60
MINERAL AGGREGATE FOR NON-SKID SINGLE SEAL TREATMENT SCHEDULE A IN STOCKPILES			
2,170 cu. yds. coarse crushed screenings ⅝-in. to ¼-in. in place in stockpile	1.10	2.00	1.60
720 cu. yds. fine crushed screenings ¼-in. to 0 in place in stockpile	1.10	2.00	1.60
BITUMINOUS SURFACE TREATMENT "PLANTMIX" TYPE CLASS F			
78,610 sq. yds. preparation of untreated roadway (runway)	.02	.06	.05
4,290 M. gals. water in place	2.00	1.00	2.00
710 cu. yds. new mineral aggregates in place	2.00	1.70	1.50
110 tons bituminous cement prime coat MC-2 in place	32.00	35.00	31.00
550 tons bituminous cement plant mix SC-6	30.00	34.00	30.00
10,740 tons mixing and placing bituminous mixture	3.00	4.50	3.00
NON-SKID SINGLE SEAL TREATMENT SCHEDULE "A"			
120 tons bituminous cement RC-4 in place	32.00	35.00	35.00
1,320 cu. yds. mineral aggregate	1.50	4.50	1.50
MISCELLANEOUS ITEMS			
2 only wind cones	50.00	80.00	50.00
1,162 rods fence	3.00	2.50	3.00
17 only special catch basins type A complete	60.00	30.00	60.00
1 only special catch basins type B complete	45.00	50.00	40.00
750 lin. ft. plain concrete or V.C. sewer pipe 8-in. diam.	.80	.72	.80
1,974 lin. ft. plain concrete or V.C. culvert pipe 18-in. diam.	2.25	3.00	2.50
SECTION 2—ACCESS ROAD			
Lump sum, clearing and grubbing	$600.00	$2,200	$5,000
17,130 cu. yds. unclassified excavation including all haul	.32	.40	.36
140 cu. yds. structure excavation	1.80	1.50	2.00
17,787 cu. yd. stas. overhaul on unclassified excavation	.03	.005	.02
53.16 cu. yd. stas. overhaul on unclassified excavation	6.00	2.00	6.00
3,940 cu. yds. ballast in place on roadway	.75	1.00	1.29
1,540 cu. yds. crushed stone surf. top course in place on roadway	1.10	1.75	1.44
510 cu. yds. crushed cover stone in stockpile	1.10	1.75	1.40
200 cu. yds. sand filler in place including all haul	.40	1.50	.60
110 M. gals. water in place	2.00	1.00	2.00
LIGHT BITUMINOUS SURFACE TREATMENT METHOD A			
1.10 miles preparation, construction and finishing	200.00	?00.00	500.00
35 tons bituminous cement MC-2 in place	32.00	35.00	35.00
230 cu. yds. placing crushed cover stone from stockpile	1.50	1.50	1.50
MISCELLANEOUS ITEMS			
6.0 cu. yds. concrete class "B" in place	25.00	40.00	60.00
78 lin. ft. dipped galv. iron irrig. pipe, 22-ga. 4-in. diam.	.50	2.00	.60
30 lin. ft. plain conc. or V.C. sewer pipe 8-in. diam.	.80	.72	1.00
183 lin. ft. plain conc. or V.C. culvert pipe 18-in. diam.	2.25	3.00	2.75
75 lin. ft. std. reinf. conc. culvert pipe 36-in. diam.	7.50	10.00	8.50

GALION

MOTOR GRADERS • ROAD ROLLERS • SPREADERS

GALION DISTRIBUTORS!

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., Seattle, Washington, Portland, Oregon, and Twin Falls, Idaho; WESTERN TRACTION CO., San Francisco, California; ORMANDE C. BELL, Reno, Nevada.

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

Union Paving Co., San Francisco, Calif., has been awarded the contract at $205,853 to construct 7.7 mi. of state highway from the Reno, Nev., airbase to the Nev.-Calif. boundary near Purdy, by Nevada State Highway Dept., Carson City.

Gibbons & Reed Co., Salt Lake City, Utah, received two contracts: $280,912 for surfacing on 21st South St., Salt Lake City, betw. Main St. and the Utah Ordnance plant, and $132,976 for a T-beam overhead bridge on the same project, by Utah State Road Commission, Salt Lake City.

N. Fiorito, Inc., Seattle, Wash., at $424,063, was awarded the contract to pave 3.1 mi. of state highway between Bremerton and Kitsap Lake, by Washington Director of Highways, Olympia.

Modern Builders Construction Co., Long Beach, Calif., $124,319 for raising and reconstructing Ocean Blvd. bridge over Los Angeles River in Long Beach, by California Division of Highways, Sacramento.

Macco Construction Co., Clearwater, and **E. S. McKittrick Co.,** Huntington Park, Calif., bidding jointly, were awarded a contract at over $2,000,000 for a naval airbase near Holtville, Calif., by Bureau of Yards and Docks, Washington, D. C.

Radich & Brown, Burbank, Calif., bidding $307,000, secured the contract for aviation facilities at Crows Landing, Calif., from Bureau of Yards and Docks, Washington, D. C.

Ertz-Burns Co., Donald M. Drake, Lorenz Bros. and **Parker-Schram Co.,** all of Portland, Ore., in combination were awarded the contract at more than $2,000,000 to construct an airfield, with all buildings and appurtenances, near Mountain Home, Idaho, by the War Dept., Washington, D. C.

M. M. Sundt Construction Co., Tucson, Ariz., received a $131,865 award to build an addition to the sewage works at Tucson, by the City Council, Tucson.

Elder R. Morgan Co., Bisbee, Ariz., $240,874 for 90 dormitory apts. and 60 temporary housing units at Douglas, Ariz., by Douglas Housing Authority.

Robert McCarthy Co., San Francisco, Calif., at $966,650, received contract for 500 temporary dwellings in Alameda, Calif., by Alameda Housing Authority.

F. C. Stolte, Inc., Alameda, Calif., received two contracts for war housing units in Alameda: $1,332,668 for 760 units and $2,447,899 for 1,240 war apartments, by Alameda Housing Authority.

Oliver M. Rousseau, San Francisco, Calif., received contract valued at $2,131,613 to construct 1,200 war apartment buildings in Richmond, Calif., by Richmond Housing Authority.

Wm. P. Neil Co., Ltd., Los Angeles, Calif., was awarded a total contract of $1,049,446 for four housing projects at mining camps, two in Nevada, two in California, by Federal Public Housing Authority, San Francisco, Calif.

Pozzo Construction Co., Los Angeles, Calif., at $370,000, will build a 100-bed hospital in Burbank, Calif., for the Catholic Sisters of Providence.

Glenn A. Doughty Co., Los Angeles, Calif., two contracts for temporary dwelling units in San Diego, Calif.: $538,159 for 304 units and $530,203 for 296 units, by Federal Public Housing Authority, San Francisco, Calif.

Simple, SYSTEMATIC DRIFTER LUBRICATION CUTS REPAIRS, BOOSTS FOOTAGE

A FEW MINUTES A DAY AND A LITTLE OIL WILL HELP YOU MEET WAR-TIME NEEDS

Regular lubrication is a vital factor in the performance and service given by any drifter drill. It is particularly important today when the war effort and the scarcity of strategic materials demand the conservation of every piece of drilling equipment.

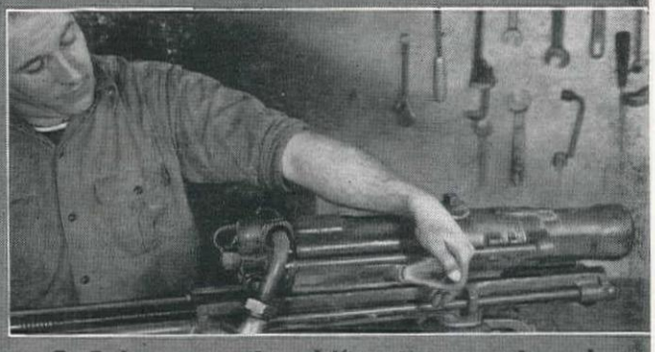
Here are four simple lubrication suggestions which will help you get the most out of your CP Drifters. While these suggestions apply particularly to CP MOTORdrifters they are applicable generally to other models. Detailed recommendations on hand-cranked CP Drifters will appear in future advertisements.

HOW TO GET MAXIMUM SERVICE FROM YOUR CP DRIFTER DRILLS

1 Twice each shift, fill the drifter oil reservoir with a good grade of rock drill oil.

2 Be sure to keep the motor feed oil reservoir filled with good grade of rock drill oil.

3 Check the feed screw frequently. Keep an oil can handy, oil feed screw occasionally.



4 Before operating drifter, turn on air and make sure oil is blowing through exhaust.

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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

Morrison-Knudsen Co., Inc., Boise, Idaho, awarded contract for widening and realigning 500 mi. of narrow gauge railroad between Mexico City and Guatemala. American labor quota has been filled by the contractors.

Morrison-Knudsen Co., Inc., Boise, Ida., $423,750 to build 170 housing units and a community bldg. at Pocatello, Ida., by Federal Public Housing Authority, Seattle, Wash.

O. J. Shearer, Las Vegas, Nev., $697,034 to erect 300 single dwelling units at Las Vegas, by Federal Public Housing Authority, San Francisco, Calif.

Housing contracts at Portland, Ore., were awarded as follows: **Askevold & Rund,** of Great Falls, Mont., $812,408 for 360 housing units; **Gilmer & Halvorson,** Portland, $285,000 for 100 row houses; **Lease & Leighland,** of Seattle, Wash., $1,088,000 for 476 apartment housing units; **Northwest Construction Co.,** of Seattle, Wash., $701,340 for 360 row houses; **Pacific Construction Co.,** of Portland, $1,370,000 for 718 row houses, and **Tri-State Construction Co.,** of Portland, $695,860 for 200 housing units.

Housing contracts at Vancouver, Wash., were awarded as follows: **W. C. Smith, Howard S. Wright Co.,** both of Seattle, Wash., and **L. H. Hoffman Co.,** of Portland, Ore., $4,720,000 for 2,100 row houses; **Sound Construction & Engineering Co.,** of Seattle, $676,000 for 300 houses; **Waale-Camplan Co.,** of Portland, Ore., two contracts, one at $1,289,000 for 586 row houses, and one for $1,579,000 for 700 temporary dwelling units. All contracts by the Vancouver Housing Authority.

Western Construction Co., Seattle, Wash., at $1,086,767, received contract to erect 580 apartment units at Seattle, by King Co. Housing Authority.

Green Bros. Construction Co., Worland, Wyo., $626,542 for a 325-unit frame housing project in Cheyenne, Wyo., by Federal Public Housing Authority, Kansas City, Mo.

Chicago Bridge & Iron Co., Chicago, Ill., $5,790,000 for a steel floating drydock at Eureka, Calif., by Bureau of Yards & Docks, Washington, D. C.

Highway and Street...

CONTRACTS AWARDED

Arizona

COCHISE CO.—**Walter L. Denison,** 207 S. Hermosa Ave., Albuquerque, N. Mex.—over $50,000 for surfacing in a utility yard—by U. S. Engineer Office, Albuquerque. 12-30

PINAL CO.—**Tiffany Construction Co.,** Box 846, Phoenix—less than $50,000, for streets at a reception center—by U. S. Engineer Office, Phoenix. 1-14

YUMA CO.—**Tanner Construction Co.,** 731 N. 19th Ave., Phoenix—$23,847, for grading and surf. roads with clay and gravel; also one cattle guard approx. 11 mi. south of Yuma, on access roads to Yuma auxiliary fields—by State Highway Commission, Phoenix. 1-11

California

LOS ANGELES CO.—**Calowell Construction Co.,** 1835 E. Wardlow Rd., Long Beach—less than $50,000, for paving an open storage area at an intransit depot—by U. S. Engineer Office, Los Angeles. 1-13

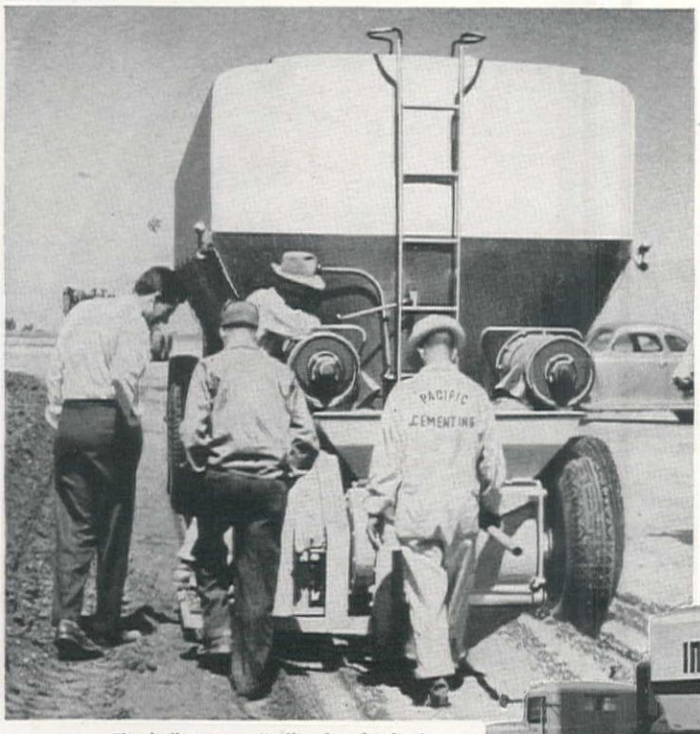
LOS ANGELES CO.—**Case Construction Co.,** Berth 109, San Pedro—over $100,000, for 15,500 ft. access road—by U. S. Engineer Office, Los Angeles. 1-19

LOS ANGELES CO.—**Griffith Co.,** 1060 S. Broadway, Los Angeles—$27,515, for asph. paving on roadway, shed floors and wharf decks—by L. A. Harbor Department, San Pedro. 1-14

LOS ANGELES CO.—**Griffith Co.,** 1060 S. Broadway, Los Angeles—less than $50,000, for paving a road at a depot—by U. S. Engineer Office, Los Angeles. 1-13

LOS ANGELES CO.—**Southwest Paving Co.,** 11402 Tuxford Ave., Roscoe—for 67,000 sq. ft. 4-in. asph. conc. paving at Taylor Yard, Los Angeles—by Southern Pacific Co., Los Angeles. 1-20

SAN BERNARDINO CO.—**Loyd Wright,** 5215 Biloxi, N. Hollywood—less than $50,000, for roads, and grading for eight



The bulk cement Trailer first hauls the cement, then spreads it. Upon arrival at the job a spreader is attached to the rear end, into which the cement is moved by two screw conveyors in the bottom of the Trailer hopper.

this Fruehauf does
A DUAL JOB
in the duel against Time

★

Whether it's cementing oil wells or airport runways the job is done with equal facility by International Cementers, Inc., Long Beach, California. For this soil-cement or concrete treated base process of airport construction, they combined ingenuity with the Fruehauf bulk cement Trailer to produce this unique method of spreading cement evenly and quickly, direct from a bulk silo to the runway.

This equipment has saved valuable time, cement and labor. On a recent California airfield job, for example, the labor saved in handling the cement was estimated at 90 per cent.

