WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

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Pit River Bridge Steel
Erection by False Bents

SEVEN PANELS of the suspended span in the Pit River Bridge superstructure served as a 279-ft. false bent during the erection of the double deck, cantilever structure by the American Bridge Co. The bridge is a part of the relocated railroad line around Shasta Dam being constructed by the Bureau of Reclamation as a part of the Central Valley Project.

Longer Rope Life

THE INSIDE STORY

NO MATTER how severe the conditions on construction jobs, you can count on longer, uninterrupted service from your wire rope . . . when you protect it with *Texaco Crater.*

Texaco Crater completely penetrates wire rope, preserving the core, coating each wire in a tough, viscous, lubricating film. It cuts down internal and external wear, seals out moisture, prolongs rope life.

The outstanding performance that has made Texaco preferred in the fields listed in the panel has made it preferred on prominent construction jobs throughout the country.

These Texaco users enjoy many benefits that can also be yours. A Texaco Lubrication Engineer will gladly cooperate . . . just phone the nearest of more than 2300 Texaco distributing points in the 48 States, or write to The Texas Company, 135 East 42nd Street, New York, N. Y.

Care for your Car ..for your Country

Dredging, digging or building dams . . . contractors everywhere are guarding wire rope against wear, weather, rust and corrosion with *Texaco Crater.*

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.

Tune in the TEXACO STAR THEATRE every Sunday night—CBS

TEXACO

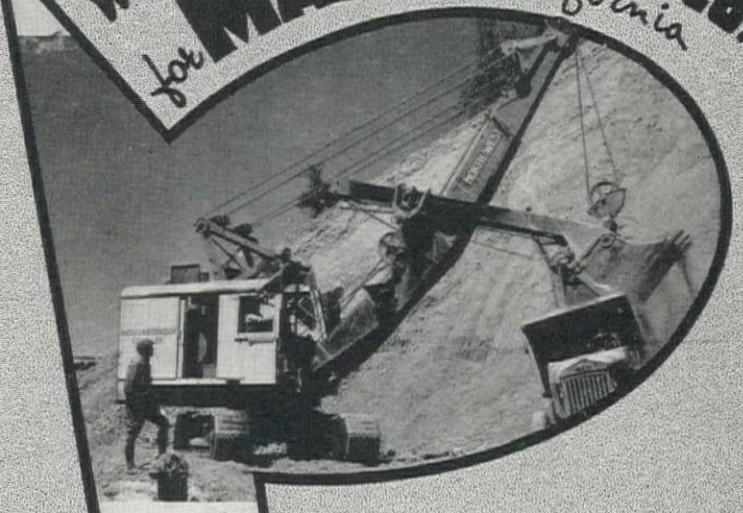
TEXACO Lubricants and Fuels

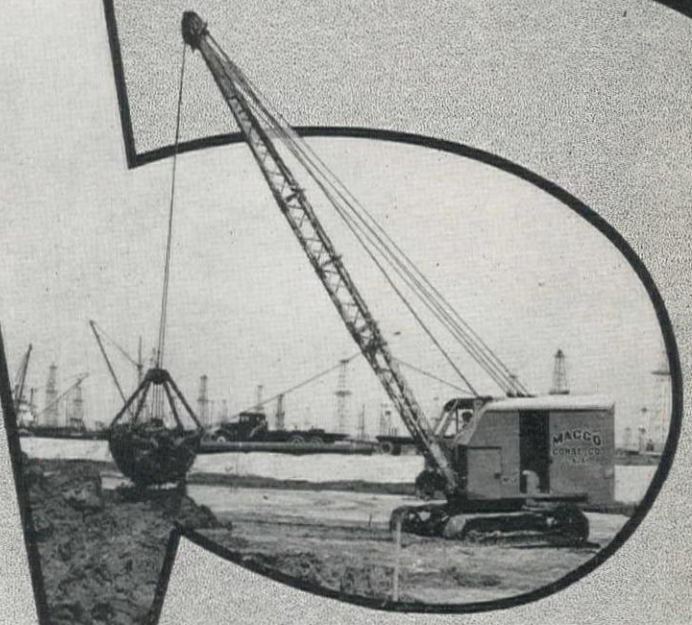
FOR ALL CONTRACTORS' EQUIPMENT

HELP WIN THE WAR BY RETURNING EMPTY DRUMS PROMPTLY

THREE MORE ROCK SHOVELS

makes THIRTEEN Northwests for MACCO CONST. CO. California





LARGE, Small,—Shovel, Crane, Dragline! Macco Construction Co., has used 'em all and under all conditions from rock to sand.

Macco Construction Co. knows what Northwest advantages mean. That's why year after year they are adding to their fleet of Northwests.

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IF YOU HAVE A REAL ROCK SHOVEL, YOU'LL NEVER HAVE TO WORRY ABOUT OUTPUT IN DIRT

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WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED WESTERN HIGHWAYS BUILDER

The National Magazine of the Construction West

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D. F. STEVENS, Editor

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BEFORE THE LAST BOMB FALLS . . .

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

American air bases have been bombed in this war and they will be bombed again. But they don't *stay* bombed. To the dauntless spirit of our Air Force ground crews and the machines at their command goes credit for the speed with which runways are restored to service.

Almost before the last bomb strikes — while our fighter planes and anti-aircraft batteries are still taking vengeance in the sky — a helmeted soldier drives his "Caterpillar" Diesel Tractor on the field. He is master of a steel brute, rugged and powerful, built to conquer the toughest earth-moving jobs. In front of the great bulldozer-blade, tons of dirt and rock tumble back into bomb craters. And in a matter of hours — not weeks — the base is ready again.

"Caterpillar" Diesel Tractors, Motor Graders, Engines and Electric Sets are helping in the fight on hundreds of fronts. Everywhere they're saving men and the time and labor of men. They're breaking trails for troops, rescuing tanks, building and repairing military roads and landing fields, hauling big guns, powering searchlights and field telephones, clearing beach-heads, supplying main or stand-by power for Navy and Coast Guard craft.

The machines we make are on war duty. "Caterpillar" men will keep right on building them night and day, and "Caterpillar" dealers will keep right on servicing them so that they will deliver full power, for this one all-important purpose, until the big job is done.

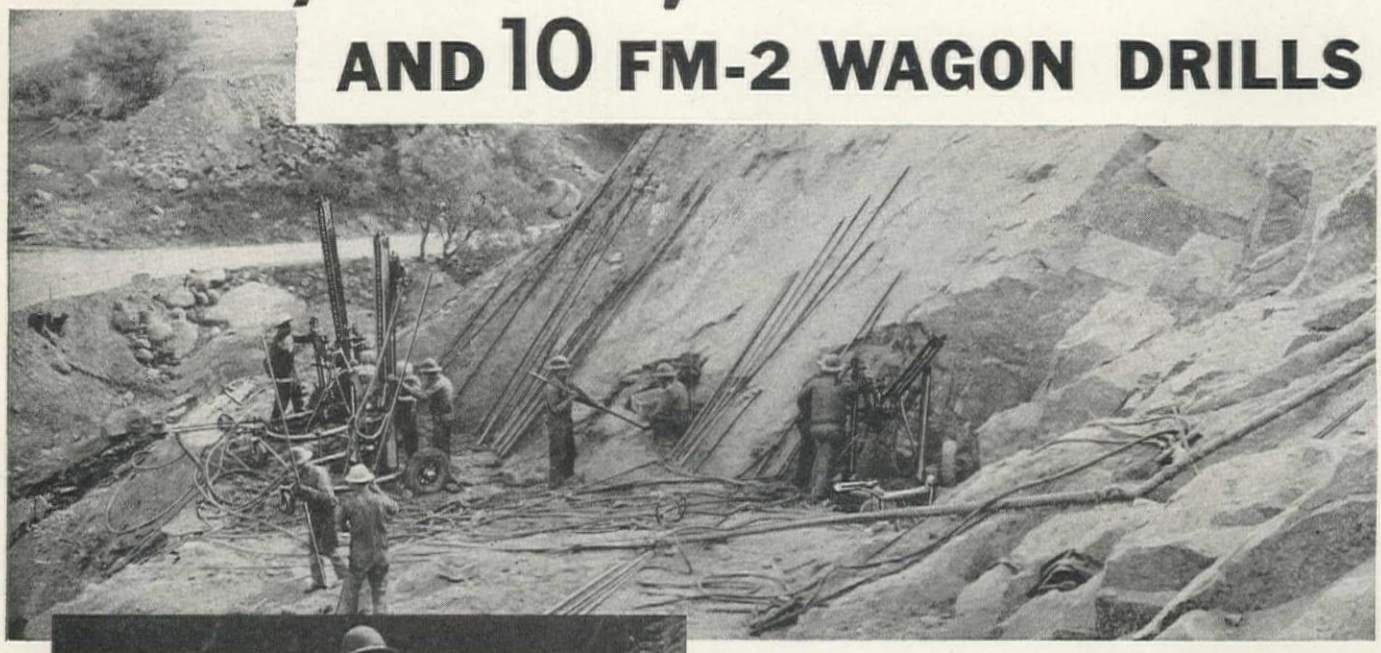
CATERPILLAR *DIESEL*

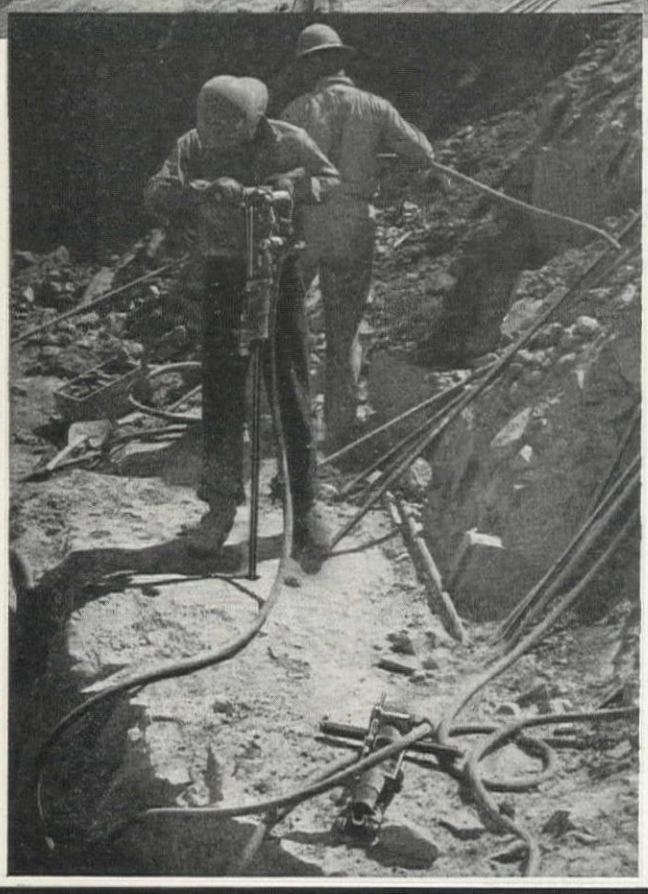
REG. U.S. PAT. OFF.

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

TO WIN THE WAR: WORK—FIGHT—BUY U. S. WAR BONDS!

SAN VICENTE DAM *Speeded Up* WITH 20 *Easy Holding* JB-5 JACKHAMERS AND 10 FM-2 WAGON DRILLS





The San Vicente Dam in California, part of a long-range program to provide water facilities for the district, had to be speeded up to take care of the rapidly increasing war industries in that locality. The rock formation was extremely difficult to drill. In some places a steel would go eight feet; in others, only a few inches.

Speed on this project was of prime importance to the war effort. To cope with the tough drilling problem and to speed up the work, L. E. Dixon, the contractor, used 20 Ingersoll-Rand JB-5 Jackhamers and 10 FM-2 Wagon Drills. Because of their easy-handling qualities, these machines were well-liked by the operators. Their dependability and durability were thoroughly proved throughout the job.

Fast, dependable Ingersoll-Rand Rock Drills are used all over the country on jobs such as this —jobs so vital to our war work.

Keep 'em Drilling

Ask your supplier for an oil that meets I-R Specification 433 —the new rock drill lubricant developed by Ingersoll-Rand.

5-168

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If Trenchers Wore Medals, Buckeye's Would Have a Chest Full!

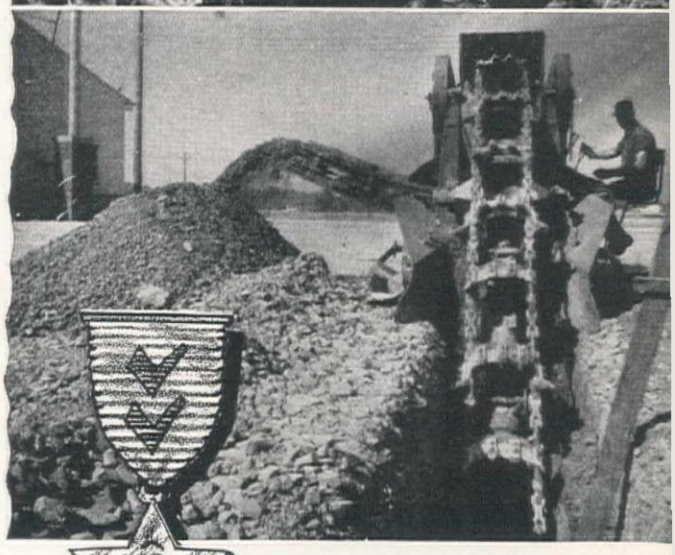
Not all decorations in war denote courage. Some show participation in campaigns. Others are recognition for tough jobs capably performed. That's the Buckeye's class—for steady, consistent performance in any kind of going, they have helped to lay the groundwork for America's offensive, in war project after war project.

Few realize the tremendous amount of trenching required for army camps, naval bases, air fields, ordnance depots and munitions plants. Before anything else, there must be trenches for drainage—for sewage—for water, gas, electricity—for foundation footings. Broad areas must be criss-crossed with these essential trenches before buildings can rise, troops commence training, assembly lines start functioning.

From Key West to Puget Sound and from Passamaquoddy to San Pedro, Buckeye Trenchers have taken hundreds of these RUSH JOBS in stride, conserving millions of hours of man-power for Uncle Sam and advancing the completion of war projects by weeks and months. No wonder then, that the men who plan and build for the government and war industries want to pin medals on Buckeye Trenchers "for gallant achievement in line of duty"!

For years, Buckeye Digging Wheel and Ladder Type Trenchers have been ably serving contractors and public works officials of the nation in countless trenching campaigns. For maximum speed and economy with minimum outlay for equipment and maintenance, they rate all the honors industry can bestow.

Today, every Buckeye Trencher is working for Victory and all our efforts and plant production are dedicated to the same purpose.



Top: Buckeye "12" Wheel Type Trencher hustles in telephone cable, removing hazard at a pilot training center.

Bottom: A Model 410 Ladder Type Trencher performs "distinguished service" at a southeastern Army camp, working from sun-up to dusk, to speed trenching for drainage, sewerage, water pipe and foundation footings.

Buckeye Traction Ditcher Company
Findlay, Ohio

DEFENSE PLANT
PART OF THE ARSENAL OF DEMOCRACY

Built by Buckeye

Convertible Shovels

Trenchers

Tractor Equipment

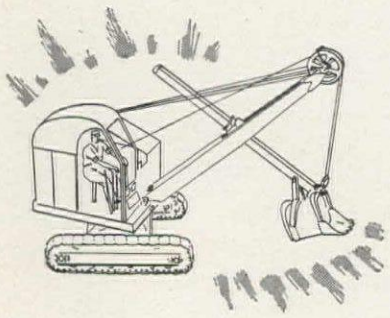
R-B Finegraders

Road Wideners

Spreaders

KEEP YOUR SHOVEL *DIGGING* FOR UNCLE SAM

Good maintenance is especially important today when new equipment is hard to get and existing equipment is called on for high-speed 3-shift service. Here are a few simple rules that may help keep your shovel digging more for longer:



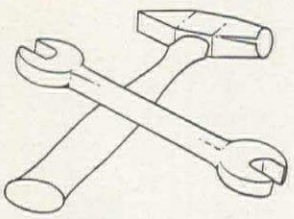
1. Lubricate regularly, following manufacturer's instructions carefully.

2. Keep machine clean.

3. Keep fuel, lubricants and radiator water clean.

4. Inspect machine at least every 6 shifts and tighten any loose bolts.

5. Fix troubles while they're still little ones. Don't let them grow.



6. Try to lay out work and drainage so machine works on dry footing.

7. Do not "sweep" the pit by sideways dipper motion.

8. Do not start swing until dipper has been hoisted or retracted clear of bank.

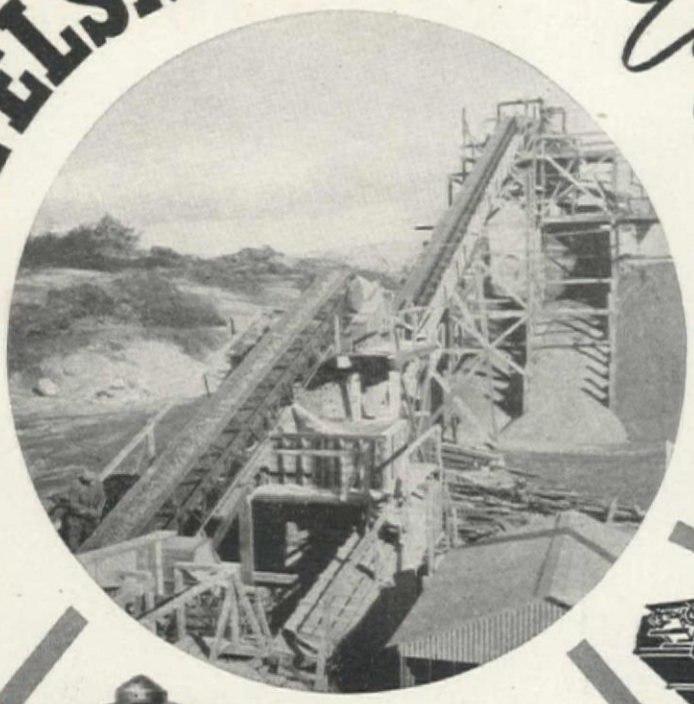
Bucyrus·Erie

SOUTH MILWAUKEE, WISCONSIN

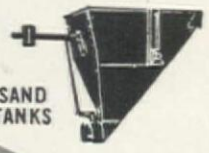
Enlarged reprints of this ad are available for your bulletin boards. In the reprints, the Bucyrus-Erie signature is omitted to leave room for your own name. Write for your copies.

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., 2990 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: J. D. Adams Co., 2313 First St. N., Billings; Westmount Tractor & Equipment Co., 150 E. Spruce St., Missoula.

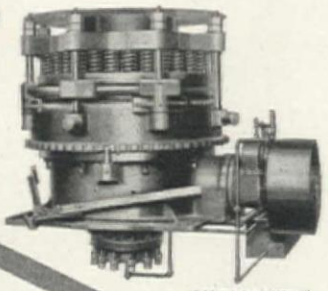
TELSMITH GRAVEL PLANT and QUARRY *Equipment*



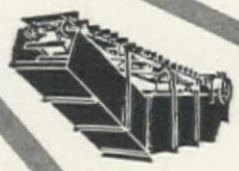
Are you modernizing, expanding, or building a new plant? Telsmith machinery is the right answer to today's problems. From crushers to bin gates, every unit is designed, engineered, and built "right" *by Telsmith.* And Telsmith selective engineering service fits it to do the job you want done *at the lowest operating cost.* To push production to peak profits—buy Telsmith. *Get Bulletin E-30.*



SAND TANKS

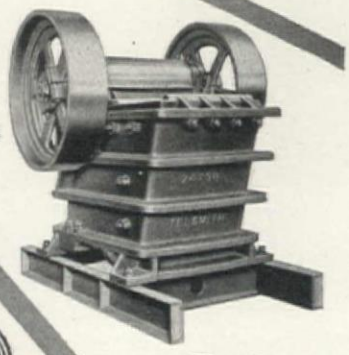


GYRASPHERE CRUSHERS



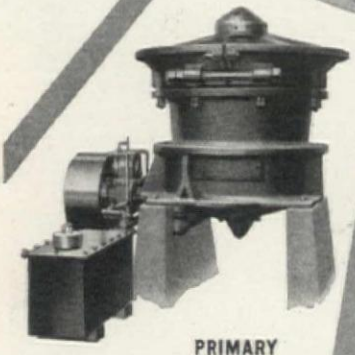
SAND DRAGS

SAND CLASSIFIERS



JAW CRUSHERS

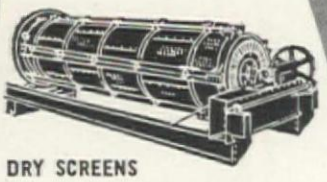
BELT AND BUCKET ELEVATORS



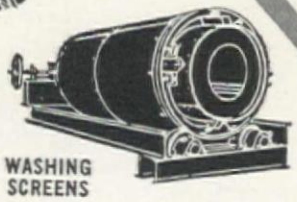
PRIMARY BREAKERS

REDUCTION CRUSHERS

HEAVY DUTY FEEDERS

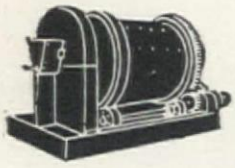


DRY SCREENS

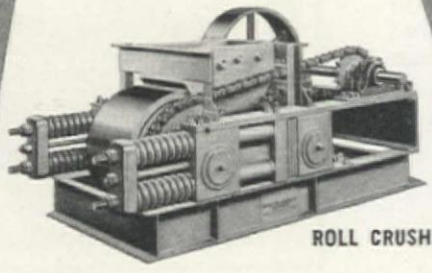


WASHING SCREENS

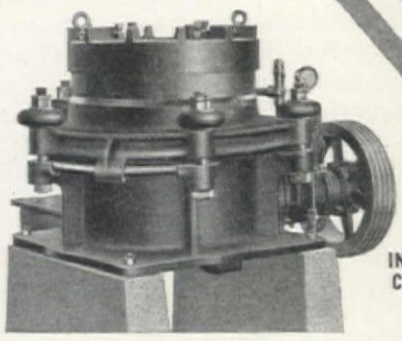
PULSATORS



SUPER SCRUBBERS



ROLL CRUSHERS



INTERCONE CRUSHERS

E-4

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General Machinery Co.
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Arnold Machinery Co.
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Gordon Russell, Ltd.
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Adams Equipment Now Works to
KEEP THE GUNS ROLLING

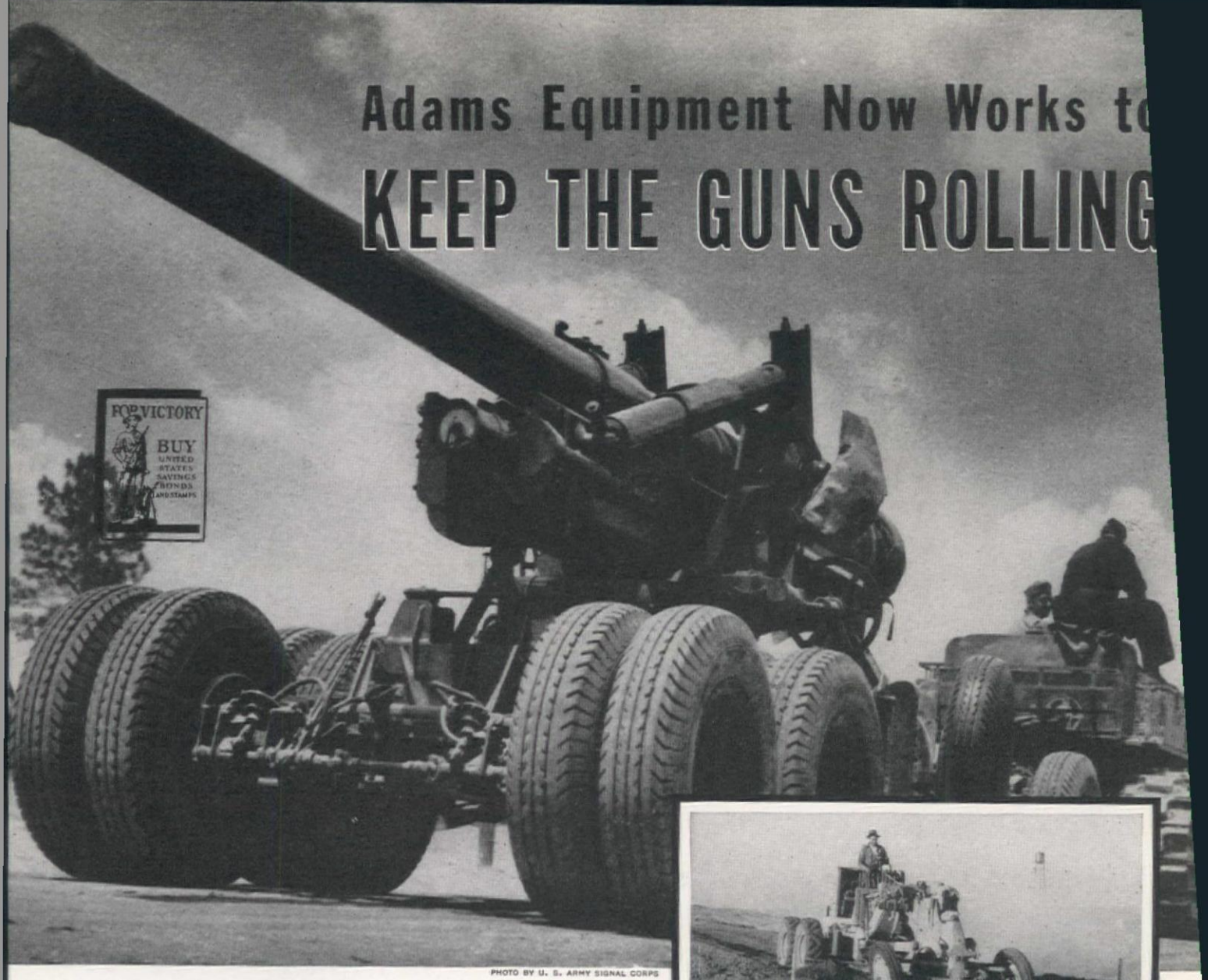


PHOTO BY U. S. ARMY SIGNAL CORPS

Overwhelming concentration of gun-fire at the right place at the right time is classic battle-winning strategy . . . In today's battles the arrival of American guns at crucial times on world-wide fronts is the climax of a chain of events in many of which Adams equipment plays a vital part . . . Earth must be moved and leveled for factories to produce the guns and for the roads carrying workmen and supplies to them; for camps for the men who use the guns, dockyards for the ships to transport them, airfields for the planes to protect them, and for the all-important roads leading into the firing lines . . . In all these links in the chain of guns rolling to the front Adams machines are swiftly and efficiently doing their jobs . . . After victory new machines designed to meet the most severe wartime performance standards will be ready for your peacetime jobs. They'll be well worth waiting for!

J. D. ADAMS COMPANY

SAN FRANCISCO • LOS ANGELES • BILLINGS

● *Adams heavy-duty motor grader builds miles of connecting roads within new ordnance plant in the east.*

● *Adams hauling scraper cuts, hauls and fills to level ground for motor and artillery park in new western camp.*

ADAMS EQUIPMENT IS SOLD IN THE WEST BY THE FOLLOWING DISTRIBUTORS

HOWARD-COOPER CORPORATION, Portland, Seattle, Spokane, Eugene, Walla Walla; THE LANG COMPANY, Salt Lake City; THE O. S. STAPLEY COMPANY, Phoenix, Ariz.; McKELVY MACHINERY COMPANY, Denver, Colo.; McCHESNEY-RAND EQUIPMENT CO., Albuquerque, New Mexico; INTERMOUNTAIN EQUIPMENT CO., Boise, Idaho; ALLIED EQUIPMENT, INC., Reno, Nevada; LOWRY EQUIPMENT COMPANY, Redding, Calif.; BUTTE TRACTOR & EQUIPMENT CO., INC., Sacramento, Calif.; GLEN CARRINGTON CO., Fairbanks, Alaska.

ADAMS

ROAD-BUILDING AND EARTH-MOVING

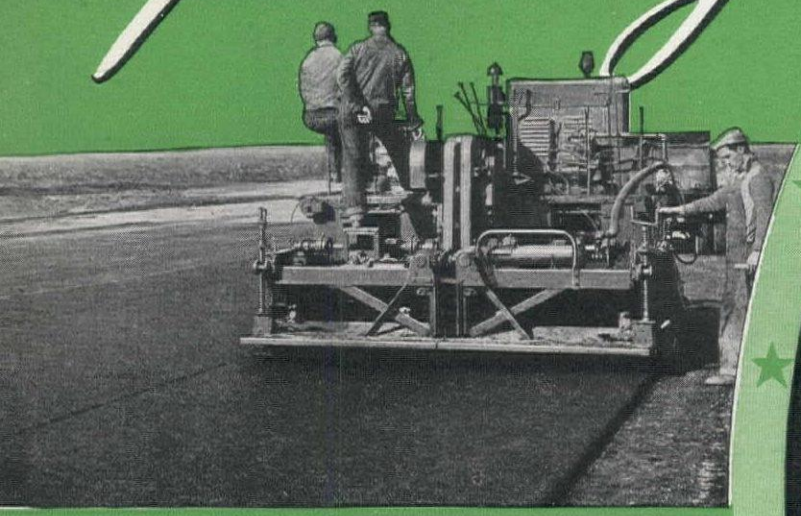
Speeding Victory

Barber

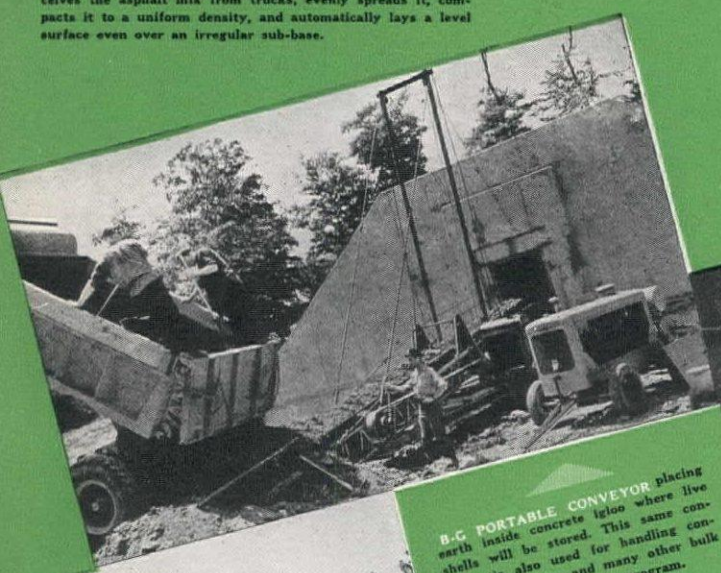
THESE machines are the products of free enterprise, developed in times of peace for normal functions. They are typical of the many ingenious results of the open competition of a democratic system. Now these very machines are working to defend the system that made them possible.

There is much more to defense than munitions . . . the building of camps, airports, roads, igloos

BARBER-GREENE COMPANY



B-G FINISHER laying runways for [redacted] Bomber Assembly Plant Airport, [redacted]. The B-G Finisher receives the asphalt mix from trucks, evenly spreads it, compacts it to a uniform density, and automatically lays a level surface even over an irregular sub-base.



B-G PORTABLE CONVEYOR placing earth inside concrete igloo where live shells will be stored. This same conveyor is also used for handling concrete, aggregate, and many other bulk materials of the Defense program.

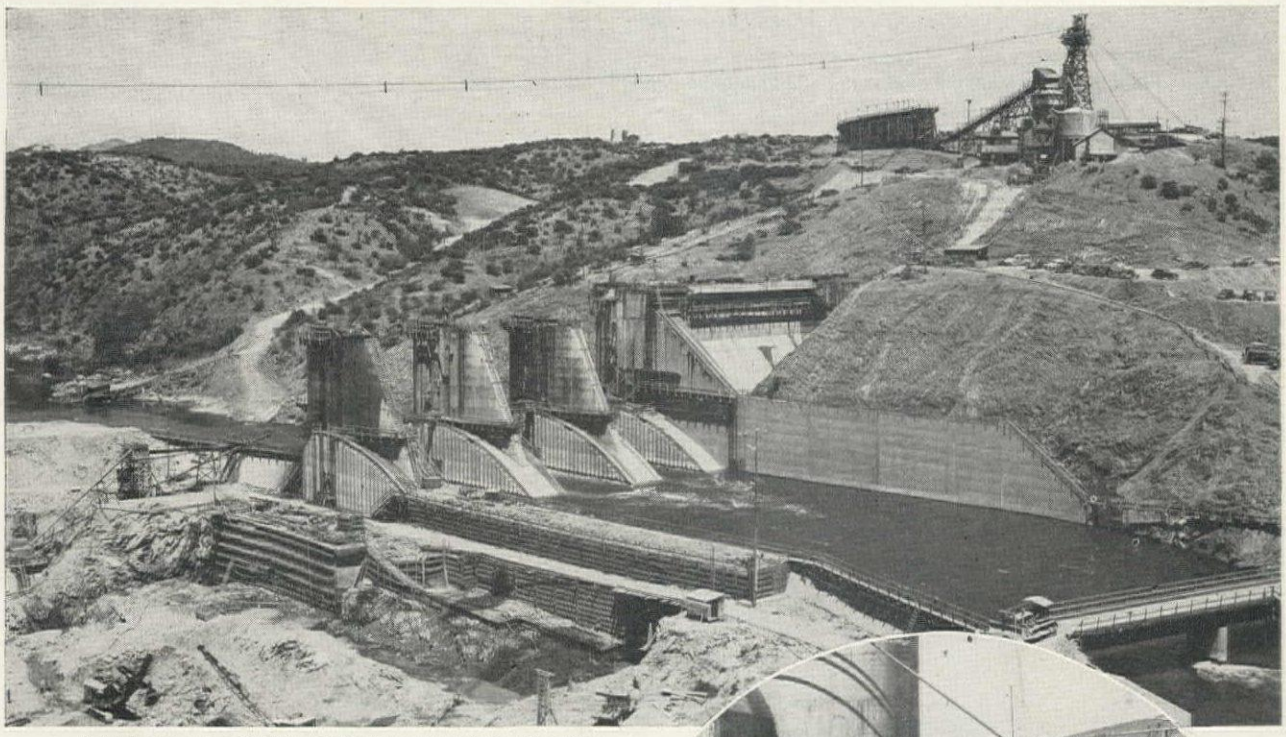
B-G SNOW LOADER clearing city streets at from 10 to 20 yards per minute. The Snow Loader has proven to be essential in the Defense producing areas.

B-G TRAVEL PLANT mixing sand asphalt for U. S. Navy [redacted]. It is delivering 3 cubic yards of mixed material per minute in this picture.

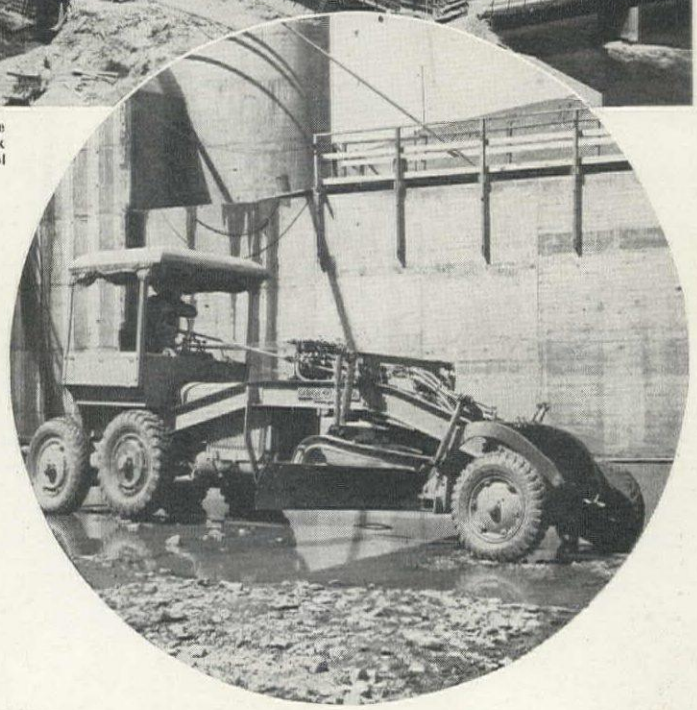
B-G "GOOSENECK" COAL LOADER, one of many being used for handling coal and coke for heating hangars and airport offices both in the United States and Canada.

B-G CAR UNLOADER. Many of these Barber-Greenes are being used for handling coal by the U. S. Quartermasters Corps. This Barber-Greene slips under the car and is practically automatic after being started.

Steep Access Roads at Keswick Dam Are Maintained by a GALION GRADER



Keswick Dam, near Redding, California, an important unit of the Central Valley Project, is slated for completion late in 1943. Keswick is being built ten miles below Shasta Dam as a secondary river control for the Sacramento River. Contractor: Atkinson-Kier.



A sturdy GALION Motor Grader is on the job at Keswick—keeping vital access roads in repair for the rapid removal of excavated material. More repair on the roads and less repair on the machine . . . . that's the story of GALION rugged construction.