These are days of making equipment do more work and save valuable time. Your Fruehauf Branch has anticipated this need. Let them help you with your Trailer Transportation problems.

FRUEHAUFS ARE SPEEDING PRODUCTION IN EVERY WAR INDUSTRY

One of a large fleet of Fruehaufs with which Lang Transportation Company of Los Angeles, hauls petroleum products for defense.

With this Fruehauf lowbed J. A. Clark Draying Company, long-established California carrier, hauls many unusual war-time loads.

World's Largest Builders of Truck Trailers

FRUEHAUF TRAILER COMPANY

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FRUEHAUF TRAILERS

FRUEHAUF TRAILERS

"Engineered Transportation" Reg. U. S. Pat. Off.

TRUCK-TRAILER TRANSPORT IS DOING AN ESSENTIAL JOB FOR ALL AMERICA

battalion areas at a camp—by U. S. Engineer Office, San Bernardino. 1-20

SAN DIEGO CO.—**Basich Bros.,** 20530 S. Normandie Ave., Torrance—$126,301, for 4.3 mi. grade and bitum. surf. treatment, betw. San Luis Rey and Rancho Santa Margarita—by Division of Highways, Los Angeles. 1-7

SAN DIEGO CO.—**Griffith Co.,** 1060 S. Broadway, Los Angeles—less than $50,000, for roads and walks at a factory training school—by U. S. Engineer Office, San Diego. 1-5

SAN MATEO CO.—**California Paving Co.,** 363 Eldorado St., San Mateo—less than $50,000 for paving a roadway—by U. S. Engineer Office, San Francisco. 1-7

SAN MATEO CO.—**L. C. Smith,** 1st and Railroad Ave., San Mateo—$21,785, for 0.4 mi. grade and plantmix surf. on crusher run base, on Butler Road, in South San Francisco—by Division of Highways, Sacramento. 1-26

SANTA CLARA CO.—**Union Paving Co.,** 310 California St., San Francisco—$37,053, for 0.9 mi. grade and plantmix surf. on Henry Ave. and California Ave., in Sunnyvale—by Division of Highways, Sacramento. 1-7

SANTA CRUZ CO.—**Leo Cardwell Construction Co.,** 530 Pacific Ave., Santa Cruz—$9,957, for improvement of Front St., betw. Water and Cooper Sts.—by City Council, Santa Cruz. 1-26

Idaho

BONNEVILLE CO.—**Dan J. Cavanagh,** Box 1038, Twin Falls—$22,425, for stockpiling cr. gravel and cover coat material adjacent to the Reno Park-Taylor Road—by Commissioner of Public Works, Boise. 1-6

Nevada

WASHOE CO.—**Union Paving Co.,** 310 California St., San Francisco, Calif.—$205,853, for 7.7 mi. of state highway from Reno air base to Nevada-California state line near Purdy—by Department of Highways, Carson City. 1-22

Oregon

BAKER CO.—**M. C. Lininger & Sons,** Medford—$26,000, for approx. 8,000 cu. yds. crushed rock in stock piles for Richland-Halfway rock production project on Baker-Homestead and Halfway highways—by State Highway Commission, Portland.

CROOK & WHEELER COS.—**M. C. Lininger & Sons,** Medford—$24,750, for 10,000 cu. yds. crushed rock in stock piles on the Ochoco Hwy.—by State Highway Commission, Portland. 1-14

LANE CO.—**A. H. Saxton & Son,** Corvallis—$52,480, for 14,400 cu. yds. crushed rock or gravel in stock piles for the Trent-Salt Creek Falls rock production project on the Willamette highway—by State Highway Commission, Portland. 1-14

WALLOWA CO.—**M. C. Lininger & Sons,** Medford—$39,400 for approx. 12,000 cu. yds. crushed rock or gravel in stock piles for the Rock Creek-Joseph rock production project on the Wallowa Lake highway—by State Highway Commission, Portland. 1-14

Texas

BEXAR CO.—**Colglazier & Hoff, Inc.,** 526 Seguin Rd., San Antonio—over $100,000, for roads and sidewalks—by U. S. Engineer Office, San Antonio. 12-24

CALDWELL CO.—**Kelly Construction Co.,** San Antonio—less than $50,000 for surfacing roads—by U. S. Engineer Office, San Antonio. 1-7

CORYELL CO.—**Gerald K. Mora,** 312 Sabine St. Houston—over $100,000, for access roads—by U. S. Engineer Office, San Antonio. 1-19

CORYELL CO.—**Dean Work,** San Antonio—over $100,000, for access roads—by U. S. Engineer Office, San Antonio. 1-19

Utah

SALT LAKE CO.—**Gibbons & Reed Co.,** 259 W. 3rd South St., Salt Lake City—$280,912 for plantmix bitum. surf. on 21st South St., betw. Main St. and the Utah ordnance plant—by State Road Commission, Salt Lake City. 1-9

UTAH CO.—**J. W. Whiting,** Springville—$31,052, for a 2½ in. roadmix bitum. surf. road for 3.4 mi. betw. Camp Williams and Lehi Junction—by State Road Commission, Salt Lake City. 1-26

MORE THAN A MILLION MILES ..

and Still Rolling

KEEPING TRUCKS IN ACTION... NOW OR IN NORMAL TIMES... DEMANDS THE BASIC QUALITY THAT MAKES THIS KIND OF PERFORMANCE POSSIBLE

Veteran of more than a million miles — and still "on the road" making its regular hauls — that's the service record of this FWD, owned by Clintonville Transfer Line, Clintonville, Wis. Built in 1933, it has performed continuously since, and is now powered by its third engine — with better than 400,000 miles on each of two previous engines.

This is another of many case histories in the FWD files all testifying to FWD's quality and capacity to haul longer for less—in normal as well as unusual times—in motor transport, highway service, public utility, oil fields, and other services demanding unusual truck performance. And now when wartime truck operation demands every last mile, FWD owners have the advantage of basic, high quality design and construction inherent in FWD's true application of the four-wheel-drive principle.

★ *Keep Your FWD's Rolling — No Matter How Old — With FWD Service* ★

FWD TRUCKS

THE FOUR WHEEL DRIVE AUTO COMPANY

CLINTONVILLE, WISCONSIN • *Canadian Factory: Kitchener, Ontario*

Washington

CLALLAM AND JEFFERSON COS.—**J. D. Shotwell,** 1920 N. Union St., Tacoma—$94,900 for resurf. portions of State highways 9-A and 9-B in the vicinity of Port Angeles and Twin, and stock piling mineral aggregates along other portions—by Director of Highways, Olympia. 1-29

CLARK CO.—**Porter W. Yett,** 6500 N. E. Ainsworth St., Portland, Ore.—$59,258, for access road to shipyard at Vancouver and Grand Aves., Vancouver—by City Council, Vancouver. 1-11

DOUGLAS AND GRANT COS.—**Leo J. Lavin,** Coulee City—$51,713 for stockpiling gravel on several sections of State Highways 2 and 7 in the vicinity of Stratford and Coulee City—by Director of Highways, Olympia. 1-27

KITSAP CO.—**N. Fiorito, Inc.,** 844 W. 48th St., Seattle—$424,063, for clearing, grading, draining and paving with Portland cement conc. and asph. conc. 3.1 mi. of state highway No. 21 and Wycoff Ave. betw. Bremerton and Kitsap Lake—by Director of Highways, Olympia. 1-6

LINCOLN CO.—**Carbon Bros.,** 3430 N. Cook St., Spokane—$17,600, for mfg. and stockpiling cr. stone surf. and mineral aggr. for primary State Highway No. 22, Davenport north—by Director of Highways, Olympia. 1-4

LINCOLN CO.—**Carbon Bros.,** 3430 N. Cook St., Spokane—$17,600, for mfg. and stockpiling cr. stone surf. and mineral aggr. for primary State Highway No. 4 betw. Wilbur and Keller Ferry—by Director of Highways, Olympia. 1-4

SPOKANE CO.—**Charles A. Power,** E. 27-8th Ave., Spokane—$42,157, for clear, grade, drain and plantmix bitum. surf. treatment; also a steel girder undercrossing on an access road to the aluminum rolling mill near Spokane—by Director of Highways, Olympia. 1-4

Central America

COSTA RICA—**Ralph E. Mills Co.,** 10th St. Ext. and Levelton Ave., Roanoke, Va.—for 80 mi. of highway near San Jose—by U. S. Public Roads Administration, Washington, D. C. 1-26

PROPOSED PROJECTS

California

KINGS CO.—Appropriation has been made for widening and resurf. 9.6 mi. of strategic highway from Lemoore to the Lemoore army base. Estimated cost is $350,000. 12-24

Bridge & Grade Separation...

CONTRACTS AWARDED

California

LOS ANGELES CO.—**Modern Builders Construction Co.,** 2812 American Ave., Long Beach—$124,319, for raising and reconst. Ocean Blvd. bridge across the Los Angeles County flood control channel for Los Angeles River—by Port Manager, Long Beach. 1-11

LOS ANGELES CO.—**Oberg Bros.,** 3914 W. Slauson Ave., Los Angeles—$9,500, for timber struct. over Compton Creek at Imperial Highway—by Board of Public Works, Los Angeles. 1-19

Utah

SALT LAKE CO.—**Gibbons & Reed Co.,** 259 W. 3rd So., Salt Lake City—$132,976 for conc. T-beam overhead and bridge and conc. box culvert on 21st South St., betw. Main St. and Utah ordnance plant—by State Road Commission, Salt Lake City. 1-11

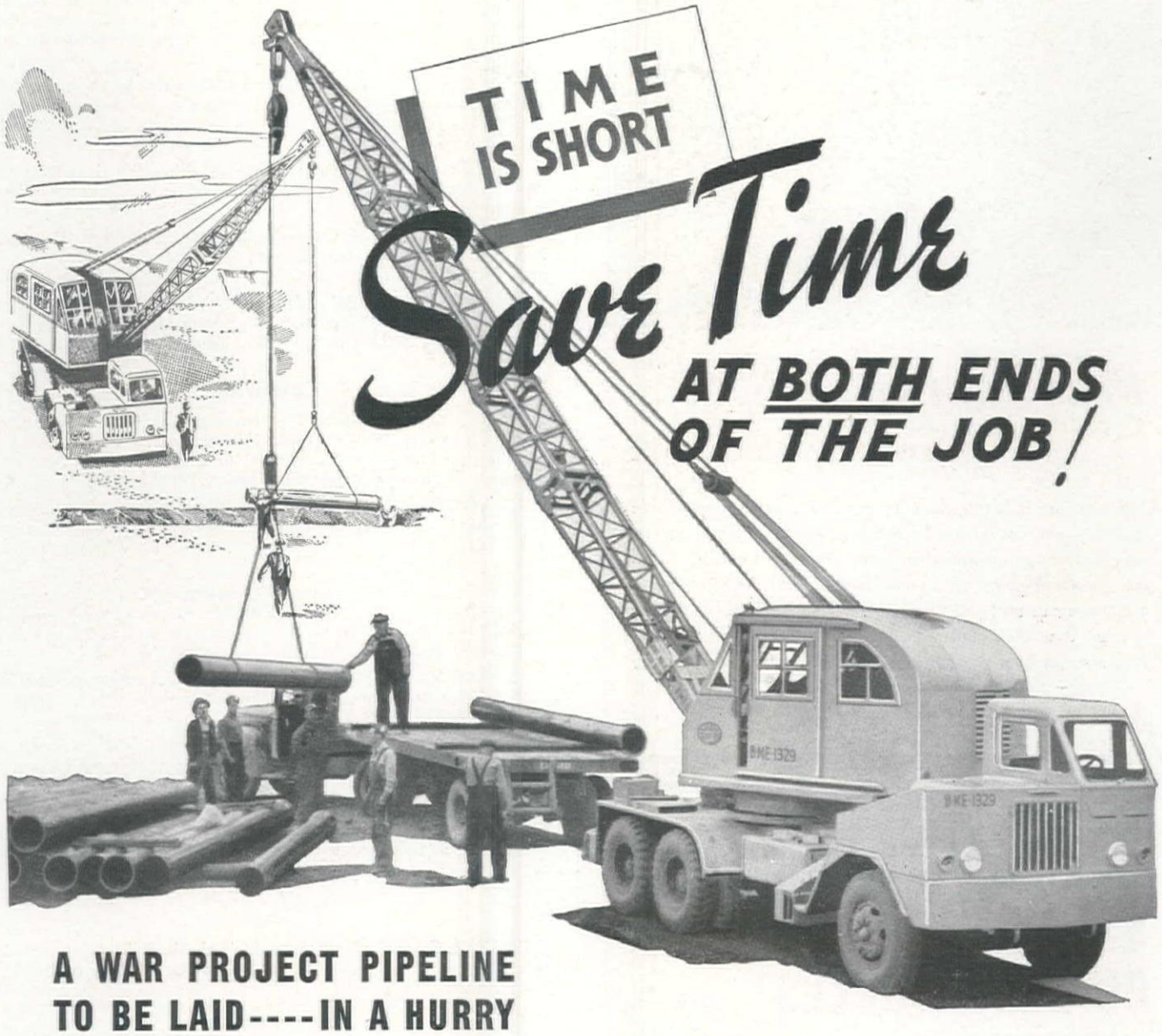
WEBER CO.—**Young & Smith Construction Co.,** 1678 Browning Ave., Salt Lake City—$59,442, for a continuous conc. T-beam overhead struct. betw. Nye's corner and Wilson Lane—by State Road Commission, Salt Lake City. 1-13

Airport . . .

CONTRACTS AWARDED

Arizona

MARICOPA CO.—**Arizona Sand & Rock Co.,** Box 1522, Phoenix—less than $50,000, for parking apron and taxiway at two auxiliary landing fields—by U. S. Engineer Office, Phoenix. 1-6



A WAR PROJECT PIPELINE TO BE LAID----IN A HURRY

MICHIGAN CRANES - - Always "ready and waiting" - - never waited upon. In this scene the Michigan has previously placed into stock pile, from railroad siding, the cast iron pipe now being loaded on to truck for delivery to job site - - but that's only HALF the story! The completely mobile Michigan will "be there" when the truck arrives ready to unload and "set" the pipe in the trench at the field.

One crane serving both ends of the job - - not a minute lost. That's mobility! - - Borchert-Ingersoll Co., Michigan dealers, know construction equipment - - that's why they recommended and placed three Michigan Tandem-Drive Cranes on this vital war project where "time saved" is all important . . . Write for your copy of Bulletin W23 today.

AIR CONTROLLED

MICHIGAN
POWER SHOVEL CO.
BENTON HARBOR, MICHIGAN

MOHAVE CO.—**Morrison-Knudsen Co., Inc.,** and **M. H. Hasler,** 810 Title Guarantee Bldg., Los Angeles, Calif.—over $500,000 for target range facils. at a flexible gunnery school—by U. S. Engineer Office, Los Angeles, Calif. 1-6

PIMA CO. — **Pearson, Dickerson, Oswald & Casson,** Luhrs Bldg., Phoenix—over $100,000, for service apron and taxiways for landing field expansion at an airfield—by U. S. Engineer Office, Phoenix. 1-19

YUMA CO.—**Kolob Construction Co.,** Phoenix—less than $50,000, for parking apron at an airfield—by U. S. Engineer Office, Phoenix. 1-14

YUMA CO.—**Tanner Construction Co.,** Box 1832, Phoenix—less than $50,000, for landing mat at an airfield—by U. S. Engineer Office, Phoenix. 1-14

YUMA CO.—**Clyde W. Wood,** 816 W. 5th St., Los Angeles, Calif.—over $50,000, for parking aprons at an air force flying school—by U. S. Engineer Office, Los Angeles, Calif. 1-7

California

IMPERIAL CO.—**Macco Construction Co.,** 815 N. Paramount Blvd., Clearwater, and **E. S. McKittrick Co.,** 7839 Santa Fe Ave., Huntington Park—over $2,000,000 for a naval air base near Holtville—by Bureau of Yards and Docks, Washington, D. C. 1-12

LOS ANGELES CO.—**Lloyd Wright,** 5215 Biloxi St., North Hollywood—less than $50,000, for taxiways and roads for gasoline distribution system at an airport—by U. S. Engineer Office, Los Angeles. 12-31

RIVERSIDE CO.—**Calowell Construction Co.,** 1835 E. Wardlow Rd., Long Beach—over $50,000, for northwest-southeast runway extension at an air transport command base—by U. S. Engineer Office, Los Angeles. 1-19

SAN BERNARDINO CO.—**Phoenix Construction Co.,** Box 906, Bakersfield—over $100,000, for two auxiliary fields at a twin engine school—by U. S. Engineer Office, San Bernardino. 1-4

SAN LUIS OBISPO CO.—**Hall & Co.,** and M. S. Ross, 615 Security Bank Bldg., Glendale—over $100,000 for runways, taxiways, aprons, etc., at an airport—by U. S. Engineer Office, Los Angeles. 1-16

STANISLAUS CO.—**Radich & Brown,** 3000 Empire Ave., Burbank—$307,000 for aviation facilities at Crows Landing—by Bureau of Yards and Docks, Washington, D. C. 1-9

Colorado

DENVER CO.—**J. B. Bertrand,** 4295 York St., Denver—less than $50,000 for conc. apron extension—by U. S. Engineer Office, Denver. 1-5

Idaho

ELMORE CO.—**Ertz-Burns Co.,** 222 Pittock Block; **Donald M. Drake,** 904 Lewis Bldg.; **Lorenz Bros.,** 603 Title & Trust Bldg.; and **Parker-Schram Co.,** 515 Couch Bldg., all of Portland, Ore.—over $2,000,000, for an air field, bldgs. and appurt. work near Mountain Home—by War Department, Washington, D. C. 1-22

New Mexico

CURRY CO.—**Walter L. Denison,** 207 S. Hermosa Ave., Albuquerque—over $50,000, for dust palliative treatment at an air field—by U. S. Engineer Office, Albuquerque. 1-13

EDDY CO.—**Lee Moor Contracting Co.,** 807 Bassett Tower, El Paso, Tex.—less than $200,000, for resurf. of runways at an air field—by U. S. Engineer Office, Albuquerque. 1-6

Oklahoma

KIOWA CO.—**Texas Bitulithic Co.,** Box 5297, Dallas, Tex.—over $500,000 for paving—by U. S. Engineer Office, Denison, Tex. 1-5

Oregon

COLUMBIA CO.—**Porter W. Yett,** 6500 NE Ainsworth St., Portland—$149,456, for clearing, grading, draining, conditioning, fencing and seeding of the Columbia County airport near Scappoose—by Civil Aeronautics Administration, Seattle, Wash. 1-26

Texas

BELL CO.—**Austin Road Co.,** 1813 Clarence St., Dallas—over $50,000 for conc. apron—by U. S. Engineer Office, San Antonio. 12-24

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ARE IN THE ARMY NOW!

Hercules-built truck bodies are doing their bit to speed Victory. Cargo and Cargo-Dump bodies by Hercules are rolling off our assembly lines and—our Army is "keeping 'em rolling" on many fronts... Busy as we are on war contracts, we're still able to supply Hercules Speedraulic Hoists and Dump Bodies for war-time construction jobs. It's more important than ever now to secure Hercules fast-operating, dependable equipment, built to withstand continuous hard service.

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HERCULES STEEL PRODUCTS CO.

GALION OHIO

LUBBOCK CO.—**Ernest Loyd,** Box 1077, Fort Worth—over $100,000, for flying field facil. at an airfield—by U. S. Engineer Office, Albuquerque, N. M. 1-27

PRESIDIO CO.—**H. B. Zachry Co.,** Box 596, San Antonio—less than $1,000,000, for runway const. at an airfield—by U. S. Engineer Office, Albuquerque, N. M. 1-19

TARRANT CO.—**Texas Bitulithic Co.,** Box 5297, Dallas—over $100,000, for addtl. runway and taxiway—by U. S. Engineer Office, Denison. 1-7

Washington

CLALLAM CO.—**F. E. Wilder,** Rt. 2, Olympia—over $100,000, for grading and surf.—by U. S. Engineer Office, Seattle. 1-4

THURSTON CO.—**C. H. Wheeler,** 612 Pittock Block, Portland, Ore.—over $100,000, for grading and surf. of runway extensions, taxiways and hardstandings—by U. S. Engineer Office, Seattle. 1-11

PROPOSED PROJECTS

California

FRESNO CO.—The War Department has announced authorization of an air force instal., to cost over $2,000,000. 1-6

Oklahoma

POTTAWATOMIE CO.—The Bureau of Yards and Docks, Washington, D. C., has authorized construction of a naval air base, estimated to cost $3,000,000. 1-16

Water Supply . . .

CONTRACTS AWARDED

Arizona

PIMA CO.—**Tiffany Construction Co.,** Box 846, Phoenix—less than $50,000, for addt. to water and sewer systems at a gunnery base—by U. S. Engineer Office, Phoenix. 1-4

PINAL CO.—**Roscoe Moss Co.,** 4360 Worth Ave., Los Angeles, Calif.—less than $50,000, for drilling a water well at a fixed gunnery sub-post—by U. S. Engineer Office, Phoenix. 1-19

California

ALAMEDA CO.—**E. T. Haas Co.,** 305 Merchants Exchange Bldg., San Francisco—$11,538, for cleaning and lining 6x8-in. water mains—by East Bay Municipal Utility District, Oakland. 1-28

KERN CO.—**Edward R. Siple Co.,** 2545 San Fernando Rd., Los Angeles—less than $50,000, for an add. to water supply system at a bombing range—by U. S. Engineer Office, San Bernardino. 1-13

LOS ANGELES CO.—**Leko & Bosnyak,** 3014 Worthen Ave., Los Angeles—$11,989, for water line extensions in Lynwood—by Federal Works Agency, Los Angeles. 12-31

RIVERSIDE CO.—**Edward Goral & Arthur Roeder,** 416 W. 8th St., Los Angeles—over $100,000, for water distribution and sewage collection systems for addtl. anti-aircraft battalions at a camp—by U. S. Engineer Office, Los Angeles. 1-4

SAN DIEGO CO.—**Edward Rohde,** 506 W. Date St., San Diego—less than $50,000, for water and sewer system at a factory training school—by U. S. Engineer Office, San Diego. 1-5

SAN DIEGO CO.—**Fred W. Weber,** 540 W. 3rd St., Downey—$93,278, for Embarcadero pipe line water system at San Diego—by Federal Works Agency, Los Angeles. 1-5

Texas

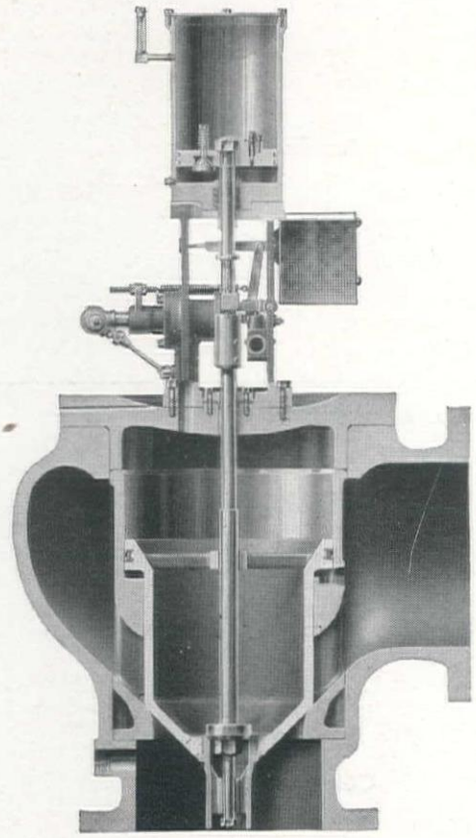
COLLIN CO.—**Creech Construction Co.,** University City, Mo.—over $100,000, for water storage and pumping facil. and a sewage treatment plant—by U. S. Engineer Office, Denison. 1-6

GRAY CO.—**Kelly Well Co.,** Oklahoma City, Okla.—less than $50,000, for drilling a well—by U. S. Engineer Office, Tulsa, Okla. 1-18

Washington

KITSAP CO.—**L. Coluccio,** 512 21st Ave., S., Seattle—less than $50,000 for water system and sanitary sewers—by U. S. Engineer Office, Seattle. 1-8

What is the PELTON SURGE SUPPRESSOR ?



It is used near the pump in water-pumping lines and it opens automatically if the pumping power goes off or when line pressures develop from other causes.

Thus the dangerous back surge of water, which causes line ruptures, is discharged and the line protected. Then the Pelton Surge Suppressor slowly and automatically closes.

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BIDS WILL BE RECEIVED until Feb. 26, by the Purchaser of supplies, City Hall, San Francisco, for the purchase of the Corral Hollow pipe line and accessories. Items for sale include 15 mi. of steel pipe in 36, 40 and 44-in. dia., transformers, motors and pumps. Have been installed but not used.

MASON CO.—**Thorburn & Logozo,** 4608 36th Ave., SW, Seattle—less than $50,000, for water supply and sewer systems at a military site—by U. S. Engineer Office, Seattle. 1-6

PIERCE CO.—**Roscoe Moss Co.,** 4360 Worth St., Los Angeles, Calif.—less than $50,000, for drilling and testing a well—by U. S. Engineer Office, Seattle. 1-4

SKAGIT CO.—**C. D. Marks & Son,** Snohomish—less than $50,000, for drilling a well at a military site—by U. S. Engineer Office, Seattle. 1-27

SPOKANE CO.—**Anderson Building Co.,** E. 4409 Sprague Ave., Spokane—over $50,000, for reservoir and pumphouse for water supply system at a military site—by U. S. Engineer Office, Seattle. 1-20

SPOKANE CO.—**Roy L. Bair,** 1220 Ide Ave., Spokane—less than $50,000 for a water supply system at a military site—by U. S. Engineer Office, Seattle. 1-6

SPOKANE CO.—**Oliver F. Zinkgraf,** Spokane—$6,891 for drilling a well at Baxter general hospital—by City Council, Spokane. 1-11

Canada

ALBERTA—**Poole Construction Co., Ltd.,** 218 Tegler Bldg., Edmonton—$23,000, for a water supply system and sewage disposal plant at the bombing and gunnery school at Lethbridge—by Department of Munitions and Supply, Ottawa.

Sewerage . . .

CONTRACTS AWARDED

Arizona

MARICOPA CO.— **Vinson & Pringle,** Box 930, Phoenix—over $50,000, for sanitary sewer system and adds. to water distribution system and appurt. facil. at a park—by U. S. Engineer Office, Phoenix. 1-20

PIMA CO.—**M. M. Sundt Construction Co.,** 440 S. Park Ave., Tucson—$131,865, for sewerage works addn. in Tucson—by City Council, Tucson. 1-28

PIMA CO.—**M. M. Sundt Construction Co.,** 440 S. Park Ave., Tucson—less than $50,000, for supplementary sewer and appurt. facil. at an airfield—by U. S. Engineer Office, Phoenix. 1-19

California

CONTRA COSTA CO.—**A. E. Downer,** 1429 N. Baker St., and **R. Goold,** 309 E. Weber St., Stockton—$42,585, for vitrified sewers in San Pablo—by San Pablo Sanitary District. 12-30

CONTRA COSTA CO.—**A. E. Downer,** 1429 N. Baker St., and **R. Goold,** 309 E. Weber St., Stockton—$84,815, for vitrified sewers in San Pablo—by San Pablo Sanitary District. 12-30

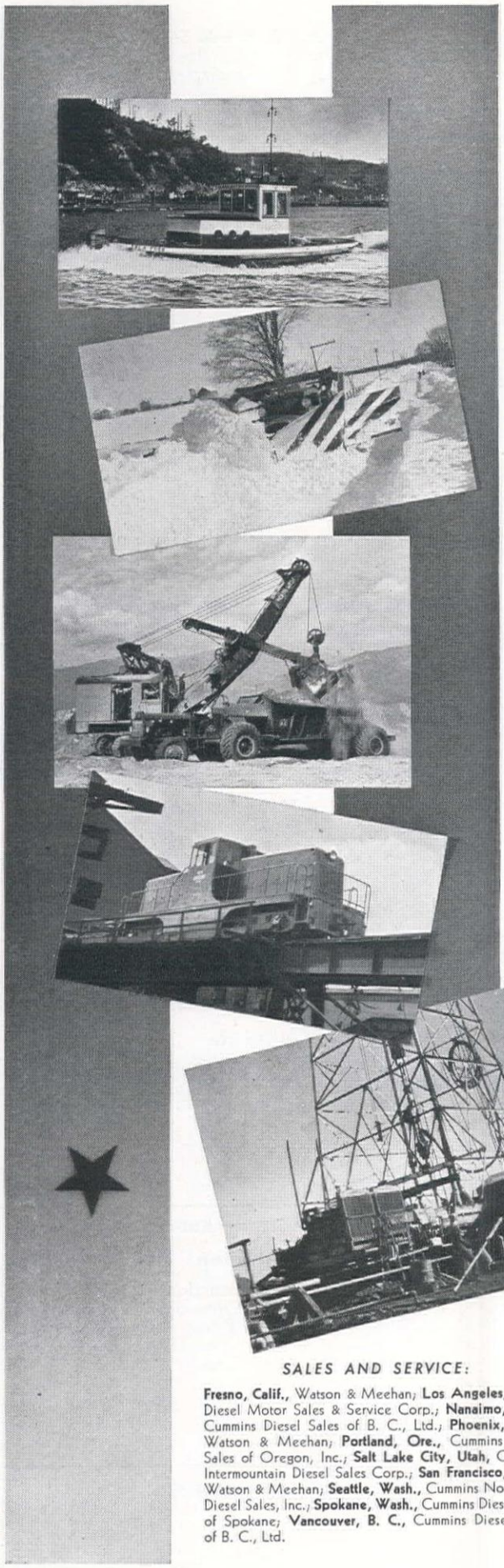
KERN CO.—**P. & J. Artukovich,** 3834½ W. Slauson Ave., Los Angeles—over $50,000, for a sewage disposal system at an army air base—by U. S. Engineer Office, San Bernardino. 1-21