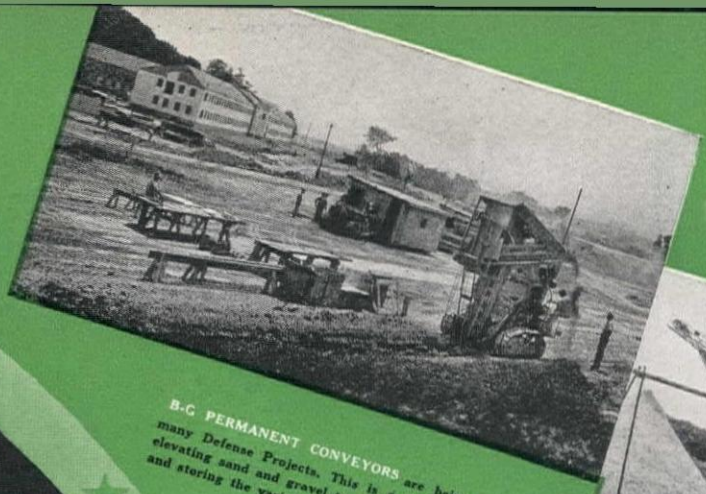
GALION ROAD MACHINERY points to better roads

GALION continues to provide "Performance Plus" on those rush war construction jobs in the West. If unable to secure new models, see that your present GALION units are serviced and reconditioned when necessary by your GALION Distributor.

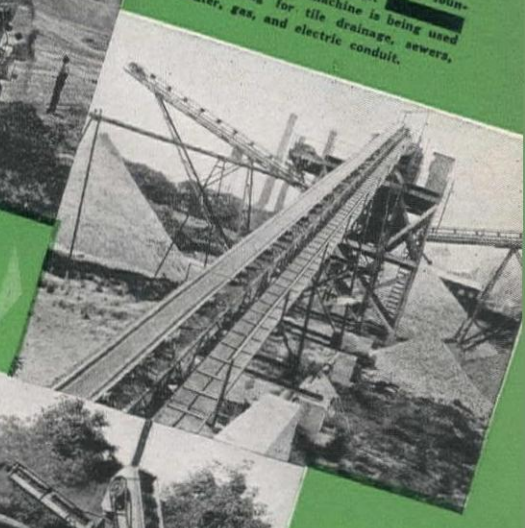
The GALION IRON WORKS & MFG. CO.
GALION . . . . . OHIO

WESTERN 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., Portland, Oregon, and Twin Falls, Idaho; Western Traction Co., San Francisco, California; Ormande C. Bell, Reno, Nevada; Service Equipment Co., Seattle, Washington.

Deletions made by Barber-Greene Company to comply with current censorship.



B-G DITCHER digging building foundations for Ordnance Plant [redacted]. This same machine is being used for cutting for tile drainage, sewers, water, gas, and electric conduit.

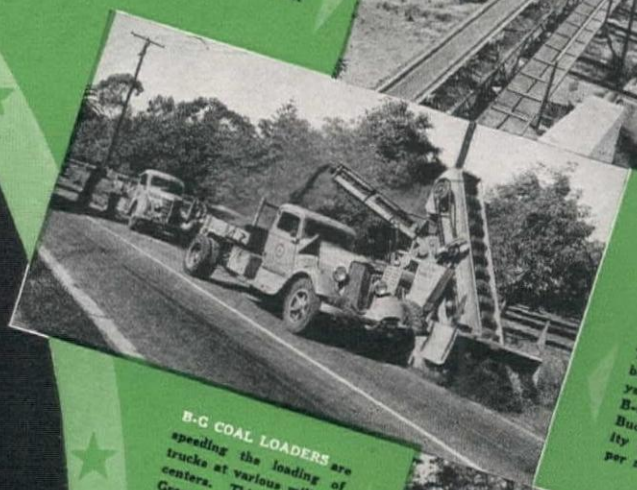


B-G PERMANENT CONVEYORS are being used in many Defense Projects. This is a typical application elevating sand and gravel to a central screening plant and storing the various sizes.

with Greenes

—a thousand major products—requiring almost every commodity used in our normal life—now required in a sudden rush of multiplied quantities. The ingenuity and unequalled efficiency of American products combined with the American spirit is responsible for the rapid progress of the defense program—a spirit that is showing the difference between being pushed together, and pulling together.

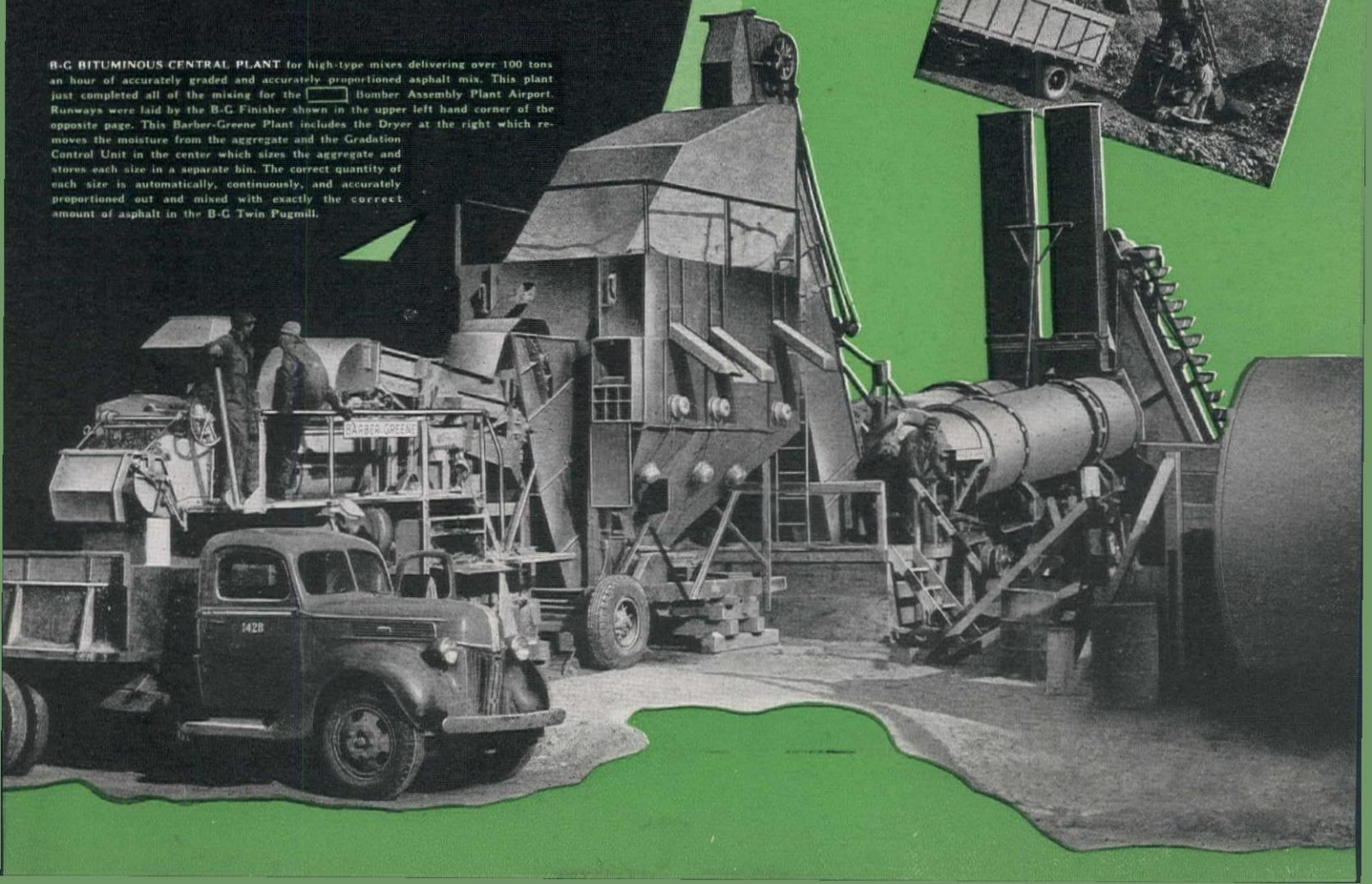
AURORA, ILLINOIS, U. S. A.



B-G BUCKET LOADER. This pneumatic tired Barber-Greene delivers 1½ yards per minute. The large B-G Crawler Mounted Bucket Loader has a capacity of over 3 cubic yards per minute.

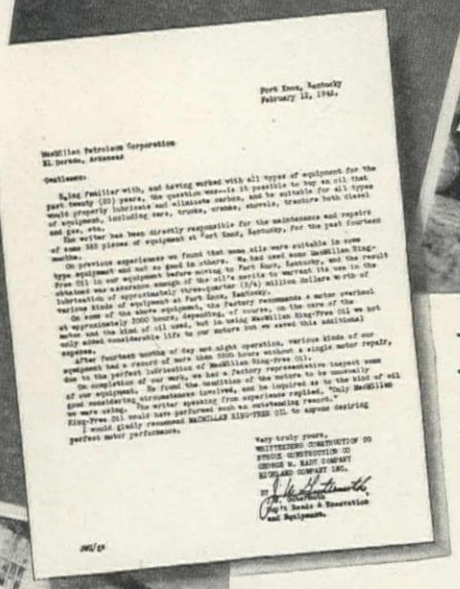
B-G COAL LOADERS are speeding the loading of trucks at various military centers. This Barber-Greene is crawler mounted, and easily delivers over two tons per minute.

B-G BITUMINOUS CENTRAL PLANT for high-type mixes delivering over 100 tons an hour of accurately graded and accurately proportioned asphalt mix. This plant just completed all of the mixing for the [redacted] Bomber Assembly Plant Airport Runways were laid by the B-G Finisher shown in the upper left hand corner of the opposite page. This Barber-Greene Plant includes the Dryer at the right which removes the moisture from the aggregate and the Gradation Control Unit in the center which sizes the aggregate and stores each size in a separate bin. The correct quantity of each size is automatically, continuously, and accurately proportioned out and mixed with exactly the correct amount of asphalt in the B-G Twin Pugmill.



"An outstanding record" on 385 pieces of equipment

CARS • TRUCKS • CRANES • SHOVELS • DIESEL AND GAS TRACTORS



Fort Knox, Kentucky
February 12, 1942.

Macmillan Petroleum Corporation
El Dorado, Arkansas

Gentlemen:

Being familiar with, and having worked with all types of equipment for the past twenty (20) years, the question was--is it possible to buy an oil that would properly lubricate and eliminate carbon, and be suitable for all types of equipment, including cars, trucks, cranes, shovels, tractors both diesel and gas, etc.

The writer has been directly responsible for the maintenance and repairs of some 385 pieces of equipment at Fort Knox, Kentucky, for the past fourteen months.

On previous experiences we found that some oils were suitable in some type equipment and not so good in others. We had used some MacMillan Ring-Free Oil in our equipment before moving to Fort Knox, Kentucky, and the result obtained was reason enough of the oil's merits to warrant its use in the lubrication of approximately three-quarter (3/4) million dollars worth of various kinds of equipment at Fort Knox, Kentucky.

On some of the above equipment, the Factory recommends a motor overhaul at approximately 2000 hours, depending, of course, on the care of the motor and the kind of oil used, but in using MacMillan Ring-Free Oil we not only added considerable life to our motors but we saved this additional expense.

After fourteen months of day and night operation, various kinds of our equipment had a record of more than 3300 hours without a single motor repair, due to the perfect lubrication of MacMillan Ring-Free Oil.

On completion of our work, we had a Factory representative inspect some of our equipment. He found the condition of the motors to be unusually good considering circumstances involved, and he inquired as to the kind of oil we were using. The writer repeated such an outstanding record.'

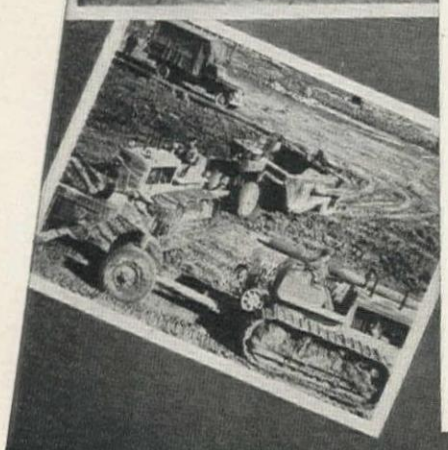
Ring-Free Oil could have performed such an outstanding record.'

I would gladly recommend MACMILLAN RING-FREE OIL to anyone desiring perfect motor performance.

Very truly yours,
WHITTENBERG CONSTRUCTION CO
STRUCK CONSTRUCTION CO
GEORGE M. EADY COMPANY
HIGHLAND COMPANY INC.

By J. W. Gutermuth
Sup't Roads & Excavation and Equipment.

JWG/gt



FROM FORT KNOX, Kentucky, comes a letter from J. W. Gutermuth, superintendent Roads and Excavation and Equipment for Whittenberg Construction Company, Struck Construction Company, George M. Eady Company, and Highland Company, Inc. He "has been directly responsible for the maintenance and repairs of some 385 pieces of equipment at Fort Knox for the past fourteen months," he writes in February, 1942.

In previous jobs, he says, some oils were good in some types of equipment "and not so good in others." His experience with Macmillan **RING-FREE** was reason enough for him to use it on $750,000 worth of equipment at Fort Knox.

On some of this equipment, the factory recommends overhauls at about 2,000 hours. But—

"After fourteen months of day and night operation," continues Mr. Gutermuth, "various kinds of our equipment had a record of more than 3,300 hours without a single motor repair, due to the perfect lubrication of Macmillan **RING-FREE** Oil."

When a factory representative inquired what oil had been used, Mr. Gutermuth replied:

"Only Macmillan **RING-FREE** Oil could have performed such an outstanding record.'

Whatever your equipment may be, write us, so that Macmillan **RING-FREE** can do for you what it is doing for others.

• • •

MACMILLAN
PETROLEUM
CORPORATION

50 West 50th St., New York
624 S. Michigan Ave., Chicago
530 West 6th St., Los Angeles

MACMILLAN RING-FREE MOTOR OIL

REG. U.S. PATENT OFFICE

Heaping loads increase the yardage gains these Le Tourneau Carryall Scrapers get for Coggins & Deermont, who work this cut both ways and spread at either end as shown in Fig. 1.

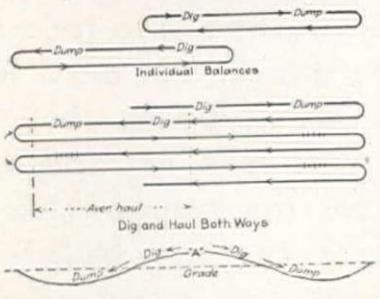
Convert Turning Time Into

Extra Yardage and Extra Profits

Get More Loads in Less Time with Your Present Equipment by Using These Victory-Speeding Cut-and-Fill Methods

The two job-proved methods shown here are applicable on almost every airport, access road, base or other Victory project requiring earthmoving. By applying them you reduce round-trip time, consequently increase the number of loads and yardages you can move with your present Tournapulls and tractor-drawn LeTourneau Carryall Scrapers.

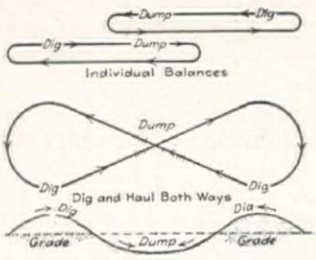
Spread Cut Two Ways



When this cut is worked in individual balances, 2 turns are required for each load. By cutting both ways and spreading at both ends, you handle 2 loads with but 2 turns.

Move Both Ends to Middle

Here again you save time by moving 2 loads with 2 turns instead of 4.



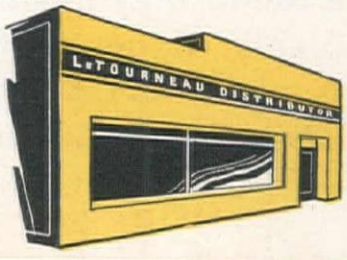
Each turn eliminated gains an average of 0.25 min.

Assume a 10 pay yard load and 5.0 min. per load, then on the basis of individual balances you could deliver 120 cu. yds. hourly. With either of the above turn-eliminating cycles, you save 3.0 min. on 12 loads, thus increase your hourly yardage to 126 cu. yds.—a gain of 126 cu. yds. per Carryall Scraper per 21-hour day. At 15c a cu. yd. this elimination of turns amounts to $18.90 per day or $9,000 on a 10,000-hour operating life!

Figure the gain in yardage and extra profit for your own Carryall Scraper fleet and job—gains will vary with scraper size and haul distances, but you'll find the method always increases the number of loads and yardage—*without an increase in equipment.*

See Your Dealer

Any time you need help on job planning ideas for getting maximum yardage and lowest costs with LeTourneau equipment, call on your local LeTourneau-"Caterpillar" dealer. He also has parts and factory-trained servicemen to keep your equipment working at full efficiency for Victory. See him TODAY!



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.

LICKING ANOTHER B

... OVER 200 ALLIS-CHALMERS TRACTORS ON ONE HUGE SOUTHWEST PROJECT

A vast array of mechanized might is winning another race against time, on another ordnance project — one of the largest, perhaps one of the toughest! Faced with a time limit, long hauls and 5 to 6 feet of muck removal before making cuts and fills ... officials in charge found they needed equipment with plenty of power for the tough hauling, plenty of speed for the long pulls. Over 200 A-C tractors, together with 102 Gar Wood scrapers and other Allied units were rushed in to take over the brunt of the attack. Put on a three shift, 7 day a week basis, they are building mile after mile of road, handling grading for the railroads, laying the groundwork for the buildings! On every project, of every size, at home and on the fighting front — you'll find these mechanical soldiers of war hurrying the day of peace!

★ ALLIS-CHALMERS ★

TRACTOR DIVISION · MILWAUKEE · U. S. A.

G JOB!

< **HUGE ASSEMBLAGE OF FIGHTIN' POWER!**

Shown here is a part of the big fleet of Allis-Chalmers tractors and Gar Wood scrapers. In all, there are over 200 A-C tractors, 102 Gar Wood scrapers, motor graders, bull-dozers, engines and other allied equipment.

∧ **BORROW PITS GO STRAIGHT DOWN!**

The borrow goes unusually deep on this project to save time and money stripping a wide area of the 5 to 6 foot covering of spongy muck. The tough-loading, sandy-clay borrow is heaped-up in the Gar Wood scrapers with the powerful, 2-Cycle Diesel tractors.

< Handling by far the greater part of the bulldozing work are 2-Cycle Diesel tractors equipped with Gar Wood and Baker bull-dozers.

TWIN-RIBBON Concrete Spreading

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

Double-Quick Dumping and Spreading

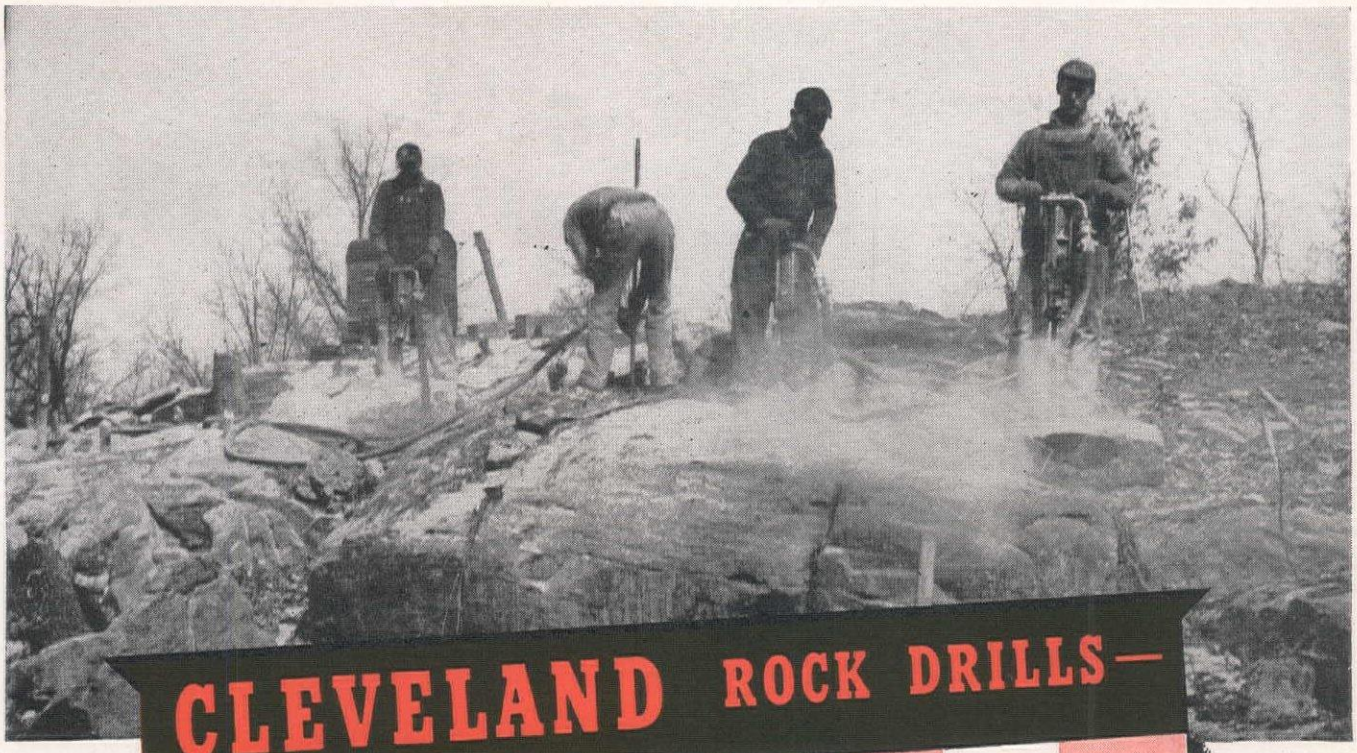
Koehring Pavers, Twinbatch and Unibatch, have the special fast spreading Twin-Door boom bucket. Twin doors, both opening same direction, provide Double-Quick Dumping and Spreading. Twin ribbons of concrete are spread on the grade. Action is instantaneous . . . large Twin-door opening is approximately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

KOEHRING COMPANY, ***Milwaukee, Wisconsin***

KOEHRING HEAVY DUTY

HEAVY-DUTY CONSTRUCTION EQUIPMENT

HARRON, RICKARD & McCONE CO., San Francisco-Los Angeles • RAINIER EQUIPMENT 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



CLEVELAND ROCK DRILLS—

HELPING TO WIN THE WAR

★ Throughout the country, and in the islands that now form the outposts of American defense, Cleveland rock drills are doing their important part in the building of roads, air bases, gun implacements, and fortifications. These projects are vital to the system by which we shall protect ourselves until barbarous Axis nations are finally disarmed and forced back within their own borders. The work must be done well, and with dispatch, so it is fitting that Cleveland rock drills are constantly being called upon to do their part in the nation's big job. Drills for this work must operate in extremes of weather conditions, from the frigid climate of Greenland to the hot and humid weather of the South Sea Islands. They must be fast, reliable, and rugged. Our armed forces know they can depend on Cleveland Hand Sinkers, Paving Breakers, Tampers, Diggers, Wagon Drills — *and so can you!* We will place Cleveland Drills on your job on a trial basis. Simply tell us the type and size, or write us about your drilling conditions.

May we send a catalog?

WESTERN BRANCHES

BUTTE, MONTANA
41 East Broadway

BERKELEY, CALIFORNIA
572 Santa Barbara Road

WALLACE, IDAHO
515 Bank Street

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1417 Texas Street

CALIFORNIA DISTRIBUTORS

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

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

DID YOU GET YOUR COPY OF THE DRILLER'S HANDBOOK?

It is chock full of hints that will help you get more work out of your air tools, and that will enable you to make them last longer. Write stating the sizes and types of rock drills you are now operating, and a copy will be sent postpaid, without charge.

THE CLEVELAND ROCK DRILL COMPANY

Cable Address: ROCKDRILL • CLEVELAND, OHIO

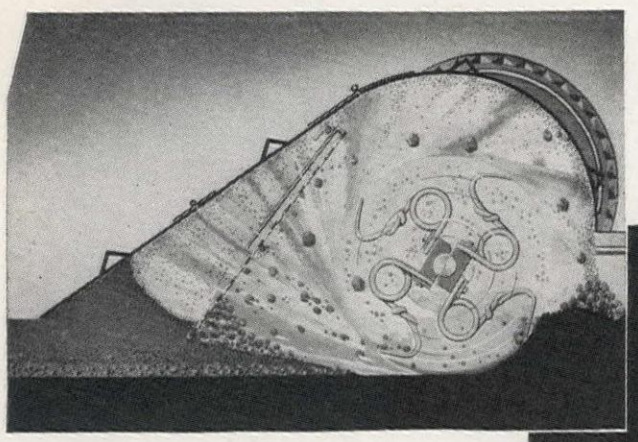
LEADERS IN DRILLING EQUIPMENT

THE dusky youngster in the foreground is not alone in her astonishment. Hard, practical, straight-from-Missouri contractors and skeptical engineers have felt the same way after watching the SEAMAN PULVI-MIXER perform.

The startled youngster is watching the SEAMAN PULVI-MIXER at work on a soil-cement job. That's just one of the many stabilization processes which the SEAMAN PULVI-MIXER handles faster, better, more economically and more thoroughly *than any other method.*

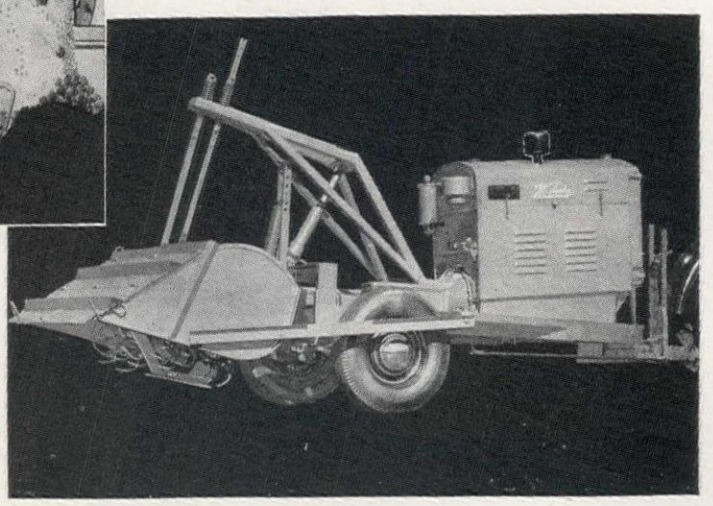
What kind of stabilization are you planning right now?—Soil cement? The SEAMAN PULVI-MIXER assures a successful operation through precision-control of cement and moisture proportions—evenly and thoroughly mixed through the full depth of the treatment ... One or another of the bituminous stabilizations? The SEAMAN PULVI-MIXER is the answer to every in-place mixing operation ... Calcium chloride? Fewer passes and a better, more thorough mix if you use a SEAMAN!

If you don't know about the SEAMAN PULVI-MIXER and the savings in time and labor it creates in highway and airport stabilization, start your investigation right now. As your first step write us for Bulletin 232.



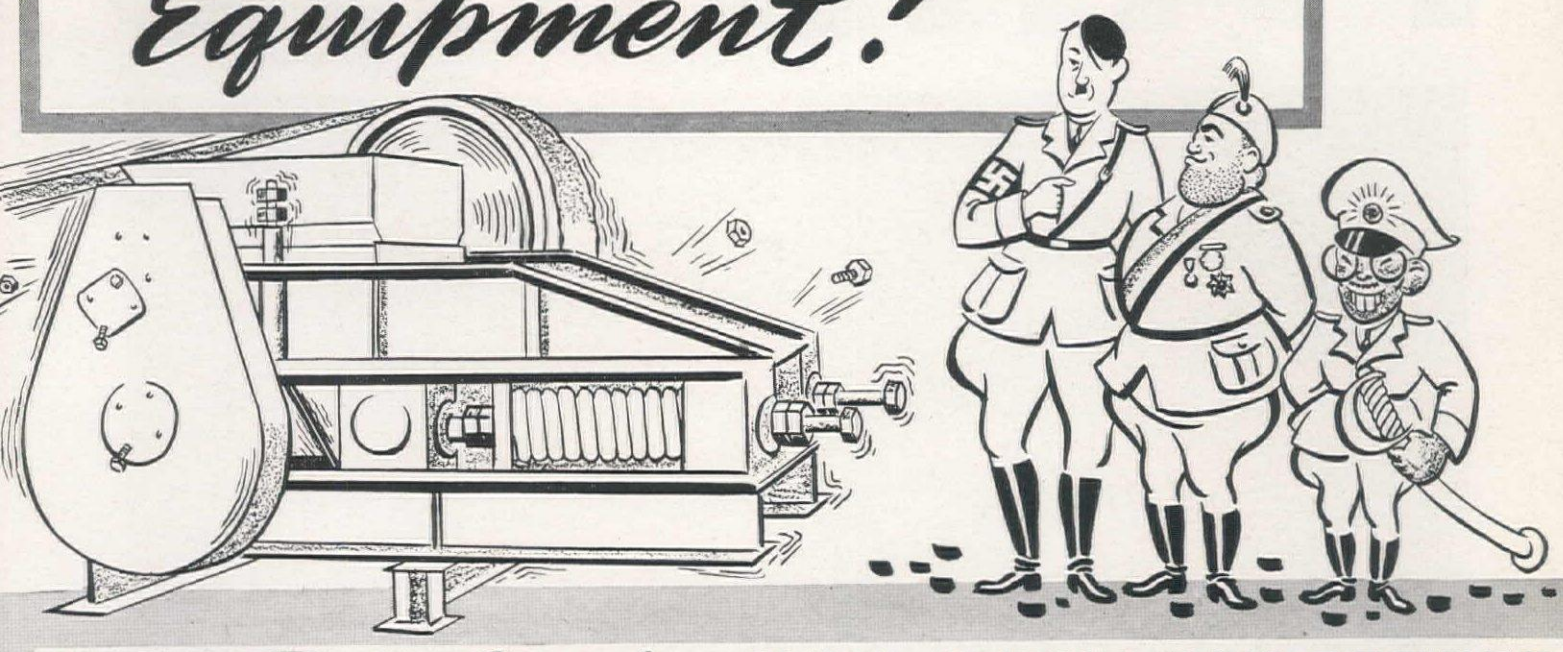
It's *rotary* action that does the trick. The rotor tines driven at great velocity literally create a tornado of the materials to be mixed. Study this cross-sectional view. It tells you more clearly than words why the SEAMAN PULVI-MIXER delivers an astonishingly thorough mix.

SEAMAN MOTORS
MILWAUKEE • WISCONSIN

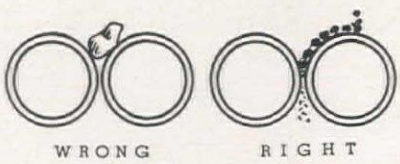


The SEAMAN PULVI-MIXER is manufactured in both tractor-operated and Motorized Models in mixing widths up to 75 inches.

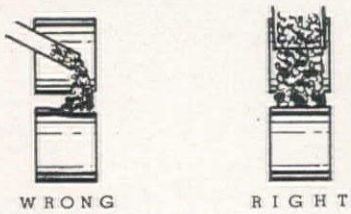
. . . THEY PROFIT
WHEN YOU ABUSE YOUR *Equipment!*



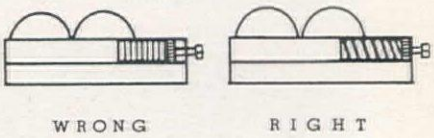
YOUR *Roll Crusher* WILL SERVE YOU BETTER AND LONGER *if you watch these points.*



1. Feed rock that the rolls can grab. Too large rocks will ride on the rolls and cut grooves in the shells.

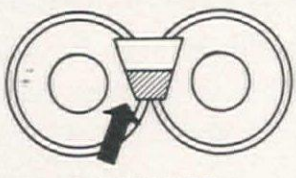


2. Feed crusher evenly over full surface of shells. Uneven feed will reduce production and cause uneven wear.

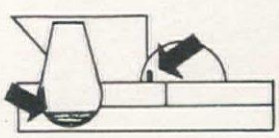


3. Keep springs tight enough to crush — but with sufficient play for safety.

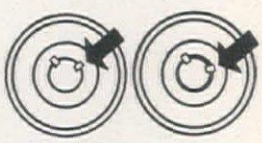
4. Keep all bolts tight. Loose bolts cause unnecessary wear and may damage bearings or the crusher. Wedge bolts on roll shells will loosen during operation and should be tightened regularly.



5. Keep cheek plates properly adjusted and replace when worn.



6. Lubricate regularly and often. Grease all fittings. Grease slide bars. Check oil in gear cases.



7. Check all keys and see that they are tight.

Every operator should have a parts book and Instruction book. They are available to users of Pioneer Roll Crushers without cost or obligation.

Pioneer
ENGINEERING WORKS
Minneapolis, Minnesota, U.S.A.

PARSONS

For extra wide trenches, not too deep, dual booms may be effectively used.

For Speedy, Convenient Trenching

Trees, Poles, steep banks and other obstructions won't halt your pipe line digging when you are using a Parsons Trencher with the shiftable offset boom. Excavations may be made with boom in extreme right or left hand position, without sacrifice of speed or ease of operation. With a Parsons you can dig within 14 inches of a side obstruction, and on line with outside edge of either crawler. This one Parsons feature alone will save hours of digging time.

For complete details write The Parsons Company, Newton, Iowa

TRENCHING EQUIPMENT

PARSONS

So That Free Men May Rule the Skies

"Production and more production" is the battle cry of a free people. They know complete security rests with production supremacy — ability to out-produce the Axis.

Marion machines are playing a vital part in keeping the Nation's assembly lines working at top speed. Their jobs as shovels, cranes, draglines and clamshells are with contractors building military highways, arsenals, housing projects, landing fields, camps and ships, and other construction projects essential to the war effort. This they are doing on a twenty-four hour schedule.

THE MARION STEAM SHOVEL COMPANY
MARION, OHIO, U. S. A. *Offices in all principal cities*
Serving industry since 1884

MARION

SHOVELS • DRAGLINES • CLAMSHELLS
CRANES • PULL-SHOVELS • WALKERS

Gasoline — Diesel — Electric — ¾ cubic yard to 35 cubic yards

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.

Wilson "Hornets" Train Better Welders

. . . AND BUILD BETTER SHIPS at Kaiser Company Shipyards

Better arc welders are not enough in Kaiser Company, Inc., shipyard operations. These wizards of the shipways are training their own operators — with welding apparatus that is well built — and that will stand up in hard service. At the Kaiser yards in Vancouver, Wash., and at the Oregon Shipbuilding Corp., there are over 400 Wilson "Hornet" arc welders in the training shops, in the assembly and shipway areas, aboard ship and elsewhere throughout the yards wherever welding jobs are going on.

The new Wilson "Hornet" has been designed primarily to help the "Man in the Helmet". Every feature of design and construction was planned with but one goal in view — to build an electric arc welding generator which would require a minimum of the operator's attention.

The "Hornet" with its single control, self-regulation and internal stabilization follows all irregularities of the arc, equalizes them and keeps the arc working. The result is a smooth, forceful arc, unbeatable in its recovery power.

Working with a "Hornet", the operator can forget all worries about his generator and give 100% attention to the important job of making a good weld. For complete details on the "Hornet" see your nearest Airco representative.

AIR REDUCTION

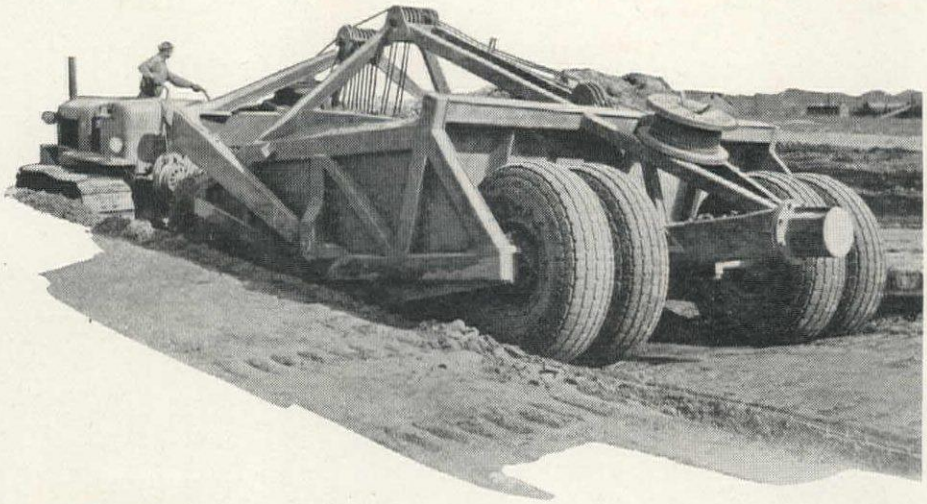
60 EAST 42nd STREET, NEW YORK, N. Y.

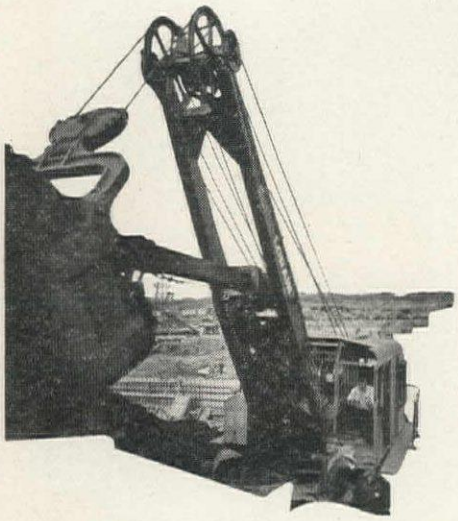
In Texas: Magnolia - Airco Gas Products Company

AIRCO

WILSON

IDLE CYLINDERS ARE PRODUCTION SLACKERS: *Keep 'em rolling for victory*





Use the wire rope that's cut out for today's jobs

There's no place for slack in industry-under-arms—or in the wire rope that literally carries so much of the load. To accelerate production, to strengthen your defense against equipment shut-downs, you need the workability and durability of Preformed Yellow Strand. With this time-tested rope as prime mover, shovels, draglines and scrapers can dig in and take the full bite. Hoists, derricks and cranes can utilize high speeds with safety. All cable-using machines can move closer to capacity operation and put off replacements.