LOS ANGELES CO.—**Joy P. Harper, Robt. E. Franklin** and **Victor F. DeBrouwer,** 1301 Electric Ave., Seal Beach—$68,250 for a portion of the Palo Verde Ave.-Clark Ave. line of the Los Cerritos drainage system near Long Beach—by Board of Supervisors, Los Angeles. 1-4

LOS ANGELES CO.—**Oberg Bros.,** 3914 W. Slauson Ave., Los Angeles—$60,500, for a reinf. conc. blanket along the north outfall sewer in Cabora Dr., betw. Hastings and Falmouth Avenues—by Board of Public Works, Los Angeles. 1-28

LOS ANGELES CO.—**Oswald Bros.,** 366 E. 58th St., Los Angeles—over $50,000, for repairs to drainage channels at an airport—by U. S. Engineer Office, Los Angeles. 1-20

LOS ANGELES CO.—**Werner & Webb,** 1116 N. Mansfield



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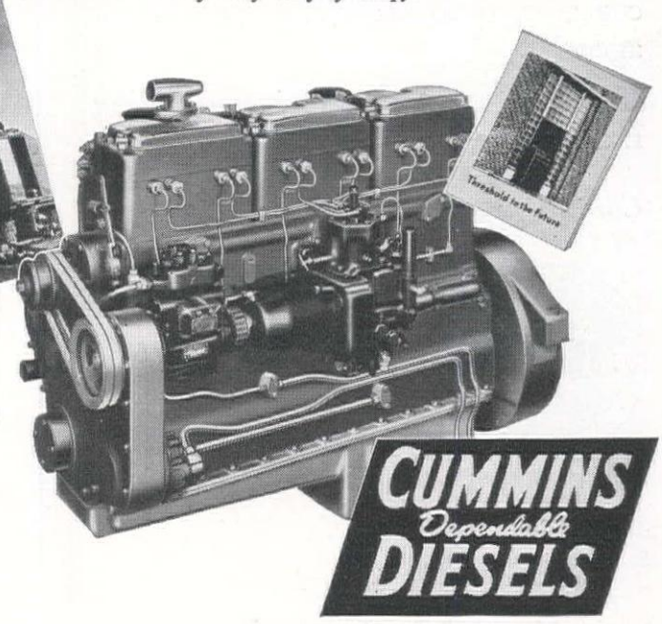
Tough

The first Cummins high-speed Diesel was offered to the public in 1932. From that day to this, the Cummins Diesel has never asked for the easy jobs . . . but has consistently proved itself in the face of the longest odds . . . on the toughest, the longest and the hardest pulls . . . on the jobs which demand the delivery of an engine's full rated horsepower day after day.

Now, after a decade of conditioning, the Cummins Diesel is ready for action—*is in action*—on every front in this global war. Its quick starting has been tested in the sub-zero arctic cold. Its cool running has been demonstrated in flaming desert heat. Its simple, easy service and maintenance has been proved in the world's most inaccessible, out-of-the-way places.

In short, the Cummins Diesel has proved its ability to uphold the highest American tradition . . . to do its best job when the going is toughest. CUMMINS ENGINE COMPANY, Columbus, Indiana.

Out of the experiences of owners during the past 10 years—plus new tests which the engine is meeting daily—a newer and better Cummins Diesel is now building . . . one which will do your job at a lower cost, for a longer time, with fewer parts replacements and service requirements. When all-over economy again becomes the yardstick of value, this new Cummins Diesel will be your first choice. The new booklet, "Threshold to the Future" will tell you why. Ask for your copy.



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DIESELS

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Ave., Los Angeles—$27,290 for the fifth section of the Lockheed storm drain in Burbank—by Federal Works Agency, Los Angeles. 1-16

RIVERSIDE CO.—**Burch & Bebek,** 5649 Cerritos St., Long Beach—over $100,000, for sewage disposal plant and outfall sewer with appurt. facil. at an anti-aircraft camp—by U. S. Engineer Office, Riverside. 1-11

SAN BERNARDINO CO.—**Frank Mogle,** 370 Central Ave., Chino—$30,000 for sewage disposal plant and sewer line at Twentynine Palms—by Twentynine Palms Flight Academy, Twentynine Palms. 1-29

SAN DIEGO—**Contracting Engineers Co.,** 2310½ W. Vernon Ave., Los Angeles—less than $50,000 for sewage disposal facils. —by U. S. Engineer Office, Los Angeles. 12-30

SAN DIEGO CO.—**M. F. Kemper Construction Co.,** 3704 Clarington Ave., Los Angeles—$88,566, for sewage pumping plant and discharge line in National City—by Federal Works Agency, Los Angeles. 1-21

SAN DIEGO CO.—**H. H. Peterson,** 3340 Harrasthy St., San Diego—less than $50,000, for a sewer line—by U. S. Engineer Office, San Diego. 1-4

SANTA CLARA CO.—**A. Contardo,** 466 N. Santa Cruz Ave., Los Gatos—$2,350, for 231 lin. ft. of 24-in. conc. pipe storm sewer on N. Santa Cruz Ave. betw. Olive Ave. and Ashler Ave., Los Gatos—by City Council, Los Gatos. 1-26

Texas

CAMERON CO.—**Dodd & Wedegartner,** San Benito—less than $50,000 for a storm sewer and appurt. struct.—by U. S. Engineer Office, San Antonio. 1-1

WICHITA CO.—**Reid-Naylor,** Wichita Falls—over $50,000, for an additional sewage treatment plant—by U. S. Engineer Office, Denison. 1-5

PROPOSED PROJECTS

California

ORANGE CO.—Joint Outfall Sewer Dist. of Orange Co. has approved plans to double capacity of sewage treatment plant, cost to be about $200,000. 1-4

Nevada

WHITE PINE CO.—No bids were received by County Clerk, Ely, for installing a septic tank and appurt. work at the Ely airport. 1-8

Waterway Improvement . . .

CONTRACTS AWARDED

California

SAN BERNARDINO CO.—**George Herz & Co.,** Box 191, San Bernardino—less than $50,000, for channel improvement at an air depot—by United States Engineer Office, San Bernardino. 1-5

Dam . . .

CONTRACTS AWARDED

Washington

WHATCOM CO.—**General Construction Co.,** 3840 Iowa St., Seattle; **J. F. Shea Co., Inc.,** 617 S. Olive St., Los Angeles, Calif.; and **Morrison-Knudsen Co., Inc.,** Boise, Idaho—$7,144,922, for second step of the conc. arch dam (Ross Dam) across the Skagit River—by Board of Public Works, Seattle. 2-2

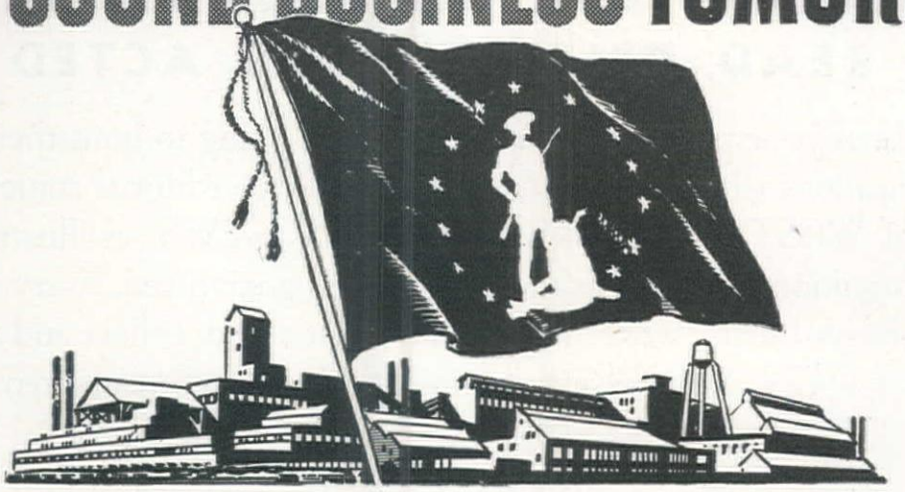
Irrigation . . .

CONTRACTS AWARDED

California

MERCED CO.—**McMillen & Norseen,** 427 Mill St., Turlock—$5,276, for conc. piping in the Palmquist ditch near Hilmar—by Turlock Irrigation District, Turlock. 1-4

FOR VICTORY TODAY AND SOUND BUSINESS TOMORROW



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We are pleased at the recognition of WCN by the Hon. Carl A. Hatch in bringing Mr. Nicholson's article to the attention of the Senate in connection with post-war planning for the West. It is gratifying to know, too, that the editorial prestige of WCN can attract such a well informed writer and authority as Mr. Rex L. Nicholson, Regional Director of the Federal Works Agency. Over 2,000 reprints of Mr. Nicholson's article were ordered for distribution to planning groups all over the country.

In the same big January post-war planning issue, another feature article—Express Highway Plans—by Lynn Atkinson, prominent Los Angeles contractor, attracted considerable attention, particularly among contractors. Over one thousand reprints of this article were ordered for distribution among western contractors.

Letters of praise for the January issue of WESTERN CONSTRUCTION NEWS were received from the following sources:

C. A. BOTTOLFSEN
Governor, State of Idaho

J. C. PLANKINTON
Ass't General Manager, Northwestern Electric Co.

ARTHUR B. LANGLIE
Governor, State of Washington

E. P. CARVILLE
Governor, State of Nevada

RICHARD J. WELCH
House of Representatives, Washington, D. C.

EARL SNELL
Governor, State of Oregon

JOHN J. DEMPSEY
Governor, State of New Mexico

A. P. DEAN
Ass't Regional Forestration, U. S. Dept. of Agriculture

DOUGLAS D. STONE
Chairman, San Francisco City Planning Commission

ELBERT D. THOMAS
United States Senate

The Post-War Planning Committees of Many Western cities and counties

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WESTERN CONSTRUCTION NEWS

"The Magazine With Outstanding Editorial Prestige"

Russian winter, to hasten H... to his Waterloo. And with the Arctic Ci... the polar bear, and now intuitive Hitler has two bears by the tail, neither of which he can let go. To further complicate conditions, the intuitive Hitler got to Moscow and to Stalingrad too soon, to Toulon too late. Divided ...tler is freezing on one side and burning ... other, though the latitude of Bristol ...ough Toulon. Bristol's elevation is ...oulon, sea level. The bitterest ... must admit he was a better p... aval. Cordell Hull, when asked a... d yesterday: "Political questions ... after the war."

General Ei... often said that Darlan has grea... Allied cause, and I say today th... and less talk will save the lives of ... n boys.

AXIS DUMFOUNDED BY ... FRICA

To Hitler's everlasting ... ident Roosevelt, the greatest apo... in nearly 2,000 years, and Cordell ... of State, the greatest diplomat ... for peace and plenty, have put on... main, the most brilliant and success... history of military strategy, that dum... ed the Axis hordes. It inspired a b... cartoonist to sketch old Hitler as a tu... gobbler, running like Rommel, losing ... tail feathers, gobbling all the while and ga... bling gobble into glorious Goebbels—German ... propaganda. Yet the doomed Germans already madly rushed to Toulon to seize the great French fleet. Methinks the spirit of the immortal Lafayette hovered over that fleet while the brave officers and seamen scuttled their ships and went to the bottom of the sea that their beloved France might be free again and restored to its proud place in the galaxy of nations.

I said in the beginning that revolution, famine, and disease would follow in the wake of Hitler to his destruction. Free France has revolted and is fighting side by side with the Allies. The Finns are proposing to mak... peace with Russia. The Mussolini kids ... ning with Rommel are flagging their few re... maining unstained white shirttails as a token ... of peace to Montgomery. The desert fox, Rommel, is running to Alamein to change from a desert fox to a swamp rat. When the Russians, the best fighters in the world except our American boys, get through with chasing the Germans into traps and exterminating them there will not be left enough German soldiers to shoot innocent people and keep down revolution in the conquered countries.

Kaltenborn said last night: "Italy is tot...ering"; Earl Godwin characterized Mus...olini's attempt to answer Churchill: "It ...as the boastful performance of a fan-tailed ...eon."

Mussolini, the vulture, never got a chance ...woop down from the crags of the Alps into ...aps of the lowland to feast upon the dead ...s of brave soldiers.

...TLER NEAR SUICIDE OR ASSASSINATION

...er is nearing suicide or assassination ...hen he is gone and our boys put cold ... his deluded followers they will squeal ...ck pigs and stop like steers in the ...f the road.

...Allies knew how much fight there is ...e I would be a welcome recruit on ... But perhaps I am fighting where ...he most good—fighting in the field ... food for our boys on the battle ...annot fight on empty stomachs.

... it is essential to buy bonds and ...ney to sustain the soldiers at ...lx months since I wired the Sec... Treasury: "Sell offense bonds ...rifice to buy more bonds." He ...anked me for the suggestion ... that a new name was being ... came as Victory bonds, now ... I am putting every dollar I ...co, cattle, and corn, sacrificing real estate, selling it at half its value ... more Victory Offense bonds to ... fice—for if we do not buy bonds and more bonds until it hurts, Hitler will win, confiscate our wealth, and make us galley slaves.

HOMES PLANNED FOR HOMELESS SOLDIERS

Hitler scoffs at our plutocracy while at the end of his rainbow is American gold at Fort Knox, Ky. If Hitler wins, our lands and homes would go to German bastards. I said in the beginning if 95 percent of our boys owned homes we would have no saboteur, no fifth column, no Pearl Harbor.

Judge Caldwell and I are planning for homes after the war for the homeless who at the front are fighting for our homes and especially for the widows and orphans of the homeless who bore the battle and returned not but sleep in foreign fields. Our means are limited, and we must ask help from patriotic friends. We may not be able to make it more than homes for the widows and the orphans of those who return not. On this ... we will be heard from again. It is close to ...ur hearts. Don't consider me a plagiarist, ... Solomon said 1,500 years before Shake...re, "There is nothing new under the sun." ...en I cry out, "Fight the devil with fire—...ile the iron is hot—hit Hitler as he ...on't tell me Hitler has pledged the ...en to not flee Germany like the ... I tell you he is stark naked with ...go. Don't tell me Rommel can ...omery. For answer I say, Mont... ...ase Rommel into the swamps ... name from desert fox to ...t me not with the boasting ...uddy, old Mussolini, sick ...ilure, while his kids are ...their damnedest to keep ...

Don't ... fate... ...r my grandson ... Pacific ... summer, ... mothers ... Virginia and ... Guadalcanal, ... harbor green in ... go and get the ... ting is good, destroy them ... n sea, that they may disturb a Chris... rld no more forever.

Post-War Planning for the West

EXTENSION OF REMARKS

OF

HON. CARL A. HATCH

OF NEW MEXICO

IN THE SENATE OF THE UNITED STATES

Monday, January 18, 1943

Mr. HATCH. Mr. President, the January issue of the Western Construction News contains a thought-provoking article on post-war planning for the West. It was written by Rex Nicholson, regional director of the Federal Works Agency for 11 Western States and the Territories of Alaska and Hawaii. Service in this capacity and in other important Government posts has given Mr. Nicholson a keen insight into the future needs of the West.

I concur in his thought that the foundation of sound planning for the western region should be built around conservation and development of our natural resources. I ask that the article be included in the Appendix of the RECORD in order that my colleagues from the West... ...dd others may have the bene... ...of the views expressed by this able administrator.

I have obtained from the Public Printer an estimate of the cost of printing this article. The estimated cost is $120.

There being no objection, the article was ordered to be printed in the RECORD, as follows:

After the war, which is it to be—a good job at good wages on important work or relief? Our men in the fighting forces are asking that question. It is up to us to find the answer.

Much has been said recently about post-war planning. There are many different opinions as to what should be done. There are those who believe the post-war problem should be forgotten until the war has been won. They feel that every ounce of energy available will be needed for the job at hand and that when the war is over the demand for consumer goods and materials for the rehabilitation of the war-devastated regions will tax our productive power to the limit and utilize our surplus manpower for several years to come. Another school of thought recommends the immediate initiation of a large-scale program of Nation-wide planning, not only as a solution for the post-war problem but also as the only way of obtaining a stabilized economy in a changing world. James J. Hill, the great railroad builder, once said the only way to succeed in the field of construction and development is to first plan the work and then work the plan. Anyone who has ever been responsible for large scale operations on any front knows how absolutely right he was. The past several years have taught us many lessons that will not soon be forgotten. One of the most important of these is that a stable economy does not just happen any more. I believe the second school of thought is the right one.

Other nations of the world which have been torn to pieces by the war will have to be rebuilt and a large portion of the raw materials for their rehabilitation will have to come from the Americas.

There will also be a considerable upturn in production for consumer markets here at home because of the inability to buy in wartime those goods and services which have come to be regarded as essential to normal, everyday life. Our automobile will either be worn out or will have become obsolete; we will need a new radio, a new range, and a new refrigerator. Furniture will need to be replaced, and the rugs will be badly frayed. A thousand other replacements will be made by those who have the purchasing power.

But let us take a look at the picture from an over-all standpoint. The adjustment to be made this time in changing from a wartime to a peacetime economy will transcend anything we have ever experienced in the past. It is estimated that our armed forces will require from seven to nine million men, and at least 25,000,000 workers will be exclusively engaged in actual war production at the height of the war effort. Six months after the actual fighting ceases 75 to 80 percent of the war plants will close. Some of them will immediately start to retool for peacetime production. But this will require from 6 to 12 months during which time they will be entirely inactive from a production standpoint. It is hoped that at least 50 percent of the armed forces can return home during the first year after the war has ended. It is this period of transition about which we need to be vitally concerned. There will be definite need for a large cushion of public works to provide jobs and sustain the purchasing power of the people until the peacetime industrial upswing can get under way, for it has been estimated that the jobs of from

STANISLAUS CO.—**Lloyd W. Terrell,** 221 9th Ave., Turlock —$7,470, for 51,500 sq. ft. conc. lining and 660 lin. ft. 36-in. conc. piping in the Pellicia ditch—by Turlock Irrigation District, Turlock. 1-21

Building . . .

CONTRACTS AWARDED

Arizona

COCHISE CO.—**Elder R. Morgan Co.,** Copper Queen Hotel, Bisbee—$240,874 for 90 dormitory apartments and 60 temporary housing units at Douglas—by Douglas Housing Authority. 1-16

COCONINO CO.—**Bailey & McCoy,** 1130 Lowell Ave., Tucson —over $100,000, for civilian war housing and util. at a depot—by U. S. Engineer Office, Albuquerque, N. M. 1-4

MARICOPA CO.—**Tifal, King & McKee,** 2880 El Cajon Ave., San Diego, Calif.—over $50,000, for buildings at a gunnery base —by U. S. Engineer Office, Phoenix. 1-22

MOHAVE CO.—**Edward L. Thornburg,** 8941 Santa Monica Blvd., Los Angeles, Calif.—over $100,000, for buildings for an auxiliary operating base—by U. S. Engineer Office, Los Angeles, Calif. 1-4

PIMA CO.—**Tifal, King & McKee,** 2880 El Cajon Ave., San Diego, Calif.—over $50,000, for addtl. buildings and appurt. facil. at a gunnery base—by U. S. Engineer Office, Phoenix. 1-19

California

ALAMEDA CO.—**Charles E. Daly,** 366 Monticello St., San Francisco—$60,000 for 20 5-rm. dwellings on Billings Blvd., San Leandro—by self. 12-24

ALAMEDA CO.—**Robert McCarthy Co.,** 1050 Kirkham St., San Francisco—$966,650, for 500 temporary dwellings in Alameda—by Housing Authority, Alameda. 1-18

ALAMEDA CO.—**Seward J. Pearson,** 108 Arlington St., Berkeley—$162,000 for 54 5-rm. houses on Billings Blvd., San Leandro

—by Standard Homes, Inc., San Leandro. 12-24

ALAMEDA CO.—**F. C. Stolte,** 1405 San Antonio Ave., Alameda—$1,332,668, for 760 war housing units on Pacific Ave., south of Alameda Belt L. R.R.—by Housing Authority, Alameda. 1-7

ALAMEDA CO.—**F. C. Stolte,** 1405 San Antonio Ave., Alameda—$2,447,899, for 1,240 war apts. south of Bethlehem Shipyard—by Housing Authority, Alameda. 1-7

ALAMEDA CO.—**C. M. Teigland,** 773 University Ave., Berkeley—$645,220, for 384 war apts. to be located at 18th and Willow Sts., Oakland—by Housing Authority. 1-8

CONTRA COSTA CO.—**Heyman Bros.,** 564 Market St., San Francisco—$518,500 for necessary bldgs. and facilities at El Portal trailer park, a 1,500-trailer camp at San Pablo—by Contra Costa County Housing Authority, Martinez. 1-19

CONTRA COSTA CO.—**Heyman Bros.,** 564 Market St., San Francisco—$162,848, for temporary grammar school bldgs. at Nystrom school, Richmond—by U. S. Maritime Commission, Oakland. 1-8

CONTRA COSTA CO.—**Oliver M. Rousseau,** 321 Kearny St., San Franicsco—$2,131,613, for 1,200 war apts. on Cutting Blvd. in Atcheson Village, Richmond—by Housing Authority, Richmond. 1-14

CONTRA COSTA CO.—**Standard Building Co.,** 1500 Judah St., San Francisco—$854,058 for 524 dwelling units north of Camp Stoneman, Pittsburg—by Contra Costa County Housing Authority, Martinez. 1-12

FRESNO CO.—**Meyer Construction Co.,** 735 Portola Dr., San Francisco—$800,000 (approx.) for buildings—by U. S. Engineer Office, Sacramento. 1-2

INYO CO. (& MINERAL CO., NEVADA)—**Wm. P. Neil Co., Ltd.,** 4814 Loma Vista Ave., Los Angeles—$1,049,446, for temporary housing units on the following projects: Pine Creek Canyon, Calif., 130 units; Bishop, Calif., 46 units; Toiyabe, Gabbs Valley, Nevada, 214 units; Luning, Nevada, 30 units—by Federal Housing Authority, San Francisco. 1-19

LOS ANGELES CO.—**Case Construction Co.,** Berth 109, San Pedro—over $50,000 for barracks—by U. S. Engineer Office,

Los Angeles. 1-6

LOS ANGELES CO.—**Weymouth Crowell Co.,** 2104 E. 15th St., Los Angeles—$30,680, for machine shop bldgs. on Lagoon Ave., Wilmington—by Department of Water & Power, Los Angeles. 1-26

LOS ANGELES CO.—**Myers Bros.,** 3407 San Fernando Rd., Los Angeles—$100,000, for extension of a forge press plant—by Earl M. Jorgenson Co., Los Angeles. 1-9

LOS ANGELES CO.—**Wm. P. Neil Co.,** 4814 Loma Vista Ave., Los Angeles—$47,300 for rebuilding fire-damaged warehouse in Central Manufacturing District, Los Angeles—by State Wholesale Groceries, Los Angeles. 1-27

LOS ANGELES CO.—**Pozzo Construction Co.,** 2403 Riverside Dr., Los Angeles—$370,000, for 100-bed hospital, reinf. conc. struc. for Catholic Sisters of Providence, in Burbank—by Roman Catholic Archbishop, Los Angeles. 1-26

LOS ANGELES CO.—**O. J. Senum,** 2646 29th St., Santa Monica—$250,000, for an aircraft factory extension—by Douglas Aircraft Co., Santa Monica. 1-22

LOS ANGELES CO.—**Sierra Construction Co.,** 25 Allen St., Pasadena—over $100,000, for new bldgs. and alterations to existing bldgs. at an ordnance training center—by U. S. Engineer Office, Los Angeles. 1-5

LOS ANGELES CO.—**Sierra Construction Co.,** 25 Allen St., Pasadena—over $100,000, for shops aand cold storage facil. at an ordnance training center—by U. S. Engineer Office, Los Angeles. 1-28

LOS ANGELES CO.—**John H. Simpson Co.,** 516 S. Raymond Ave., Pasadena—over $100,000, for automotive and artillery shops (steel bldgs.) at an ordnance training center—by U. S. Engineer Office, Los Angeles. 1-20

MARIN CO.—**Leo Epp,** 4745 Geary St., San Francisco—$244,877, for 125 housing units, to be located on a 12-acre site south of Hamilton Field and east of Highway 101—by Housing Authority, San Rafael. 1-18

MARIN CO.—**Leibert-Caletti Co.,** 319 Albert Bldg., San Rafael—$250,000 (approx.), for 120 war housing units on the road to Tiburon (Old Reid Ranch)—by Marin Co. Housing Authority, San Rafael. 1-20

MONTEREY CO.—**Howson Bros.,** Gilroy—over $50,000, for hospital extension—by U. S. Engineer Office, San Francisco. 1-19

SAN BERNARDINO CO.—**J & B Construction Co.,** 5572 Valley Blvd., Los Angeles—over $100,000, for hospital bldgs. at an anti-aircraft range—by U. S. Engineer Office, San Bernardino. 1-8

SAN BERNARDINO CO.—**R. V. Mead,** 633 S. La Brea Ave., Los Angeles—over $100,000, for supply bldgs. at an air depot—by U. S. Engineer Office, San Bernardino. 1-7

SAN BERNARDINO CO.—**J. O. Oltmans & Son,** 810 E. 18th St., Los Angeles—over $100,000, for a radio repair bldg. at an air depot—by U. S. Engineer Office, San Bernardino. 1-7

SAN DIEGO CO.—**Wm. C. Crowell Co.,** 495 S. Arroyo Parkway, Pasadena—$130,000 (approx.), for a 50-unit temporary housing project in Fallbrook—by Federal Housing Authority, Los Angeles. 1-21

SAN DIEGO CO.—**Glenn A. Doughty Co.,** 8063 Beverly Blvd., Los Angeles—$538,159, for 304 temporary dwelling units at San Diego—by Federal Public Housing Authority, San Francisco. 1-25

SAN DIEGO CO.—**Glenn A. Doughty Co.,** 8063 Beverly Blvd., Los Angeles—$530,203, for 296 temporary dwelling units at San Diego—by Federal Public Housing Authority, San Francisco. 1-25

SAN DIEGO CO.—**Jackson Bros.-Le Sage,** 547 S. Fairfax Ave., Los Angeles—over $500,000, for addtl. housing and veterinary hospital facil. at a camp—by U. S. Engineer Office, Los Angeles. 1-11

SAN DIEGO CO.—**Nordin Construction Co.,** 3030 Exposition Blvd., Los Angeles—over $100,000, for a 297-bed expansion to a hospital at a camp—by U. S. Engineer Office, Los Angeles. 1-15

SAN FRANCISCO CO.—**Chas. Stockholm & Sons,** 447 Sutter St., San Francisco—$45,000 for remodelling an 8-story bldg. into

soldier service center—by Pepsi-Cola Co., Long Island City, N. Y. 1-28

SAN JOAQUIN CO.—**Thomas C. Buck,** 315 E. Weber Ave., Stockton—$500,000 (approx.), for 200 family housing units in Wainwright Village, east of Tracy—by San Joaquin County Housing Authority, Stockton. 1-14

SAN JOAQUIN CO.—**J. S. Metzger & Son,** 3045 Gilroy St., Los Angeles—$228,220, for struct. and facilities at Vernalis rubber farm labor camp—by U. S. Department of Agriculture, Los Angeles. 1-13

SAN MATEO CO.—**C. H. Bessett Building Co.,** 826 Walnut Ave., Burlingame—$250,000 (approx.), for add. to cadet school, barracks for 200 men and officers and other bldgs. at Coyote Point—by U. S. Merchant Marine Cadet School, Coyote Point. 1-25

SOLANO CO.—**J. B. Brennan** and **E. W. McGah,** 1121 Washington St., Oakland—over $1,000,000 for 400 war apartment units at Francesco Terrace housing project in Benicia—by Housing Authority, Benicia. 1-5

SOLANO CO.—**A. R. Liner,** Box 43, Merced—$77,176, for additions to county hospital at Fairfield—by Board of Supervisors, Fairfield. 1-5

STANISLAUS CO.—**Cahill Bros.,** 206 Sansome St., San Francisco—$406,000 for 150 family type dwellings and a community bldg. in Riverbank—by Federal Public Housing Authority, San Francisco. 1-14

STANISLAUS CO.—**J. S. Metzger & Son,** 3045 Gilroy St., Los Angeles—$156,162, for structures and facilities at Patterson rubber farm labor camp—by U. S. Department of Agriculture, Los Angeles. 1-13

STANISLAUS CO.—**J. S. Metzger & Son,** 3045 Gilroy St., Los Angeles—$67,820, for struc. and facilities at Rogers Road rubber farm labor camp, near Patterson—by U. S. Department of Agriculture, Los Angeles. 1-13

Colorado

DENVER CO.—**Newstrom-Davis & Co.,** 2000 W. 8th Ave., Denver—over $50,000 for parachute bldg., engine repair bldg. and other bldgs.—by U. S. Engineer Office, Denver. 1-6

MONTROSE CO.—**R. E. Wear,** Montrose—$213,484, for a housing project at Uravan—by Federal Public Housing Authority, Kansas City, Mo. 1-6

MONTROSE CO.—**R. E. Wear,** Montrose—$177,875, for a housing project at Naturita—by Federal Public Housing Authority, Kansas City, Mo. 1-5

Idaho

BANNOCK CO.—**J. W. Brennan,** Box 507, Pocatello—over $100,000, for bldgs. and appurtenances—by U. S. Engineer Office, Portland, Ore. 1-5

BANNOCK CO.—**Morrison-Knudsen Co., Inc.,** Boise—$423,750, for 170 housing units and community bldg. at Pocatello—by Federal Housing Authority, Seattle, Wash. 1-28

Montana

CASCADE CO.—**Dudley-Anderson Co.,** Great Falls—$306,254, for 100 family type dwellings in Great Falls—by Housing Authority, Great Falls. 12-22

DEER LODGE CO. — **Cahill-Mooney Construction Co.,** 220 E. Front St., Butte —for a 50-bldg. housing project in Anaconda, containing 3, 4 and 5-room apartments—by Federal Public Housing Authority, Seattle, Wash. 1-19