These gains result from pointing up Yellow Strand's stout, drawn-to-order steel wires with the limberness of preforming. The rope reeves easily . . . runs freely around small sheaves . . . spools evenly despite overloads. Still every length is as tough as ever—highly resistant to shock, abrasion and drum crushing. Today time-and-labor saving cable counts *double* in production. Install Preformed Yellow Strand and help your men and machines deliver to the limit.

BRODERICK & BASCOM ROPE CO., SEATTLE

Branches: New York • Chicago • Houston • Portland • St. Louis

Factories: St. Louis • Seattle • Peoria

FREE—this 96-page Riggers' Hand Book of useful information on wire rope and slings. Send for it today.

A MAINSTAY

YELLOW STRAND
PREFORMED
WIRE ROPE

OF NATIONAL DEFENSE

Utility Plus!

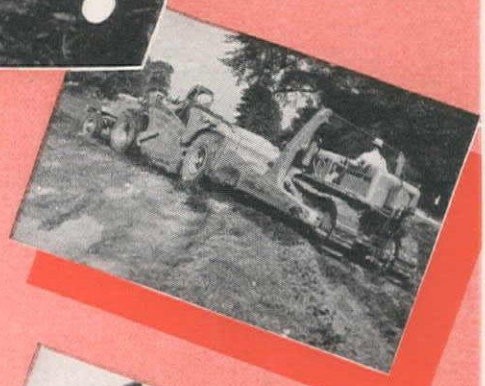
Baker Hydraulic Bulldozers

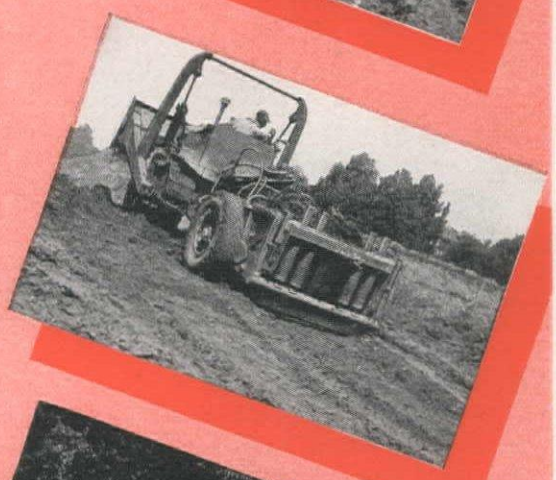
Tree dozing, stump pulling, dirt moving, filling ravines, building ramps, mowing down glacial ridges—Bakers, the utility earth movers, by the dozen, are doing these things and a lot of others that are not in the blueprints all up and down [censored] !

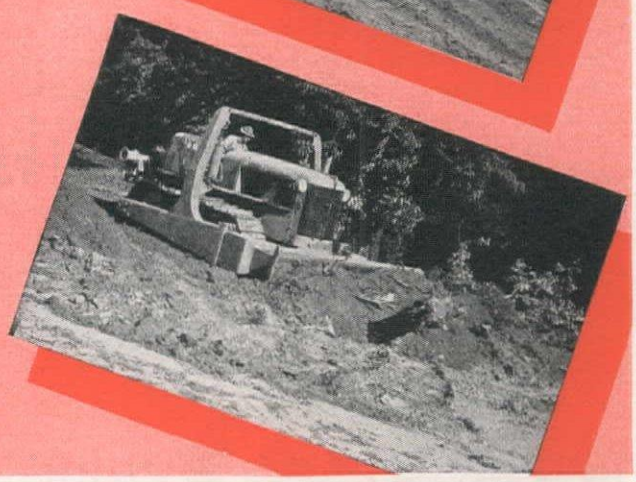
Contractors who have used Bakers for years and have had an opportunity to compare all types of earth moving equipment, still praise the Baker's utility.

And much of its plus utility results from the fast, direct, positive hydraulic control. You can *jiggle the blade* to roll a log as shown above. Or bring the moldboard into play to *shove a dirt lugger.* And you *can hook a Baker Hydraulic Scraper on your tractor back end* with a Baker Bulldozer on the front end. And if you need a *winch on the back end,* you can have that, too, and still have the utility you get only from a Baker Hydraulic Bulldozer or Gradebuilder.

Let us send a copy of "Unsung Heroes" which gives a picture account of what Bakers, like these, are doing to win the war.







THE BAKER MFG. CO.

542 Stanford Ave. Springfield, Illinois

BAKER

The Modern Tractor Equipment Line for

EARTH MOVING
LEVELING AND GRADE BUILDING
SNOW REMOVAL
ROAD MAINTENANCE

"THAT SKIPPER IS THE FASTEST HALF-BAG MIXER I'VE EVER HAD ON A JOB!"

"SO? WHAT'S IT GOT AND WHERE CAN I GET THE LOWDOWN?"

"Well, for one thing, it's got that new Hi-Lo skip hopper that cuts shoveling height six inches. This figures to as much as a mile of shoveling height in a full day's work! Ask your Rex distributor about it!"

YOUR REX DISTRIBUTOR can tell you more about the half-bag Rex Skipper that trails like a Pullman, spots like a kiddy-car. Another thing, its self-cleaning hopper cuts drum loading time as much as 50%! If you're interested in a 3½S Mixer that will compete on a par with many 5S Mixers at far lower cost, see him the next time you drive by. And keep in touch with him at all times. He's a good man to know when it comes to getting information on what's new in the construction business in your area; what jobs are to be let; where new or used equipment is available; and other valuable local news items.

The Skipper's Hi-Lo skip hopper puts all other "rigid charging hopper" half-baggers in the obsolete class these days when speed *is the thing.*

SEE YOUR REX DISTRIBUTOR

CHAIN BELT COMPANY *OF MILWAUKEE*

MIXERS • PUMPS • PAVERS • MOTO-MIXERS • PUMPCRETES

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

P&H

hydraulic control

Speeds work—
Saves manpower!

LOW PRESSURE HYDRAULIC CONTROL gives you quick, positive response for smoother operation—*cushioned action*—easier on both machine and operator.

TRIPLE-SAFE PLANETARY BOOM HOIST—stops and holds boom at any elevation. Boom *can't* drop suddenly.

ROLLED ALLOY STEELS, with one-piece welded construction of both upper and lower structures provide greater strength, greater resistance to shock loads.

These and other P&H advantages mean steady operation and the ability to complete war projects on schedule.

General Offices: 4490 West National Avenue, Milwaukee, Wisconsin

HARNISCHFEGER CORPORATION: 82 Beale Street, San Francisco, Calif.

Warehouses, Service Stations: Seattle, Los Angeles, San Francisco

Portland, Ore.: Loggers & Contractors Machinery Co., 240 S. E. Clay St.; Reno, Nevada: R. D. Jenkins & Son, 202 E. 2nd St.; Willows, Calif.: Willow Motor Sales Co.; Albuquerque, N. M.: Mr. Floyd Ames, P. O. Box 372; Great Falls, Mont.: Midland Implement Co.; Salt Lake City, Utah: National Equipment Co., 101 West Second St. So.; Seattle, Wash.: Glenn Carrington & Co., 91 Columbia St.; Spokane, Wash.: F. M. Viles & Co., 1007 Second Avenue West; Redding, Calif.: Lowry Tractor & Equipment Co., 2637 Angelo St.; Napa, Calif.: Berglund Tractor & Equipment Co., 1224 Third St.; Prescott, Ariz.: Arizona Mining Supply Co.

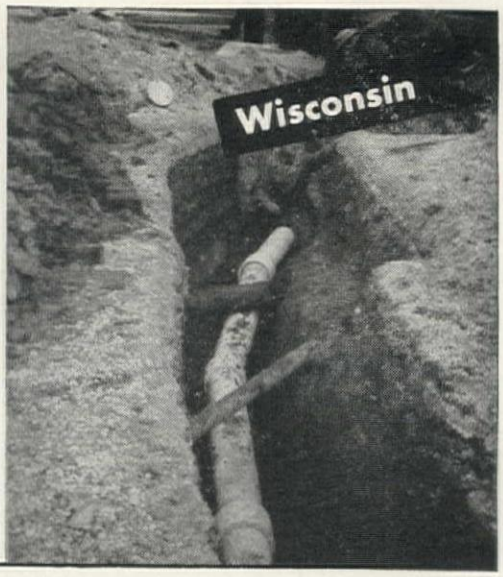
HARNISCHFEGER
CORPORATION

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

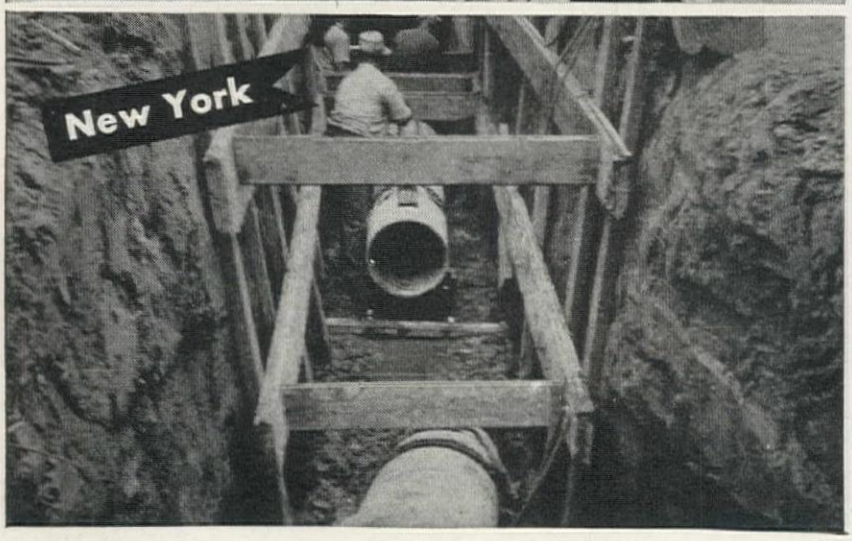
BE A STEP AHEAD WITH P&H

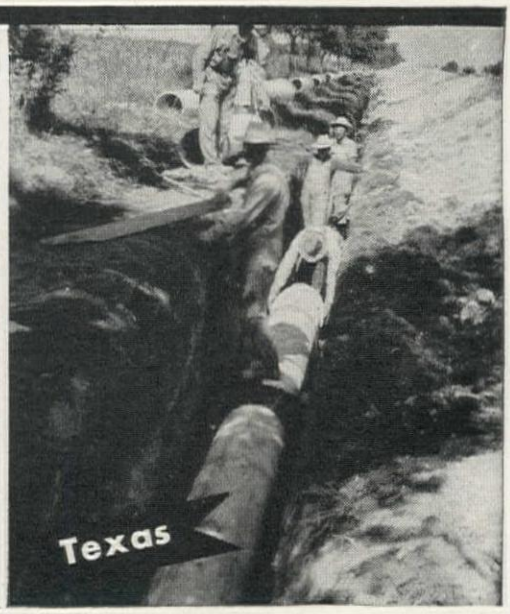
MORE FOR YOUR EXCAVATOR DOLLAR

Awarded the Navy "E" for excellence in war production, P&H displays it also as a pledge of future effort.



From Coast





For Water Lines

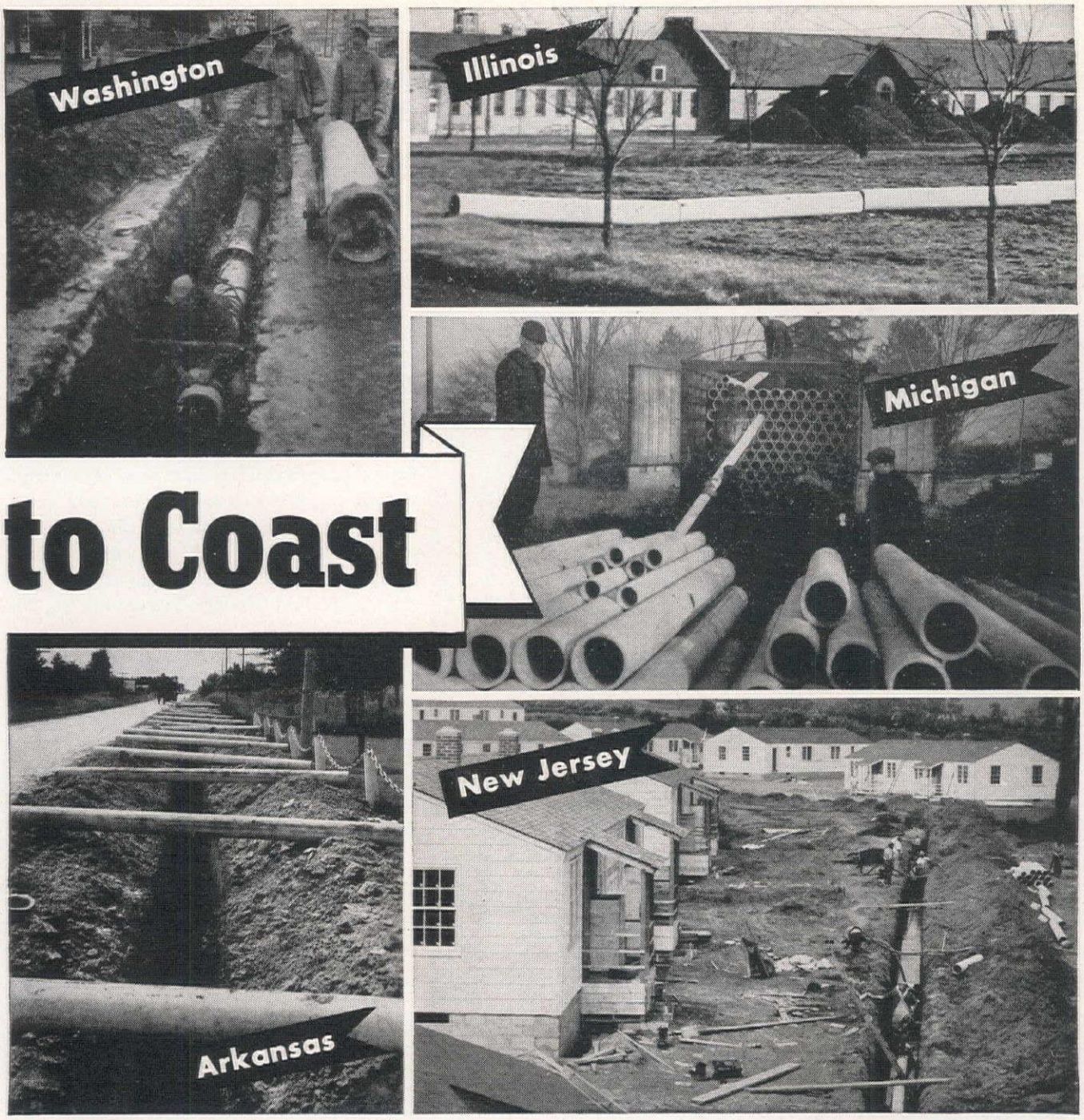
In hundreds of cities, towns and villages, J-M Transite Pipe is contributing to efficient, low-cost water transportation. Here are some of the reasons why . . .

JOHNS-MANVILLE JM PRODUCTS

Rapid Assembly—The Simplex Coupling means rapid, economical assembly, even by unskilled crews. Joints are assembled cold, without heating or pouring.

Easy Handling—Transite Pipe is unusually light in weight. Mechanical loading and unloading equipment is needed only for the larger sizes.

Tight, Flexible Joints—Consisting of a Transite sleeve and two rubber rings, Simplex Couplings provide tight, flexible joints. Finished joints are checked merely by gauging the position of the rings. The Simplex Coupling allows deflections up to 5° at each joint, permitting wide sweeps to be made with straight lengths of Transite.



No Tuberculation—because Transite is of non-metallic, asbestos-cement composition. Tubercles can never reduce its high flow coefficient (C=140).

Low Maintenance—Transite's asbestos-cement composition also means high corrosion-resistance. This advantage, plus lasting tight joints, contributes to Transite's low maintenance costs.

• • •

For complete details on Transite Pressure Pipe, send for brochure TR-11A. And for facts on reducing sewage disposal costs with Transite Sewer Pipe, write for brochure TR-21A. Address Johns-Manville at Los Angeles, San Francisco or Seattle.

Johns-Manville Transite Pipe

AN ASBESTOS PRODUCT

For efficient, economical water and sewer lines

★ ★ ★ ★ CHICAGO PNEUMATIC NEWS ★ ★ ★ ★

CP No. 60, A UNIVERSAL DRIFTER

POPULAR 3½" MODEL ADAPTABLE TO WIDE VARIETY OF CONDITIONS

Well Balanced, Easy to Handle

NEW YORK—Popular model among the Chicago Pneumatic line of drifters—Hand-Crank, MOTORfeed and AUTOfeed—is the CP No. 60, a 3½" hand-crank drill. Because of its high drilling speed, low air consumption and ease of handling, the CP-60 is a favorite with contractors, mines and quarry operators. It is a particularly good drill for operations in which it is desirable to standardize on one size of medium weight drifter. Write for complete data on the fast-drilling Chicago Pneumatic No. 60.

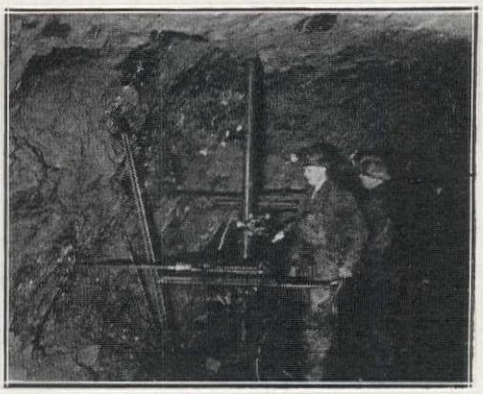
CHICAGO PNEUMATIC TOOL COMPANY

General Offices: 8 E. 44th St., New York, N. Y.

↑ **EQUALLY GOOD FOR HARD ROCK OR SOFT,** Chicago Pneumatic No. 60, 3½", 148 pound drifter, is ideal where conditions make it desirable to standardize on one size of medium-weight drill. Check the CP-60 under your conditions.

THOROUGH LUBRICATION of the entire drill from one oil chamber . . . front head of extra wall thickness and bushing to take up wear . . . these are only two of the features which contribute to the low maintenance of CP-60 Drifter. →

HIGHER DRILLING SPEED, lower air consumption per inch drilled, long life and continued efficiency of CP-60 Drifter are assured by an unusually light, fast and economical valve with short travel and large bearing areas. ↓



← **COMPARATIVE TESTS** in this Canadian mine demonstrated the fast drilling, low air-consumption and exceptionally low maintenance cost of the popular Chicago Pneumatic No. 60, the 3½" drifter that meets readily the requirement of general, all-around mining.

CHICAGO PNEUMATIC

ROCK DRILLS

ALSO: Air Compressors, Pneumatic Tools, Electric Tools, Diesel Engines, Hydraulic Aviation Accessories

DRIFTERS
MOTORdrifters
AUTOdrifters
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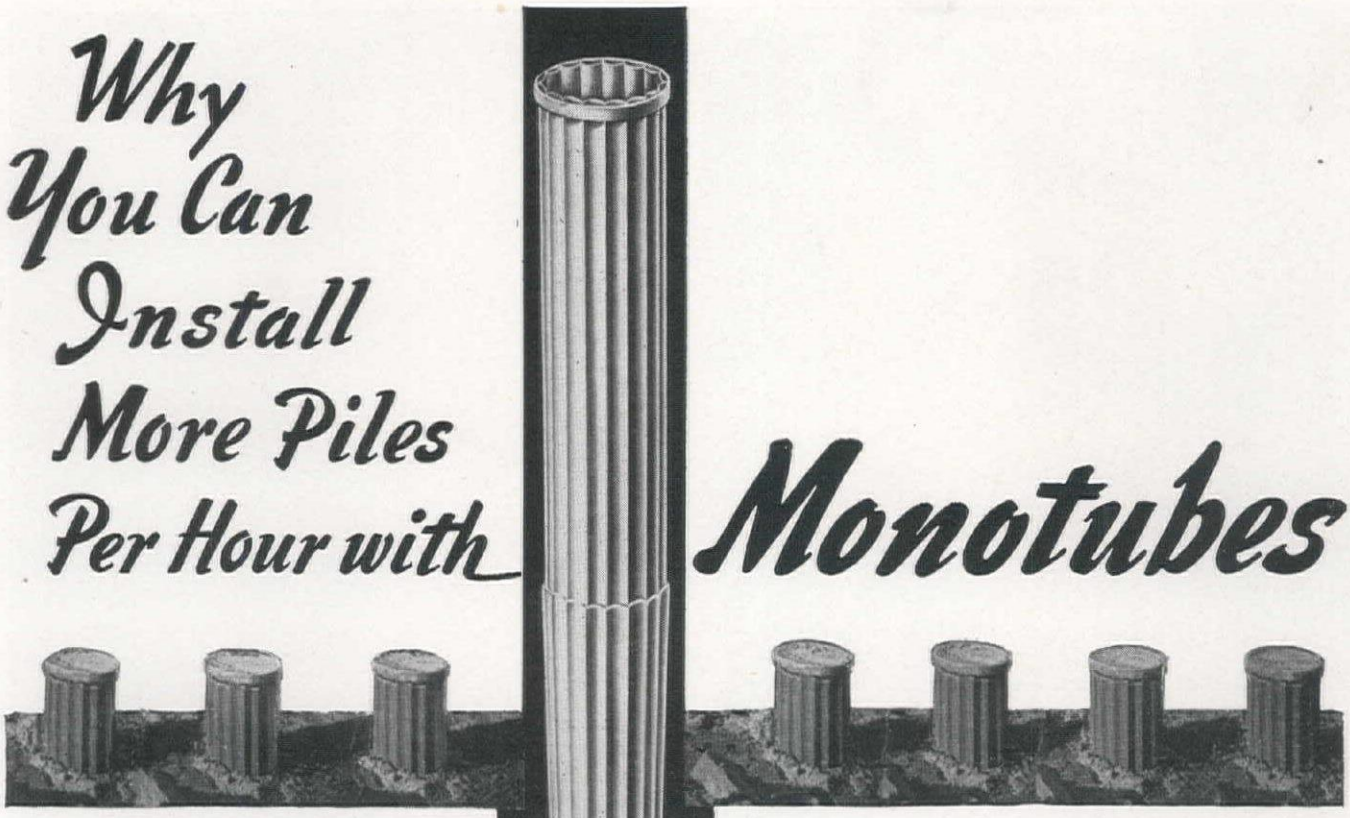
San Francisco: 855 Bryant St. Los Angeles: 655 Santa Fe Ave. Seattle: 1928 First Ave., South. Spokane: E. 217 Montgomery.

Why You Can Install More Piles Per Hour with Monotubes



Our Slogan—*"More Production Means Axis Destruction!"*

Nothing goes up until the piling goes down—therefore any method of pile construction that will even reduce by hours the established schedule, is highly desirable at the present time.

Job records show the use of Monotubes for the installation of cast-in-place concrete piles has resulted in time savings of many days, yes, even weeks. Here's why:

1. *SPEEDY Handling.* Monotube steel casings are light in weight for fast and economical handling.

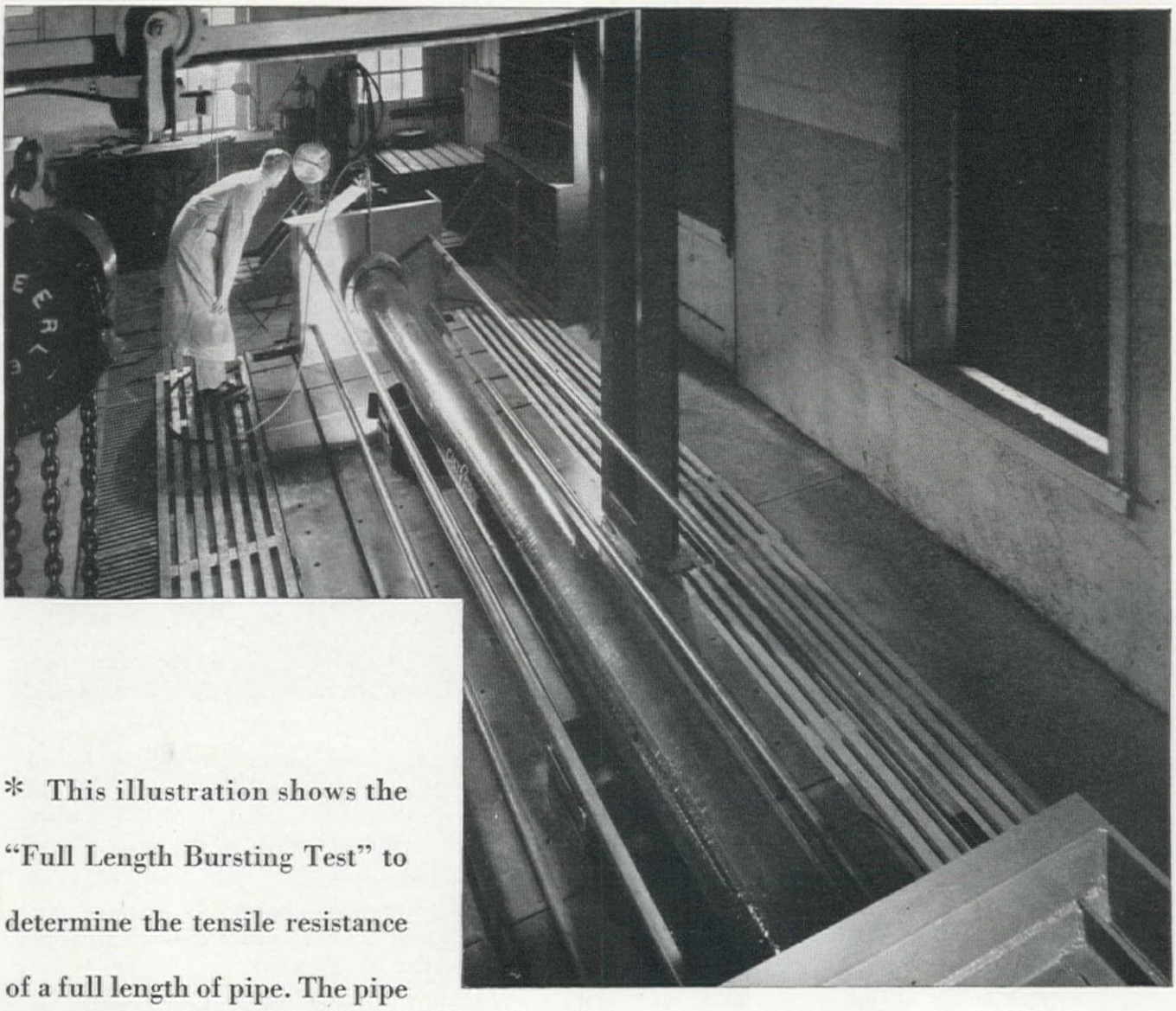
2. *SPEEDY Driving.* Tapered Monotubes are so strong and rigid they require no heavy core or mandrel and can be driven with average job equipment (crawler crane, equipped with standard leads and hammer).

3. *SPEEDY Extension.* Use of Extendible Monotubes permits installation of varying pile lengths on the job without delay or waste—even in low headroom.

4. *SPEEDY Inspection.* Hollow, tubular design enables you to inspect casing quickly and thoroughly from top to toe, prior to concreting.

Union Metal Monotubes are made in a gauge, taper, and size to meet load-bearing requirements in *any* soil condition. Experienced Union Metal engineers will show you how they can be used to best advantage. Write today for Catalog No. 68A.

THE UNION METAL MANUFACTURING CO.
CANTON, OHIO

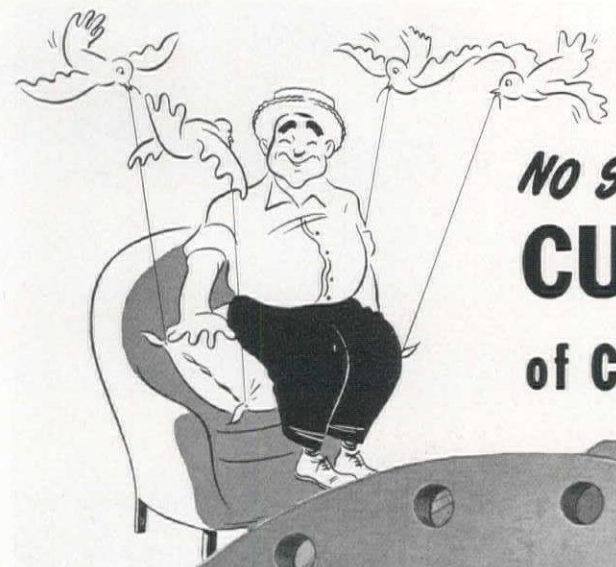


* This illustration shows the "Full Length Bursting Test" to determine the tensile resistance of a full length of pipe. The pipe is subjected to progressively increased hydrostatic pressure until failure occurs. Although not a required acceptance test, it is one of the additional tests regularly made by this Company to further check and maintain the quality of its pipe so that it will adequately meet severe service requirements. *United States Pipe and Foundry Co., General Offices: Burlington, New Jersey.* Sales Offices in Principal Cities.

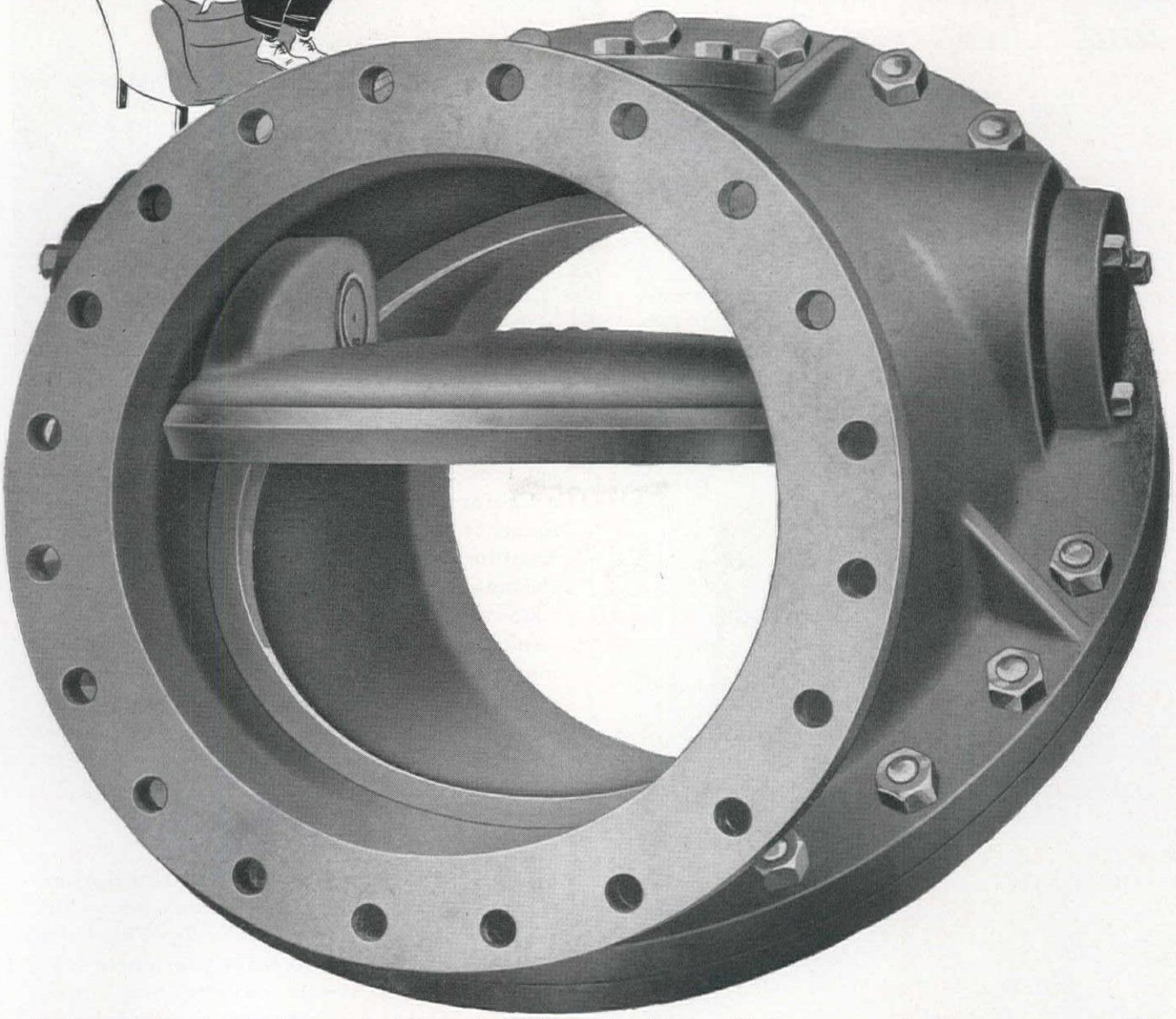
*** One of a series of controls in operation at each of our plants, beginning with inspection and analysis of raw materials and ending with tests of the finished product, all subject to the central control of our headquarters staff at Burlington.**

U.S. cast iron PIPE

Centrifugally or Pit Cast for water, gas, sewerage, drainage and industrial services.



NO SOUND... NO JAR... NO DAMAGE to the CUSHIONED SEATING of Chapman Non-Slam Check Valves



As flow slows down, Chapman's balanced airfoil disc closes *silently* to a drop-tight seat, without even a flutter. So there's no water-hammer or surging to vibrate the line or open up the flange joints. And head loss is cut 65% to 80%.

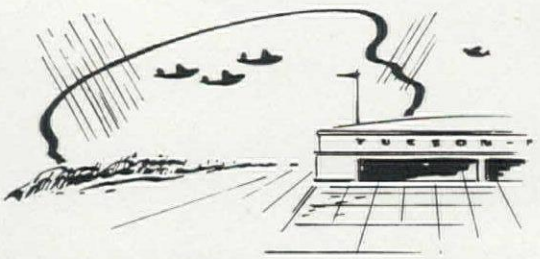
What's more, there's no rubbing or wear in the valve itself . . . which means reduced maintenance. This unique Tilting Disc Non-Slam Check Valve is made for pressures from 150 to 1500 lb., with any type of end connection, in iron or steel. Write for illustrated book giving complete operating data and test results.

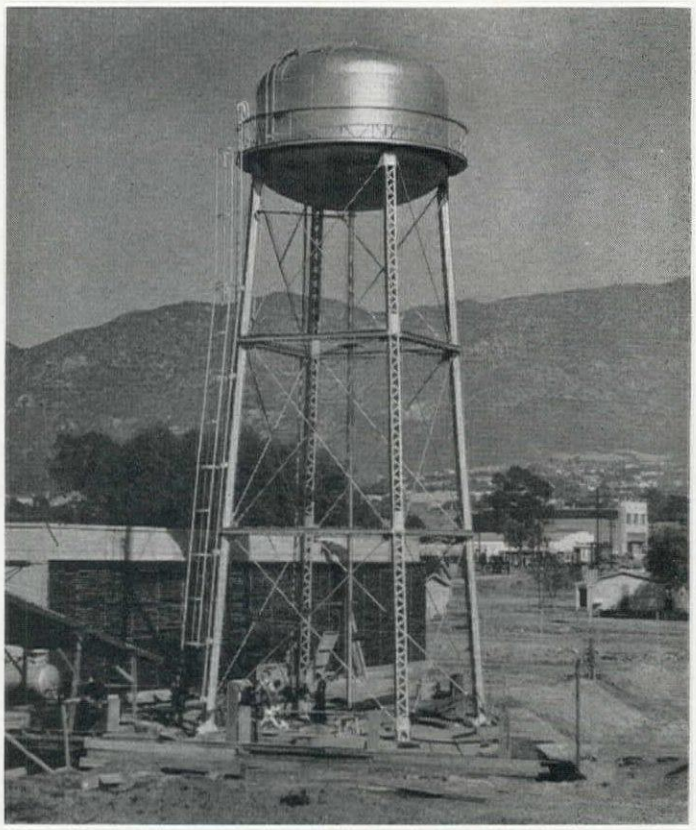
THE CHAPMAN VALVE MFG. CO., INDIAN ORCHARD, MASS.