Nevada

CLARK CO.—**O. J. Shearer,** Las Vegas —$697,034, for 300 single dwelling units near the Basic Magnesium plant at Las Vegas—by Federal Public Housing Authority, San Francisco, Calif. 1-12

CLARK CO.—**Steed Brothers,** 714 Date St., Alhambra, Calif.—less than $50,000, for motor repair shop—by U. S. Engineer Office, San Bernardino, Calif. 1-13

MINERAL CO. (& INYO CO, CALIF.) **Wm. P. Neil Co., Ltd.,** 4814 Loma Vista Ave., Los Angeles, Calif.—$1,049,446, for temporary housing units on the following projects: Pine Creek Canyon, Calif., 130 units; Bishop, Calif., 46 units; Toiyabe, Gabbs Valley, Nevada, 214 units; Luning, Nevada, 30 units — by Federal Housing Authority, San Francisco, Calif. 1-19

New Mexico

LUNA CO.—**J. J. Bollinger Construction Co.,** 922 Braniff Bldg., Oklahoma City, Okla.—$402,112, for 175 family dwelling units at Deming—by Federal Public Housing Authority, Fort Worth, Tex. 1-28

McKINLEY CO.—**E. S. McKittrick Co., Inc.,** 7839 Santa Fe Ave., Huntington Park, Calif.—over $50,000, for a workshop and necessary utils.—by U S Engineer Office, Albuquerque. 1-7

Oregon

CLATSOP CO.—**Jens Lervick,** Astoria—$59,300, for 21 dwelling units at Fort Stevens—by Federal Public Housing Authority, Seattle, Wash. 1-27

MULTNOMAH CO.—**Askevold & Rund,** Great Falls, Mont.—$812,408, for 360 housing units at Portland—by Housing Authority, Portland. 1-27

MULTNOMAH CO. — **Clarence Gilmer** and **Howard Halvorson,** Spalding Bldg., Portland—$285,000, for 100 row houses, and a community bldg., at Portland—by Housing Authority, Portland. 1-27

MULTNOMAH CO.—**K. T. Henderson,** Longview, Wash.—$207,268, for 90 housing units in Portland—by Housing Authority, Portland. 1-27

MULTNOMAH CO. — **Lease & Leighland,** Dexter Horton Bldg., Seattle, Wash. —$1,088,000, for 476 apartment housing units in Portland—by Housing Authority, Portland. 1-27

MULTNOMAH CO. — **Northwest Construction Co.,** 3950 6th Ave., NW, Seattle, Wash.—$701,340, for 360 row-house dwelling units in the Guild Lake area of Portland—by Housing Authority, Portland. 1-27

MULTNOMAH CO.—**Pacific Construction Co.,** Portland—$1,370,000, for 718 row-house dwelling units in the Guild Lake area of Portland—by Housing Authority, Portland. 1-27

MULTNOMAH CO. — **Ernest Sinnett,** Portland—$226,900, for 114 housing units at Portland—by Housing Authority, Portland. 1-27

MULTNOMAH CO. — **Tri-State Construction Co.,** 4112 NE Sandy Blvd., Portland—$695,860, for 200 housing units at Troutdale—by Housing Authority, Portland. 1-27

UMATILLA CO.—**C. F. Davidson Co.,** 711 Broadway, Tacoma, Wash.—$1,189,800, for 450-unit housing project near Hermiston Munitions Dump—by Portland Housing Authority. 1-26

Texas

BEXAR CO.—**Victor Prassel,** San Antonio—over $50,000, for civilian housing—by U. S. Engineer Office, San Antonio. 1-1

BEXAR CO.—**Victor Prassel,** San Antonio—over $100,000, for a hospital—by U. S. Engineer Office, San Antonio. 1-1

BEXAR CO.—**J. H. Raybourn,** San Antonio—over $100,000, for const. of hangars —by U. S. Engineer Office, San Antonio. 1-19

DALLAS CO.—**James I. Barnes Construction Co.,** Dallas—over $50,000, for an additional warehouse—by U. S. Engineer Office, Denison. 1-6

GRAYSON CO.—**E. V. McCright & Co., Ltd.,** Dallas—over $50,000, for housing and utils.—by U. S. Engineer Office, Denison. 1-6

POTTER CO.—**Busboom & Rauh,** 109 E. Iron Ave., Salina, Kans.—over $50,000, for temporary frame bldgs.—by U. S. Engineer Office, Denison. 1-5

POTTER CO.—**J. J. Tracey,** Oklahoma City, Okla.—over $50,000, for temporary frame bldgs.—by U. S. Engineer Office, Denison. 12-24

REEVES CO.—**Cunningham & Widmer,** Pecos.—over $50,000, for bldgs. and facil. at an airfield—by U. S. Engineer Office, Albuquerque, N. M. 1-12

WARD CO.—**Suggs Construction Co.,** Big Spring — over $50,000, for low pressure chamber, and other bldgs.—by U. S. Engineer Office, Albuquerque, N. M. 1-7

WICHITA CO.—**J. L. Green,** Wichita Falls—over $50,000, for temporary frame bldgs.—by U. S. Engineer Office, Denison. 12-31

Utah

SALT LAKE CO.—**Ford J. Twaits Co.,** 325 Atlas Bldg., Salt Lake City—$460,000, for 135-family housing unit at Garfield—by Housing Authority, Salt Lake City. 12-31

TOOELE CO. — **Jacobsen Construction** Co., 734 S. 3rd E. St., Salt Lake City—over $50,000, for civilian war housing—by U. S. Engineer Office, Salt Lake City.

Washington

CLARK CO. — **W. C. Smith,** Board of Trade Bldg., Seattle; **Howard S. Wright Co.,** 407 Yale Ave. N., Seattle, Wash,; and **L. H. Hoffman Co.,** 715 S.W. Columbia Blvd., Portland, Ore.—$4,720,000, for 2,100 row housing units in Vancouver—by Housing Authority, Vancouver. 1-18

CLARK CO.—**Sound Construction & Engineering Co.,** 1701 Northern Life Tower, Seattle—$676,000, for 300 dwelling houses east of McLoughlin Heights — by Vancouver Housing Authority. 1-6

CLARK CO.—**Waale-Camplan Co.,** 2100 SW. Jefferson St., Portland, Ore.—$1,-298,000, for 586 row house dwelling units at Vancouver — by Housing Authority, Vancouver. 1-11

CLARK CO.—**Waale-Camplan Co.,** 2100 SW. Jefferson St., Portland, Ore.—$1,-

579,000, for 700 temporary dwelling units for Kaiser Shipyard workers—by Housing Authority, Vancouver. 1-26

GRANT CO.—**Gaasland Construction Co.,** 2828 34th St., S., Seattle—$335,000, for 100 row houses and a community bldg. at Ephrata—by Federal Public Housing Authority, Seattle. 1-27

KING CO. — **Western Construction Co.,** 702 Alaska Bldg., Seattle—$1,086,767, for 580 apartment units of war housing—by King Co. Housing Authority, Seattle. 1-20

KITSAP CO.—**C. F. Davidson Co.,** 711 Broadway, Tacoma — $560,000, for 250 dwelling units at Sheridan Park, Bremerton—by Federal Housing Authority, Seattle. 1-8

PIERCE CO.—**Sam Bergeson, Wick & Dahlgren,** Box 428, Tacoma—$1,077,200, for 400 family dwelling units and 64 war apartments for workers at Ft. Lewis motor base—by Housing Authority, Tacoma. 1-12

SNOHOMISH CO. — **Sam Bergeson, Wick & Dahlgren,** Box 428, Tacoma—over $50,000, for misc. bldgs.—by U. S. Engineer Office, Seattle. 1-4

SNOHOMISH CO.—**Nettleton & Baldwin,** 26th St. S.W. and W. Florida St., Seattle—$150,700, for 50 temporary dwelling units to accommodate families of war industry workers—by Housing Authority, Everett. 1-20

SPOKANE CO.—**Hazen & Clark,** Welch Bldg., Spokane—over $50,000, for a post utilities area—by U. S. Engineer Office, Seattle. 1-27

WALLA WALLA CO.—**J. W. Brennan,** Box 507, Pocatello, Ida.—over $100,000, for temporary frame bldgs.—by U. S. Engineer Office, Portland, Ore. 1-5

Wyoming

LARAMIE CO.—**Green Bros. Construction Co.,** Worland—$626,542, for 325-unit frame construction housing project in Cheyenne—by Federal Public Housing Authority, Kansas City, Mo. 1-28

PROPOSED PROJECTS

Arizona

COCONINO CO.—Federal Public Housing Authority, San Francisco, Calif., is preparing plans for 200 temporary dwelling units at Flagstaff. 1-28

GREENLEE CO.—Federal Public Housing Authority, San Francisco, Calif., is preparing plans for 230 temporary dwelling units at Morenci. 1-28

MARICOPA CO.—Federal Public Housing Authority, San Francisco, Calif., is preparing plans for 50 temporary dwelling units at Wickenburg. 1-28

MOHAVE CO.—National Housing Agency, San Francisco, Calif., has approved construction of 150 family units and 200 dormitory units for war workers at Kingman. 1-12

YUMA CO.—Federal Public Housing Authority, San Francisco, Calif., is preparing plans for 100 temporary dwelling units at Yuma. 1-29

California

FRESNO CO. — The War Department announced authorization for const. of hospital facil. in connection with an army air force instal., to cost over $2,000,000. 1-20

KERN CO.—The Federal Housing Au-

thority has approved plans for cost of dwelling accommodations at Muroc, to cost $500,000. 1-13

MADERA CO. — National Housing Agency, San Francisco, has approved construction of 135 family units and 20 single dormitory units at Dos Palos. 1-12

NAPA CO.—Napa Union High School District is preparing plans for a 16-classroom addition to the high school, of emergency war type construction, to cost about $100,000. 1-29

SAN DIEGO CO.—The War Department announced authorization for const. of housing and facil. at a military installation, to cost over $1,000,000. 1-20

SAN DIEGO CO.—Board of Supervisors are preparing plans for a 212-bed hospital to be erected in San Diego, estimated to cost $300,000. 1-28

SAN LUIS OBISPO CO.—Federal Public Housing Authority, San Francisco, is preparing plans for 60 war apartments, 140 family dwelling units, and 100-unit trailer camp at San Miguel. 1-28

SAN MATEO CO. — National Housing Agency has approved construction of 853 housing units in South San Francisco. 1-4

New Mexico

CURRY CO.—Federal Public Housing Authority has authorized construction of 32 dormitory apartments and 75 family units at Clovis. 1-7

LEA CO.—Federal Public Housing Authority has authorized construction of 100 family units and 96 dormitory apartments at Hobbs. 1-7

Oregon

MULTNOMAH CO.—H.R. 494 of the U. S. Congress proposes const. of a national guard armory in Portland to cost not over $1,500,000. 1-6

Washington

GRANT CO.—Presidential approval has been given for erection of a recreation center at Ephrata, estimated to cost $67,000. 1-5

KING CO. — The National Housing Agency has approved plans for 2,000 war housing units in Seattle, to cost approx. $5,000,000. 1-12

KITSAP CO.—All bids for an 800-student junior high school at Bremerton have been rejected because of changes in specifications. 12-30

KITSAP CO.—Plans are being drawn by the Public Buildings Admin. for a fire station in Bremerton, near Westpark, to cost approx. $60,000. 1-29

SNOHOMISH CO.—The Housing Authority, Everett, has rejected bids received for 250 permanent housing units, and will re-design plans. Estimated cost is $600,000. 1-23

WHITMAN CO.—Chemical & Metallurgical Engineering Co. has announced early construction of a starch plant at Colfax, to cost about $200,000. 1-27

Wyoming

CONVERSE CO.—The U. S. Engineer Office, Omaha, Nebr., is preparing plans for a prisoners' camp. Estimated cost is over $1,000,000. 1-20

Miscellaneous . . .

CONTRACTS AWARDED

Arizona

COCHISE CO.—**Bailey & McCoy,** 1130 Lowell Ave., Tucson—less than $50,000 for a gasoline fueling system—by U. S. Engineer Office, Albuquerque, N. Mex. 1-7

YUMA CO.—**W. E. Callahan Construction Co.,** 714 W. Olympic Blvd., Los Angeles, Calif.—less than $50,000, for railroad spur at an operating base—by U. S. Engineer Office, Los Angeles, Calif. 1-12

YUMA CO.—**H. B. Nicholson,** 572 Chamber of Commerce Bldg., Los Angeles, Calif.—over $100,000, for water and sewer systems and roads at an operating base—by U. S. Engineer Office, Los Angeles, Calif. 1-12

YUMA CO.—**Silver State Construction Co.,** Fallon, Nev.—over $50,000, for dust control and fence at an operating base—by U. S. Engineer Office, Los Angeles, Calif. 1-28

California

ALAMEDA CO. — **Macco Construction Co.,** Freight and Ferry Sts., Alameda—over $50,000 for a dry fill—by U. S. Engineer Office, San Francisco. 1-7

HUMBOLDT CO.—**Chicago Bridge & Iron Co.,** 1305 W. 105th St., Chicago, Ill.—$5,790,000, for a steel floating drydock at Eureka—by Bureau of Yards & Docks, Washington, D. C. 1-4

IMPERIAL CO.—**John A. Klarquist,** 618 S. Western Ave., Los Angeles — over

$50,000, for a gasoline fueling system at an airport—by U. S. Engineer Office, Los Angeles. 1-4

INYO CO.—**Peter Gadd,** 2173 Colorado Blvd., Los Angeles—over $50,000 for a gasoline fueling system at an airport—by U. S. Engineer Office, Los Angeles. 12-30

KERN CO.—**Edward R. Siple Co.,** 2545 San Fernando Rd., Los Angeles—less than $50,000, for facilities at a material center and flight test base—by U. S. Engineer Office, San Bernardino. 1-26

LOS ANGELES CO.—**Cardox Corp.,** Chicago, Ill.—$33,172, for bldgs. at Harbor Steam Plant, Wilmington—by Department of Water & Power, Los Angeles. 1-4

LOS ANGELES CO.—**Oilfield Construction Co.,** 2650 Cherry Ave., Long Beach—$24,789, for fire protection system for fuel oil storage tanks at San Pedro—by Department of Water & Power, Los Angeles. 1-4

LOS ANGELES CO.—**United Concrete Pipe Corp.,** Box 1, Station "H", Los Angeles—over $50,000, for known distance rifle range at an ordnance training center—by U. S. Engineer Office, Los Angeles. 1-4

RIVERSIDE CO.—**Flotation Systems,** 4031 Goodwin Ave., Los Angeles—over $50,000, for gasoline fueling system at a ground air support base—by U. S. Engineer Office, Los Angeles. 1-13

SAN BERNARDINO CO.—**Donald & McKee,** 50 E. Vine St., Redlands—$45,272 for facilities for a 250-dwelling trailer camp at Fontana—by Housing Authority, San Bernardino County. 1-12

SAN BERNARDINO CO.—**George Herz & Co.,** Box 191, San Bernardino—$79,061, for facilities for 500 house trailers in San Bernardino—by Housing Authority, San Bernardino. 1-20