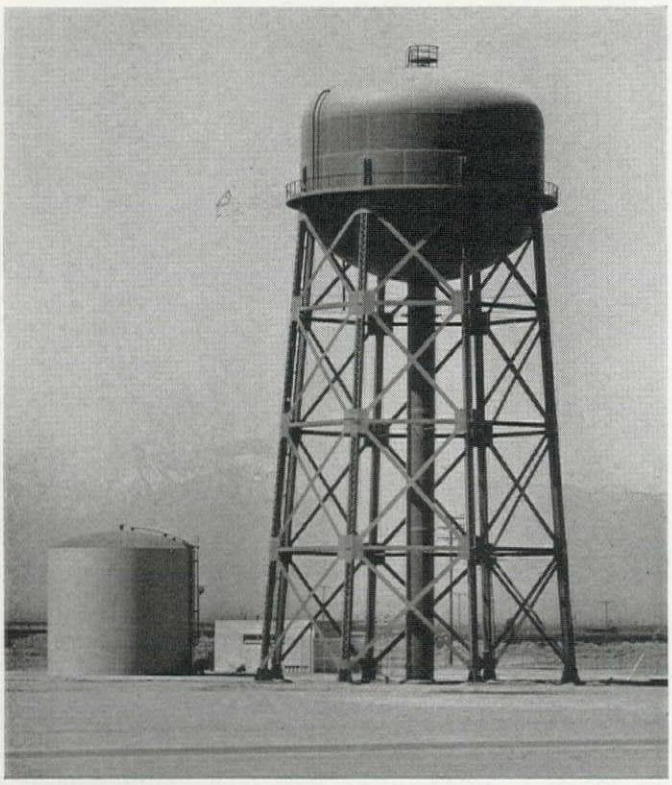
CHAPMAN NON-SLAM CUSHIONED CLOSING **CHECK VALVES**

Two HORTON ELEVATED STORAGE TANKS

Help to Build Planes and "Keep 'em Flying" in California







BUILDING—The Horton elevated storage tank shown above was installed recently in a California city to help meet power requirements of the city's rapidly expanding airplane manufacturing plants. Holding 30,000 gals., the tank is used for storage of boiler "make-up" water at a local power plant. It holds about one week's supply and provides an adequate reserve and a constant head. Water is taken from the city mains or from a deep well on the property and is treated with a Zeolite softener before being pumped into the tank.

•

FLYING—Shown at the left is a Horton elevated storage tank installed at an Army Air Force training field in California. This is a 500,000-gal. unit, which helps provide an efficient water supply system for the training center while maintaining an adequate reserve for fire protection.

CHICAGO BRIDGE & IRON COMPANY

San Francisco.....1013 Rialto Bldg.	Havana.....402 Edificio Abreu	Cleveland.....Guildhall Bldg.
Greenville.....York Street	Houston.....5621 Clinton Drive	New York.....165 Broadway Bldg.
Birmingham.....1598 N. Fiftieth Street	Tulsa.....Hunt Bldg.	Philadelphia....1700 Walnut St. Bldg.
Chicago.....McCormick Bldg.	Detroit.....Lafayette Bldg.	Washington.....632 Washington Bldg.

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

WESTERN CONSTRUCTION NEWS
WITH WHICH IS CONSOLIDATED WESTERN HIGHWAYS BUILDER
September, 1942 Vol. 17, No. 9

Ingenious Maintenance

MORE THAN anything else, contractors and their master mechanics are going to find an increasing need for quick-wittedness if machines are to be kept operating. So many vital parts of modern construction machines are made of critical high alloy steels that it would appear on the face of things that the construction industry would be unable to operate with any appreciable degree of efficiency with the supply of repair parts drastically reduced. The supply of repair parts has been seriously cut down and although there are strong hopes that it may be increased in the next three months, quick repair of breakdowns will still depend to a large extent upon the ingenuity used by contractors and their master mechanics.

One possible means of securing parts not otherwise available might be to combine the resources of the small machine shops scattered over the country with careful salvage of useful scrap from wornout machines. Drive shafts and rear axles of automobiles, for example, are frequently made of high alloy steels and might be salvaged and turned into bolts and rods by local machinists. In spite of the fact that scrap metal is badly needed, a considerable saving can be realized in the national war effort if full advantage is taken of all possibilities in making parts on the job.

Let's Turn in Our Scrap

IN SPITE of the fact that the construction industry is almost solely devoted to the war effort, there is still a vital service which contractors and engineers can and should render individually, and that is the salvage of unused and abandoned construction machines and structures. There are undoubtedly scattered throughout the west a good many tons of scrap metal in the form of antiquated equipment and bridges which have served no useful purpose for many years, but which might mean the difference between producing new steel and not producing new steel.

Under the direction of the Industrial Salvage Section of the War Production Board, American industry has undertaken to contribute every possible bit of scrap to the rapidly dwindling stockpiles of the manufacturers. As the fourth most important field of business, construction should provide a large share of the scrap which will be uncovered in coming months. The richest source of scrap in the construction industry should be the contractors' equipment yards, whose corners are so frequently cluttered with machines and machine parts long since abandoned but never actually junked. Another source worth investigation is the construction equipment abandoned on the job and left in gravel pits or on roadsides years ago because the cost of transportation was greater than the salvage value at the junkman's gate. Still another source is the bridges and structures abandoned when a highway or railroad line was modernized. In all three of these sources are tons of metal now badly needed for the production of some 90,000,000 tons of new steel this year.

The salvage of all this metal is not the responsibility of any one man, or even of any one group, but it is the responsibility of the entire construction industry and every individual within the industry. Contractors and their employees can clean out their yards and turn over to the junkman the tons of unserviceable and unuseable metal that they contain; state, city, and county engineers can turn over to salvage authorities abandoned structures (although many of these are being used, or may be useful in new structures); and everyone can note and report the location of abandoned equipment. We urge that every individual, engineers, contractors, catskinners, mechanics and laborers, take a direct and personal interest in expediting the movement of junk metal to the scrap pile (see page 391 of this issue) by reporting any and all possibilities for salvage.

Comprehensive Labor Agreements

LAST MONTH from the United States War Labor Board chairman, William H. Davis, came a comment on labor agreements which should lend much encouragement to the contractors and labor leaders who worked hard and long to establish the successful comprehensive labor agreement which has been in effect in Southern California for the past year and a half. Mr. Davis, as quoted by *Time*, said in effect that the next logical development in labor problems seems to be industry-wide collective bargaining. This logical development " . . . makes for greater stability throughout an industry, more responsible unions, and puts management on a more fair and equitable competitive basis so far as wage costs are concerned," said Mr. Davis.

At least the first step in such a development has already been made in the Southwest in the form of comprehensive labor agreements which were discussed at length in the July issue of *Western Construction News*. With very similar if not exactly identical agreements in effect in southern California, southern Nevada, and Arizona the construction industry in the west has a sectional industry-wide collective bargaining agreement that should serve as a model and inspiration for development of similar agreements in the other sections of the West.

Expansion of the comprehensive agreements until they cover at least all of the West, and then gradual consolidation of all agreements until the West is covered with a single agreement would be one method in which the desired result might be accomplished. That there will come a time when the entire construction industry must present a unified front if it is to survive is almost certain. The establishment of an industry-wide comprehensive labor agreement will not only assist both contractors and workmen to establish satisfactory working conditions and wages, but will be of material aid in uniting the construction industry against the time when complete agreement between all factors of the industry is essential.

Wanted urgently:

STEEL SCRAP

Shortage of steel scrap is threatening the war-production program.

If ships, planes, tanks and guns are to be produced in the volume needed to win the war, the country's steel-making facilities must operate at full capacity. But the plain truth is that the steel scrap to support continued capacity operations is not available, and not in sight.

United Effort Will Do the Job

Thanks to the construction of new blast furnaces, the deficiency is being partly made up by using more pig iron in steel-making. But tremendous quantities of additional scrap must be found within the crucial next few months.

Actually, many thousands of tons of steel scrap are potentially available *if only they can be gathered in*. This scrap, needed so urgently in the war effort, is scattered through the industrial plants, mines and railways, the farms and the homes of the nation. The problem is to collect it and get it moving to the steel mills. Everyone must help. If everyone will, there will be scrap to meet the needs of the war-production program.

Make a checkup in your plant or warehouse, or any other property you own or manage, and in your home.

Have any odds and ends of steel or iron that may be lying around collected. If you have any obsolete or idle equipment, machinery, or parts—anything that's made of iron or steel and isn't really needed—junk it, and get the scrap moving toward the steel mills.

How to Put Your Scrap to Work

Some iron or steel now lying rusting and forgotten around your property may help to save the lives of Americans in the battle areas. Gather up every possible bit of iron and steel scrap. Sell it to a local junk dealer, or get in touch with your local scrap salvage committee. Put your scrap to work for your country. It's needed, now!

BETHLEHEM STEEL COMPANY

BETHLEHEM STEEL

Contribute Now to:
The Scrap Salvage Campaign

Contractors, engineers and construction workers can make a valuable contribution to the war effort by aiding in the salvage of abandoned equipment —Equipment yards should be cleared of junk

SCATTERED all over the West there are abandoned construction machines that can be salvaged for scrap metal; contractors' yards are filled with scrap metal, old machines, and junk that can be scrapped; there are steel bridges no longer used that can be junked and the metal salvaged to provide new steel for ships, tanks, shells, and trucks, and possibly a few new construction machines. Contractors, engineers, master mechanics, shovel runners, catskinners —everyone in the construction industry —can and should help make the scrap drive a success by taking a direct personal interest and seeing that salvage authorities are fully informed of every possible scrap source.

The need is great

Steel, as nearly everyone knows, is composed of both new pig iron and iron and steel scrap on approximately a 50-50 basis. With a present capacity of something like 90,000,000 tons a year it can easily be seen that the steel producers will require about 45,000,000 tons of scrap this year if their maximum production is to be maintained.

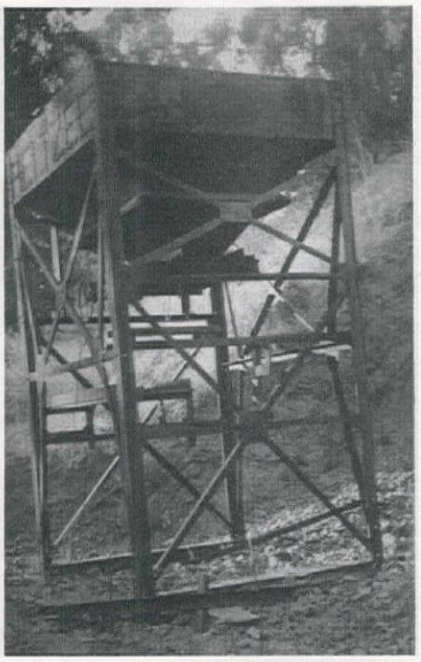
Although the construction industry is devoted practically 100 per cent to the war effort, there are still a number of ways in which you can give additional help. Everyone working in the construction business has frequently noted old construction machines abandoned along the roadside. Make sure that the salvage authorities are informed of such machines by jotting down the location and type of machine together with any other information which you may be able to secure on the coupon on this page and mail it at once to *Western Construction News*. The information you send in will be turned over to the Industrial Salvage Section of the War Production Board, which will take immediate steps to salvage the machine for scrap. You may be certain that no effort of yours in this direction will be wasted.

Contractors' yards all contain much old equipment, parts, and scrap iron that can never be utilized. Everything that is unlikely to be of use in the immediate future should be sold to the nearest junkman, who will in turn see that it gets into the scrap stockpile of the steel producers.

Abandoned bridges, highway and railroad structures, form another source of scrap. If you know of any of these, or similar structures that are not being used and have not been salvaged send in a description including the location and name of owner if possible to *Western Construction News*, and the information will be turned over to the Industrial Salvage Section for salvage action.

There is money in it

The staff of *Western Construction News* is sure that there is a tremendous amount of scrap available in abandoned construction equipment in the western states and is willing to pay for the proof. For the first ten snapshots of abandoned construction machines accompanied by a statement of location and description, *Western Construction News* will pay $5 each. Get our your camera now, snap that picture and send it in. Any abandoned shovel, dragline, tractor, scraper, grader, truck, compressor, mixer, bridge, or similar construction machine will do, but be sure to include the type of equipment, exact location, owner's name if possible, and your own name and address. Naturally, the machine or structure must be made of steel or iron, wooden ones have little value as scrap.



PICTURES of abandoned construction equipment such as this old hopper are worth $5 to you. *Western Construction News* will pay that for each of the first ten received accompanied by information as to location, type of equipment and owner (if possible).

ABANDONED CONSTRUCTION EQUIPMENT can be salvaged by the Industrial Salvage Section of the War Production Board if the location is known. Write a letter or fill out the coupon below if you know of any abandoned machines, send it to *Western Construction News*, and the information will be turned over to WPB for salvage action.

To: WESTERN CONSTRUCTION NEWS, 503 Market St., San Francisco, California
Here's some scrap that should be salvaged for war production:

Type.....
(Shovel-tractor-crusher-truck-compressor-roller-bridge-etc.)

Location.....

Owner (if known).....
(Name) (Address)

Approximate weight..... **Remarks**.....

.....

.....

From.....
(Your name) (Your address)

THROW YOUR SCRAP INTO THE FIGHT!

EVERY ROAD LEADS TO VICTORY

● There are no *unimportant* roads in America today! Unless food products move over "secondary" farm-to-market roads with dispatch and unfailing regularity . . . unless raw materials and finished parts get to far-flung processing, fabricating and assembling plants on schedule . . . the vital high-speed timetables of our armed forces and armament builders can't be maintained.

Since war needs make it impossible for you men who must build and maintain America's roads to get much new equipment, it's mighty important to keep available machines in the pink of condition.

This calls for instructions to operators on avoidance of abuse, overloading and excessive speeds. Even ruggedly built A-W machines have endurance limits. And regular inspection and maintenance by men who know exactly what to do, means extra years of effective performance . . . will help you keep irreplaceable equipment operating for the duration.

Your nearby Austin-Western dealer has this experience. He is trained and equipped to do a thorough job with a minimum of lay-up time for the machines. Use his expert service for all major maintenance and repair jobs. He will gladly help you work out a practical system of operator instruction, of inspection, lubrication and adjustment that will prevent many breakdowns . . . help you make good on your vital assignment of keeping 'em rolling on the home front.

THE AUSTIN-WESTERN ROAD MACHINERY CO., Aurora, Illinois

HIGHWAY EQUIPMENT CO., San Francisco, Calif.; COLUMBIA EQUIPMENT CO., Portland, Oregon; Spokane and Seattle, Wash.; Boise, Idaho; SMITH BOOTH USHER CO., Los Angeles, Calif., and Phoenix, Ariz.; THE HARRY CORNELIUS CO., Albuquerque, N.M.; LIBERTY TRUCK AND PARTS CO., Denver, Colo.; WESTERN MACHINERY CO., Salt Lake City, Utah; C. D. ROEDER COMPANY, Reno, Nevada; WILSON EQUIPMENT & SUPPLY CO., Cheyenne, Wyoming; WESTERN CONSTRUCTION EQUIPMENT CO., Billings, Mont.

WESTERN CONSTRUCTION NEWS

SEPTEMBER • 1942

The Alaska Highway—Reconnaissance by Dog Sled

A locating engineer for the Public Roads Administration reports on the topography of the Alaska highway route and experiences of a 19-day trip made by means of dog teams over one section of the line between Fort Nelson and Watson Lake

By W. H. CURWEN

Highway Engineer, Public Roads Administration, Federal Works Agency, Fort Nelson, British Columbia

On March 6 of this year the Canadian Government announced its approval of the proposal that a highway be built to Alaska. On the same date the War Department addressed a request to the Federal Works Agency that the Public Roads Administration cooperate in the location and construction of the highway. Public Roads engineers were immediately sent into the field to make preliminary investigations of possible route locations. There follows a report of one such investigation revised to eliminate geographic details.

ACCOMPANIED BY F. W. Ambos, senior engineering aid, John Callison, guide, and Dennis Callison, musher, and with two dog teams, I made a reconnaissance from Ft. Nelson, B. C., toward Watson Lake, Yukon Territory, between March 25 and April 12, 1942. Mileages between the different points are those estimated and used by trappers using this route. As the trails and streams followed are very winding, these distances are probably about 35 per cent greater than the distances would be on a located highway.

Day by Day Account

March 25, 1942. The party left Ft. Nelson and traveled approximately along the present road, and proceeded west and up river on a combined horse and dog trail about 20 mi., where camp was made for the night. The trail is located at varying distances north of the river near the toe of a low ridge running approximately east and west. At the foot of this ridge, a belt of aspen and birch timber from 200 to 1,000 ft. wide follows the toe of the slope. The ground slopes across this belt vary from 0 per cent to 20 per cent. South of the aspen to the river, the ground is a flat covered with spruce, tamarack, and brush. On this section the most desirable place for a road appears to be in the aspens, where good alignment and easy grades can be secured, and where surface conditions indicate the presence of the best materials for the construction of the road grade.

The temperature on that day was –20 deg. to +20 deg., and the average amount of snow on the ground was 18 inches.

March 26, 1942. Left our first night camp and continued westerly along the trail a distance of about 20 mi., where we camped for the second night. On this section, the country, timber and soils are the same as between Ft. Nelson and our first night's camp.

The temperature on that day was from 0 deg. to +30 deg., and the average depth of snow about 18 inches.

March 27, 1942. Just west of our second night's camp, the horse and sleigh trails separate, with the horse trail taking a more northerly route to avoid crossing a canyon. We continued west from this separation to the canyon, and then followed the bottom of the canyon to the confluence of the creek and the river, a distance of about 4 mi., and continued westerly up the river to a small settlement, where camp was made for the next 5 days. The country covered during this day was similar to that traversed the second day, except for about 600 ft. of muskeg swamp that can be avoided by following the horse trail. Downstream are deposits of sand and gravel in the creek channel. The sides of the canyon are of a clay soil, saturated, sloughing, and very unstable for highway construction.

The river from the mouth of the creek to the settlement flows through a shale formation that outcrops in the north bank of the river occasionally, overlaid with clay from 0 to 250 ft. thick. When wet, the clay is very unstable, as evidenced by a slide 1,000 ft. long by 600 ft. wide by 200 ft. thick just above the mouth of the creek. The settlement is located at the mouth of a large tributary to the main river.

The distance covered that day was about 15 mi.; the temperature 0 deg. to 32 deg., and the snow averaged 18 in. deep.

March 28, 1942. Dennis Callison returned to Ft. Nelson for the remainder of our supplies for the trip. F. W. Ambos, John Callison, and myself spent the day reconnoitering the country west of the creek and the large tributary north of the river. This country is a mesa approximately 200 ft. higher than the river, cut by several small gullies, and is covered with spruce, aspen, birch, and brush; the best location for a highway is about 6 mi. north of the settlement.

The miles covered that day were about 15; the temperature was from 5 deg. to 25 deg., and the average snow depth was 20 inches.

March 29, 1942. The party spent the day reconnoitering the creek. The first satisfactory crossing of this creek is about 7 mi. north of its mouth, where the horse trail crosses the stream. Here the creek can be crossed with about a 20-ft. bridge, or a double 10x10-ft. box culvert.

The distance traveled this day was about 18 mi., the temperature 10 deg. to 40 deg.

March 30, 1942. The party made a reconnaissance up the large tributary of the main river from its mouth for a distance of about 7 mi. This stream has an average width of channel of about 240 ft. The lower 2-mi. of its banks and valleys are inundated under several feet of water from the main river in flood stage. A creek enters the tributary from the west, about 3 mi. upstream from the settlement, and about a mile north of this point is a good crossing of the large tributary. Along the tributary are gravel bars covered with 2 to 8 ft. of black soil, with the best gravel appearing at the mouth of the creek.

The distance traveled this day was about 14 mi.; the temperature 10 deg. to 40 deg., and the average amount of snow 18 inches.

March 31, 1942. The day was spent reconnoitering the main river on each side of the mouth of the large tributary. Here the main channel of the river is from 800 to 1400 ft. wide with several overflow channels. The river inundates

the valley during periods of extreme high water, and at the mouth of the river, ice jams and piles up to 6 to 10 ft. high.

In the stream channel are numerous gravel bars, and the river valley is in a black soil of unknown depth covered with a growth of spruce, willow, alder, cottonwood, birch, and aspen.

The temperature on this day was 10 deg. to 40 deg.

April 1, 1942. All day spent in camp waiting for supplies; these arrived from Ft. Nelson about 4 p.m.

April 2, 1942. The party left the settlement and traveled up the main river westerly to the mouth of a second large tributary; then 1½ mi. up the tributary, where camp was made for the night. The distance traveled was approximately 32 miles. The main river from the settlement to the second tributary is a meandering stream 600 to 1,400 ft. wide, with several overflow channels in places. The stream flows through a clay and shale formation, with cutbanks 50 to 200 ft. high in the shale, and many extensive slides in the clay. Overflows cover the bottom lands several feet deep during high water. The best crossing of the main river from the south appeared to be about ¼ mi. southeast of the mouth of the second tributary, where there are no overflow areas, and where the river channel is about 700 ft. wide. On this section of the river are numerous gravel bars. Because of the river overflow and the unstable condition of the river banks and vicinity, it is desirable to keep the highway back away from the river several miles.

The temperature on this day was from 0 deg. to 35 deg., and the snow depth about 18 inches.

April 3, 1942. The party left the camp of April 2 and traveled 12 mi. westerly up the second tributary. The tributary, which is followed for the remainder of the trip, flows through a channel 600 to 1,400 ft. wide in a shale formation that forms bluffs 50 to 200 ft. high. About halfway between our camps of April 2 and April 3, the river flows along the steep and rugged slope of a mountain for a distance of about 4 miles. Here the river meanders back and forth from one canyon wall to the other, and has taken out nearly all of the timber in the bottom of the canyon. Numerous gravel bars block the river channel; by using these gravel bars to construct the road, and at the same time opening the river channel, a good road can be constructed through the river channel in this section of the canyon.

Temperatures on this day were 10 deg. to 35 deg., and the average depth of snow was 20 inches.

April 4, 1942. The party continued up the second tributary approximately 20 mi., and camped for the night. The shale formation ends about 8 mi. above our camp of April 3, and a harder rock formation replaces it; here the canyon widens into a valley about ½ mi. wide, with a timber growth of spruce and cottonwood. There is about 2 ft. of top-soil overlaying the gravel in the river bottom.

Temperatures on this day were 0 deg. to 35 deg.

April 5, 1942. The party continued up the second tributary about 1½ mi. to a fork, took the right hand fork to a lake which is the source of this fork of the river, and about 1½ mi. past the north end of the lake, made camp for the night. The country between the forks and the lake, a distance of approximately 16 mi., is more mountainous than below, and the rise of the river increases as it approaches the lake. The lake is on a small divide that separates the drainage areas flowing north and east. For the above 16 mi., 15 are through country requiring about a 3 per cent grade of road, and the last one to the lake about 5 per cent. The elevation of the pass between drainage areas is about 4,320 ft. The rock formation on this section is chiefly limestone. Just below the lake is encountered a limestone canyon about 600 ft. long and 50 ft. deep; this can be easily negotiated by keeping to the east side of the canyon. Practically the entire length of the second tributary flows through gravel in a valley overgrown with spruce and willow and scattered patches of lodgepole pine.

About 10 a.m., snow began to fall, the temperature dropped to 0 deg., and the wind velocity approached 25 m.p.h. The depth of snow at the end of the day was 24 in. to 36 in.

April 6, 1942. The day was spent reconnoitering the headwaters of a creek in the drainage area flowing northward. The lake is about 1½ mi. long and 2,000 ft. wide. About ¾ of a mile north of the lake a low divide separates the two drainage areas. From this divide, about 3½ mi. of sidehill construction will be required to reach the bottom of the creek. The most of this sidehill construction will not be heavy, and is through a limestone formation. The bottom of the creek canyon is from 800 to 2,000 ft. wide, with a creek channel about 600 ft. wide filled with boulders. At this time of the year, the streambed appeared to be dry.

Snow fell all through the day, and the wind velocity was about 20 m.p.h. Temperature was –20 deg.

April 7, 1942. The party returned to the camp site of April 4, and camped for the night. Temperature was –20 deg. to 0 deg.

April 8, 1942. The party returned to the camp site of April 3, and camped for the night. No wind, but very cold, –20 deg. to 0 deg.

April 9, 1942. The party returned to the camp site of April 2, and camped for the night. Temperatures were 0 deg. to 20 deg.

April 10, 1942. The party returned to the settlement, and camped for the night. Temperatures were 10 deg. to 35 deg.

April 11, 1942. The party left the settlement, traveled down the main river for 22 mi., and camped for the night.

About 10 mi. below the mouth of the first tributary, a creek enters the main river from the south. The river from here to Ft. Nelson flows through a shale formation covered with several hundred feet of clay, the latter continually sliding into the river. The river bottoms are covered with a growth of spruce, aspen, cottonwood, and brush.

Temperatures were 10 deg. to 40 deg.

April 12, 1942. The party continued down the main river to Ft. Nelson. The river enters a larger river about 1 mi. south of the town, and another tributary enters the main river about 12 mi. west of Ft. Nelson.

Temperatures on this day were 10 deg. to 40 deg. Distance covered this day was about 40 mi.

End of trip.

Summary

According to statements made by the guide and by trappers living in the country, the most difficult part of the route would be over a pass in the mountains west of the drainage area entered beyond the lake. According to their descriptions of the country, I do not believe that it would be difficult to secure satisfactory grade and alignment through this pass. On this route very little muskeg would be encountered, and, as far as reconnoitered by the writer, very good alignment can be had. From the origin to the second large tributary of the main river, it is possible to locate a line for a speed design of 60 m.p.h., and from the mouth of the second tributary to the creek beyond the pass, a speed design of 50 m.p.h. can be secured economically. The maximum grade should not exceed 6 per cent, and the sharpest curve would be 6 deg. or less. After talking with the guide and several trappers, I have concluded that a 50 m.p.h. speed design may be possible over the balance of the route.

Another possible route may be obtained by turning northwest at our campsite of March 27-April 2, crossing the divide between the first large tributary and a creek; then down this creek to a river, across this river over its mouth, thence northerly across a large river, where a very good crossing is available about 8 mi. above the mouth of another tributary. The latter route probably would be 30 to 40 mi. longer.

Organization

Design and construction of the Alaska highway is under the general supervision of the Corps of Engineers, U.S.A., and the immediate direction of the Public Roads Administration. Pioneer roads are being constructed along the general line of the route by Corps of Engineer troops commanded by Brig. Gen. William M. Hoge. Arthur Dixon, chief engineer of the British Columbia Department of Public Works, is cooperating with Gen. Hoge in the pioneer road construction program.

Location, design and construction of the final road are under the direction of the Western Division of the Public Roads Administration. Dr. L. I. Hewes is chief engineer of the Western Division and N. M. McCoy is senior highway engineer. Headquarters of the Alaska Highway are established in Seattle, Wash., and are under the direction of J. S. Bright, construction engineer, assisted by C. C. Morris, senior highway engineer. For a complete list of major construction-management contractors on the project see *Western Construction News*, August, 1942, page 360.

Airport Foundation Problems

Corps of Engineers building major air base in the Pacific Northwest finds difficult foundation problems in spring-fed lakes with blue clay beds—Construction of earthfill foundations carefully controlled to provide building support

WITH AS MUCH CARE and precision as is usually exercised in the building of an earth-filled dam, 1,800,000 cu. yd. of earth are being moved and scientifically placed in the construction of a huge airplane repair base in the Pacific Northwest under the direction of the U. S. Army Engineers, Seattle District.

By means of a soils laboratory on the project, the moisture content and amount of compaction are rigidly controlled with the result that fills are able to stand the weight of whatever structure may eventually be built on them—whether it is a road, street, runway, taxiway, repair building, housing quarters or what have you. Because of the careful control of the filling operations and the vast area covered, four square miles, the project is more of a problem to the engineers than is usually the case.

Topography of location

Scene of the project is what looks, at first glance, like a common everyday northwest wheatfield. Actually, however—and this is adding a great deal to the difficulties of the job—the terrain and soil composition of the area are as varied as you will find anywhere in this part of the country. As the soils lab technician says, "This is an interesting project. We've run into practically everything in the way of soils that I've ever heard of—and a few I haven't."

The weather hasn't made the job any easier. Varying between clear cold, snow, rain and extreme heat, it keeps the ground in a constant state of change from frozen to super-saturated to dusty. The job is a must, however, and the engineers and contractors have gone on with it regardless.

Covering the larger part of the four square miles comprising the site of the project was a surface of loess (ideal for compaction but difficult to work with on hot, dry days because it is so fine) and loam. One formation of solid rock was found, and scattered over all the area were small, innocent-looking lakes and swamps. First job, of course, was to drain the lakes and swamps, and blast out the rock.

Foundation problems

Upon closer inspection, the lakes and swamps were found to be fed by underground streams and to have mucky, wet

SMALL LAKES fed by underground streams were found to have blue clay bottoms as deep as 21 ft. After excavation these were backfilled and compacted.

LAKE BEDS were excavated with tractors and scrapers. Drainage systems consisted of 6-in. perforated concrete pipe in herringbone patterns placed in the excavations on a 6-in. layer of crushed rock secured from the rock excavated in other locations.

blue clay bottoms, unsuitable for foundation material. The streams were charted back to their sources where they were stopped or diverted. Then channels were dug to drain off the surface water and the bottoms mucked out down to a subsurface strata underlying the entire area of clean sand and sand mixed with small stones.

The rocky formations were blasted, dug out with a 1½-yd. shovel, crushed and placed in a 6-inch layer on the strata underlying the site of the lakes. On this layer of rock, at the natural water table, 6-in. perforated concrete pipe was placed in herringbone pattern, so that any water which wouldn't seep away through the crushed rock would drain away in the pipes. These pipes were connected with an 8-in. pipe that terminated in a ditch alongside a conveniently close county road. The area was then backfilled with pervious and semi-pervious material.

In the meantime the soils lab was busy. Several hundred tests were made to determine the amount of moisture and compaction necessary for each type of material encountered in the entire area. When the cutting and filling got under way, it was known in advance the exact compaction possibilities and moisture needs for material cut from any particular location.

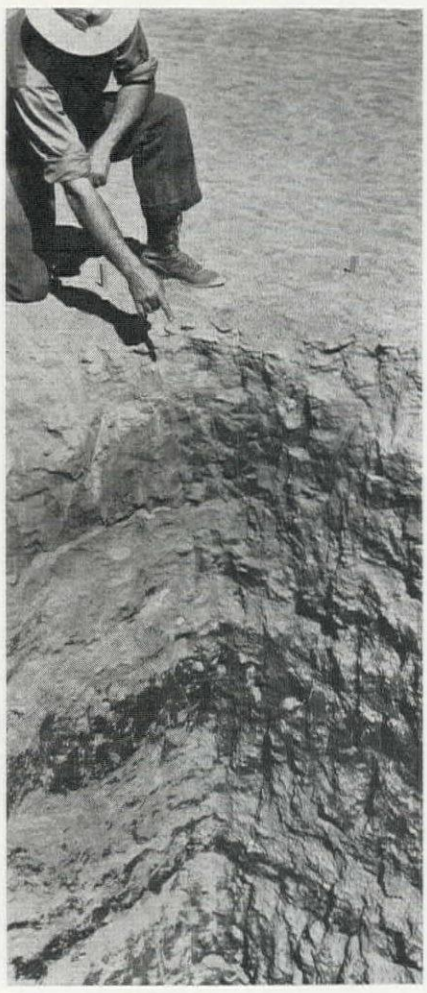
Fill construction

Because of the large area covered by the project and the extreme care with which the material was selected to insure proper compaction, long hauls were common—as long as 6000 ft.

In view of this, the speed with which the filling is being accomplished is a nice testimonial to a capable contracting team, with the proper equipment, and practical knowledge gained through years of experience. Twelve Tournapulls, churning the dust at 18 m.p.h. for the long hauls, and fourteen tractors and scrapers plugging away on the short hauls, are doing the job in record time. Three shifts are operating, averaging a haul of 20,000 yd. of material every 24 hours.

The fill material is placed in 9-in. layers by the Tournapulls and scrapers, the larger stones and rocks removed and as many as six sprinklers wet it thoroughly to the optimum moisture content determined in advance by the soils tests. Following the sprinklers, two sheepsfoot rollers and a 12-ton tandem roller make enough passes over it to ensure the proper compaction.

STABILITY of the compacted fills in the lake bed areas is illustrated by this photograph of a footing cut through the fill. Some cuts of this type were as much as 26 ft. deep and material stood satisfactorily without support.



After each layer is rolled, a test of the compaction is made by the soils technician. Used to make the test is a steel density plate ½ in. thick and 24 in. in diameter with a 6-in. circular hole in the center and handles near the outside edges of the top.

Density test method

To test a compacted portion of the fill, the density plate is placed on a level surface, after removing the upper 6 or 8 in. of new fill, so that the edge of the hole in the plate makes a firm contact with the compacted material beneath it. Sand that has been dried in an oven is then poured into the hole in the plate and is leveled off so that the surface of the sand is level with the upper surface of the plate. The amount of sand used for filling the hole in the plate as it rests on the fill is determined by careful weighing of the calibrated container from which the sand has been poured.

This sand is removed and material required for sampling taken from the fill through the hole in the plate without disturbing the plate. The resulting hole beneath the plate is then backfilled with oven-dry sand and struck off as before to bring the sand surface exactly to the level of the plate surface. The volume of the material sample taken from the fill is then known to be the difference between the two sand volumes, and it is then weighed and the compaction easily computed. This test, made at regular intervals, makes certain the proper compaction has been given to the material used.

Backfilling excavated fill

Deepest of the fills is on the site of one of the larger buildings—a building covering 10½ acres that will be called upon to support considerable load. Here the fill is 21 ft. deep, and so compact that a clamshell shovel can hardly dig through it for the 26-ft. holes necessary for footings. The digging is being accomplished only with some difficulty, leaving sides that stand up as smooth as a wall without any sheathing and showing clearly

Major Items of Equipment

2 Cletrac tractors
2 Allis-Chalmers tractors
15 D8 Caterpillar tractors
14 LeTourneau Carryalls, 13 to 16-yd.
3 No. 12 Caterpillar Auto Patrols
1 No. 11 Caterpillar Auto Patrol
8 Super C Tournapulls, 13 to 16 yd.
2 Model C Tournapulls, 8-yd.
2 Koehring Wheelers, 8-yd.
1 Northwest shovel, 1½-yd.
1 Northwest dragline, ¾-yd.
1 Bucyrus-Erie dragline Model 10B with backhoe attachment.
1 P & H backhoe
5 Dump trucks
2 Sheepsfoot roller units
6 Water trucks
2 Ingersoll-Rand air compressors

the stages of the fill. This is in marked contrast with the natural ground material near the bottom of the holes. There the sides have a tendency to work in or slide and must be squared by hand.

Wherever the ground is moved or dug, care is taken to see that it is tightly compacted again. For example, in digging sewer lines, the ditches are dug as narrow as possible, and after the pipes are placed the earth is carefully packed back in place with mechanical tampers operated from air compressors.

Organization

The project is under the direction of Colonel Peter P. Goerz, District Engineer, Seattle, Washington. Major A. C. Nauman is area engineer with First Lieutenant Harry L. Hart and First Lieutenant Ernest J. Simons as his assistants. Raymond F. Bracelin is project engineer; William Neland, grade engineer; Gerald D. Bletcher, chief of inspectors; H. E. Johnson, soils technician, and Ralph Smith, field man.

The design and original soil testing were all done in the Seattle laboratory under the direction of Allen S. Carey, well-known for his development and use of soil testing methods at Mud Mountain Dam.

The grading and paving are being done by the Erickson Paving Co. and K. L. Goulter, jointly. The contractors' staff on the project includes: C. W. Erickson, superintendent; Stan Goulter, assistant superintendent; J. F. Costello, office manager; Conrad Aune, general grade foreman; Ed Lemon, culvert foreman; Earl Chandlee, shop foreman; Douglas F. Giessen, shop foreman; and A. N. Anderson, grade foreman. The need for two shop foremen will become apparent after a glance at the list of major equipment being used on this project.

Computation of Slope Stake Settings Simplified by the Use of Slide Rule

By A. R. KINGAARD

Engineering Department, McNeil Construction Co. Las Vegas, Nev.

A SLIDE RULE METHOD adopted by the writer for setting slope stakes is derived from two trigonometric formulae, and reduces all calculations to one of division for "Cut" stakes and one of multiplication for "Fill" stakes.

For "Cut" stakes the formula is:

Horiz. dist. = Vert. dist. ÷ nat tan vert. angle.

For "Fill" stakes the formula is:

Vert. dist. = Horiz. dist. × nat tan of vert. angle.

This method, in common with others, uses trial measurements to determine the correct components for establishing slope stakes. The function of the slide rule is to eliminate unnecessary arithmetical computations.

Slope ratios can be expressed as trigonometric functions. Thus for example, a

$$1\tfrac{1}{2}:1 \text{ slope} = \frac{1}{1\frac{1}{2}} = \frac{1}{1.5} = 0.666 = \text{nat}$$

tan of 33°–40′. Likewise, a $1\frac{1}{4}:1$

$$\text{slope} = \frac{1}{1\frac{1}{4}} = \frac{1}{1.25} = 0.800 = \text{nat tan of}$$

38°–40′. After determining what slope the cross-section specifies, any trigonometric slope ratio function can be determined in the office before going into the field and used as a constant factor. In "Cuts" the operation is one of division; in "Fills," one of multiplication.

To illustrate:

A 30-ft. proposed roadway level section at station 5+00 has a calculated subgrade of 1754.2. It is required to set $1\frac{1}{2}:1$ slope stakes for grading operations, the left side of center line being in "Cut" and the right side in "Fill." Taking the left side first, a trial rod is read at a trial distance of 30 ft. from center line. The elevation of this point as determined by the levelman is 1764.2, or 10 ft. higher than the calculated sub-grade to toe of slope. The function of a $1\frac{1}{2}:1$ slope is 0.666. Therefore, dividing 10 by 0.666 on the slide rule, the answer read is 15. Therefore, the trial measurement is correct, as 15 ft. out from the trial rod-point would place the toe of slope 15 ft. from center line.

Secondly, taking the right side of the road in "Fill," a trial rod is read at a trial distance of 36 ft. from center line. The elevation as determined by the levelman is 1740.2, or 14 ft. lower than the calculated sub-grade for top of slope. The distance from roadway center line to top of slope, or 15 ft., subtracted from 36, establishes the trial horizontal component of 21 ft. Therefore, on the slide rule, 21 ft. × 0.666 = 14 ft., which places the trial rod at the correct point for setting the $1\frac{1}{2}:1$ slope stake, as 1740.2 plus 14 ft. = the calculated sub-grade, 1754.2, and 36 ft. minus 15 = 21 ft., which is the correct horizontal component.

* * *

CONSTRUCTION of an aviation gasoline plant at a cost of $1,000,000 on Imperial Oil property in Alberta now is under way, it was announced officially recently. The Allied War Supply Corp., backed by the British, United States and Canadian governments, is undertaking the project which may be completed this winter.

The plant will produce alkylate from high fractional bases. This fluid when blended with ordinary gasoline yields a high octane product essential in the operation of powerful modern war planes.

War Training Courses Given in S. F. Bay Area

FOUR EVENING COURSES in structural engineering, three in electrical engineering and one in mechanical engineering are scheduled by the University of California War Training office for the latter part of September and beginning of October.

A course in Structural Design is to begin Sept. 25 at Wilmerding school in San Francisco, and is open to high school graduates with at least two years of technical training, including courses in strength of materials and structural analysis.

Also at Wilmerding school will be a course in Advanced Mechanics of Materials, to start Sept. 28 and designed to give advanced training to persons with a background in strength of materials.

A third structural engineering course —Strength of Materials, beginning Sept. 30 in San Francisco—is to provide training for persons with two years of technical study or three years practical experience in design of simple structures.

On the Berkeley campus a course in Analytical Mechanics, beginning Oct. 1, is intended to coordinate previous technical training and to provide an analytical background in the solution of problems in machine design and operation. At least two years of technical training including physics and mathematics, or three years practical experience in design of simple structures and machines are required.

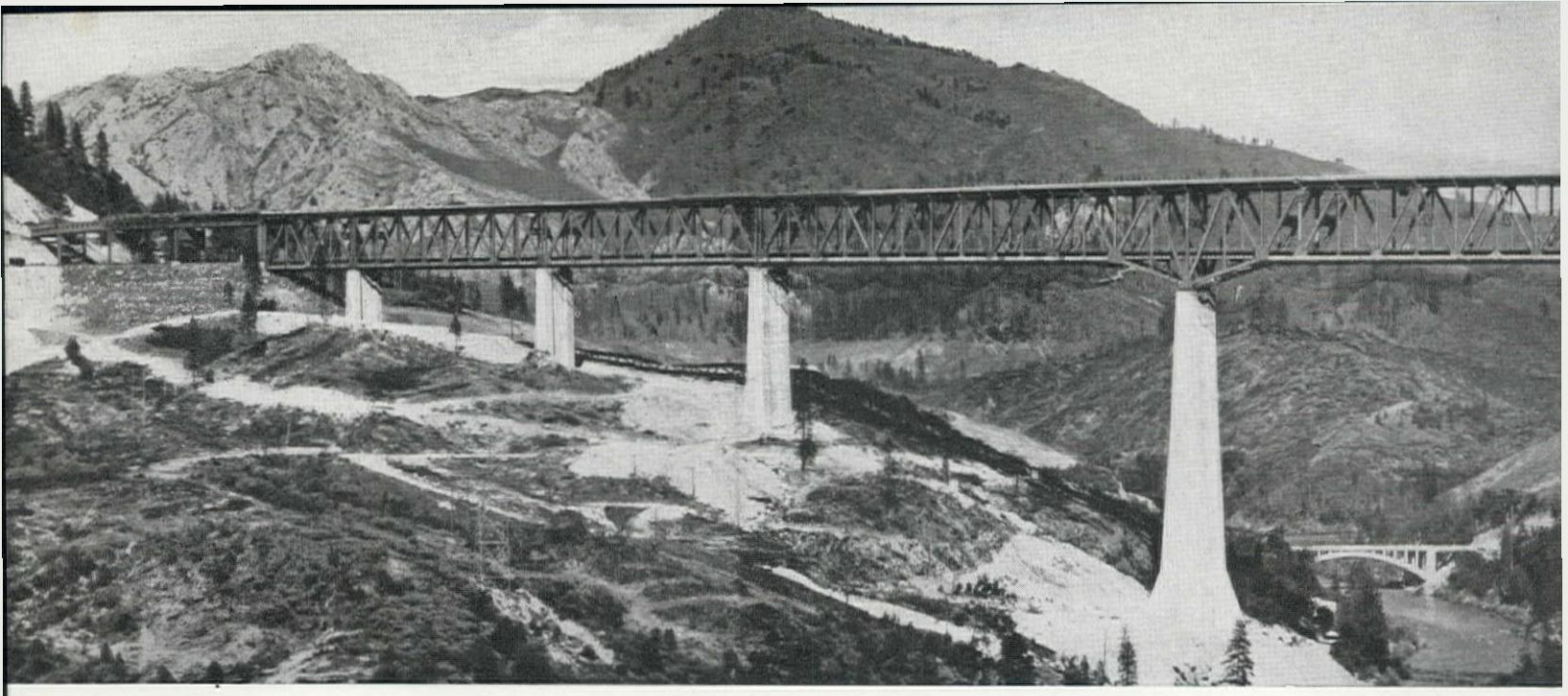
In electrical engineering the War Training program offers Maintenance and Trouble Correction of Electrical Machinery, beginning in San Francisco on Sept. 28. This course is valuable for journeyman electricians, supervisory electricians and electrical maintenance engineers engaged in electrical machinery in a war agency or shipbuilding industry.

For journeyman electricians interested in being up-graded, a course in Characteristics and Operation of Electrical Equipment will be given at Berkeley, beginning Oct. 8. A trade knowledge of electricity and arithmetic and employment with journeyman electrician rating or better are required.

A course including lectures and laboratory demonstrations in Metallurgical Testing and Inspection begins Monday evening, Oct. 5, in San Francisco for persons engaged in the fabrication of ferrous materials.

All War Training courses are tuition-free, all require high school graduation, and all the above-mentioned, unless otherwise stipulated, consist of two-hour lectures given once a week for an 18-week period.

For further information write to or call at the War Training office, Room 201, California Hall, University of California, Berkeley, Telephone THornwall 5377, or Wilmerding school, 2250 Seventeenth Street, San Francisco, Telephone MArket 1647.



False Bents Formed During Erection of

Structural steel members from cantilever section set on concrete foundations for use as falsework during early stages of construction of combination highway and railroad bridge forming part of relocations made necessary by filling Shasta Reservoir of Central Valley Project

By SPEED S. LEONARD
Associate Engineer, U. S. Bureau of Reclamation
Redding, Calif.

MORE THAN 2,000 tons of structural bridge members were utilized to form the highest false bents in the world during the erection of the Pit River Bridge for the highway and railroad relocation around Shasta Dam Reservoir site 14 mi. north of Redding, Calif. This structure is to carry the main line of the Southern Pacific railroad and four lanes of U. S. Highway 99 traffic.

The foundations of these false bents, with two exceptions, consisted of two square reinforced concrete shafts 34 ft. center to center, extending from solid rock to a few feet above ground level where they were connected by a concrete diaphragm. From this elevation, bridge members from some span not yet under construction were erected to form the superstructure of the bent. When completion of a span made further support unnecessary the false bent superstructure was dismantled and bridge members returned to storage yards until required for future erection. For the smaller bents, railroad stringers, cross-braced with lateral bracing, were used as superstructure; for the two large false bents, full trusses were erected in a vertical position to such height as required for the lateral support of the top chord sections which were used full height as main supporting columns. Adequate bearings for the false bents were located in most cases about 60 ft. below ground surface with the exception of false bent No. 3 for span 4, between piers 2 and 3, where it became necessary to excavate 106 ft. to secure suitable rock. Footings were increased at the bottom of shafts to provide additional bearing area.

General description

The Pit River Bridge is composed of two 140-ft. truss spans, three 280-ft. truss spans and a 1620-ft. cantilever span with anchor arms of 497⅓ ft. and a center span of 630 ft. The center span consists of two 118-ft. 1½-in. cantilever arms and one 393-ft. 9-in. suspended span. The south approach consists of one 150-ft. plate girder span while the north approach has four 141-ft. plate girder spans. The trusses in the spans are 34 ft. center to center. The truss and girder spans support a 44-ft. highway deck 3587 ft. long at the top chord level and a double track railroad deck 2753 ft. long at the bottom chord. As the largest piers are over 350 ft. in height, the highway deck is approximately 500 ft. above the river bed. The construction of the bridge involved the use of 17,000 tons of steel. Design of the bridge was described in *Western Construction News*, February, 1940, and construction of the piers in November, 1940.

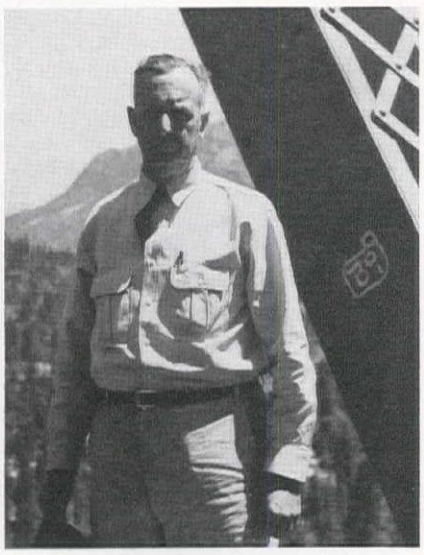
Erection details

The truss members of the bridge were built of plates and angles, with the angles turned in to form box sections. Silicon steel, due to the higher unit stresses which permitted smaller sections, was used in all the trusses with the exception of the 141-ft. truss spans. In these, carbon steel was used as the computed sizes met the requirement for minimum thickness of metal.

As erection proceeded, rivet holes in the main truss connections were filled with manganese steel drift pins and bolts in the ratio of two full size drift pins to each bolt, except in special cases where a ratio of three drift pins to each bolt was used to develop erection stresses in members. Copper bearing rivets were used throughout the structure; ⅞-in. being used in lateral bracing, sway frames, portals, tie plates, and lacing; 1-in. in truss connections except at certain splices and gusset plates, where 1⅛-in. and 1¼-in. were used. Rivets as large as 1¼ by 13¼ were used in parts of the gusset assembly at L 14 and L 14′ over piers 3 and 4.

Riveting followed as close behind erection as was practicable except in the simple spans where the bottom chords were driven while cantilever erection proceeded and top chords were driven after the span was swung. Compression joints, where finished for bearing, were riveted while the joint was in compression. Other joints for chords and diagonals were driven as soon as they had fair holes. It was not considered necessary to withhold riveting these connections until spans were swung, since a reversal of stresses, such as occurs from erection condition to final condition was not deemed detrimental.

# of Suspended Span Pit River Bridge



SPEED S. LEONARD, associate engineer with the U. S. Bureau of Reclamation, acted as principal inspector during construction of Pit River Bridge.

Field riveting required an average of seven four-man crews to follow steel erection. In the anchor arms of the cantilever span, 4 and 5 days were consumed by one crew in driving some of the points, the larger of which contained as many as 2500 field rivets.

All rivets were heated with blacksmith coal. Hand forges were used for 7/8-in. rivets, but for the larger sizes, pots equipped with an air blast proved more efficient. Boyer 80-x and No. 90 riveting guns were used in driving, with the occasional use of a Boyer 83-x; however, this latter type being heavier, it was used principally for cut-outs. A battery of five stationary air compressors, each of 210 cu. ft. per minute capacity, located at the base of pier 3, supplied the air pressure, augmented by booster pumps on the line when required. Seven-eighths-inch rivets were driven with 120 lb. air pressure; for larger sizes the pressure was increased to 145 lb.

Erection equipment

As the size of most of the panel points permitted men to work inside the sections, rivet shooters were found to be a more advantageous method of conveying hot rivets than the usual method. The shooter consisted of a flexible metallic tube with an entrance air lock at one end and a receiving hopper at the other. The hot rivet is shot through the tube by compressed air. Seven-eighths-inch and 1-in. rivets required the use of a 2-in. tube, while 1 1/8-in. and 1 1/4-in. sizes required a 2 1/4-in. tube.

Hitting jacks, pneumatically operated, were used whenever possible for bucking-up the larger rivets (1-in., 1 1/8-in., 1 1/4-in.), in conjunction with a Boyer 80-x and 90 gun. When space did not permit the use of hitting jacks, pneumatic bucker-ups or special type dolly bars were employed. A total of 350,000 field rivets were driven on the bridge.

The erection equipment consisted of one traveling stiff leg derrick (S2) powered by a 75-hp. motor, having a weight of 200,000 lb.; a jinniwink traveler, weighing 54,000 lb.; one 150-ton locomotive crane and two 60-ton locomotive cranes. Three Plymouth locomotives, gasoline driven, of 2, 5, and 8-car capacities, were employed in moving bridge members from storage yards to points of erection. A 3-drum Lambert hoist having a weight of 44,000 lb. supplemented this erection equipment. At low speed this unit had a lead line pull of 22,500 lb., and at high speed it had a pull of 16,000 lb. A 2-drum National engine, having a weight of 20,000 lb. with a lead line pull of 9000 lb. was used on the jinniwink traveling derrick.

The S2 traveler was supported on trucks and moved on tracks (100-lb. rails) directly over the top chords of the trusses. It was equipped with a 90-ft. boom, a 15-ft. intermediate section being removed to give a 75-ft. boom for lifts exceeding 52 tons. With the use of the longer boom it had a capacity of 52 tons at 60 ft. horizontally from the main point of support; while with the 75 ft. boom, the capacity increased to 60 tons at 40 ft. Three lines were operated from the derrick; the load line, which consisted of 13 parts of 3/4-in. cable, used extensively for hoisting the structural members; the runner line, which was formed of 3 parts of 7/8-in. cable, used principally for drifting and keeping the members stable during fitting-up; and the topping lift, 17 parts of 7/8-in. cable employed for raising and lowering the boom. To secure rigidity in operation, the front trunnions were blocked up with hardwood and steel plates. The derrick was tied down behind by two 3-in. tie-down rods connected to hitch plates bolted to each top chord, all connections being fitted with manganese bolts.

The jinniwink traveler was an A-frame derrick of 8-ton capacity, supported on skids and moved on the top flanges of the highway stringers. The lower ends of the legs and the mast were attached to the ends of a horizontal T-shaped frame of timbers which were lashed to the upper chords during course of erection. It was used primarily for erection of highway stringers which followed closely behind erection of main members and further provided anchorage during cantilever erection.

The 150-ton and two 60-ton locomotive cranes were steam driven and

equipped with interchangeable booms. The crane mechanism was mounted on 8-wheel standard railroad trucks, the wheels being driven by power transmitted through the central shaft from the engine. All were equipped with outriggers to insure stability during the heavier lifts. The 150-ton crane used an 85-ft. heavy boom; had portable counterweights on the back consisting of two sections of 7½ tons each, permitting it to hoist heavier loads at greater radii. One 60-ton crane used a 75-ft. boom in girder erection and had a back hitch which provided a longer arm for topping lift connection. The other 60-ton crane used a 50-ft. boom principally for storage yard work. All booms were equipped with hammerhead attachments. The 60-ton cranes, when not used in conjunction with the 150-ton crane in the erection of the girder spans, were employed in the erection of lighter structural members and also in the storage yards for unloading and rehandling of bridge members.

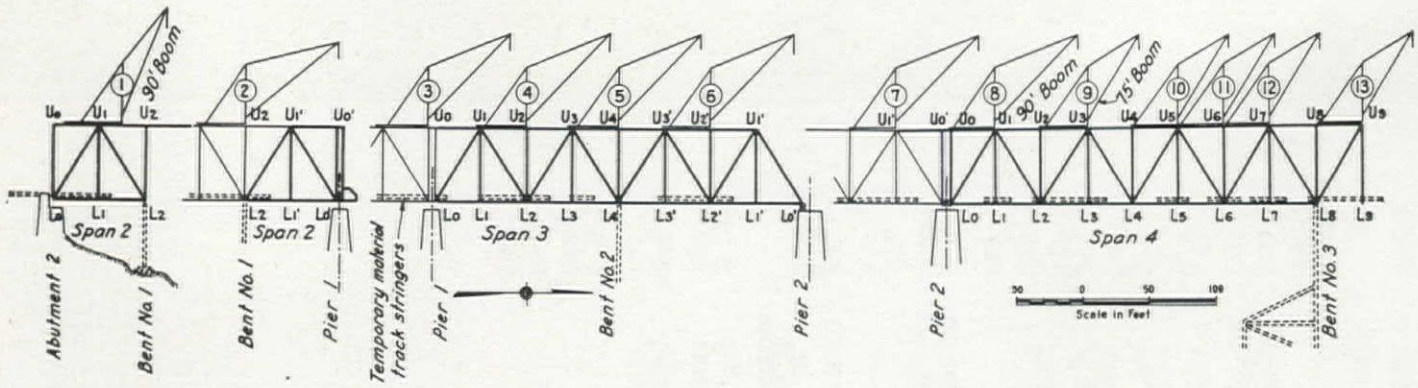
Prior to the erection of a span the safety net, consisting of ½-in. rope on 6-in. centers with a binder at each cross intersection of the mesh, was rigged between piers. The nets were supported by two ¾-in. cables in the short spans and two ⅞-in. cables in anchor arms and main span, clamped to lashing that surrounded the pier tops. These cables were supported and spread out by timber outriggers bolted to inspection platform rails and hung off by ⅝-in. cables extending from top chords to outer end of outriggers.

Erection From South Approach

The erection of steel commenced at abutment 2, and proceeded northward to U20-L21, span 5 (see accompanying diagrams), cantilevering over piers 1, 2, and 3, and temporary steel erection bents at L2, span 2; L4, span 3; and L-8, span 4. Using the 150-ton locomotive crane and outhaul line from the 2-drum National engine located at abutment 2, false bent No. 1 was erected midway between abutment 2 and pier 1.

The false bent consisted of four railroad stringers (two per leg) from span 7 with permanent bracing. The stringers were fabricated several feet longer than final length with special slabs, angles, and beams placed at top and bottom to serve as shoes. A set of bottom laterals from span 5 was used for bracing between the legs, erection lateral plates being bolted to inside stringers.

Under each leg timber mats 12 by 14 ft. were constructed as foundation pads. Since the capacity of the locomotive crane was insufficient to set the stringers in an upright position on foundation mats, outhaul lines were extended from the National engine through two sheave blocks secured to a U-anchor in base of pier 1 and connected to each end of the stringers. As the crane lowered the stringer, the lower outhaul line landed it on the timber mat. Slacking the main



DIAGRAMMATIC REPRESENTATION of the position of false bents on the south end of the bridge, and the successive positions of traveler crane S-2.

load on crane and proceeding with runner line, the upper outhaul line tipped the stringer into vertical position, from which it was jacked to correct center lines. The bent was equipped at the top with jacking beams and two 500-ton hydraulic jacks for the purpose of raising and lowering the span.

The 150-ton locomotive crane was then blocked up over abutment 2 and erected the fixed shoes, bottom chord L0-L2, railroad floorbeams at L0 and L1, hanger U1-L1, post L0-U1, diagonal U1-L2 and portal bracing L0-U1, railroad floorbeams at L2, railroad stringers and bottom laterals between L0 and L2, of span 2. The 150-ton locomotive crane was moved back from abutment 2 to allow the 60-ton locomotive crane to advance to L2 and erect post U2-L2 and top chord U1-U1'. The 60-ton crane was then backed up to abutment 2 and erection continued with post U0-L0, top chord U0-U1, highway floorbeam at U2 and U1 and top laterals between U0 and U2.

The S2 traveler was then erected on the upper chords of the completed portion of span 2, in position No. 1, equipped with a 90-ft. boom. Structural members L21-L22 from the suspended span each having weight of 20,000 lb. were placed between L0 and L1 for additional counterbalance. Temporary wind bracing below the railroad floorbeam at L0 was erected. The material track, including temporary cantilever stringers with a railroad track of 90-lb. rail was used on the lower deck, ahead of the S2 traveler in such a position that bridge members when delivered from storage yard on trucks could be reached and hoisted to proper position.

Temporary tie-down

S2 traveler moved to U2, span 2, position No. 2; erected fixed shoes for span 2 on pier 1, bottom chord L2-L0', diagonal L2-U1', hanger U1'-L1' and end post U1'-L0'. Span 2 was landed on pier 1 by releasing the jacks at top of false bent No. 1. Erection continued with post U0'-L0', top chord U1'-U0' (gusset plates were provided at U0' to tie top chord to span 3), temporary rocker at L0, span 3, gussets and floorbeams at L0, span 3, post U0-L0, span 3, temporary wind bracing between floorbeam and pier 1, temporary compression blocks and tie rods between span 2 and 3 at center line of bottom chord. Temporary tie-down rods were provided at pier 1, span 2, to take uplift when span 4 (anchor span) was cantilevered. The lower section of these rods was placed in the last concrete lift at pier 1. Span 2 was swung, and false bent No. 1 was dismantled by the S2 traveler in position No. 2; the erection material removed to the storage yard.

S2 traveler moved to U0', span 2, position No. 3; erected L0-U1, span 3, and guyed top end to span 2; erected U0-U1 and released guys; hanger U1-L1, bottom chord L0-L2, diagonal U1-L2, vertical U2-L2 and top chord U1-U3. While traveler was located and operating at position No. 3, the highway stringers between U0 and U2, span 2, were erected with the locomotive crane. Temporary rod bracing was placed at mid-point of stringers and the jinniwink traveler was then erected on them. A push car track over which the highway stringers were to be delivered to the jinniwink was constructed.

S2 traveler moved to U2, span 3, position No. 4; erection continued over pier 1 by construction of the lower section of false bent No. 2 midway between piers 1 and 2 and guying to anchors in lower portion of piers 1 and 2, after which the upper section of the false bent was erected and likewise guyed to the piers. Again structural members were used for the superstructure of this false bent including top chords, floorbeams, and

laterals U20 to U20′ (4 panels of suspended span).

Rocker shoes from north approach girder spans provided the connection to the concrete substructure which extended 71 ft. below ground surface on east shaft and 58 ft. on west shaft. This false bent was located in the middle of U. S. Highway 99 and a protection shed built over the highway at this point was supported by cables from span 3 (see accompanying photograph). Four 500-ton hydraulic jacks with jacking beams at the top of this false bent were required to elevate and lower this span.

Landing span No. 3

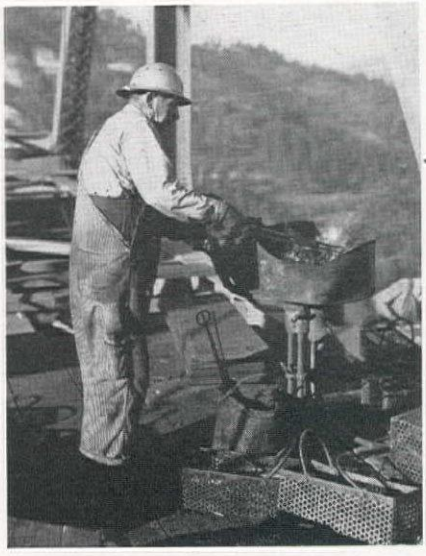
Erection of main members with S2 traveler continued with diagonal L2-U3, hanger U3-L3, bottom chord L2-L4, and diagonal U3-L4. The completed portion of the span was landed on bent No. 2 by jacking vertically at the top of the bent until all stress was removed from the top chord tie over pier 1, after which this tie was flame cut and edges ground to smooth surfaces. The bottom chord compression blocks and rod ties between spans 1 and 2 remained in place to resist wind stresses and further provided longitudinal stability until span 4 was landed on false bent No. 3, and the fixed shoes for span 3 at pier 1 were erected. Highway stringers were erected to U0′, span 2 with the jinniwink traveler. Erection continued with post U4-L4, top chord U3-U3′ and diagonal U3′-L4.

Lateral, sway bracing and blast plate erection followed closely behind the main truss erection. Manganese bolts of ¾-in. diameter were used for fastening the top laterals and the bottom laterals were fitted with ⅞-in. manganese bolts. These bolts were loosened and tightened after each 2-panel point forward movement of the S2 traveler, the connections riveted after the span was swung. When the truss structure of a span was completed the inspection car rails, which depended from the lower chords, platforms for electric communication lines and traction bracing were erected by the jinniwink traveler.

S2 traveler moved to U4, span 3, position No. 5; erected hanger U3′-L3′, bottom chord L4-L2′, diagonal U3′-L2′, post U2′-L2′, top chord U3′-L1′ and diagonal L2′-U1′.

S2 traveler moved to U2′, span 3, position No. 6; erected hanger U1′-L1′, bottom chord L2′-L0′, in temporary position with L0′ end resting on pier 2, post U1′-L0′. Bottom chord L2′-L0′ was raised into final position and connected to U1′-L0′. Shoes for span 3 at pier 2 were erected with temporary rocker and bed plate which remained in place until span 4 was landed on pier 3. Span 3 was then landed on pier 2 by lowering the jacks at top of false bent No. 2. Span 3 was in a temporary position, 3¼ in. high, to line up bottom chord with span 4, this position was maintained until permanent roller nest was erected at L0′, span 3.

S2 traveler was backed up to U2, span 3, position No. 4, and dismantled false bent No. 2. This procedure was followed in order to hoist all structure members on lower deck, land on cars and return to storage yards, in order that the highway would be clear of steel and trucks.



RIVET HEATER operates hand-driven bellows and coke forge high on deck of Pit River Bridge, assuring ample supply of rivets near point of use.

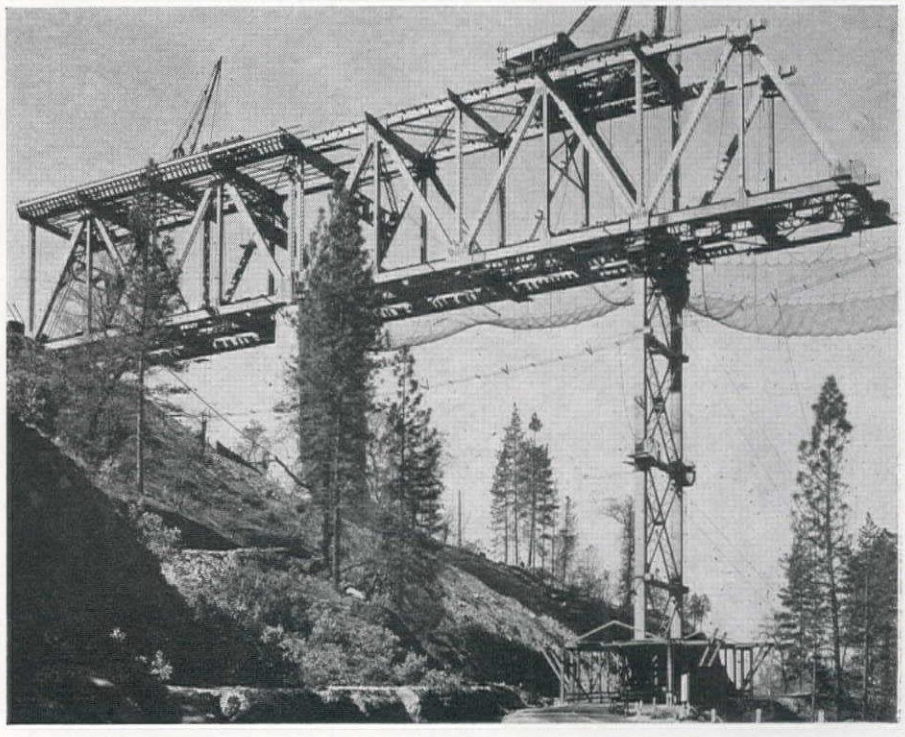
S2 traveler was moved to U1′, span 3, position No. 7. The upper section of tie-down rods at L0, span 3, was erected. Nuts were tightened firmly against lead washers for the purpose of obtaining uniform stress in all rods. Erection proceeded with U0′-L0′, span 3, temporary top chord U1′-U0′, span 3, permanent roller nest and shoes at L0, span 4, gussets and shorter section of bottom chord at L0, end post L0-U1, together with gusset and short section of top chord at U1. Temporary compression blocks between bottom chords of span 3 and 4 were erected. Temporary top chord U0-U1, span 4, was erected and connected to U1′-U0′, span 3, by an 18-in. nickel steel pin. The top chord tie backs between span 3 and span 4 consisted of the bottom chord L21-L22, segmented member from the suspended span, erected at U0-U1, span 4, and connected to U1′-U0′, span 3. This latter member was temporarily provided with top chord web plate extensions and 18-in. pin hole for connections.

False bent No. 3

Before the S2 traveler could move to U1, span 4, it was necessary to drive the chord splices at U1 in the top chord member U1-U3 to compensate the erection stresses which would occur before span 4 was swung. This chord was inclined upward from the splice by lifting with the load line of S2 traveler, which brought the top edges of the shapes into full bearing. While in this position, the top cover plates were fully driven, and a few holes along the upper edge of the splice plates were also driven. As erection continued from this point, additional weight had the tendency to draw the remainder of the splice into full bearing at which time the splice was driven. This method was used to assure full bearing before driving and thereby preclude the necessity of cutting out rivets and redriving the joint after the span was swung.

S2 traveler moved to U1, span 4, position No. 8; erected bottom chord L0-L2, diagonal U1-L2, post U2-L2, diagonal L2-U3, top chord U1-U3, hanger U3-L3, floorbeam at L3, railroad stringers, and laterals. At this time the boom on the S2 traveler was changed from 90 to 75 ft. to prevent exceeding the capacity of

FALSE BENT NO. 2, erected in two sections by traveler mounted on cantilever end of span above and guyed to anchors in lower portion of piers on either side, was located in middle of U. S. Highway No. 99, and protection shed was built over roadway and supported by cables from Span No. 3.



the S2 derrick with heavier structural members. The anchor spans contained the largest gusset plates in the bridge, 17 ft. 2½ in. by 12 ft. 5 in.; and the largest chord sections, which were in the top chords of these spans, 3 ft. 6½ in. deep by 2 ft. 6½ in. wide.

S2 traveler moved to U3, span 4, position No. 9; erected bottom chord L2-L4, diagonal U3-L4, post U4-L4, diagonal L4-U5, top chord U3-U5, hanger U5-L5, railroad floorbeam at L5 and railroad stringers and laterals. S2 traveler moved to U5, span 4, position No. 10; erected bottom chord L4-L6, diagonal U5-L6, post U6-L6, diagonal L6-U7 and top chord U5-U7.

S2 traveler moved to U6, span 4, position No. 11 and erected false bent No. 3. Two 7-ft. square reinforced concrete shafts 106 ft. below ground surface supported the front legs, while two 12-ft. square reinforced concrete pedestals were designed for the rear legs. Seven panels of bridge from the suspended span including bottom chords and laterals L18-L21 (3 panels) and top chords, floorbeams, and laterals U18 to U19′ (7 panels), and all diagonals and verticals to L21-U22 inclusive formed the false bent superstructure.

The height from bottom of the base plates under the front legs of the false bent to center line of bottom chord at span 4 was approximately 279 ft. With the concrete substructure, the total height of the false bent No. 3 was 385 ft. Fixed base plates provided the connection to the concrete shafts. The back legs rested on hydraulic jacks, each of 300-ton capacity. Located above the jacking beam at top of the bent and spaced to provide equal distribution of load were eight hydraulic jacks, each of 500-ton capacity. These were connected in series and operated in unison by a centralized control.

Adjustments at false bent No. 3

Before the completed portion of span 4 was landed on the false bent, the dead load reactions at the back legs were weighed and equalized by raising or lowering with the 300-ton jacks. This was accomplished in the absence of side winds. These reactions were maintained during the landing of the span on the false bent. As erection progressed beyond the false bent these reactions were checked after each 2 panels of bridge were erected and brought equal to the original dead load reaction.

Before landing, the false bent inclined backwards (towards pier 2) 3¾ in. at 60 deg. F; when the tie backs between span 3 and 4 were released the bent became plumb. Cantilever erection in advance of L8 caused the false bent to incline backward approximately 1 in. Accurate and frequent measurements were recorded daily of movements of this false bent. Upon completion of false bent No. 3 erection continued with hanger U7-L7, floorbeam at L7, stringers and laterals L6 to L7.

S2 traveler moved to U7, span 4, position No. 12; erected bottom chord L6-L8 and diagonal U7-U8. At this time completed portion of anchor span was landed on false bent No. 3 by jacking at top of bent. Jacking was continued until all stress was relieved in the top chord tie over pier 2 between spans 3 and 4 which required raising the span 2 ft. 4 in. The jinniwink traveler had completed erection of highway stringers to U1′, span 3, and was here blocked up. The nickel steel pins were removed in the temporary tie at U0 but bottom chord compression block and wind tie remained in place.

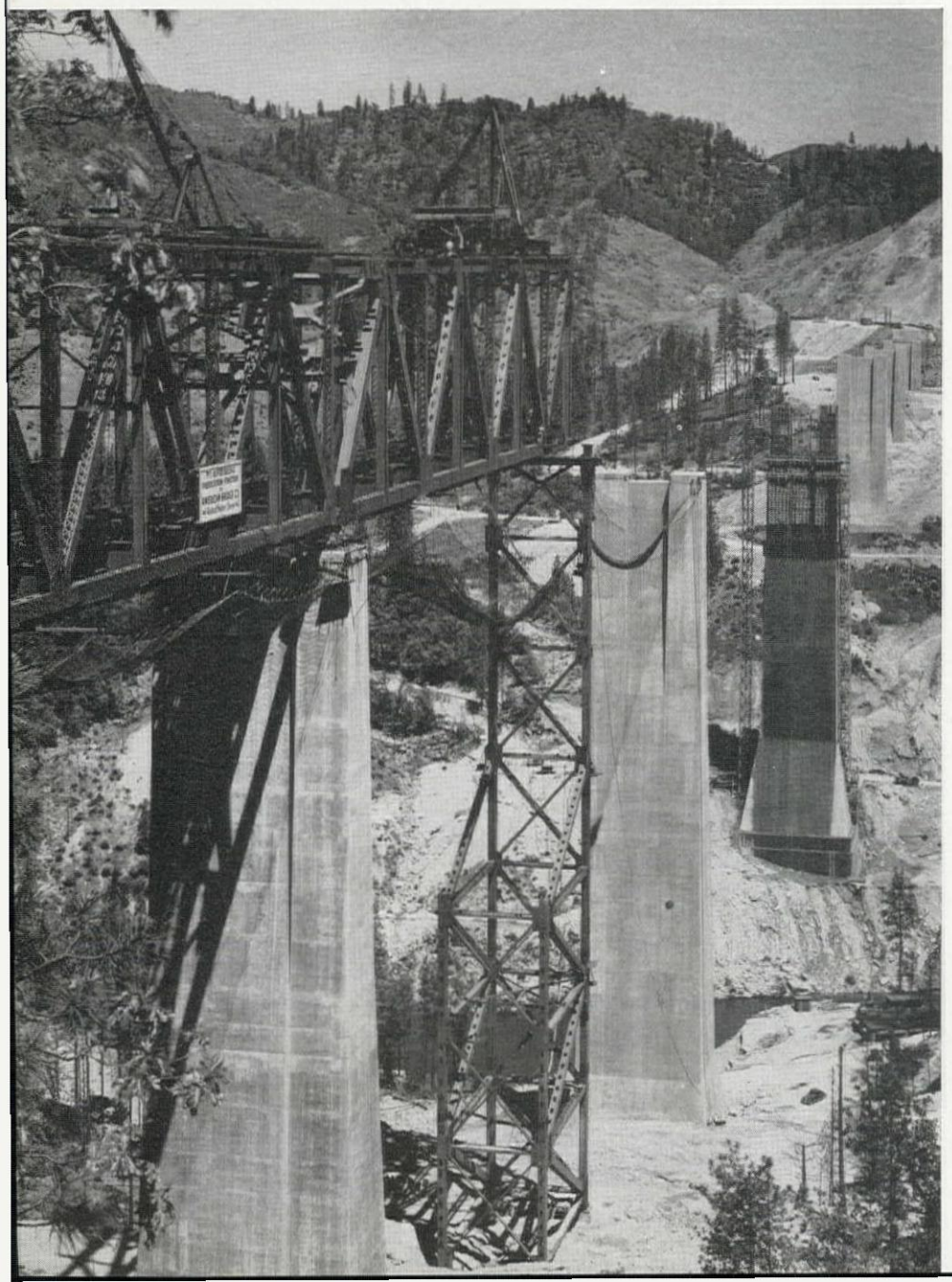
Hold down rods at pier 1, span 3, were removed and the span was raised by means of hydraulic jacks at which time the temporary rocker was removed and the fixed shoe erected. Tie rods and compression blocks at pier 1 were removed; however, the temporary wind bracing between floorbeam and pier 1 remained in place throughout these operations and was not removed until span 4 was landed on pier 3. Wind bracing at abutment 2 was now removed.

The temporary top chord U0-U1, span 4, was removed with a 60-ton locomotive crane. This member consisted of a center segment and two outside segments and its weight exceeded the capacity of the jinniwink derrick. Highway floorbeams at U0′, span 3, top lateral bracing and temporary top chord U1′-U0′, span 3, were removed and permanent top chord U1′-U0′, span 3, floorbeam and brackets at U0′, top laterals and stringers were erected.