SAN DIEGO CO.—**J. S. Barrett Co.,** 455 Spreckles Theater Bldg., San Diego—over $50,000, for bldgs., roads and util. at a camp—by U. S. Engineer Office, San Diego. 1-20

VENTURA CO.—**Hommes & Eudemiller,** 6521 Wilshire Blvd., Los Angeles—for facil. for 75 house trailers at Port Hueneme—by Federal Housing Authority, Washington, D. C. 1-5

Idaho

ELMORE CO.—**Morrison-Knudsen Co., Inc.,** and **Triangle Construction Co.,** Boise—over $250,000 for a railroad—by U. S. Engineer Office, Portland, Ore. 12-30

Oklahoma

COMANCHE CO.—**W. A. Zant,** Lawton—over $100,000, for const. of facil.—by U. S. Engineer Office, Denison, Tex. 1-19

Texas

CORYELL CO.—**Gerald Mora,** 312 Sabine St., Houston—over $50,000, for rifle range—by U. S. Engineer Office, San Antonio. 1-19

Utah

TOOELE CO.—**Patti-MacDonald Construction Co.,** 1114 Broadway, Kansas City, Mo.—$79,500 for development of a trailer campsite at Tooele—by Federal Public Housing Authority, Kansas City, Mo. 1-28

Washington

GRANT CO.—**Gaasland Construction Co.,** 1161 Ellis St., Bellingham—over $50,000, for facil. for a utility yard—by U. S. Engineer Office, Seattle. 1-4

JEFFERSON CO.—**Sound Construction & Engineering Co.,** 1701 Northern Life Tower, Seattle—over $100,000, for conc. const.—by U. S. Engineer Office, Seattle. 1-4

KING CO.—**General Construction Co.,** 3840 Iowa St., Seattle—over $50,000 for terminal facilities—by U. S. Engineer Office, Seattle. 1-8

KITSAP CO.—**American Automatic Sales Co.,** Chicago, Ill.—$52,354, for improving automatic telephone system and naval radio station at Bremerton Navy Yard—by Bureau of Yards & Docks, Washington, D. C. 1-15

SPOKANE CO.—**Hanson & Weidner,** E. 3806 30th St., Spokane—less than $50,000 for a cold storage bldg. and warehouse for subsistence storage—by U. S. Engineer Office, Seattle. 12-31

PROPOSED PROJECTS

California

LOS ANGELES CO.—Defense Plant Corp., Washington, D. C., has announced authorization for addtl. plant facil. at Douglas Aircraft Co., to cost more than $600,000. 12-19

Oregon

MULTNOMAH CO.—H.R. 490 of the U. S. Congress proposes const. of a national cemetery in Portland, to cost $200,000. 1-6

TRADE WINDS

News of Men Who Sell to the Construction West

CALIFORNIA

Joshua Hendy Iron Works, Sunnyvale, Calif., has completed the purchase of the *Pomona Pump Co.,* and its subsidiary, Westco Pump Division. Combined with Hendy's recent purchase of the Crocker-Wheeler Electric Manufacturing Co. of Ampere, N. J., these additions bring to seven the number of plants under the one banner now engaged in turning out marine engines and other ship fittings and equipment. There is the parent plant at Sunnyvale, the Pomona plant in Pomona, Calif., two plants in St. Louis, Mo., the one in Ampere, and new plants at Torrance and Long Beach, Calif. **George A. McKenna,** president of Pomona, and the entire executive personnel have been retained in the larger organization.

* * * *

John Jorgensen, manager of the air equipment division of *Western Machinery Co.,* San Francisco, Calif., has been commissioned a major in the U. S. Army and is presently stationed in Washington, D. C.

* * * *

Edwin Forrest, Pacific Coast manager of the *Erie Forge & Steel Co.,* of Erie, Pa., died Jan. 5, in San Francisco, Calif., at the age of 76. During the last war he owned and operated his own forge company in Oakland, and at various times had represented other western steel companies.

CHARLES E. MOORE, president of Joshua Hendy Iron Works confers with A. J. M. Baker, general manager of Crocker-Wheeler Electric Manufacturing Co. division, and G. A. McKenna, general manager of the Pomona-Westco Pump Co. division.

* * * *

National Cylinder Gas Co. (Pacific Coast) has opened a new office and stock room at 326 Howard St., San Francisco, handling a complete stock of welding electrodes, welding machines and accessories.

* * * *

B. F. McDonald Co., Los Angeles, Calif., manufacturers of safety appliances, have equipped a safety car to tour shipyards, oil fields, and all types of industrial installations to explain and illustrate care and use of safety appliances and techniques. The specially built truck has panels of mounted safety equipment, and lecturers accompanying the truck actually demonstrate specific operations.

* * * *

Philip W. Mettling, compressor calculation engineer of the *Cooper-Bessemer Corp.,* at the company's plant in Mt. Vernon, Ohio, for the past several years, has been transferred to a similar position at the firm's branch office in Los Angeles, Calif. Among other duties, he will assist in the installation, operation, and maintenance of Cooper-Bessemer engines in the west coast area.

* * * *

PACIFIC NORTHWEST

Mitchell, Lewis & Staver have been appointed distributors in the Portland and Salem, Ore., districts for Ring-free motor oil, product of MacMillan Petroleum Corp.

* * * *

Robert S. Sloan has been appointed north Pacific area welding specialist by *Westinghouse Electric & Manufacturing Co.,* and will assist in the application of Westinghouse equipment throughout the northwest industrial area.

* * * *

C. V. Wooden, lubricating engineer of the Winslow Engineering Co., of Oakland, Calif., has joined the staff of *Jackson Improvement Co.,* Portland, Ore., as technical advisor to users of Winslow oil conditioners. **J. G. Ward** will serve as agency director in the five northwestern states for Winslow products.

* * * *

Sumner Williams, of the *Loggers & Contractors Machinery Co.,* Portland, Ore., has been appointed to the post of specialist in the used construction machinery branch of the War Production Board in Portland, being in charge of the territory included in Oregon, southern Washington, and southern Idaho west of the Clearwater River.

* * * *

R. B. Gallant has been made manager of industrial sales for *Montana Hardware Co.,* of Butte, Mont.

* * * *

Lomen Commercial Co., Seattle, Wash., has been given the appointment as Alaska distributor for C. S. Johnson Co., of Champaign, Ill., to handle its complete line of cement and aggregate handling equipment.

* * * *

Ernest Jones, formerly general superin-

tendent of the Sorel Industries, of Quebec, is now head of the steel melting department of the South Seattle, Wash., plant of *Isaacson Iron Works.*

* * * *

Robt. C. Hayes, manager of the Manufacturers' Association of the state of Washington, has been commissioned a first lieutenant in the Marine Corps air force.

* * * *

Dulien Steel Products, Inc., Seattle, Wash., has been given the exclusive mountain states territory sales agency by the Kerlow Steel Flooring Co., of Jersey City, N. J., manufacturers of steps, bridge paving, steel flooring, boiler room floors, and similar products. The territory includes Montana, Colorado, Nevada, Utah, Wyoming, Idaho, Arizona, and New Mexico.

* * * *

AMONG THE MANUFACTURERS

Union Wire Rope Corp., Kansas City, Mo., has received its second Navy "E" award, being the addition of a white star to the pennant already in their possession. The star symbolizes a renewal of the award for a six-months' period dating from Nov. 15, 1942. The announcement was contained in a letter from Rear Admiral George H. Rock, chairman of the Navy Board for Production Awards to **M. G. Ensinger,** president of the company.

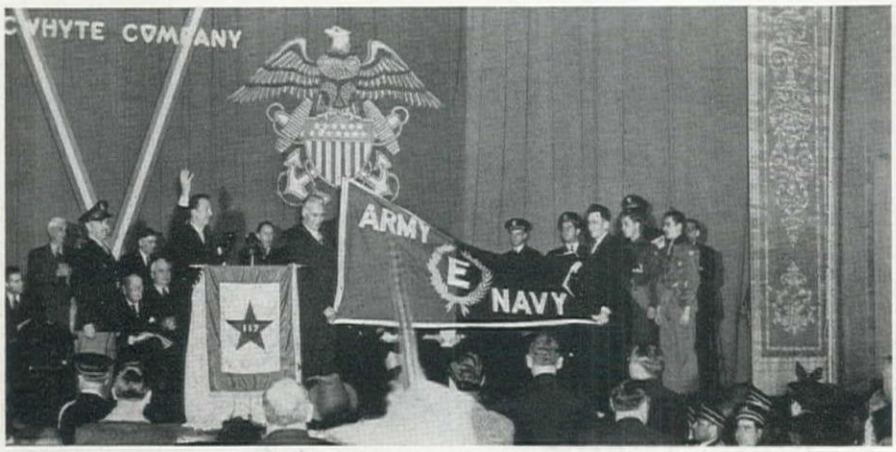
* * * *

An Army-Navy "E" pennant was awarded to the *Anthony Co., Inc.,* Streator, Ill., on Jan. 22. The company, now turning out its products from two factories in Streator and three foreign plants, is currently celebrating its 25th anniversary. The company manufactures hydraulic hoists and bodies, in 2,900 different sizes, types, and models, and its award is the first given to any operator in that field. Over 500 Anthony units were used on construction of the Alaska highway.

* * * *

When *Macwhyte Co.,* Kenosha, Wis., was presented with the Army-Navy "E" award for production excellence on Dec. 27, the emphasis was placed on the fact that the employees, "the men and women of

LIDGERWOOD MANUFACTURING CO., of Elizabeth, N. J., builders of the cableways for many large western dam construction plants, was recently awarded the joint Army-Navy E for excellence in war production. Participating in the award ceremony were (left to right): Col. John H. Holder, U. S. A.; William G. McNee, president of the shop local, United Electrical, Radio and Machine Workers; W. G. Schalascha, executive vice-president, Lidgerwood Manufacturing Co.; Rear Admiral H. L. Brinser, U. S. N.; William Cole, 42-year employee of Lidgerwood; and Rear Admiral Wat T. Cluverius, U. S. N.



MACWHYTE CO., manufacturer of wire rope of Kenosha, Wis., was awarded the joint Army-Navy E at ceremonies (left) held at the plant on Dec. 27, 1942.

Macwhyte," by their efforts, had made the award possible, and that to them the honor rightfully belonged. The presentation of flag and pins was made by Lt. Col. Edward H. Bowman, and Lt. Com. Roger Q. White, and acceptance was by **Jessel S. Whyte,** president of the company, and **Clarence J. Pinzger,** president of the Macwhyte Club, for the employees. The company manufactures wire rope and appurtenant products, the entire production now going into the airplane and other war work.

* * * *

The Erie, Pa., works of *Bucyrus-Erie Co.,* manufacturer of dirt-moving and material handling equipment, now being extensively used in the war effort, was awarded the Army-Navy "E" banner for excellence in production activity, on Jan. 16. The company's South Milwaukee plant had previously received the same honor for production achievement. The pennant was awarded by Col. John S. Seybold, chief of the army procurement branch, and was accepted by **W. L. Little,** manager of the Erie works.

* * * *

United States Steel Supply Co., is the new name of Scully Steel Products, subsidiary of United States Steel Co. No change in management or business is involved in the change. The company is located at Chicago, Ill.

* * * *

About one hundred dealers and representatives of *Diamond Iron Works, Inc.,* and *Mahr Manufacturing Co.,* met in Minneapolis on Jan. 4, for their second annual sales conference. Sales for 1942 were reported as more than twice those of 1941.

* * * *

E. G. Hartmann, formerly manager of round and flat wire specialties division of *John A. Roebling's Sons. Co.,* Trenton, N. J., has been promoted to assistant general manager of sales. At the same time **Douglas W. Vernon,** previously chief of the priorities division of the company, has been advanced to the post of assistant to the general manager of sales.

E. G. HARTMAN (left), and D. W. Vernon have recently been appointed assistant general manager of sales and assistant to the general manager of sales, respectively, for John A. Roebling's Sons.

NEW EQUIPMENT

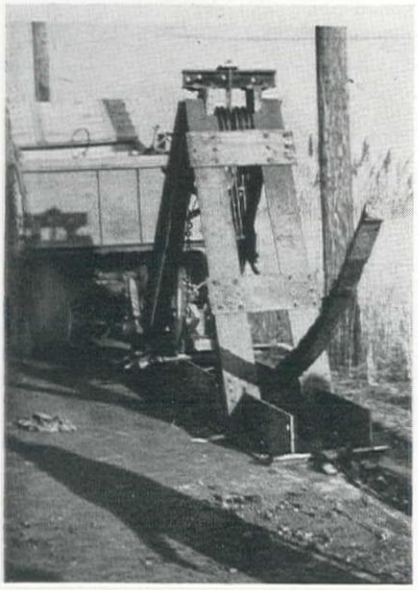
MORE COMPLETE information on any of the new products or equipment briefly described on these pages may be had by sending your request to the Advertising Manager, Western Construction News, 503 Market St., San Francisco, Calif.

Rail Remover

Manufacturer: Fred W. Steifel Associates, New York, N. Y.

Equipment: Railroad rail salvage process.

Features claimed: Skims railroad rails rapidly from pavement without previous digging, leaving a narrow, cleancut trench. A V-shaped superstructure carries a block and fall which draws the rail end upward, after which a



roller is slipped under the rail end. This roller fits into bearing openings in T-beams lying on the pavement parallel with the rail, and as the truck moves forward this roller slides under the rail raising it from the pavement. The edges of the T-beams, with their downward pressure, act as cutting agents to insure a narrow, straight resultant trench.

Manhole Covers of Wood

Manufacturer: American Lumber & Treating Co., Chicago, Ill.

Equipment: Wooden manhole covers.

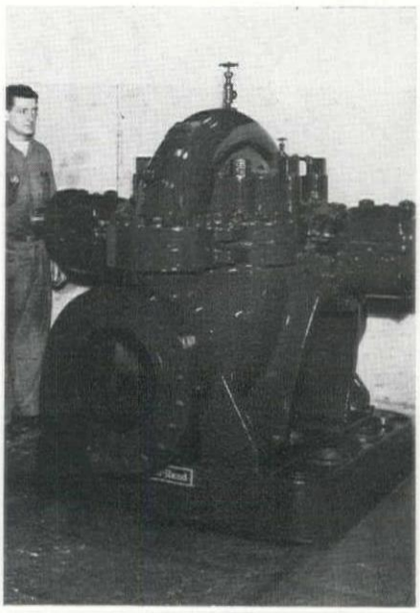
Features claimed: Easily constructed of short pieces of 2 x 8 and 4 x 8 lumber which would otherwise be discarded, each cover saves approximately 250 lb. of cast iron. In some cases they are held together with 20-penny nails and ⅜-in. bolts, in other cases by wooden dowels and waterproof glue. Weight is approximately 130 lb. The lumber is treated with Wolman salts preservative. Wear and splintering is reduced by laying the strips at a 45-deg. angle with the line of traffic, and applying a thin coating of emulsified asphalt, covered with sand or fine gravel.

Flexible Gravel Plant

Manufacturer: Pioneer Engineering Works, Inc., Minneapolis, Minn.

Equipment: Flexible aggregate plant.