Erection continued with 60-ton locomotive crane placing post U0-L0, top chord U0-U1, floorbeam at U0 and top laterals, span 4. Highway stringers were erected with the jinniwink to U5 to provide additional anchorage as cantilever erection progressed beyond false bent No. 3. S2 traveler at U7, span 5, position No. 12; erected post U8-L8, diagonal L8-U9, top chord U7-U9, hanger U9-L9, floorbeam at L9, stringers and laterals L8 to L9.

S2 traveler moved to U9, span 5, position No. 13; erected bottom chord L8-L10, diagonal U9-L10, post U10-L10, diagonal L10-U11, top chord U9-U11, hanger U11-L11, floorbeam at L11 and stringers and laterals L10 to L11. S2 traveler moved to U11, span 5, position

FALSE BENT NO. 3 was composed of 7 panels of top chords, floor beams, and laterals, and 3 panels of bottom chords and laterals, with diagonals and verticals, from the suspended span, set on concrete shafts sunk 106 ft. below ground surface. Total height of Bent No. 3, including shaft, was 279 ft.



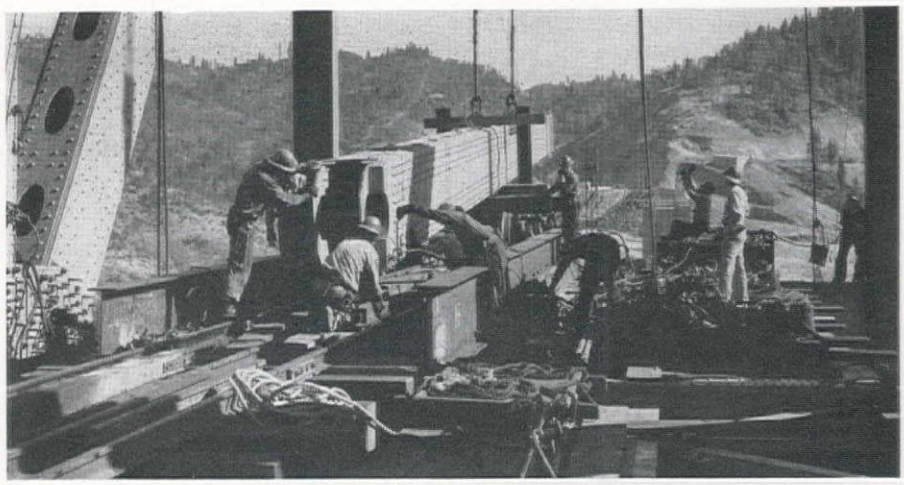
No. 14; erected bottom chord L10-L12, diagonal U11-L12. The diaphragm between gussets at L12 was bolted and had to be rotated about lower end to allow diagonal U11-L12 to be swung into place. Erected post U12-L12, diagonal L12-U13, top chord U11-U13, hanger U13-L13, floorbeam at L13 and stringers and laterals L12-L13.

S2 traveler moved to U13, span 5, position No. 15. From this position the lower cast shoes on pier 3 were erected and all anchor bolts tightened. The upper structural shoes were then placed on cast shoes in temporary position about 4 in. towards the river (north). Extensions were provided on upper shoes to permit jacking the span for making pin connections. A 300-ton hydraulic jack on each shoe was used for this operation. Erection continued with bottom chord L12-L14, 22 in. nickel pin equipped with pilot head and driving nut was then driven into place, proper alignment for pin being made by jacking shoe on pier 3 longitudinally with additional movement of false bent No. 3 when required.

Completion of span 4

The completed portion of span 4 was swung by releasing the jacks at the top of bent No. 3. This span from U0-L0 to U13-L14 had a weight of 3,200 tons and only ⅓ of the weight was released from the false bent the first day. The following day the supporting jacks were entirely released and the span swung free of false bent. Upon completion of swinging span 4, dismantling of false bent No. 3 was accomplished by the use of the Lambert hoist and sets of falls, located at L2, span 4, with cables dropped through blocks at L8. The members from the dismantled bent were placed at the base of pier 3 where they were trucked to the south storage yard from where they were brought forward when needed for future erection.

Compression blocks at lower chord between spans 3 and 4 were removed.



MATERIAL TRACK of 90-lb. rail laid on temporary cantilever stringers was placed on the lower deck, in such position that bridge members could be delivered from the storage yard on trucks, hoisted by the traveler crane mounted on the upper deck, and placed in proper position for erection.

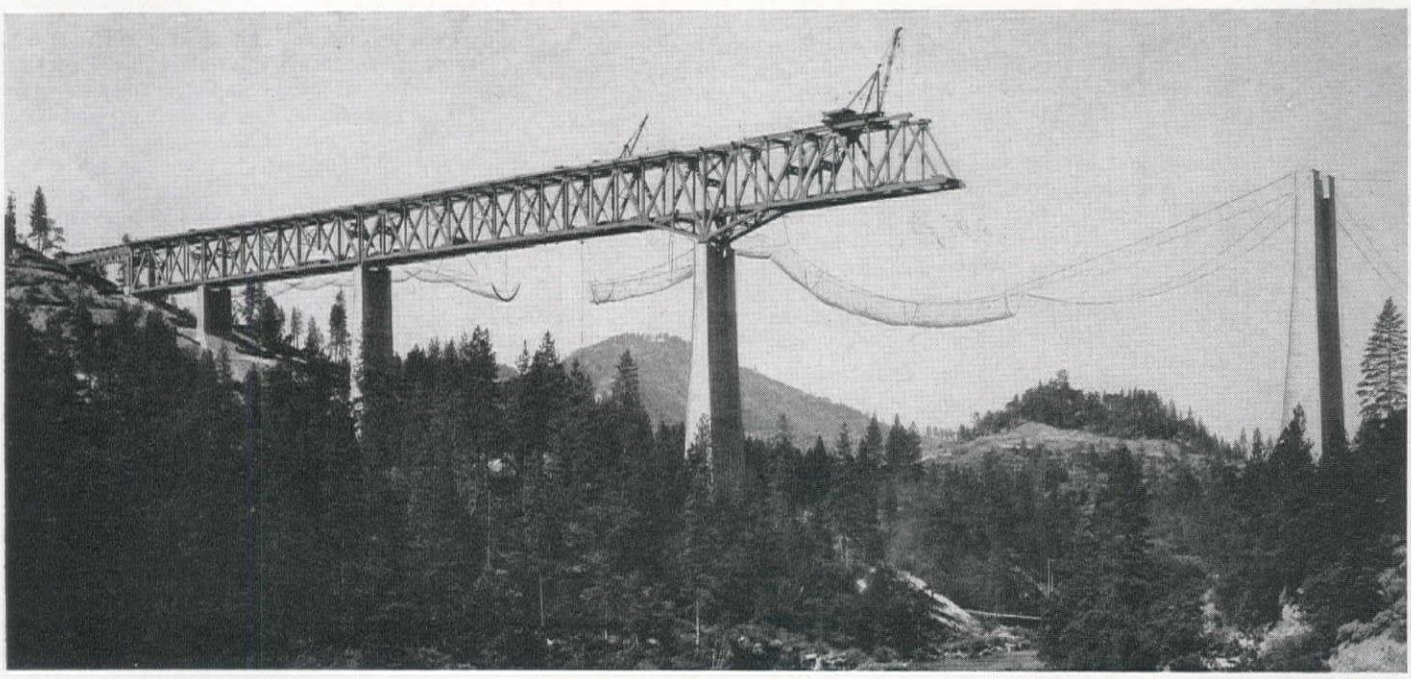
Span 4 was jacked longitudinally until upper shoe at pier 3 was in final position on lower cast shoe and then bolted in place, filling all holes. Span 3 at pier 2 was raised, temporary rocker and base plate removed and permanent roller nest erected, after which the span was lowered into final position. Gusset extensions at L0′, span 3, and L0, span 4, were then flame cut. Erection continued with post U14-L14 and connected to diagonal U13-L14 with temporary timber strut for support, top chord U13-U15, floorbeam at L4, stringers and laterals L13-L14.

S2 traveler was moved to U14, span 5, position No. 16; erection diagonal L14-U15, floorbeam at L15, stringer and laterals L14 to L15. S2 traveler moved then to U15, span 5, position No. 17; erected bottom chord L14-L16 and diagonal U15-L16. Diaphragm at L16 was bolted in place and had to be removed to allow U15-L16 to be entered. Erection continued with post U16-L16, diagonal L16-U17, top chord U15-U17, floorbeam at L16, stringers and laterals to L16. Boom on traveler was then changed from 75 ft. to 90 ft.

The oil boxes enclosing the roller nest at the expansion end of span 4, over pier 3, were erected. They consisted of ¼-in. structural carbon steel; the top cover plate welded to the lower shoe, the bottom of the boxes welded to the sole plates. Two hundred thirty-five gallons of petroleum base cylinder oil were required to fill each. These assemblies provided free and unobstructed action for the rockers.

S2 traveler was moved to U16, span 5, position No. 18; erected hanger U17-L17, and drove an 18-in. nickel pin at U17, this member being the south hanger of the suspended span. Erection continued with bottom chord L16-L17, together with gussets at L17, which were

COMPLETED ERECTION from south approach, showing safety net, and S-2 traveler before being dismantled.



temporarily bolted in place. This connection remained bolted until diagonal L17-U18 and top chord were erected. Immediately in rear of L17, in the member L16-L17 was a jacking assembly, which contained a shim support plate, compression block, and a slotted hole 22 in. in length and 12 1/32 in. in width for the accommodation of a 12-in. nickel pin. Previous to the insertion of pin, journal jacks were installed by which movements of the completed portion of the suspended span could be controlled by operation of these jacks. Shim stacks 8¼ in. thick were assembled at this lower chord connection and pin driven, after which jacks were released.

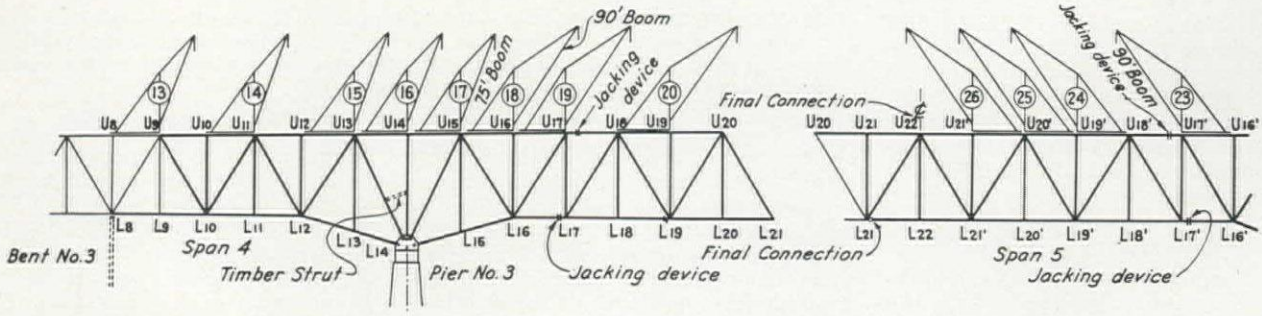
dismantled with locomotive crane. Inspection platforms, rails, traction bracing and P.T.&T. expansion loop platforms were erected with one of the locomotive cranes following main structural member erection as soon as practicable.

Girder erection

The girders for the south approach span 1 had been received at this time. The right girder weighed 97 tons, the left girder 80 tons and they were approximately 154 ft. in length. Three standard flat cars were required for the transportation of each and special couplings and support plates were used to distribute their weight over the cars. These

The north end of span 9 in its final position was 18 in. out of line with span 8. This was necessary to conform to the alignment of the railroad which was on a 240-ft. spiral to a 3-deg. curve left, commencing 11.52 ft. south of pier 7 center line. The main truss members of the bridge remained on a tangent from abutment 2 to abutment 3, the railroad stringers with bottom laterals of span 9 fabricated to the chords of the curve.

Employing the 150-ton locomotive crane, the north end of span 9 was erected 18 in. to the right of its final position. This rotation caused a 4-in. longitudinal displacement and placed the span in direct line with span 8 temporarily, to



DIAGRAMMATIC SKETCH of successive crane positions from north approach and for making closing connection.

Traveler work completed

Erection continued, assembling gussets at U18 to end post L17-U18 and erecting as one piece, followed by top chord U17-U18. Immediately in advance of U17 in the member U17-U18 was a jacking assembly, containing a shim support plate, compression block, and a slotted hole 27 in. in length and 16 1/32 in. in width for the accommodation of a 16-in. nickel pin. Journal jacks were here also installed with shim stacks of 1-1¾ in. thickness and pin driven. It might be noted here that the thickness of the shim stacks was decided upon after calculations determined to produce fair pin holes for the final connections at lower chord L21.

Erection continued with floorbeam at L17, removed temporary bolted connection between bottom chord L16-L17 and gussets at L17, stringers L16-L17 by jacking joint L17 forward with journal jacks. S2 traveler moved to U17, span 5, position No. 19; erected hanger U18-L18, bottom chords L17-L18 and L18-L19 were erected as one piece, diagonal U18-L19, post U19-L19 and top chord U18-U19, and the shear lock assembly at the fixed end of the suspended span.

S2 traveler moved to U19, span 5, position No. 20; erected diagonal L19-U20, top chord U19-U20, hanger U20-L20, bottom chord L19-L21, diagonal U20-L21, railroad floorbeams and stringers L19-L21, bottom laterals, highway floorbeams, brackets and top laterals to U20. Highway stringers were erected to U14 with jinniwink derrick. S2 traveler was removed to a point near U15 and was dismantled with the jinniwink derrick. The dismantled traveler was lowered to the ground beside pier 3 and hauled immediately to north approach by truck. Highway stringers were placed to U19 after which the jinniwink was

girders had a web thickness of ¾ in., flange angles were 8 in. x 8 in. x 1⅛ in., and cover plates 20 in. wide.

Bent No. 1 consisting of structural members was erected in three sections—the two columns and cross girder—by the 150-ton locomotive crane. After setting expansion rockers, the girders for span 1, between abutment 1 and abutment 2, were erected with the 150 and 60-ton locomotive cranes. In order to insure stability of the cranes while lifting these girders, the outriggers were supported by timber blocking and further precautions were exercised by clamping cranes to rails at each corner. Highway floorbeams were erected with the 60-ton locomotive crane and floorbeam extensions with crane, the boom equipped with the hammerhead attachment. This concluded the erection from the south approach.

All erection equipment was trucked to the north approach except the locomotive cranes. These were returned to Redding over S. P. relocated line, thence to Delta on main S. P. line and back to the north side over S. P. relocated line.

Erection of the North Approach

Erection from this approach commenced with the simple truss span 9. The 150-ton locomotive crane was stationed at abutment 3, blocked up, and false bent No. 4 was erected. The foundation of this bent consisted of a mat of timber cribbing 12 by 14 ft. under each leg, the superstructure consisting of the same structural members and erection material as used in false bent No. 1 as earlier described.

accommodate cantilever erection of span 8. Anchor bolts in abutment 3 were set, rails and temporary rollers were placed under fixed shoes here to permit moving the span longitudinally. Clamping devices were provided to arrest movements when desired. Erection proceeded, with 150-ton locomotive crane, bottom chord L0-L2, railroad floorbeams at L0 and L1, hanger U1-L1, end post L0-U1, diagonal U1-L2, and portal bracing L0-U1, railroad floorbeam at L2, stringer and bottom laterals between L0 and L2.

The 150-ton locomotive crane was moved back from abutment 3 and the 60-ton crane was run out and blocked up at L2, span 9. The S2 traveler, with 90-ft. boom was assembled on completed portion of span. It required nine days from the time dismantling of traveler was begun at U15, span 5, until it was in operation on the north side. Erection continued until completion of this span.

Expansion shoes for span 9 had been placed; however, as the span was not in its final position, the anchor bolts had not been set. The roller nest was locked with temporary clip angles provided for that purpose. At pier 7, the span was equipped with a temporary roller on the right shoe, and a 300-ton hydraulic jack on the left shoe which provided a pivot point in moving the span back into its final position, after span 8 was swung and the tie backs released.

Drilling of anchor bolts was completed at pier 7, after which fixed shoes for span 8 were set. The S2 traveler was moved to U0', span 9 and cantilever erection of span 8 over pier 7 continued. As span 8 was similar to span 3, erection followed the procedure as outlined for span 3. Highway stringers were erected in span 9 with the 60-ton locomotive crane after which the jinniwink was assembled on upper system. False bent No. 5 was erect-

FALSE BENT NO. 6, composed of three panels from suspended span, being dismantled by S-2 traveler, following completion of span 7 above it.

ed midway between piers 7 and 6, the substructure consisting of two 5-ft. reinforced concrete shafts extending 58 ft. on right shaft and 52 ft. on left shaft to solid rock foundation. The superstructure of this bent consisted of top chords, floorbeams, and laterals from the suspended span U20 to U22 (2 panels).

Upon completion of swinging span 8, the dismantling of bent No. 5 followed immediately. In this connection it might be stated that no appreciable deflection was noticed in releasing the supports from a span. Bottom chord compression blocks between span 9 and 8 and the tieback rods over pier 7 were removed. Temporary wind bracing remained in place until span 6 was landed on pier 4.

False bent No. 6

Rotation of span 9 into its final position was commenced after swinging span 8. The span was raised at abutment 3 by four 300-ton hydraulic jacks and rollers were reversed so that they were parallel with the trusses, after which the span was lowered onto the rollers. Temporary locking angles on roller nest at pier 7 were then removed, and 50-ton journal jacks were installed at abutment 3; after raising span the 4 in. at pier 7, temporary roller plate and rollers were inserted under shoe at right truss. Jacks were operated in moving span to the left into final position, and after lowering span into place, omitted anchor bolts were grouted on pier 7.

Cantilever erection of span 7 over pier 6 commenced with temporary tie rods and compression blocks between spans 8 and 7. Erection continued to U1-U3 and S2 traveler was moved to U2, span 7. From this point false bent No. 6 was erected midway between piers 6 and 5 and guyed to anchors in the lower portion of these piers. The substructure at this bent consisted of two 5-ft. reinforced concrete shafts extending 48 ft. on right shaft and 52 ft. on left shaft to solid rock foundation, the superstructure consisting of top chords, floorbeams and laterals from the suspended span U19′ to U22 (3 panels).

Erection continued until bottom chord L2-L4 was landed on false bent No. 6, after which all stress was removed from top chord tie over pier 6 by raising jacks at top of bent. Bottom chord tiebacks remained in place until span 6 was landed on pier 4. After erection of U4-L4, U3-U3′, and L4-U3′, the S2 traveler was moved to U4 and cantilever erection over false bent No. 6 commenced. When erection had progressed sufficiently, temporary rocker and bed plates were erected at pier 5, span 7. Span 7 was then landed on pier 5, 3¼ in. high and remained in that position until span 6 was swung.

It may be stated that the tiebacks between spans 2 and 3 were the same as between spans 9 and 8, and 8 and 7, the top chord web plates of first span erected being extended so as to connect to end post L0-U0 and the top chord of second span. When the second span was landed on falsework the portion of plates between ends of top chords was burned off.

Following the erection of bearing plates, shoe assembly, compression blocks and temporary upper chord ties at pier 5, cantilever erection of span 6 commenced. The top chord tiebacks between spans 7 and 6 were the bottom chords from L21-L22, suspended span, connected to anchor arm at U1 and to short span at U0′. After landing span 6 on false bent, the tiebacks were removed and temporary pin holes and top chord web plate extensions burned off. The permanent chords U1′-U0, span 7, normally redundant, were of heavier design to sustain erection stresses as cantilever erection progressed from span 5, previous to landing on false bent No. 7. They were temporarily used at U0′-U1′, span 3, but left in final position at span 7.

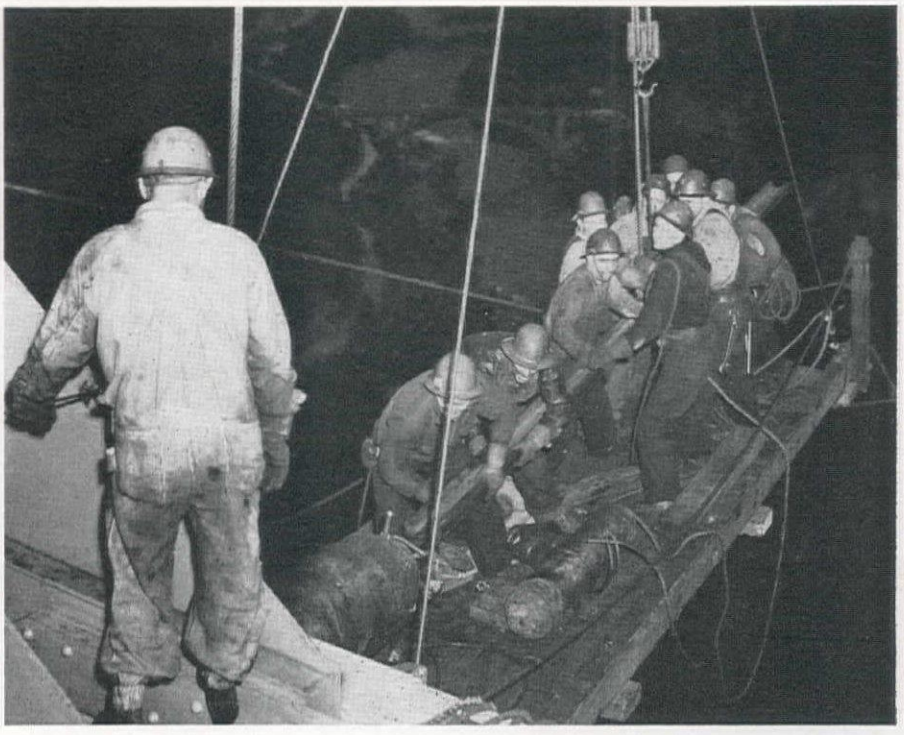
False bent No. 7

Spans 6 and 4 being similar in design, the erection followed the procedure as outlined for span 4. Upon completion of erecting bottom chord L4-L6, diagonal U5-U6, post U6-L6, diagonal L6-U7, and top chord U5-U7, the S2 traveler was moved to U6 and erected false bent No. 7. This false bent was similar in design to false bent No. 3; two 7-ft. sq. reinforced concrete shafts, the right 56½ ft. and the left 62 ft. below ground surface supported the front legs, while two 12-ft. sq. reinforced concrete pedestals were constructed for the rear legs.

Structural members from the suspended span again formed the superstructure of this false bent, including bottom chords and laterals, L19′ to L21′ (2 panels), and top chords, floorbeams and laterals U18′ to U20 (6 panels), and all diagonals and verticals to L21-U21′ inclusive. The rear leg of this bent was one panel above the front leg because of the differential in ground levels. The distance from center line of lower chord, span 6, to the bottom of the base plates of front legs was 239 ft., making a total height of false bent approximately 300 ft. A 300-ton jack was installed under each back leg of the false bent to provide longitudinal movement of the span, and eight 500-ton jacks were inserted between jacking beam and lower chord at L8 to move span vertically.

Cantilever erection continued over false bent No. 7 similarly as over false bent No. 3. With S2 traveler at U12,

NICKEL STEEL PIN being driven into place at position L21 on lower chord, using 90-lb. rail as driver. A similar pin is driven simultaneously at the like position on the opposite side of the bridge to complete closure of the entire structure. The diameter of the pins was 18 inches.



lower cast shoe was erected on pier 4 and anchor bolts tightened. The upper structural shoe was erected on cast shoe in temporary position about 4 in. towards river (south). Erection proceeded with bottom chord L12-L14′, diagonal U13-L14′, and attendant pins. Jacking was done at top of bent to assist in making pin holes. The completed portion of span 6 was swung free of bent by releasing jacks on false bent No. 7.

Compression blocks and tieback rods between spans 8 and 7, also compression blocks and pins at bottom chords between spans 7 and 6 were removed. Span 6 was jacked longitudinally until upper shoe at pier 4 was in final position on lower cast shoe and bolted in place. Span 7 at pier 6 was raised, wind bracing and temporary rocker removed, fixed shoe erected. Span 7 at pier 5 was then raised, temporary rocker removed and roller nest erected for expansion end of span, after which span 7 was lowered to final elevation. Oil boxes, enclosing roller nest, span 6 at pier 5, were erected.

After swinging span 6, false bent No. 7 was dismantled, members removed to north storage yard where they were cleaned and painted in order to permit continuation of highway deck as soon as possible after completing closure of the suspended span. Cantilever erection of span 6 continued over pier 4 in a manner identical to erection of span 4, previously described, to the beginning of span 5, at U17′-L17′, the north hanger of the suspended span. Jacking arrangements, including shim support plate, shims, journal jacks, pins, etc., were assembled in the top chord U17′-U18′ in advance of U17′, and in rear of L17′, in the bottom chord member L16′-L17′, similar to method described at U17 and L17 respectively.

S2 traveler at U17′, span 5, position No. 23, continued cantilever erection over pier 4 with hanger U18′-L18′, bottom chord L17′-L19′, diagonal U18′-L19′, post U19′-L19′, and top chord U18′-U19′. S2 traveler moved to U19′, span 5, position No. 24; erected diagonal L19′-U20′, bottom chord L19′-L21′, hanger U20′-L20′, and diagonal U20′-L21′. S2 traveler moved to U20′, span 5, position No. 25; erected post U20′-L21′, diagonal L21′-U22 and top chord U20′-U22.

S2 traveler moved to U21′, span 5, position No. 26; erected hanger U22-L22 with gusset at L22 bolted in place, bottom chord L21′-L22, making all connections. Erection continued with floorbeam at L22, also highway floorbeams at U21 and U22, bottom chord L21-L22, and pin at L22 was driven; diagonal L21-U22, post U21-L21, making connections at L21. Erected top chord U20-L21, and made connections at U20 and U21. This completed the erection with S2 traveler and preparations were effected to close the suspended span.

Closing suspended span

Two 500-ton jacks were placed in each of the jacking devices at U17, L17, U17′ and L17′, in order to adjust the opposite halves of the suspended span. At the time erection of main truss members was completed with S2 traveler at U21′, span 5, the north arm was 8 in. lower than the south arm on the right truss, and 8⅝ in. lower on the left truss. The two additional panels of bridge erected in the suspended span from the north side accounted for part of this differential.

The longitudinal gap at the milled joint U22 was 8⅛ in. at 57 deg. F. and the two arms were ¾ in. out of alignment. The bottom chord measurements indicated 2 in. long for the right truss and 2¼ in. long for the left truss.

NORTH GIRDER SPANS were placed by 150-ton locomotive cranes. Stiffening trusses were bolted to the top flanges to prevent distortion.

The S2 traveler was backed to U15′, span 5, at which point measurements disclosed that the north arm was 5⅞ in. lower than the south arm at right top chord and 6½ in. at left top chord. Four inches of shims were removed at U17, 1 in. at U17′; 1½ in. of shims were added at L17, ¾ in. at L17′, which produced fair pin holes at L21. At this time the top chord of the south arm was 1 in. above the north arm and the gap at the milled joint U22 was 4 in. The span remained in this position until the following morning in order to make the final closure with the temperature as near 60 deg. F. as possible.

During the subsequent operations which culminated with final closure, it was necessary to add ½-in. shims at U17 to bring pin holes at L21 into agreement, so that lower chord pins could be driven simultaneously.

Slacking the span down, the diagonal U22-L21 was made next at the U22 connection, the milled splice at U22 being open ¾ in. Continued release of pressure from the jacks at U17 and U17′ brought the top chord splice at U22 into fair holes. After the top chord joint at U22 had been brought to bearing, the pressure on jacks at U17, U17′, L17, L17′ was released simultaneously and in equal increments until the suspended span was swung free. The span was then jacked ⅝ in. north so that traction pin at L17′, the expansion end of suspended span, could be installed. The temperature was 58 deg. F. with a light rain falling during these operations, and the time consumed in making the final closure was 2½ hours.

The 500-ton jacks were at capacity with water pressure at 8,200 lb. p.s.i. The gauge pressures noted to release shims were 6,000 p.s.i. at U17 and 8,100 p.s.i. at U17′, decreasing to 5,800 p.s.i. at U17 and 7,600 p.s.i. at U17′ while slackening

the span down. The 500-ton jacks were removed and span 5 was swung.

The S2 traveler at U15′ was dismantled with jinniwink derrick, members moved by truck to the north storage yard and loaded on cars. Jinniwink derrick completed highway stringers to U19′, span 5, where it was dismantled with Lambert hoist, members lowered to railroad trucks on temporary erection track and returned to storage yard for shipment. Omitted steel in the suspended span was erected with locomotive crane, the final member in the truss span being the 6-in. pin in shear lock assembly at L17′, the expansion end of the suspended span.

North girder spans

Erection continued with north approach girder spans. Structural bent 2 was erected at abutment 3 similarly to the construction of bent 1 at abutment 2. Bents 3, 4, and 5 were provided with rocker shoes for connections to concrete piers. After completion of setting rocker shoes on pier 8, the 60-ton locomotive crane erected the left column of bent 3, held it in plumb position until four metal straps were welded between the upper and lower shoes to prevent the structural member from rocking. The cross girder was then erected with the 150-ton locomotive crane, making connections with the left column. The right column was hoisted in an outward angular position by another locomotive crane, set on rocker, and tipped inward at the top to make connection with the cross girder.

The girders for span 10 were raised by simultaneous operation of the 150-ton and 60-ton locomotive cranes. Stiffening trusses which had previously been bolted to the top flanges of the girders to eliminate any distortion of these members, were removed as floorbeam erection progressed. Bent 4 at pier 9, and bent 5 at pier 10 were erected similarly to bent 3, followed by the swinging of spans 12, 13, and 10, in that order. This order of erection permitted more clearance for the operation of the locomotive crane booms.

The north approach right side girders weighed 76 tons each and on the left side 87 tons each. A special spur track was laid between pier 10 and abutment 4 for the erection of span 13. Terrain conditions at this location necessitated the use of the 150-ton locomotive crane alone in erection of these 2 girders. This area was stabilized by cribbing to insure adequate bearing for cranes and girders.

Floor systems, including floorbeam extensions and bracing, were erected with 60-ton crane, the 4-in. traction pins between spans 11 and 12, spans 12 and 13, being the final installation.

Organization

The steel superstructure of the Pit River Bridge was furnished and erected by the American Bridge Co. under the general direction of C. S. Garner, vice president in charge of erection and C. D. Christie, manager of erection. Edward Nimmergood, superintendent of erection; W. G. Beckerley, resident engineer; and George Carter, assistant engineer; were on the job throughout the erection period.

Construction of the Pit River Bridge was under the supervision of the Bureau of Reclamation, of which John C. Page is Commissioner, and S. O. Harper is Chief Engineer. In the field, the men in charge were Ralph Lowry, construction engineer, Kennett Division Central Valley Project; C. M. Jackson was chief inspector, Southern Pacific Railroad Relocation, and Speed S. Leonard, principal inspector, Pit River Bridge.

New Rules Issued for Army Labor, Supply Procurement

Negotiation accepted as general policy, with speed the principal factor considered. Field agencies decentralized and increased authority given local contracting officers

By ARNOLD KRUCKMAN
Washington, D. C.

PROCUREMENT REGULATIONS governing War Department transactions under needs of the present emergency have been completely revised and a new issue of the publications published. Comprising about 250,000 words of text, the new regulations apply directly and actively to the construction industry. Procurement powers stemming from the Undersecretary of War have been delegated to Chiefs of the Supply Services, and they in turn are authorized to redelegate their powers to other officers and to civilian officials.

Contract negotiation

The new regulations specifically include procurement of construction work, including Rivers and Harbors work. They contain a prohibition against the use of troop labor, and prohibit the use of Government facilities to transport employees or materials, unless special authority is given. Negotiated purchases are defined as including all purchases not made as a result of formal advertising, and may be made by securing informal written bids from any number of suppliers, or by securing telephone quotations. The general policy is indicated as contracting by negotiation. The details are left largely to the officers in charge.

Decentralization to the field agencies is especially ordered. In negotiating contracts primary emphasis is placed on speed. Preference is to be given to those who are best able, by reason of engineering, managerial, and physical resources, to handle the contracts. Awards of less than $5,000,000 may be made by any officers the chiefs of supply services may designate. Awards of $5,000,000 or over must be submitted to the Chief of the Purchases Branch, Procurement and Distribution Division, Headquarters, Service of Supply, War Department, Washington, D. C. Architect, engineer, management, or similar contracts, for $5,000,000 or more, must be submitted to the same source.

Walsh-Healey Act, Davis-Bacon Act, the Copeland "Kickback" Act, are applicable to contracts. Contracts amounting to $5,000 or more, and those involving more than one payment, are required to be supported by a written agreement; contracts for less than $5,000, and those liquidated in one payment, need not be supported by a written quotation.

Contract forms

Contract forms are listed as War Department Contract Form No. 1, the Lump Sum Supply Contract; Contract Form No. 2, the Lump Sum Construction Contract; Contract Form No. 3, the Cost-Plus-A-Fixed-Fee Construction Contract; Contract Form No. 4, Cost-Plus-A-Fixed-Fee Architect-Engineer Contract; Contract Form No. 5, Short Form Supply Contract (Negotiated); Contract Form No. 6, Offer and Acceptance; Contract Form No. 7, Letter Purchase Order; Contract Form No. 8, Letter Contract (Supplies); Contract Form No. 9, Letter Contract (Fixed-Fee); Contract Form No. 10, Letter Contract (Lump Sum Construction); Contract Form No. 11, War Risk Indemnity Contract. If the forms do not fit a special need the officer negotiating is empowered to devise the necessary instruments. They must, however, be approved by Headquarters.

It is wise to note that no contracts are valid unless they are approved by the authority specifically designated to approve them. Chiefs of supply services are empowered to modify or amend contracts upon adequate legal consideration. They may not, however, modify or release accrued obligations, or any similar financial obligations, and are directed to make recommendations to higher authority if any modifications of the kind are desirable. Change orders may be made in the form of letters. Supplemental agreements or change orders involving $5,000,000 or more must first be submitted to Headquarters for approval.

Advance payments

Advance payments are authorized to speed war work. Officers in the field are authorized to approve advance payments when the amount is less than 50 per cent of the estimated amount of the contract, and when the contract is for less than $5,000,000. Advances are to be limited to

30 per cent, but may be larger for a variety of reasons. Advance payments on letter contracts must be supported by supplemental agreements.

But advances are authorized regardless of the form of the contract. If advances requested exceed 50 per cent, and involve contracts for more than $5,000,000, they must be submitted first to Headquarters. The contractor must pay an interest fee of 2½ per cent per annum on advances. If the contractor derives no profit from the contract he is not required to pay interest on advances. Contingent fees are prohibited. The interest that may be due the Government on advance payments is protected by very elaborate legal documentation. There is an additional interest charge for interest and principal delinquency ranging as high as 6 per cent per year in addition to the original 2½ per cent. Provision is also made for advance payments to subcontractors.

Partial payments may be made in an amount not to exceed 75 per cent of the cost of the job to the contractor. Partial payments also are authorized in an amount not to exceed 90 per cent of direct labor and material cost.

The regulations set up the method by which the contractor shall be reimbursed if the contract is terminated for the convenience of the Government. He naturally receives what he has expended and also receives a profit on the uncompleted part of the contract.

There is a stiff clause against discrimination, involving race, creed, color, or national origin. There are detailed regulations for negotiating bonds and insurance involved in contracts.

Wages and hours

The Regulation also provides all contracts should contain specific mention of taxes involved in performance of the contract. The Regulation in detail outlines how various taxes are to be covered.

The Government must be protected in any agreement against suit for the use of patented devices. There is the usual clause covering secret, confidential or restricted contracts. There are provisions for re-determination of prices, and for re-negotiation of prices.

Contracts subject to the Davis-Bacon Act are those in excess of $2,000, and for construction, alteration, repair of public buildings or public works. The Act requires weekly payment of wages to mechanics and laborers, and requires the wage scale to be prominently displayed. Government is empowered to withhold funds due the contractor if the workers are not sufficiently paid under the law. The Eight-Hour Law of 1912 is part of all contracts. Overtime naturally is rated as time and one-half.

A very full labor policy is outlined as it applies to contractors. It provides for payroll deductions, for predetermination of wage rates, and prescribes the method by which the contractor must make reports in regard to local wage conditions. Considerable space is given to detailed regulations under the Walsh-Healey Act.

Special regulations are imposed in regard to wage rates in the cement industry. The rate in Colorado, Wyoming, Utah, Montana, Idaho, Oregon, Nevada, Arizona and New Mexico is set at 55c an hour or $22.00 per week of 40 hours; in Washington at 70c an hour or $28.00 per week of 40 hours; in California at 62½c an hour or $25.00 per week of 40 hours.

Financing

Where plant facilities are expanded it is made policy that contractors who will finance themselves shall be preferred. In connection with new structures the simplest structures of temporary nature are designated. Operators of new facilities, so far as feasible, are expected to pay the cost of construction. When the Government finances the construction it owns the title; or, the operator, in the name of the Defense Plant Corporation, constructs the buildings, and the Corporation provides the funds. Plant Site Board must approve all construction in excess of $1,000,000.

When the officer in charge deems expedition essential, clearance may be obtained by telephone. Contracts for construction in excess of $5,000,000 must be approved by Headquarters. No discounts are permitted. Contracts executed on the basis of speculative cost estimates must contain a clause for redetermination or renegotiation of the price. Redetermination of price may be negotiated downward only, when costs are materially different from estimates.

The new regulations are formally known as Title 10—Army: War Department, Chapter VIII—Procurement and Disposal of Equipment and Supplies. Part 81—Procurement of Military Supplies and Animals. If you wish a complete copy, write Chief of the Purchases Branch, Procurement and Distribution Division, Headquarters, Service of Supply, War Department, Washington, D. C. The text in full may be consulted in any Government library where there is available a file of the Federal Register. It may be found under date of August 7, 1942.

NEW BOOKS...

AMERICAN HIGHWAY PRACTICE—Volume II—By Laurence Ilsley Hewes, Chief, Western Region, U. S. Public Roads Administration. Published by John Wiley & Sons, Inc., New York, N. Y. 492 pages, 6x9. Price $6.00

Volume I of American Highway Practice, which was reviewed in the February 1942 issue of *Western Construction News* covered the first steps in the design and construction of rural highways, including location, design, grading, landscaping, bases, low-type surfaces, and intermediate bituminous surfaces. Beginning where Volume I ended, Volume II includes discussions on penetration macadam, sheet asphalt, asphaltic concrete, portland cement concrete paving, brick roads, and miscellaneous structures, including small bridges, smaller drainage structures, guard rails, and grade separation structures.

As in the first volume, Dr. Hewes, who is chief of the western region for the U. S. Public Roads Administration, has gone in careful detail into all of the factors comprising each method of construction for each type of structure.

Three chapters are devoted to portland cement concrete pavements. The first of these covers subgrade, side forms, mixing and placing, joints and reinforcement, compacting and finishing, curing, super-elevation and widening, cost, warping of slabs, test cylinders, beams and cores, and maintenance. In all of these discussions of construction methods, considerable space is devoted to the machines used in the work. The chapter following that on construction of concrete pavement is devoted to a discussion of the design of pavement mixtures, and what is probably most important, the practical application of design-mix theories. The final chapter on concrete pavements is devoted to the design of slabs. As such, it is highly theoretical, and includes the results of much of the investigation work which has been undertaken on the subject by the Public Roads Administration highway departments during recent years. The chapter on miscellaneous structures includes a brief discussion of bridges with spans of less than 20 ft., as well as culverts of various types, guard rails and parapets, drop inlets, catch basins, and miscellaneous items. Some discussion is also devoted to grade separation structures and highway tunnels.

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PROCEDURE HANDBOOK OF ARC WELDING DESIGN AND PRACTICE—Seventh Edition. Published by The Lincoln Electric Company, Cleveland, Ohio. 1,267 pages, 6x9. Price $1.50 per copy in the United States, elsewhere $2.00 per copy.

In the Seventh Edition of this standard work on arc welding, the publisher has placed particular emphasis on the application of arc welding to industrial products of war machines. New information is given on the following subjects: welding symbols, allowable stresses, preheating, stress relieving, flame cutting, alternate current vs. direct current, estimating costs, procedures, speeds and costs, automatic welding, fleet-fillet technique, easy-to-build testing machines, metallurgical characteristics of metals and alloys, weldability of aluminum alloys, S.A.E. steel numbering system, tubular construction, appearance and styling in welded design, design of a press, cities whose building permit laws permit welding, rigid frames with fixed ends, rail end welding, and thirty-nine other arc welding applications.

In eight chapters, the handbook covers welding methods and equipment; technique of welding; procedures, speeds and costs; weld metal and methods of testing; weldability of metals; welded steel construction in machine design; design of arc-welded structures; and typical applications of arc welding in manufacturing, construction and maintenance.

Priority and Price Rulings

Permanent lumber distribution control replaces temporary freeze order—Maximum asphalt prices on Pacific Coast are revised—All power project construction halted—Prices established on new low-alloy steels—Rubber uses listed

Lumber control

DISTRIBUTION of construction lumber which has been under temporary control for several months was placed under permanent regulations on August 27 with the issuance by the War Production Board of Conservation Order M-208, replacing Limitation Order L-121. Under the terms of M-208, purchase orders for softwood lumber are divided into four classes, based on the relative essentiality of the use to the war and civilian economies.

Class 1, covering the construction of manufacturing plants under preference rating orders and the maintenance and repair of buildings, structures or projects owned and operated by the principal governmental agencies engaged in the war effort. These orders are allotted a minimum preference rating of AA-2X, although higher preference ratings may be extended.

Class 2 orders apply to the same type of structures and uses as Class 1, but include the less urgent needs, and will bear maximum preference ratings of AA-2X and minimum preference rating of A-1-a.

Class 3 orders include the construction of defense projects not included under Classes 1 and 2, but which are constructed under preference rating orders. It also includes defense housing, remodeling projects, and the construction of buildings or structures destroyed by fire, flood, earthquake, etc. It includes the construction of new railroad structures and structures and projects other than buildings to be constructed by any governmental unit, and the maintenance and repair of electric, gas, communications, water or sewage facilities, hospitals, roads and bridges, dams, wharves, harbor facilities, and airport structures. This Class also includes the maintenance and remodeling of all office buildings to provide accommodations for agencies of the Government. Preference ratings for projects of this type rank from A-1-a to A-1-k.

Class 4 orders include projects with preference ratings lower than A-1-k, and cover the construction of churches, elevators, school and college buildings, and the maintenance of school and college buildings.

Each class also includes permission for the replacement in inventory of an equal number of board feet of lumber sold for uses specified under each class.

Assignment of preference ratings, as provided for in the Order, does not constitute authorization to begin construction under Conservation Order No. L-41, and does not automatically authorize the delivery or use of material. The types of softwood lumber covered by the order include Douglas fir or Western larch to meet specifications of 1,800 or 2,000-lb. fiber stress per sq. in., or 1,300 or 1,400-lb. compression stress, except on Class 1 orders; Douglas fir or Western larch to meet specifications of 1,200, 1,400 or 1,600-lb. per sq. in. fiber stress, or 1,000, 1,100 or 1,200-lb. compression stress, except on Class 1 or Class 2 orders; Douglas fir, West Coast hemlock, and Sitka spruce of grades Nos. 1 and 2, or any higher common grade, except on orders of Class 1, Class 2, or Class 3; Idaho white pine, Norway white pine, Ponderosa pine, sugar pine, Lodgepole pine, Jack pine, white fir, tamarack, or Western white spruce of grades Nos. 2 and 3 common, except on Classes 1, 2 and 3 orders.

In addition to the restrictions on use, the delivery has been restricted to cases where the material will be used within 60 days after receipt, except that green lumber requiring seasoning may be delivered as much as 120 days before use. So far as dealers are concerned, deliveries may not be accepted when the inventory is in excess of a 60 day supply.

Paving asphalt prices

MAXIMUM PRICES for paving asphalt, cut-back, emulsions, road oils, roofing asphalt, and roofing flux in the states of California, Washington and Oregon have been revised by the issuance of Amendment No. 29 to revise present Schedule No. 88. The revision was made to permit adjustment of prices from refineries in the Santa Maria Valley in California which had been abnormal in their relationship to other California refineries during the basic period selected for price stabilization. Prices are fixed f. o. b. refinery in California, and f. o. b. ocean terminals in Oregon and Washington.

Power projects halted

Further construction of electric power and light projects, which was formerly permitted by the War Production Board where completion had reached 40 per cent on Dec. 5, 1941, has been halted by WPB by Amendment No. 3 to Preference Rating Order P-46. The amendment removes the authority granted to all utilities in Preference Rating Order P-46 to complete construction projects, and provides that additions and expansions must be specifically authorized by the Director General for Operations. The amendment does not affect the construction of certain projects which have been specifically authorized by WPB. The amendment applies to both public and private utilities. Rural Electrification Administration projects were shut down, so far as construction is concerned on July 20, 1942.

Builders' hardware

SPECIFICATIONS for builders' hardware which are not in violation of any existing regulations, restrictions or orders have been issued in the form of a Builders' Hardware Manual by WPB as a guide for architects and builders. The use of the manual as a specification of the maximum allowed hardware has been made a requirement for the Army, Navy, Maritime Commission, Reconstruction Finance Corporation, Public Buildings Administration, and National Housing Agency, by the chairman of the War Production Board. The construction bureau of WPB will require that hardware be limited to materials set forth in the manual on all projects with an estimated cost of more than $50,000 before issuing priorities. The manual will apply to the installation of hardware in nearly every type of building, including offices, dormitories, schools, hospitals, water works, sewage disposal, ammunition, manufacturing, storage, warehouses, residential housing, and cantonments.

Prices for emergency steels

MAXIMUM DELIVERED prices for the sale to users of new low alloy emergency steels have been established for less-than-carload quantity sales by Amendment No. 7 to revise Price Schedule No. 49, covering the re-sale of iron or steel products. The amendment also revises the prices of iron and steel products in the twelve western states. The new low alloy steels which have been in the process of development during the past three months are now being delivered to warehouses, and the new price schedule has been brought out to govern their sale.

Use of rubber

CONTROL of consumption of crude rubber, latex, reclaimed rubber, and scrap rubber in civilian products has been revised by Supplementary Order M-15-b, issued by WPB, which consolidates the original order and 13 amendments issued since last December. Hereafter the use of rubber will be permitted only on specific allocations by the War Production Board. Crude rubber may be used for the manufacture of certain products upon authorization by the Di-

rector General for Operations. These products include belt splicing and repair material, conveyor and elevator belting, flat transmission belts, air drill hose, cement handling hose, including grouting, placing, and dry material handling, dredging sleeves, grease gun hose, jetting and hydraulic hose, pneumatic hose, sand blast hose, sanitary hose, suction hose, welding hose, mine ventilating tubing, molded seals for dam and lock gates, a number of miscellaneous automotive parts, pneumatic tires for automobiles and trucks, and also for earthmoving and roadbuilding equipment, tire and tube repair material, rubber footwear for severe industrial use, and electric gloves.

Upon authorization, latex may be consumed in the manufacture of electricians' gloves, flat transmission belts, and mine ventilating tubing. Reclaimed rubber and scrap rubber may be utilized, under the same conditions, for certain miscellaneous automotive parts, V-belts, storage battery parts, friction tape, water hose, goggles, and tire and tube repair materials. No crude rubber, latex, or reclaimed rubber or scrap rubber may be used in contraction joint seals and concrete fillers or street sweeper belts.

Tire regrooving

REGROOVING of tires, without the prior written approval of the Director General for Operations, has been prohibited by WPB in Amendment No. 12 to Rubber Order M-15-b. The action was taken upon recommendation of the Office of Price Adminstration in order to prevent the regrooving of tires on which treads are worn smooth. As a means of tightening the control on rubber transactions, the amendment also prohibits the sale or purchase of scrap and reclaimed rubber except to or from the Rubber Reserve Company.

Preference ratings

PRIORITIES REGULATION No. 1 has been amended again to change the order of ratings in the AA series. Gradings of AA-1 and AA-2 have been created as equivalents, with neither to take precedence over the other, and a new rating of AA-2X established to fill in between AA-1, AA-2, and AA-3. Revisions of Priorities Regulation No. 12 permits the extension of re-ratings to obtain operating supplies up to 10 per cent of the value of materials processed. This applies where orders have been re-rated, and to companies operating under the Production Requirements Plan. The extension of re-ratings to suppliers has been simplified, and the higher ratings may be applied to outstanding purchase orders by telegram or letter or by issuance of a new purchase order, as well as the use of PD-4Y certificates.

Industrial service prices

CONTROL over the charges of various service establishments has been revised by the Office of Price Administration to include a number of industrial services, as well as strictly consumer services, which were formerly covered in Service Regulation No. 165. Among those services used by the construction industry which are now covered by the regulation are lubrication and maintenance, rental and repair of automotive vehicles, maintenance, rental and repair of engineering and surveying instruments, drying, milling, and processing and treating of lumber by custom mills or driers.

Engineering instruments

CONTROL over the rental and repair of surveying and drafting instruments and engineering reproduction equipment has been excluded from Maximum Price Regulation No. 136, which covers machines and parts and machinery services. These instruments are now included under Maximum Price Regulation No. 165 (see above).

Freight car availability

SHIPPERS have been asked to permit railroads to determine, so far as is practicable, the type of car to supply on orders for loadings by the Office of Defense Transportation. The supply of gondola cars has become so critical that the substitution of box cars should be permitted wherever possible. Gondola cars are particularly in demand for the shipment of steel and iron, while flat cars are being utilized by the Army for transportation of war equipment.

Engineer employment

EMPLOYERS of engineers and other professional and scientifically trained men are to be instructed to obtain new personnel with the assistance and advice of the U. S. Employment Service, according to a recent announcement of the War Manpower Commission. Technically trained men registered in the National Roster of Scientific and Professional Personnel, and those who have registered for military service, will be classified by the Employment Service under the direction of the War Manpower Commission. Employment offices will be in a position to obtain from the National Roster the qualified persons in highly skilled classifications which employers in war production work may need.

Apprentice training

THE APPRENTICE-TRAINING SERVICE of the Federal Security Agency has reorganized its field offices in the twelve regions as a means of providing smoother relations with other labor supply and training agencies, and permitting more specific utilization of existing apprenticeship facilities and personnel. Although final details of headquarters have not been established, the following regional offices will be located in the West.

Region 10, covering New Mexico, Texas and Louisiana. Headquarters at Austin or Dallas, Texas.

Region 11, covering Montana, Idaho, Wyoming, Utah, Colorado, and Arizona. Headquarters at Denver, Colo.

Region 12, covering California, Nevada, Oregon, and Washington. Headquarters at San Francisco, California.

National standards for carpentry apprenticeship have just been published by the Apprentice-Training Service, and are available to war construction contractors and labor unions in order to facilitate the task of supplying qualified building tradesmen. The standards were developed jointly by representatives of the national building contractors associations and the carpenters' international union. The carpentry apprentice is defined in the standards, which outline the functions and powers of State apprenticeship councils and local joint committees, and the education and physical qualifications of candidates. The carpentry standards are the fifth set compiled by the construction industry in cooperation with the Federal Commission on apprenticeship. Also available in printed form are national standards for setting up apprentice-training programs in plumbing, steel fitting, electrical work, painting, and decoration.

Truck manufacturing

AUTHORITY to manufacture a total of 4,000 heavy trucks with a gross vehicle weight of 16,000 lb. or more has been granted to 15 producers by the Director General for Operations of WPB. The largest single authorization of 1,564 was allotted to The White Motor Co., and the second largest of 1,077 to the International Harvester Co. Other large authorizations included 35 to the Autocar Co.; 290 to the Mack Manufacturing Corp.; and 250 to the Walter Motor Truck Co. Of the western manufacturers, Kenworth Motor Truck Corp., Seattle, Wash., was authorized to construct 30 units, and Peterbilt Motors Co., Oakland, Calif., 20 units.

Idaho Highway Bureau Studies Traffic Problem On Three Access Roads

THREE TRAFFIC bottlenecks probably will require early action by the Idaho Bureau of Highways. Traffic surveys have been instituted by the bureau to determine the needs and the best way of meeting them.

These three bottlenecks are on roads leading to important war-time installations. One is the huge naval base being built at Bayview, near Sandpoint, on Lake Pend d'Oreille, where 12,000 men are now at work, and which ultimately will house 35,000 to 40,000 trainees (second largest in the United States); the second is at Eden, where a concentration camp for 10,000 Japanese is to be built, and where already several thousand workmen are choking the highways every morning and evening, and the third is a giant gun relining plant for the navy, being constructed at Pocatello. Each constitutes a traffic headache of the first magnitude now, which is likely to get worse rather than better.

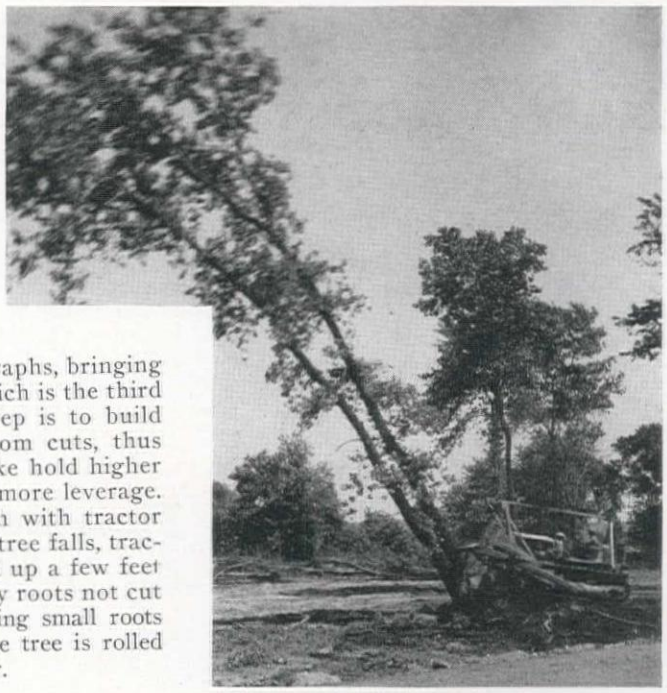
HOW IT WAS DONE

JOB AND SHOP TIPS FROM THE FIELD EDITOR'S NOTEBOOK

Bulldozer Method of Clearing Large Trees

When a large manufacturing plant recently acquired some land for purposes of plant expansion, its clearing job was complicated by a thick cover of fairly large trees. Instead of cutting each tree, and grubbing or blasting out the roots, a simple method of removing them was devised using five operations with a tractor and bulldozer.

The first step is to "saucer" around the base of the tree, on the side opposite to the fall, cutting small roots and obstructions. Second step is to saucer fall side to a depth of about three feet for trees of the size shown in the photographs, bringing dirt into first cut, which is the third operation. Fourth step is to build a ramp with dirt from cuts, thus enabling dozer to take hold higher on the trunk, giving more leverage. Final step is to push with tractor and lift on blade. As tree falls, tractor should be backed up a few feet to allow space for any roots not cut in saucering. Remaining small roots are pulled loose as the tree is rolled away by the bulldozer.



NEWS OF WESTERN CONSTRUCTION

SEPTEMBER, 1942

J. A. Terteling & Sons Set New Igloo Pouring Record

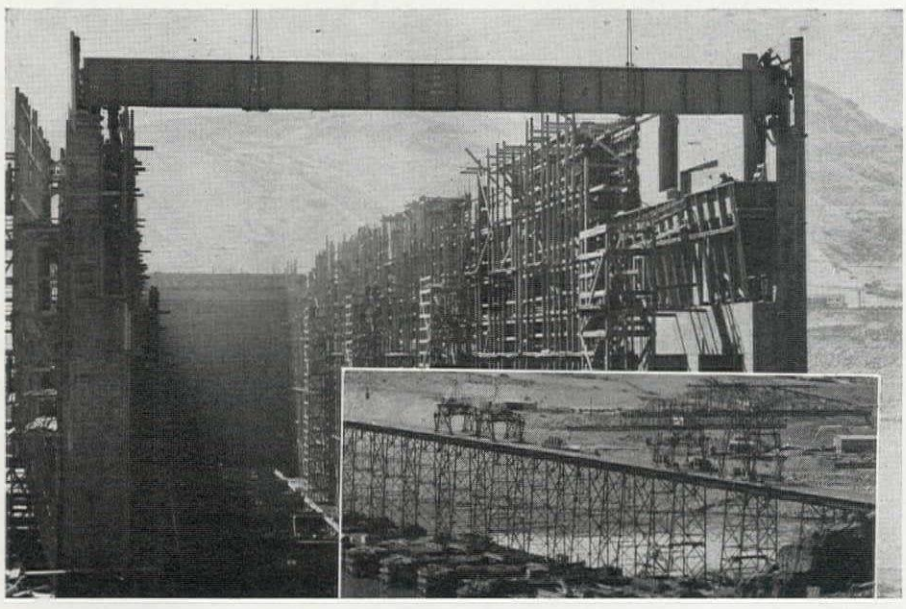
J. A. TERTELING & SONS, for the second time, broke all records in the construction of ammunition storage facilities on August 25 when 32 igloo arches were poured in a period of 23 hr. and 55 min. The new record was established during the construction of the Black Hills ordnance depot in western South Dakota, under the direction of the U. S. Engineer Department. Twenty-five hundred workmen in three 8-hr. shifts, with the assistance of 40 batch trucks, 18 flat beds, 3 dual pavers, 34 complete sets of forms, 8,000 bd. ft. of lumber, 720 pans and panels, 6,400 pieces of small hardware, and 26 concrete vibrators, poured 3,300 cu. yd. of concrete. In charge of the work on the record-breaking day were J. W. Terteling, head of the construction organization, Roy King, general manager, and W. C. Foss, general superintendent. F. B. Berger was assistant superintendent, Sid Bartlet was superintendent in charge of pouring, Fred Steckman was expediter, Inart Oleson was in charge of concrete equipment, "Bill" Varney was in charge of batching plant, "Red" Williams was day shift foreman, and Harry Seamen was night shift foreman. Major E. H. Oechsle was area engineer in charge of the work for the U. S. Engineer Department.

Plan Replacement Of Draftable Men

ALL EMPLOYERS have been warned by Major General Lewis B. Hershey, director of selective service, to make a prompt inventory and analysis of the manpower in their organizations, and to make immediate plans for the replacement of those between 20 and 45 years of age who may be subject to call by their local selective service boards. Each employer should know how many men on his payroll are between the ages of 20 and 45; he should investigate the classification of each one, and on the basis of such an inventory should plan ahead and prepare to train men for replacement of those who might necessarily enter the armed forces. Deferments, granted so that employers may train women or men not liable to early induction, are temporary, and cannot exceed six months at the most, and may be only 30, 60 or 90 days. He should undertake to secure and train women, young men, older men, men physically handicapped or those with a high degree of dependency. In seeking temporary deferments to permit training of replacements, it is not necessary to obtain a man's consent. Employers may secure from the local selective service board Form 42A which forms the request for deferment when properly filled out and signed. If the request is not granted, an appeal may be made to the local selective service board, and later to the state director of selective service. To employers seeking deferments, Gen. Hershey pointed out that the Army is required to train a bomber pilot in an 8-mo. period, and industry should not expect to be granted training periods of two or three years for industrial tasks not nearly as complicated. Employers now have a double duty. Each one should know personally what his manpower situation is, and make replacements of those employees who should be available for the armed services. The job of filing requests for deferments, where it is necessary, should not be left to the minor employee. At the same time, it should be kept in mind that the filing of deferment requests keeps reinforcements out of the army.

GRAND COULEE CONSTRUCTION TRESTLE USED IN POWERHOUSE

Because of the steel shortage, 39 girders formerly used in the construction trestle built by Consolidated Builders, Inc., second stage contractors on Grand Coulee Dam, huge Bureau of Reclamation project on the Columbia River, are being refabricated and used as roof supports for the second powerhouse at the site. Building is being rushed to allow installation of additional generators.



Tacoma Narrows Towers, Cables to Be Removed

DISMANTLING of the main cables and towers of the Tacoma Narrows Bridge is scheduled to begin this month, following the award of a negotiated contract for the work to Woodworth & Co., Tacoma, Wash., and J. Philip Murphy, San Francisco, Calif. The joint bid of

these two contractors for the dismantling work was rejected last month as being too high, and the negotiated contract awarded by the Washington Toll Bridge Authority on the basis of a $68,000 fee plus costs which are estimated to run between $175,000 and $250,000. G. A. McClain, erection engineer for the Bethlehem Steel Co., who was in charge of the tower erection and cable spinning on both the Golden Gate Bridge and the Tacoma Narrows Bridge, will supervise the dismantling work for Woodworth and Murphy.

California Contractors' Roster Issued for 1942

A NEW DIRECTORY of contractors licensed in California has just been published by the Contractors' State License Board, under the direction of Allen Miller, registrar of contractors. The summary preceding the directory reveals that during the past year there had been a decrease of 2,166 in the number of licenses in good standing on June 30. Class A licenses held by general engineering contractors have decreased by 41, whereas, general building contractors have increased 1,567. However, Class B-2, which formerly separated the speculative building contractors from general building contractors, had been eliminated this year. The number of specialty and subcontractors has decreased from 24,924 last year to 22,657 on June 30, 1942. Since the Contractors' Registration Law was first placed in effect in 1929, the number of licensed contractors has increased from 27,657 to 36,808.

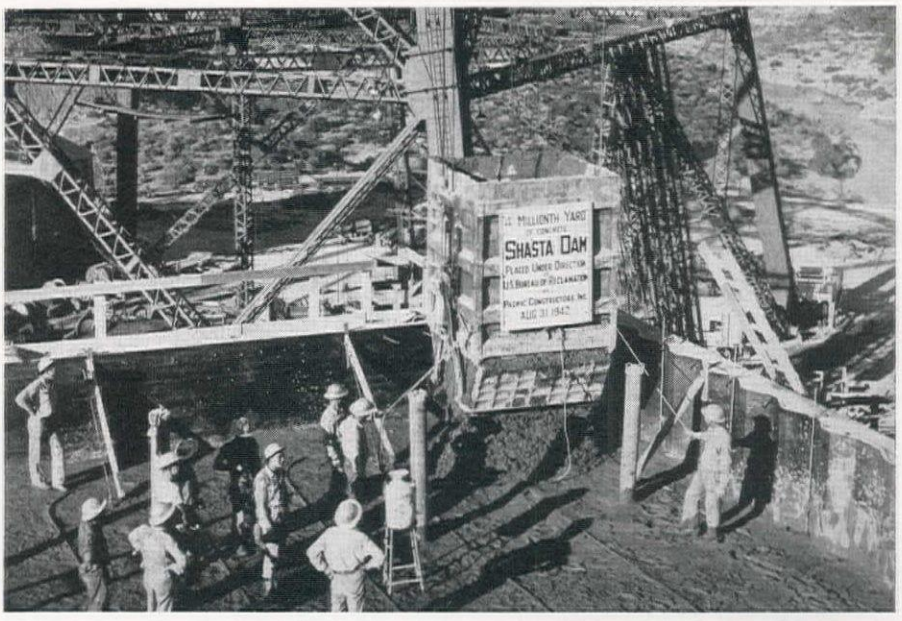
Copies of the 1942-43 directory, together with monthly supplements to be issued during the fiscal year, are available on payment of $10.00 to Allen Miller, registrar of contractors, 503 Business and Professions Building, Sacramento, Calif.

Reclamation Association to Meet in Denver Next Month

THE 1942 ANNUAL MEETING of the National Reclamation Association will be held in Denver, Colo., on October 14-16, with headquarters at the Shirley-Savoy Hotel. The discussions at the convention will include the problems of production of food, forage, fiber, and power for war, and post-war planning in the reclamation states. Every individual and organization in the 17 western states interested in any of the phases of irrigation, reclamation and water conservation is invited to attend.

Second Nisqually Project Construction Not Stopped

CONSTRUCTION of the Second Nisqually Project by the City of Tacoma, Wash., will not be affected by the War Production Board order halting construction on power projects, since the Nisqually project was specifically authorized by WPB. The manufacture of generating units and construction of transmission lines are being suspended for the time being, but work on Alder and La Grande dams and the La Grande tunnel will be continued. Bids were called on Aug. 31 for 6½ mi. of railroad relocation in the vicinity of La Grande dam, where a branch of the CMStP&P must be removed from one abutment of the structure.



FOUR MILLIONTH YARD OF CONCRETE POURED IN SHASTA DAM

Recent pouring of the four millionth cubic yard of concrete at Shasta Dam, keystone structure of California's Central Valley project, being built by the Bureau of Reclamation on the Sacramento River near Redding, Calif., brought the monumental structure to two-thirds of completion. Work on the dam and powerhouse are being accelerated so as to provide power for war production at the earliest possible moment. Diversion will take place this fall when first spillway paving is complete.

Wooden Highway Signs

HIGHWAY SIGNS in California will be made of pressed hardwood, and redwood supporting posts will be used in place of steel for the duration of the war. Reflectorized signs will be made of the same material, and beaded to reflect the light. The first of the wooden signs are being erected to designate dim-out zones along the California coast.

Housing Project Award Revoked—Re-Awarded

TEUFEL & CARLSON, building contractors of Seattle, Wash., have been awarded a negotiated contract for construction of 1,000 permanent housing units in Vancouver, Wash., after a contract for the work originally made to the Lewis W. Hunt Co. of Los Angeles had been cancelled. In July, the Federal Public Housing Authority called for bids on the project, and a contract was awarded to Hunt on his figure of $3,752,000. Following negotiations which resulted in the elimination of several construction items, and reduction of the contract to $3,500,000, the contract was awarded to Hunt, who received an order to proceed with the work, and began clearing of the site. Just as foundation pouring was about to begin, the Federal Public Housing Authority announced that the contract had been cancelled, and another contract for the same work awarded to Teufel & Carlson. Reports from Seattle indicated that the transfer of the contract was due to an insufficient surety bond supplied by the contractor, but Hunt denied that contract preliminaries had not been fulfilled properly.

California A. W. W. A. October Meet at Oakland

THE CALIFORNIA SECTION, American Water Works Association, will hold its annual meeting at the Hotel Oakland in Oakland, Calif., on October 28-30. Entitled "A Water Works Wartime Conference," the meeting will include a comprehensive program concerned principally with wartime problems affecting the water works man. Details of the program have not yet been announced, but it is expected that they will include such subjects as maintenance and operation, sanitation, purchase of materials and equipment, and administrative problems. Morris S. Jones, water works superintendent of Pasadena, is chairman of the California Section; J. S. Peters, chief engineer and general manager of the Marin Municipal Water District, is vice-chairman; and H. Arthur Price of Los Angeles, is secretary-treasurer.

WASHINGTON NEWS

. . . for the Construction West

By ARNOLD KRUCKMAN

Washington, D. C.—Power expansion projects have been reduced by WPB from 9,600,000 kw capacity on which work was in progress to 5,500,000 kw. Public projects received priority ratings for the building of projects which will produce 2,100,000 kw. Private utilities, many steam, will produce 3,400,000 kw. Projects reasonably developed in construction were preferred to later undertakings.

High priority ratings are the order for West Slope power and reclamation projects. Keswick and Shasta Dams were given AA-4, and are expected to be further lifted to AAA-3. Keswick may build to full scale, under the original plans; and Shasta is scheduled for completion of the dam as planned with 3 power units of 75,000 kw each. Grand Coulee finally got AA-3 for two of its 75,000-kw units, and AA-4 on the three 108,000-kw generators.

Boulder Dam is able to bring in an 83,500-kw unit this year with an AA-3 rating, and another next year with AA-4. Green Mountain was rated AA-4 to install two new units of 10,800 kw next year. Under the fresh and intense pressure for food, it is expected both the Davis Dam and the Anderson Ranch Dam may be given good ratings later. Work is still in progress at both places.

Projects stopped in part or in whole by the recent WPB order in the Pacific West are: Albuquerque Gas & Electric Co.; City of Colorado Springs, Colorado; Town of Gunnison, Colorado; City of Los Angeles, Harbor, 2 projects; Murray City, Utah; Pacific Gas & Electric Co., 2 projects; San Diego Gas & Electric Co., Silver Gate; City of Tacoma, Wash.

Rural Electrification Administration power lines exceeding a total of 380,000 mi. affected by the order have left many small electric plants dead for the duration. Plants capable of producing 110-volt or 220-volt a.c., having engines and generators with capacities of 500 watts to 25 kw or more may be purchased by the U. S. Signal corps to operate communications equipment at remote bases. U. S. Signal Corps suggests those who have facilities send their names, plant location, date of purchase, manufacturer, model number, capacity, type of engine, plant condition, repairs necessary, and parts needed, to J. C. Beatty, USDA War Board, Lincoln, Neb.

Incidentally, most of the Reclamation Bureau people have now moved to Denver from Washington. Gordon W. Lineweaver, well known to those who transact business with the Bureau of Reclamation, is now Acting Chief of Information in the Bureau with headquarters here in Washington.

Future reclamation projects

Reclamation Commissioner Page returned from the West Slope with many data and plans for expansion of established projects, and for initiation of new projects. It is anticipated we will be required to provide increasingly more food for Russia and China, via the Pacific. In addition, the War, and the production for the War, will vastly increase the need for food supplies on the West Slope. Already this situation has deeply cut our ability to supply 75 per cent of what we eat, which is the normal proportion we continued to contribute to our own support from the West Slope region. With application of the cross-haul policy, which will radically cut shipments of everything except War supplies, the West Slope will be obligated to develop home products to an unprecedented degree.

Barring the unexpected (which is normally the expected during War), it is estimated now that the War will continue for some years. Therefore, Washington anticipates long-range plans for new reclamation projects are reasonable and practical. Apparently you have immediately ahead a great burst of activity in building reclamation jobs, limited only by manpower and materials. Undoubtedly most of the construction must be restricted to the use of tools and equipment not utilized in War work, and to materials that are plentiful.

Dehydration is one of the great new activities in the East that is engaging the feverish attention of the big corporations which have facilities, either in laboratories or in plants. It is anticipated here that dehydration and other forms of food processing will develop in a very large way out on the West Slope, following the growing of the products on farms and orchards as swiftly as the volume of raw materials is provided. Technologists and scientists here urge that food processing out there be expanded as swiftly as feasible in order to make the present supply on the West Slope stretch as far as possible. It is held that processed food conserves much that otherwise is wasted. All this, naturally, means more construction, by hook or crook, in all sections of the West Slope.

N.R.A. convention

F. O. Hagie, Secretary, National Reclamation Association, makes a preliminary trip to Denver late in September to prepare for the annual convention October 14-16. Reclamation Commissioner Page; Maj.-Gen. Eugene Reybold, Chief, Corps of Engineers; Undersecretary of Interior Abe Fortas; President Frank Kemp, Western Sugar Company; President Eric Johnson, U. S. Chamber of Commerce; Maj.-Gen. John F. Curry; Gov. Carr of Colorado, and Senator Johnson of Colorado, already have accepted invitations to speak.

A very well known Engineer Officer will be in California late in September. Col. Miles Reber, who heads the Rivers and Harbors section of the Corps of Engineers in Washington, plans a trip to San Francisco, and other parts of the Coast, late in the month. Col. Reber has not visited the West Coast for a long time. He now has considerable work in connection with the power problems of the War program. Aside from a limited activity in Harbor projects essential for the War needs, most of the Rivers and Harbors activities everywhere are restricted to absolutely minimum maintenance.

Both National Reclamation Secretary Hagie and Col. Reber plan to visit the guayule projects planned for immediate development with Federal funds in Southern California, Arizona, New Mexico and Texas. There is great interest here in the report that the harvest in California and other Southwestern States this year exceeds 1,000,000 lb. of rubber from the guayule plant.

Renegotiation of contracts

It is possible, when Congress comes back after Labor Day, that the plan to repeal the renegotiation process in War work contracts may be accomplished. It is proposed to substitute limit on profits. Meanwhile Price Adjustment Boards are functioning in Army, Navy, Maritime Commission, and Corps of Engineers. Thomas W. Woodward is Chief of Maritime Commission Section; Maurice Karker and Harry W. Loving, head the Army Boards, and Kenneth H. Rockey is Chief of the Navy Board. Division and District Offices of Corps of Engineers also function. If costs are lower than estimated, contracts exceeding $100,000, awarded after April 28, may be cut down. The investigation, as now conducted, includes a survey of all War jobs of specific contractors. Those who show a fat profit may find they will be compelled to make refunds. Promotion and selling will be eliminated as an expense, in considering contracts; profits are to be gauged on the costs of the specific project rather than on the capitalization of the contractor.

Formal statement by OWI on behalf of all agencies declared:

> "Situation of no two companies is exactly alike. Consideration is given to relative efficiency, risks, financial record of the company, performance in the War effort, etc. A company's overall profit before taxes provides the primary approach for arriving at voluntary agreements. Agreements on reduced profits usually cover fiscal periods, and so require estimates on unfulfilled portions of contracts. It is the policy to allow original agreements to stand unless the actual figures of cost, production volume, or nature of product prove to be materially at variance with estimates.
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> "Navy and Maritime Commission handle all cases in Washington. Army will function in field procurement offices as well as in Washington."

California drivers speed

Army's Highway Traffic Advisory Committee, using a special apparatus

provided by Public Roads Administration, has checked auto speeds in 10 States and found Californians exceed the suggested 40 m.p.h. speed limit more than the people of other States. Between 52 and 55 per cent traveled more than 40 m.p.h. In Arizona the speeds were also well in excess of 40 m.p.h. Under Presidential impulse further appeals will be made to the drivers of the country to stay well within the 40 m.p.h. limit.

On August 6 the President signed the appropriation bill providing the Navy with funds to build naval shore temporary or permanent public works. The schedule is as follows: fleet facilities, $60,000,000; aviation facilities, $399,494,000; storage facilities, $24,000,000; liquid-fuel storage, $20,000,000; Marine Corps training facilities, $11,000,000; ordnance storage facilities, $52,000,000; personnel training and housing facilities, $26,140,000; hospital and dispensary facilities, $25,000,000; shore radio facilities, $15,000,000; naval research laboratory, $2,000,000; passive defense facilities, $25,000,000; miscellaneous structures and advance bases, $315,000,000. The total is $974,634,000, a large part of which will be spent on the West Coast.

Engineer employment

Those requiring engineers for war work have been "requested" to hire their personnel through the U. S. Employment Service. Engineers available for jobs have been "requested" to register with U. S. Employment Service. There is no compulsion, now; but it appears reasonable to assume that the process will become compulsory as needs develop.

Here in the East, war plants have taken the hint and secure their engineering and technical help solely through the Service. The service provides help through the National Roster of Scientific and Professional Personnel; also, it has listed the names of those qualified who have registered for the Draft. Engineers and other technical personnel in the heavy construction industry in the East also have taken the hint and are filing their records with the Service.