Features claimed: Large capacity plant, for the production of all types of aggregates from either quarry or gravel bed. To save time and money in moving between jobs, each unit is mounted on tracks or wheels. The primary crusher is 30 x 42-in. eccentric jaw crusher with welded steel base, and 3 additional roll crushers provide capacity for any size or requirement. Can be used either as a wash or dry plant.



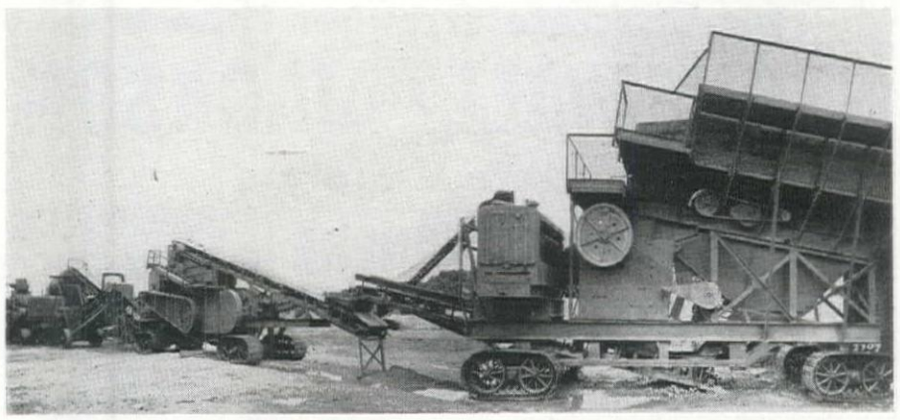
High Head Pumps

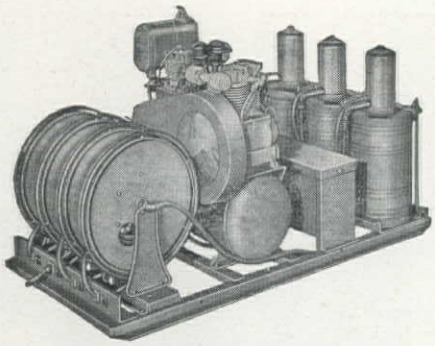
Manufacturer: Ingersoll-Rand Co., New York, N. Y.

Equipment: Heavy-duty centrifugal pumps.

Features claimed: Pumps being specially built for use by War Emergency Pipelines, Inc. Each pump will be electric-motor-driven at 1,780 r.p.m. and will operate against total head of 707 ft. Three of these pumps in series are used to obtain a head of 770 lb. per sq. in., to meet certain special operating conditions.

PIONEER PORTABLE, FLEXIBLE AGGREGATE PRODUCTION PLANT





Field Lubrication Unit

Manufacturer: The Gray Co., Inc., Minneapolis, Minn.

Equipment: Convoy luber for small contractor.

Features claimed: Specially designed for small operator of construction equipment who doesn't need a large portable lubrication unit, but does need power lubrication for his machines. This luber feeds directly from 100-lb. drums. Power is by a 4½-h.p. gas engine, operating a 12-cu. ft. compressor, with 175-lb. air pressure. There are 3 lubricant pumps for different types of lubricant, and 30-ft. high-pressure lubricant hoses. In addition, a 50-ft. air hose is provided for servicing pneumatic tires.

Plastic Spray Guns

Manufacturer: Eclipse Air Brush Co., Inc., Newark, N. J.

Equipment: Black plastic spray gun.

Features claimed: Weighs less than aluminum model it replaces. It is not affected by thinners, solvents, paint removers, etc., and has a good impact strength. Operating mechanism is similar to former design, only change being body, now made of plastic.

Women's Safety Clothing

Manufacturer: American Optical Co., Southbridge, Mass.

Equipment: Complete line of tailored protective clothing for women welders.

Features claimed: Made of specially selected cowhide, it is light in weight, but renders positive protection from flying sparks. Clothing is tailored to afford easy movement of the body, at the same time fit snugly. Items available are tailored cap, short jacket, coat, overalls, sleeves, and a 36-in. tailored apron. Overalls are styled like women's slacks, having a side placket to insure trim, comfortable waist line and flared trouser legs to permit putting on and off over safety shoes. All seams of welted inseam construction, located away from direct line of fire.

Plastic Nameplates

Manufacturer: Plastic Fabricators, Inc., San Francisco, Calif.

Equipment: Durashield, laminated plastic.

Features claimed: A three-layer plastic to replace brass, copper or bronze nameplates, dial faces, and marking plates on machinery, tools, etc. Wording is printed on center sheet, .01 in. thick, and two outside layers of transparent acetate plastic are .02 in. thick. Material may be die-cut, stamped, or drilled, is fire-resistant, and is obtainable in colors.

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.

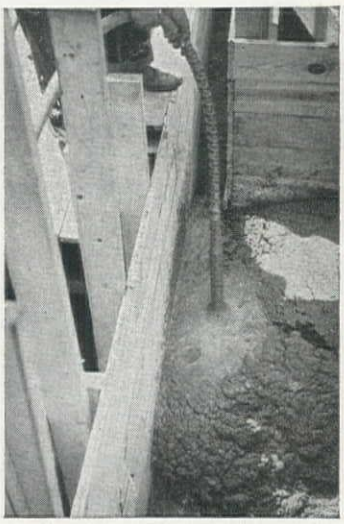
R. G. LeTourneau, Inc., Peoria, Ill.—Form G-1052 is a guide to the lubrication of LeTourneau equipment, giving in graphic form the spots to be lubricated, and at what periods during the life and use of the machine. Also two pages of description of each lubrication point and type of oil or grease to use.

Sika, Inc., Passaic, N. J.—Leaflet describes structural waterproofing compounds and quick-setting compounds. Uses such as waterproofing, hardening, oilproofing, pres-

(Continued on page 78)

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.



FOR SALE—TRENCHERS

3—Barber Greene, Model 44C, 7 ft. x 24 in.
2—Parsons, Model (21), 9 ft. x 24 in.
1—Cleveland Pioneer, 10 ft. x 30 in.
1—Austin, Model 45-21, 18 ft. x 40 in.
1—Bucyrus Erie Shovel, Model 16B, ½ yd.

AIR COMPRESSORS
RENTAL CO.
Contractor's Equipment Rental & Sales
2324 EAST 105TH STREET
CLEVELAND, OHIO

FOR SALE
Skid-Mounted Pumping Unit

(1)—D-4 00 Cat. Motor Direct-connected to (1)—4" Krogh Gritty Water Pump Cap. 500 G.P.M. at 150' Head.
W. K. POTTS, BOX 645, AUBURN, CALIF.

FOR RENT

The following equipment is available for immediate delivery — most of it is rebuilt and Government inspected.

1—Diesel Power Shovel, Lima 101, with 1¼ yd. Dipper, 50 ft. Crane Boom with 25 ft. extension, Clamshell and Dragline Bucket.
1—Lorain "75" Combination Dragline and Shovel.
1—Speeder ½ yd. Shovel, Combination Dipper, Clamshell and Dragline.
1—Universal Shovel, ⅜ cu. yd.
1—Truck Crane "Bear Cat" mounted on Kleiber Truck.
16—Caterpillar Tractors, D8 and D7s, with Bulldozers and Angledozers.
2—International Tractors TD-18 with Bulldozers or Angledozers.
1—"30" Caterpillar Tractor, with cable controlled Bulldozer.
1—DG with Angledozer.
1—TD-40 International with Dozer.
7—28 yd. Scrapers, Wooldridge and LeTourneau.
5—Motor Graders, Caterpillar 12, Austin-Western 99, Adams 50 and 302.
2—Three Wheel Rollers, 12 tons.
1—Tandem Road Roller, 8 to 10 tons.
2—Water Wagons, 3 axle, 1500 gallons.
1—Johnson Float.
1—Lewis Sub-Grader.
2—Pavers 27E, Koehring and Smith.
6—Sheepsfoot Tampers, oscillating type, 6 and 8 ft. wide.
1—Rock Crusher, Telesmith, 15 x 38 with 80 HP. Power Unit.
1—Heavy Duty Ripper, 3 teeth, 14,000 lbs.
4—Concrete Vibrators, 1 Jackson hyd. gas driven, 1 Mall, gas driven, 2 Vibres, electric.
5—Air Compressors, portable, 110-210-242 and 315 cu. ft. A.A.D.
1—Jaeger Mixer, 10-S.
1—Double Drum Hoist, on skids, with 40 HP., 4 cyl. gas engine.
10—Clamshell and Dragline Buckets, ⅜, ½, ¾ and 1 cu. yd.
17—Pickup Trucks, ½ and ¾ ton.
1—Lowbed Diesel Transport, 25 tons.
2—Welding Machines, 300 and 400 amp. gas driven.
3—Alemite Compressed Air Grease outfits.
10—Two drum LeTourneau Power Control Units.
4—Light Plants, 1½, 5 and 10 KW.
10—Bulldozers and Angledozers for D7 and D8s.
1—Pile Hammer, McKiernan-Terry 9B3.

Ken Royce Construction Equipment Rental Co.

VAlencia 5121 185 Bayshore Boulevard
SAN FRANCISCO, CALIFORNIA

BARGAINS

for immediate delivery WITHOUT PD-556 Application

1—DIAMOND Quarry Plant with 10 x 20 roller bearing jaw crusher and 25' 0" folding type bucket elevator with buckets 12" x 6" x 7¾". Mounted on truck with four steel wheels. Rebuilt and priced for quick sale.
1—DIAMOND 40" x 16' combination rotary scrubber screen. Rebuilt and ready for shipment.
1—DIAMOND double shaker screen. Top deck 19" x 10', bottom deck 30" x 10'. Rebuilt.
1—DIAMOND bucket elevator. 20' centers. Buckets 16" x 6" x 7¾"—rebuilt and complete except frame.
1—DIAMOND 18" x 20' flight conveyor on steel wheels. Rebuilt and complete with gasoline engine.
1—DIAMOND 50 cubic yard steel bin. I beam leg type. Bolted. Rebuilt and in perfect condition.
1—Telsmith #7 settling tank. As is. Used.
2—Used G.E. motors. 40 HP, 1200 RPM, 550 V, 3 PH, 60 CY. Open horizontal sleeve bearing type with compensators. As is.

The following Equipment is USED but not complete. Must be Rebuilt. Requires priority.

1—DIAMOND No. 36 saucer type rotor-lift crushing and screening plant using 10 x 20 jaw crusher and 26 x 20 roll crusher. Can quickly be put in first class condition.
1—DIAMOND 22 x 18 plain bearing roll crusher.
1—DIAMOND bucket elevator 20' centers. Buckets 10" x 6" x 7¾" mounted on chain.
1—DIAMOND 20" x 3' 0" plate feeder with hopper, grizzly and frame.
1—Allis-Chalmers gasoline engine. 40 HP.
1—International model PD-40 Diesel power unit.

The following NEW DIAMOND Equipment is ready for shipment at once on proper priority.

1—DIAMOND 15 x 36 roller bearing jaw crusher.
2—DIAMOND 10 x 36 roller bearing jaw crushers.
4—DIAMOND 10 x 24 roller bearing jaw crushers.
2—DIAMOND 10 x 20 roller bearing jaw crushers.
1—DIAMOND 40 x 22 roller bearing roll crusher.
1—DIAMOND 9 x 36 roller bearing jaw crusher.
1—DIAMOND 9 x 24 roller bearing jaw crusher.
4—DIAMOND 4' x 10' three deck Mogul Type vibrators.
3—DIAMOND 3' x 10' three deck Standard vibrators.

★

DIAMOND IRON WORKS INC.

AND MAHR MANUFACTURING CO. DIV.

1818 No. 2nd Street, MINNEAPOLIS, MINN.

★

Write us or one of these dealers

GARLINGHOUSE BROS., LOS ANGELES, CALIF.
A. H. COX EQUIP. CO., SEATTLE, WASH.
COAST EQUIP. CO., SAN FRANCISCO, CALIF.
LOGGERS & CONTR. MACHY. CO., PORTLAND, ORE.
CONSTRUCTION EQUIP. CO., SPOKANE, WASH.
OLSON MFG. CO., BOISE, IDAHO
C. H. JONES EQUIP. CO., SALT LAKE CITY, UTAH
STUDER TRACTOR & EQUIP. CO., CASPER, WYO.

Literature . . .

(Continued from page 76)

sure grouting, caulking, and others are tabulated, along with method of application of material. Pictures of typical installations are shown.

B. F. Goodrich Co., Akron, Ohio—Catalog 7900 on Vibro-insulators, has been revised and reprinted. An engineering work sheet on the subject has been added. Because of insistent demand for ever-increased precision in manufacture of war products, there is an increasing demand for vibration damping, and this work sheet is to aid in compiling all necessary data for manufacturing such insulation for the particular problem. Necessary factors are location, motivating power, frequency of vibration, supporting foundation, and reactions to be resisted. The Goodrich vibro-insulator is a metal and rubber device illustrated fully in the catalog.

National Lumber Manufacturers Assoc., Washington, D. C.—A 48-page book of news pictures showing the jobs the forest industries are doing to forward the war effort, entitled, "The Forest Fights." The book contains 200 photographs, with brief descriptive material, including views from all the fronts involved in the war, through the supply line and training camp, industry and housing, to actual war uses. Also shown are uncommon or revised uses of wood, research in broader uses, and methods being employed in protecting forests from fire.

Johnson-March Corp., New York, N. Y.—Leaflet tells of Ritecure, a colorless membrane cure for concrete, giving data on recent tests showing high efficiency of this product in moisture retention, resistance to wear, and compressive strength. Illustrations of applications of the product are also shown.

California Redwood Assoc., San Francisco, Calif.—A 16-page bulletin entitled, "Redwood Pipe," gives drawings and information for contractors and engineers based on an inquiry into the use of redwood pipe on sewage, water supply, irrigation, and drainage problems, made necessary by wartime curtailment of steel pipe manufacture. Both eastern and western practices in wood pipe construction are in the book, and four types of redwood pipe are considered: continuous stave pipe, machine-banded pipe, bored pipe, and redwood lined metal pipe. Costs, capacity, service experiences, and installation data are shown.

Allis-Chalmers Manufacturing Co., Milwaukee, Wis.—A 143-page loose-leaf service manual covering the model "M" Allis-Chalmers tractor contains 230 illustrations and is complete in every detail covering the care, operation, and maintenance of this particular tractor. The book is written in simple, understandable language, and illustrated with large photos, cross-section views, and exploded pictures. Specifications of all parts are given, and lubrication, adjustment, motor repair facts are detailed. In addition, care of tractor treads, rollers, and other moving parts, and of the chassis of the machine are included. The manual sells for $1.00, postpaid.

Young Radiator Co., Racine, Wis.—Catalog 2942 covers the Young vertivent heater and ventilator in which the air intake section is completely blacked out, making it suitable for war plant use. Cross-sections illustrate the device, and capacities of several different models are tabulated.

Richmond Screw Anchor Co., Inc., Brooklyn, N. Y.—A booklet entitled "Form-ty Engineering Guide," gives information on concrete form work, contains over 100 different types of form-tying devices and accessories, has a number of tables, charts, graphs, and cost facts, and is believed to fill a long-standing need for specific facts relating to faster, better and less costly construction work.

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