Preliminary steps in organizing the mobilization of engineers and other technical help is under special direction of Dr. Edward C. Elliott, President, Purdue University, as Chief of a section of War Manpower Commission. One of the principal jobs he is now grappling with is the training of civil engineers and architects for engineering efforts more necessary in War work. Special short courses have been started in various universities.

Wage and Hour Division, in a recent ruling, declares the time spent by an outside employee driving an automobile on business of his employer must be considered as time worked, under the Law. If however the employee works at a fixed place the time spent driving to and from work is not ordinarily to be considered time worked, and need not be treated as hours employed . . . Builders' Hardware Manual, recently promulgated by WPB, defines quantities and types of hardware contractors and others may use in any building construction. Copy of the Manual may be had by writing Elliot Selinger, Conservation Branch, WPB, Indiana Ave., Washington, D. C. . . . All personnel of the National Parks Service late in August moved from the Interior Building in the Capital to Chicago. Tentatively the new headquarters will be located in Merchandise Mart.

Interstate river contract

The President finally approved the law by which Colorado, Kansas and Nebraska may negotiate and make a compact for the division of the waters of the Republican River. The law as finally passed, under direction from the President, prevents the States from entering into any compact unless the compact is approved by Congress. . . . Senators O'Mahoney, Hatch, Gurney, Murdock, and Thomas, representing Wyoming, New Mexico, South Dakota, Utah and Idaho, have held a series of hearings in the Pacific West, and in the Capital, to organize the development of oil on public lands. Private operators are to be encouraged to explore new resources.

Reclamation Handbook, formally cataloged as Conservation Bulletin No. 32, has been published by the Bureau of Reclamation. It was written by William Slavick of the Information Division. The book is probably the best study of the history and achievements of the Reclamation Bureau, and of the whole history of irrigation, ever published by Government. Some copies may be had from the Bureau of Reclamation in Washington. It sells for 20c by the Superintendent of Documents, Government Printing Office, Washington, D. C.

The new Signal Corps Replacement Training Center at Walerga, 12 miles from Sacramento, will be opened Sept. 15. Brig.-Gen. Stephen H. Sherrill, Operations Division, General Staff, has been named Commander. . . . Prof. H. Grant Ivins, Brigham Young University, has been named OPA State Director, with headquarters at Salt Lake City. . . . Daniel B. Gage has been named Director of the Rental Area in Clark County, Washington, and Clackamas, Multnomah and Washington Counties in Oregon. . . . William Livingston Muncy, Sales Personnel Manager for Standard Oil of California, has been made Director, Petroleum Section, Transportation Service, Specialist Corps, with rank of Lieutenant-Colonel.

Cement advisory committee

Portland Cement Industry Advisory Committee includes in its membership Garner A. Beckett, Riverside Cement Co., Seattle; Henry J. Kaiser, The Permanente Corporation, Oakland; E. P. Lucas, Superior Portland Cement Co., Seattle; H. O. Warner, Ideal Cement Co., Denver. . . . Wright W. Gary, resigned, as director of refining for OPC, to become President, Filtrol Corporation, Los Angeles. . . . Ernest A. O'Donnell, Las Vegas, Nev., was appointed ODF Supervisor of Rail Terminals at Los Angeles. . . . ODT announced the Los Angeles and Intercoastal Carriers' Advisory Committee with C. F. Fennma, Wilmington Transportation, as chairman; members are Fred Hooper, American Hawaiian Steamship Company; J. D. Baker, U. S. Lines; Roy Beaton, Los Angeles Harbor Department; John Phelps, H-10 Water Taxi Co.; Walter Smith, Case Construction Co.; L. H. Connor, Wilmington Transportation; Charles Bland, Long Beach Harbor Department; Capt. William McGillvray, San Pedro Tugboat Co.; John Harvey, De Lux Water Taxi Co.; O. J. Hall, Star & Crescent Boat Co.; Joseph Brennan, San Diego Harbor Department.

George Herrington, Portland, Ore., has been appointed Labor Production Division representative for WPB. . . . Frank C. Lathrop, San Francisco, was appointed a member of the Solid Fuels Advisory War Council. . . . David P. Goldwin, Assistant Chief, U. S. Forest Service, has been appointed National Coordinator of Forest Fire Fighters Service, OCD.

West Coast shipping

We were told here recently by several War agencies that a greater part of ocean freight will be shipped from West Coast ports. Seattle Foreign Freight Forwarders Corp. was organized to handle all Lend-Lease shipments at Puget Sound ports. Others have been organized at San Francisco and Los Angeles. Oregon Foreign Forwarders, Inc., will handle Lend-Lease shipments from Portland, Vancouver, Astoria and similar ports.

Bureau of Economic Warfare has announced the development of these facilities are necessary in order to relieve congestion at Atlantic and Gulf ports. Late in August, the Oregon Shipbuilding Corporation, Portland, received its third award for merit for outstanding ship production. The first award in April was for breaking records in producing Liberty ships; the second in July for delivering ships in an average of less than 105 days. The third was for general production.

Idaho Gas Tax Receipts Drop Only 20 Per Cent

IDAHO GAS TAX collectors were surprised when August collections (reported as of August 15), showed only a 20 per cent drop compared with the anticipated 30 per cent drop. Total collections were $464,671.96, as against $584,445.41 collected in the corresponding month of 1941.

The bureau, in its calculations, expects another 30 per cent drop next month (reportable as of September 15) but with fingers crossed is hoping the record will be as good as last month's or maybe a bit better.

Puzzled to account for the continuous holding up of revenues in the face of tire rationing and the war bond drive, George Thiessen, director of the bureau, attributes part at least to the influx of workers for big defense projects in the state, located far enough from population centers to require extensive commuting.

PERSONALLY SPEAKING

Raymond F. Goudey, sanitary engineer with the Los Angeles Bureau of Waterworks and Supply, was awarded the John M. Goodell Prize of the American Water Works Association at its 1942 convention. The award is made annually to the member who has made the most notable contribution to the profession. The basis of the presentation to Goudey was his paper "Practical Aspects of Cross-connection, Inter-connection, and Back-flow Protection," which was published in the Journal of the association.

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R. F. Graef is project engineer for Whitman, Requardt, Smith & Kuljian Co., architect-engineers on the Rocky Mountain Arsenal in Colorado, and is assisted by **A. R. Volimer** as principal assistant. Engineer in charge of construction is **B. S. Shriver** and **K. J. Koons** has charge of design. Chief architectural-structural engineer is **J. H. Tudor,** chief sanitary engineer is **R. T. Reilly,** and chief engineer of highways and railroads is **J. J. Donohue.** The project is one of the largest in the Rocky Mountain region.

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Garner A. Beckett, president of the Riverside Cement Co., Los Angeles, Calif., **Henry J. Kaiser,** president of the Permanente Corp., Oakland, Calif., and **E. P. Lucas,** president of the Superior Portland Cement Co., Seattle, Wash., have been named on an industry advisory committee for the portland cement industry by Price Administrator Leon Henderson.

* * *

L. R. Durkee has been appointed acting administrator of the WPA for the state of Washington. He will retain his status as sub-regional director of the FWA for the Pacific Northwest and Alaska. Decision to combine the two agencies under one head came as a result of the curtailment of WPA due to national emphasis on war production.

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Edward R. Bowen, consulting engineer of Los Angeles, Calif., has been retained by the City of Bakersfield, Calif., to formulate a report on the value of the California Water Service plant, a private utility in that city. The city is contemplating either the purchase of the company's facilities or the development of other water sources.

* * *

Wallace Skidmore, formerly a civil engineer with the Bureau of Reclamation, stationed at Shasta Dam, has transferred to the Boeing Aircraft Co., Seattle, as a stress engineer, working on stress analysis and redesign.

LT. COL. RUFUS W. PUTNAM, recently made U. S. District Engineer at Los Angeles, Calif., was formerly consultant engineer on water and maritime problems, located at Chicago, Ill.

James A. Lindley is director of the War Relocation Authority assembly center at Granada, Colo. He was formerly chief engineer of the southwest division of the Soil Conservation Service, and in his new position succeeds **Richard Bennetts,** who has been made chief engineer of the regional public works division of the WRA.

* * *

J. Warren Nute is now planning engineer with the Marin Shipbuilding Division of W. A. Bechtel Co., at Sausalito, Calif., working on production management. He was formerly with Bechtel-McCone-Parsons Corp. on refinery design and construction.

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Col. Edwin C. Kelton, formerly chief engineer of the Los Angeles district of the U. S. Engineer Department is now director of construction of the Pan-American Highway through Central America, for a length of approximately 500 miles. The highway will cost about $20,000,000, two-thirds of which is being financed by the U. S. Government.

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Max Bookman has resigned from the California division of water resources, to assume new duties as structural engineer on construction of floating drydocks at Stockton, Calif.

* * *

L. B. De Long, formerly general superintendent of all Alaska operations of Morrison-Knudsen Co., Inc., has been commissioned Lieutenant Colonel in the Corps of Engineers, and assigned to special duty in Alaska. **R. R. Gebo** has been named De Long's successor at the Anchorage office of Morrison-Knudsen.

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L. Deming Tilton, city planning consultant, has been retained by the city of San Francisco, Calif., on a full-time basis, succeeding **Ernest P. Goodrich,** who was on a part-time schedule. **George Melville,** planning engineer, who served as assistant to Goodrich, will remain in the same capacity. Problems of traffic control and design of future city growth will be the immediate object of study by Tilton.

* * *

Frank S. Hale, assistant to the area engineer for the Olympic district of the Seattle U. S. E. D. office, has been promoted to the rank of Captain. He was formerly chief of engineering and operations in the Los Angeles office of the U. S. E. D., and has been at Port Townsend, Olympic headquarters, since 1940.

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Samuel B. Morris, dean of engineering at Stanford University, was elected vice-president of the American Water Works Association at its 1942 convention. Prof. Morris is acting president of the San Francisco section of the American Society of Civil Engineers, and past president of the Los Angeles section.

* * *

Lawrence E. Strahm, for the past year construction engineer at Paine Field, Washington, and prior to that, city engineer of Kent, Wash., has been commissioned a captain in the Corps of Engineers, and assigned to be post engineer at Camp White, Medford, Ore.

* * *

Bruce Vernon, formerly in charge of engineering and design for Marinship, as project manager for Bechtel-McCone-Parsons Corp., has been made assistant to general manager **W. E. Waste** of the W. A. Bechtel Co., Sausalito, Calif., where he will supervise cost control and progress information.

* * *

Arthur J. McNeil, superintendent of building maintenance for the city of Sacramento, has resigned that post to act as resident engineer and inspector on the civilian housing project at Mather Field, as a member of the staff of Harry Devine, architect.

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E. A. White, road engineer of Pierce County, Washington, has resigned that post to enter the state highway department, where he has been assigned the position of maintenance engineer for

FRED J. GRUMM, engineer of surveys and plans of the California Division of Highways, has been appointed consultant to the Bureau of Governmental Requirements of the War Production Board for the purpose of continuing an investigation and study of priority procedure.

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the Tacoma district, succeeding **Harold (Buck) Williams,** who has been commissioned in the army.

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Col. Theodore Wyman, Jr., for several years district engineer of the Los Angeles office of the U. S. E. D., has been conferred the Distinguished Service Medal, the army's highest award for non-combat service, for "exceptionally meritorious and distinguished service" in the direction of emergency construction at isolated and widely-separated points in the South Pacific.

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Major William E. Hoy was assigned to the Seattle office of the U. S. E. D. on Aug. 23, as chief of the engineering division. He has served as construction engineer on Mud Mountain Dam, Sardis Dam, Vicksburg, Miss., and Arkport flood control dam, New York, also on locks and dams at Rock Island, Ill.

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Ivan Ogden, associate civil engineer, has become coordinator of field and office activities incident to war construction, at the Sacramento office of the U. S. Engineer Department, South Pacific Division.

* * *

Walter Smith, marine manager of the Case Construction Co., of Los Angeles, has been appointed contractors representative on a newly organized Los Angeles Coastwise and Intercoastal Carriers' Advisory Committee, functioning under the Office of Civilian Defense, and dealing with port and shipping problems in southern California.

* * *

H. H. Hutcheson, formerly office engineer on airport construction in the Seattle office of the U. S. E. D. has been promoted to assistant chief of the construction section, and his former post has been filled by **1st Lt. Edward L. Pine,** formerly his assistant. Lt. Pine has just been commissioned.

* * *

Rolland L. (Pinky) Miller has transferred from the employ of the U. S. E. D. at Camp Adair, near Corvallis, Oregon, to the position of party chief on layout and excavation at a lighter-than-air base in western Oregon, being employed by John Cunningham & Associates, of Portland.

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H. O. Wagner, engineer with the Colorado state highway department, has been appointed acting chief draftsman of the Denver office, succeeding **John Marshall,** who recently became affiliated with the Corps of Engineers as Captain.

* * *

Maj. Theodore A. Huntley, information officer and assistant to the regional representative of FWA at Seattle, Wash., has been ordered to active military duty with the commanding officer of the air force technical training command at Denver, Colo.

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MAJOR ARTHUR C. NAUMAN, recently promoted from the rank of captain, is area engineer at Spokane, Washington, for the U. S. E. D., and in that position is in charge of construction at the northwest air depot, a description of which will be found in this magazine.

Capt. O. E. Schroeder, until recently in charge of construction work at the Klamath Falls, Oregon, airport, has been transferred to similar activity at Redmond, Ore., where the municipal airport is being expanded for army use.

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First Lt. Emil H. Rausch, assistant to the chief of the Alaska operations division of the Seattle U.S.E.D. office, has been promoted to the rank of captain. He formerly was a civilian employee of the Seattle and Rock Island offices.

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John C. Bisset, assistant director of public works in the city of Dallas, Texas, has resigned to accept a commission as major in the Corps of Engineers, and has been assigned to Fort Sam Houston, Tex.

* * *

J. E. Buchanan, dean of the college of engineering at the University of Idaho, has been commissioned a first lieutenant in the Corps of Engineers, and has been sent to the Engineering Replacement Training Center at Camp Leonard Wood, Mo.

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Maj. Fairman B. Lee, for the past year in charge of the Seattle office of the San Francisco ordnance district of the army, and for eight years secretary of the Seattle Engineer's Club, has been transferred to duty at the Rock Island arsenal, Rock Island, Ill.

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Henry E. Barber is now assistant sanitary engineer with the Montana State Board of Health, stationed at Helena, engaged in inspection of water supplies and sewage installations. He was formerly with the B. A. & P. railroad.

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Capt. Lester V. Johnson, presently stationed at Arlington, Va., has been promoted to the rank of Major. He was formerly affiliated with the Bureau of Reclamation.

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Carl B. Wirsching, member of the Los Angeles, Calif., Board of Public Works, has been commissioned a major in the Corps of Engineers, and is to report at Camp Claiborne, La., for active duty.

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Vance Johnson, formerly with the Colorado state highway department has accepted a position as party chief for the firm of Whitman, Requardt, Smith & Kuljian Co. on their arsenal project near Denver.

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Milton S. Harris, formerly with the headquarters priority section of the Sacramento, Calif., office of the U. S. E. D., has been commissioned a major in the Corps of Engineers, and transferred to duty at Salt Lake City, Utah.

SUPERVISING THE JOBS

T. O. Russell, chief engineer of the Oregon public utilities commission for the past eight years, has joined the Corps of Engineers. **David Dunn,** assistant chief engineer, will fill the post during Russell's absence.

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A. J. Hoover, engineer with the Bureau of Reclamation in its Denver, Colo., office, has recently resigned from that connection and has become affiliated with the U. S. Navy as a Lieutenant, Jr. grade.

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Albert E. Pierce, superintendent of the Seattle street railway system, has been appointed deputy manager of the inventory and requisitioning division of the Seattle offices of WPB.

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J. G. Rawhauser, until recently engineer of buildings at Stanford University, is now office engineer at the northern California office of Macco Construction Co., located in Oakland, Calif.

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Roy H. Clarke, Spokane, Wash., mining engineer has been named assistant to the supervising engineer of the RFC in the eastern Washington area. **H. B. Sherman** is the supervising engineer.

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Tracy W. Bousman, formerly city engineer of the twin cities of Bell and Maywood, Calif., has been commissioned as first lieutenant in the Corps of Engineers.

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Fred Pearson, chief design engineer at Basic Magnesium, Inc., Las Vegas, Nev., has resigned that position to engage in private engineering practice in Los Angeles.

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A. V. Williamson has been made assistant district engineer of the Public Roads Administration at Denver, succeeding **R. A. Klein,** recently transferred to Fort Worth, Texas.

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William Canton, of Klamath Falls, Ore., has been appointed acting county engineer of Klamath County, succeeding **Frank Z. Howard,** resigned.

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George Jones, building contractor of Ellensburg, Wash., is now a captain in the Corps of Engineers, and is stationed at Camp Claiborne, La.

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J. H. Mickelson and **LeGrand Johnson,** both of Logan, Utah, have formed a partnership to be known as Johnson & Mickelson, to engage in the building and highway contracting business.

Floyd Rupp is general superintendent of construction for MacIsaac & Menke, Inc., contractors on most of the buildings being erected at the Kaiser Co. steel plant at Fontana, Calif. His assistant is **Al Gotterdam.** Because of the magnitude of the project, foremen have been appointed for each portion of the work, as follows: Machine locomotive repair and electric shop, **J. F. Rechs;** Boiler, forge and pipe shop, **J. F. Rechs;** Cafeteria building, **John Haugen;** North office and locker building, **S. L. Killion;** South office and locker building, **Otto H. Malzahn;** Administration building, **Charles K. Dale;** Water treatment plant, **Al Gotterdam.** Field offiice manager is **Eric Bronish.**

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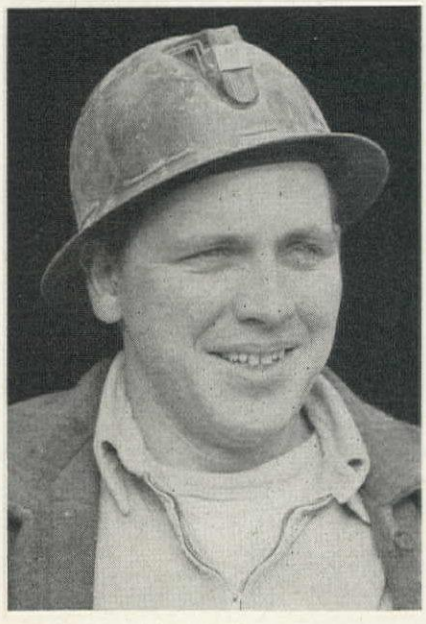
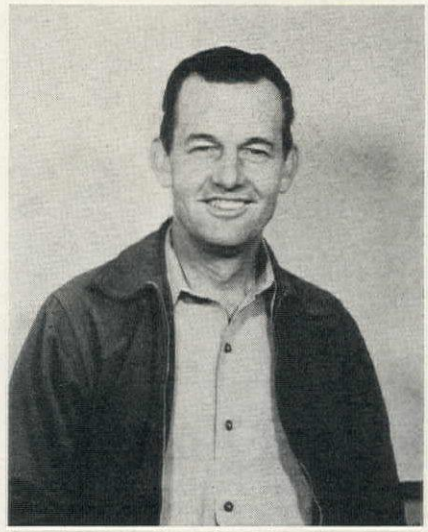
John W. Davis, assistant superintendent for Contractors, Pacific Naval Air Bases, on their big project at the U. S. Naval Air Station at Barber's Point, Oahu, Hawaii, has sent *Western Construction News* two copies of *Puka,* the weekly paper put out by the employees of the big project, in one of which is a splendid editorial from his own pen. **H. A. Schroedel,** superintendent, is head of the editorial board which issues the publication, and also contributes editorial comment.

F. A. HUNTINGTON, who was with Platt Rogers, Inc. for two years, on the first contract of the west portal of the Continental Divide tunnel, and the Granby diversion tunnel, is now dehydrator superintendent on the Anderson Ranch Dam, at Mountain Home, Idaho.





CARL W. ERICKSON, president of the Erickson Paving Co. of Seattle, Washington, is supervising construction of a Washington airport for the combined firms of Erickson and Goulter, who hold the contract.

R. W. Ramey is construction superintendent for Thomas Bate & Sons, Houston, Tex., contractors on a more than $500,000 project to provide gas, water, and sewer systems, and to grade, drain and pave an area in Victoria Co., Texas. Others on the job are **Melvin Ward,** assistant superintendent, **Al Mason,** sewer superintendent, **M. C. Pace,** water superintendent, and **H. B. Combs,** in charge of grading and paving.

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D. (Pete) Young is project manager for MacDonald & Kahn, Inc., San Francisco, Calif., on their contract to construct the airfield at Reno, Nev. Superintendents on the same job are **H. McArthur, Sam Pursley,** and **Lou Myers** on various sections of the buildings, and **William Dicksheidt** on warehouses and hangars. The office engineer is **Eddie Nelson,** and **Danny Trade** is master mechanic. Vice-president and general manager of MacDonald & Kahn, Inc., is **B. F. Modglin.** Simultaneous contract for grading and paving runways is held by J. A. Casson, of Hayward, Calif., and N. M. Ball Sons, Berkeley, Calif. **J. A. Snowden** is cat foreman on this part of the job.

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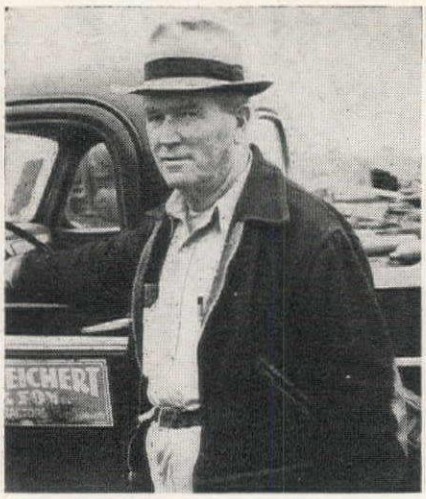
A Hallberg and **Ralph Wigle** are rock plant superintendents on the $14,000,000 arsenal project being built for the army in the Sierra Nevada Mountains of eastern central California, a very large job.



I. F. (IKE) LINDSAY

I. F. (Ike) Lindsay is superintendent for A. Soda & Son, contractor, Sacramento, Calif., on a difficult contract to replace a bridge across the Feather River at Nicolaus, Calif., which was washed out by a flood. **Ike Erickson** is carpenter foreman, and **Franklin J. Lindsay** is timekeeper on the undertaking.

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H. L. Morisette and **W. E. Baker** are serving as superintendent and foreman, respectively, on two jobs simultaneously for Union Paving Co., of San Francisco, Calif. The jobs are the $115,170 contract to pave 7 mi. of State Route 9 between Reno and Reno airbase in Washoe County, Nev., and the $87,854 contract to surface 4.5 mi. of Route 1 between Verdi and Lawtons, also in Washoe Co.

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R. U. Lindgren is superintendent for the L. A. Woodward Co., Missoula, Mont., on Schedule 1 of its contract of $259,414 to grade, surface, and erect structures on the relocation of the Lincoln county road between Creston and Ft. Spokane, Wash., and **L. A. Woodward** is himself superintendent on Schedule 2. **M. A. Byrd** is bookkeeper for the entire project.

* * *

N. T. Lewis is acting superintendent of two jobs simultaneously for Hayward Construction Co., Hayward, Calif., who has contracts to build groups of demountable defense houses at Golconda and Mills City, Nevada. The contracts are for $53,095 and $336,382 respectively. Serving with Lewis on both jobs are **Orland Close**, project manager, and **Hugo Frank**, electrical superintendent.

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R. G. Holland is job superintendent on a contract for more than $1,000,000 to construct housing facilities at units No. 2 and 3 of a reception center in Arizona, which was awarded to L. M. White Contracting Co., and M. M. Sundt Construction Co., of Tucson. **E. G. Shaver**, formerly affiliated with the Del E. Webb Construction Co., is administrative manager.

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R. B. Reith, general superintendent for A. Teichert & Son, Inc., contractors, of Sacramento, Calif., is assisted by **Howard Gould**, job superintendent, **Charles Doyle**, grading foreman, and **George Adair**, concrete foreman, on the "over $500,000" contract to construct concrete runways at an airport in Sacramento County, California.

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Ellis L. Mendenhall is superintendent of construction on the $517,000 contract awarded to the Ed Krist Co., Compton, Calif., to build 200 five-room frame dwellings in the Compton and Willowbrook districts, adjacent to Los Angeles. He is assisted by **Harry S. Rudelson**, purchasing agent, and **D. R. Brown**, general foreman.

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Henry Berschauer is superintendent for A. G. Homann, contractor, of Olympia, Wash., on a contract to construct housing facilities in Pierce Co., Wash. Foremen on the job are: **Sam W. Hale**, labor; **Elmer Sundvik**, carpenters; **Frank Hallmyer**, brick; **A. M. Long**, painting; and **Dave Stohl**, concrete. **H. G. Beckwith** is office manager.

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Wade Perong is superintendent, **Norman Smith, Tyler Bennett**, and **Dick Riding** are his assistants, on construction of a maintenance and inspection hangar and a boilerhouse at a Santa Barbara County, Calif., airbase. R. J. Daum, Inglewood, Calif., secured the contract valued between $100,000 and $500,000.

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William Hoops, Jr. is supervising work on the $59,079 contract awarded to Hoops Construction Co., Twin Falls, Ida., for 22 mi. sealcoating on Old Oregon Trail between Bliss and Burley and 26.3 mi. on Raft River Highway between Burley and Idahome. **W. Osterloh** is timekeeper and **Ed Priest** is foreman.

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Charles H. Gilstrap is purchasing agent for Morrison-Knudsen Co., Inc., at Jerome, Idaho, on construction of the Minidoka re-location center for Japanese evacuees. He was previously associated with Brown & Root, Inc., of Houston, Tex., on construction of the Red River Ordnance depot at Texarkana, Tex.

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Frank O'Brien, an old-timer with the Rohl-Connolly Co., of Los Angeles, Calif., and who was superintendent of construction for them on Headgate Rock Dam, has been under a doctor's care for 18 months, and it is still uncertain how soon he will be able to get into construction activity again.

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W. G. Hale, formerly with the Hoosier Engineering Co., Columbus, Ohio, on transmission line construction, is now electrical superintendent for the City Electric Co., Pocatello, Idaho, on construction of an electrical distribution system at Pocatello airbase.

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Jack McPhee has been appointed job superintendent for the Del E. Webb Construction Co., of Phoenix, Ariz., on the latter's contract valued at over $1,000,000 to construct the buildings for an airforce flying school at an Arizona airfield. **L. S. Dorman** is field office manager.

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E. F. Lawrence is superintendent of construction for Harms Bros., Sacramento, Calif., on their $255,769 contract for surfacing and bridge building ten miles south of Half Moon Bay, Calif. The bridges are all Douglas fir except the railings, and one is built with an inclined bent.

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Robert McElueny is in charge of construction for Bradbury & Marchant, Albuquerque, N. Mex., on their "over $50,000" contract for brick and concrete building in Bernalillo Co., N. Mex. **Cecil Marchant** is his assistant, and **Ernest Marchant** is job engineer.

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S. S. Willis is job superintendent on the $88,024 contract secured by R. C. Carrico, Albuquerque, N. Mex., to surface with roadmix asphalt, 12.9 miles of Highway No. 85 between Santa Fe and Las Vegas. **Clyde Wiley** is crusher foreman and Norbert Zimmer is bookkeeper.

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Oscar Erickson is superintendent of construction on the erection of a $5,500,000 synthetic rubber plant at Los Ange-

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A. M. HARSH is construction superintendent for Fredrickson & Watson, Oakland, Calif. on construction of streets and roads at Camp Cooke, near Lompoc, Calif.

JOE CONGUISTA, sewer job superintendent for Superior Construction Co., of Seattle.

les, Calif., to be used by the Goodyear Tire & Rubber Co. The Ford J. Twaits Co. of Los Angeles holds the contract. **W. N. Drew** is construction manager.

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Joe Congiusta, superintendent for Superior Construction Co., Seattle, on its $50,000-$100,000 contract to construct a sewage system in King County, Washington, is assisted by **Barney Campbell** and **Dominic Coluccio,** foremen, **Hugh Park,** bookkeeper, and **Robert Caldwell,** engineer.

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H. O. Anderson has been made superintendent and **E. F. McCoy** has been appointed carpenter foreman by A. D. Ford & Son, Portland, Oregon, on their contract to erect 23 dwelling units at Olympia and Mohawk St., Portland, to cost $54,739.

CONRAD AUNE is general foreman on a Pacific Northwest airport project, for Erickson & Goulter, contractors.

H. H. Hensley is job superintendent, and **Max Westbrook** is office manager on a contract of the Osage Construction Co., Dallas, Tex., for over $100,000 to construct electric, water, and sewage facilities at a location in Val Verde Co., Texas.

* * *

Glen L. Rowell is acting superintendent for E. C. Hall and J. C. Compton, joint contractors on the north unit of the Monmouth-Benton County line section of Pacific Highway, in Oregon. **Charles Holmes** is foreman on the $264,935 contract.

* * *

Fred C. Greenfield is supervising construction of temporary frame buildings at a site in San Bernardino, Calif., for William J. Hunter, Los Angeles, contractor. **Charles Nagel** is in charge of the office. The contract is for more than $100,000.

* * *

A. E. Mitchell is superintendent of carpenters at Miami, Ariz., where W. A. Bechtel Co., San Francisco, Calif., is engaged in construction of a complete copper mining plant. He was formerly engaged in the same type of work at Morenci, Ariz.

* * *

Paul Fiorito is supervising construction on the state highway contract on the Rainier Valley project held by N. Fiorito, Inc., of Seattle. He has just completed a similar job on the contract held by the firm at a military airport near Walla Walla.

* * *

Oscar Mannon has been named by Tony Marrazzo, contractor of Boise, Idaho, to act as job superintendent on the $261,756 contract to grade, drain, and surface 7.1 miles of Old Oregon Trail in Elmore County, Idaho.

* * *

D. L. Morrison is in charge of construction of taxiways at an airport in Merced Co., Calif., for Union Paving Co., of San Francisco, who secured the contract at over $100,000.

* * *

S. E. Engman is now superintendent for Morrison-Knudsen Co., Inc., near Niland, Calif., on excavation of the second section of the Coachella lateral of the All-American Canal.

* * *

Frank C. Wright is general foreman for J. E. Haddock, Ltd., Pasadena, Calif., contractor, on construction of the marine training base at Camp Pendleton, near Oceanside, Calif.

* * *

Robert L. Russell, formerly construction superintendent at the CCC camps in Yosemite National Park, Calif., is now employed as a rigger at the Marinship division of W. A. Bechtel Co., in Sausalito, Calif.

OBITUARIES . . .

George Nick, pioneer northwest railroad construction engineer, died Aug. 15 at Tacoma, Wash. Previous to his retirement in 1938, he had devoted many years to construction and maintenance on the Chicago, Milwaukee, and St. Paul, commencing that connection with the building of the line from St. Paul to Puget Sound. He was also roadmaster for many years in Montana.

* * *

Lars Bergsvik died August 6 at Portland, Oregon, closing the career of an important figure in waterworks engineering in the Pacific Northwest. He had been chief engineer of the Astoria, Ore., water commission, engineer of the Conconully storage dam in Washington, and as an employee of the Bureau of Reclamation, was in charge of construction of Sherburn Lakes dam in Montana.

* * *

Leo B. Hardiman, construction supervisor for Wesco Construction Co., of Los Angeles, died suddenly while on a short vacation near Portland, Ore., on July 26. He was currently working on his company's contract to erect a $3,000,000 defense housing project at Portland, and previously had been in charge of a similar project at Camp Haan, Calif.

* * *

Harry Carpelan, civil engineer and explorer, died Aug. 28 in Los Angeles at the age of 68. He had traveled over most of the world, and had been active in railroad building in South America and the arctic. He was a graduate of the Imperial Military Academy in Sweden and the Imperial Institute of Polytechnics of old Russia.

* * *

Anthony C. Kimmell, 55, civil engineer with the General Land Office at Denver, Colo., died August 30 in that city after a brief illness. He had been associated with the General Land Office since 1920 and was well known in Colorado engineering circles.

* * *

Bert C. Darland, engineer-inspector for the Bureau of Reclamation, died at Grand Coulee Dam, Washington, on Aug. 20. He was 55 years old.

* * *

Lt. Col. Irven Waldo Kenney, construction engineer of the adjutant general's office at Camp Murray, near Tacoma, Wash., died suddenly on Aug. 18.

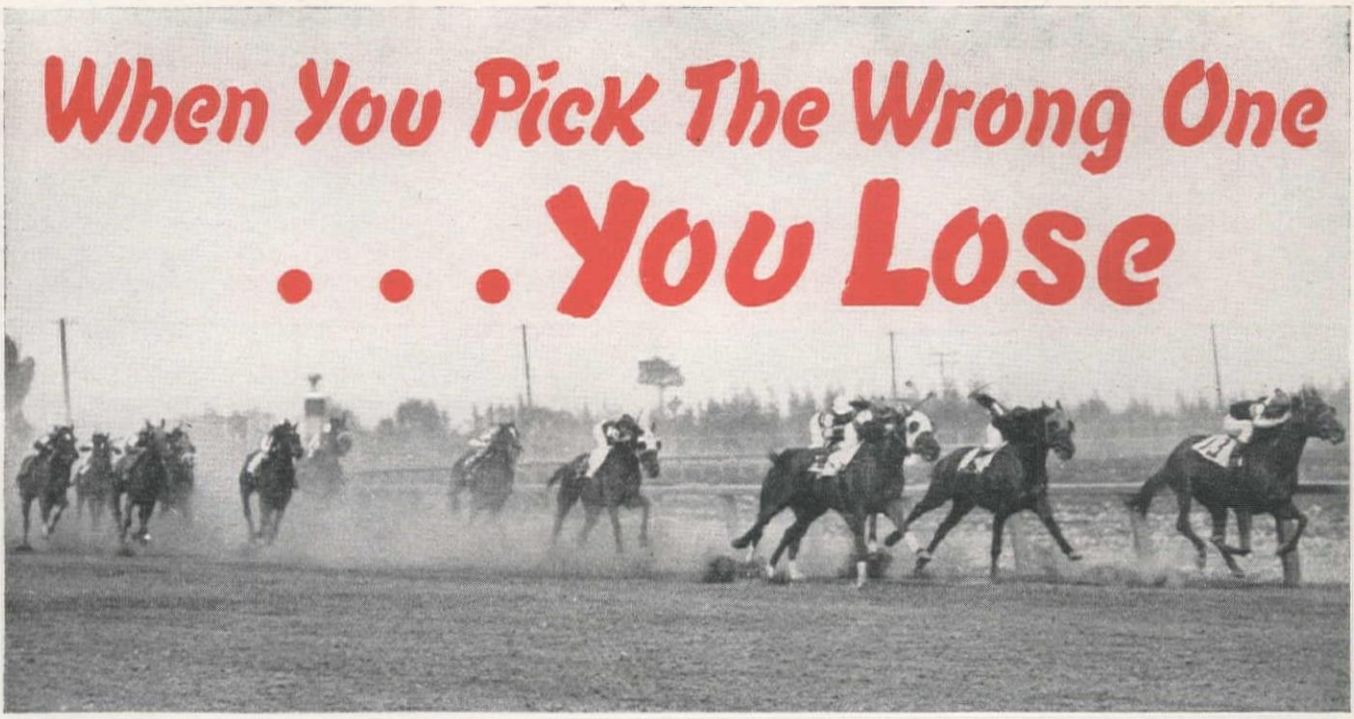
* * *

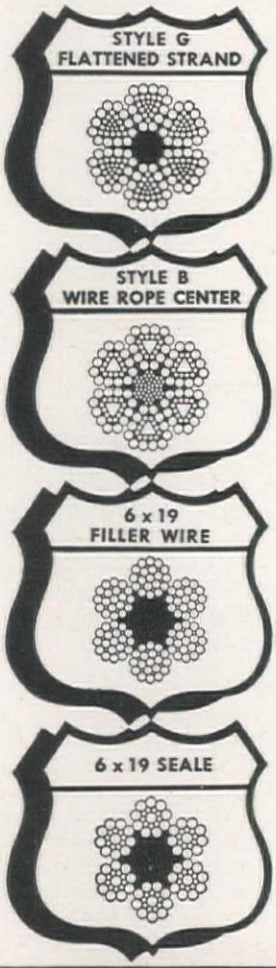
William S. Riggins, 88, retired former member of the engineering staff of the City of Los Angeles, died in that city recently.

* * *

L. D. Matter, consultant on army camp construction, died August 7 at Dallas, Texas.

When You Pick The Wrong One . . . You Lose



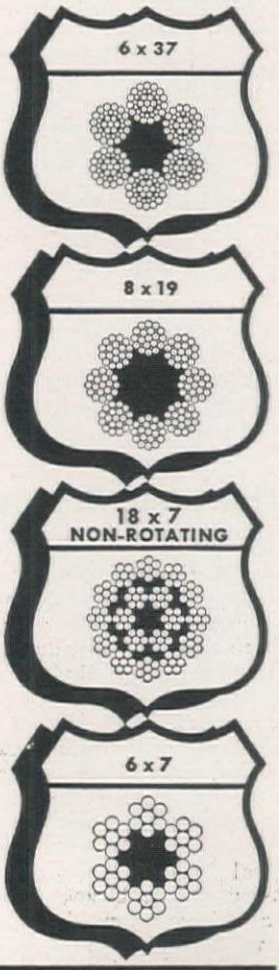


And it is the same with wire rope.

As wire rope is made for many purposes, it is made in a wide range of grades, constructions and types. To obtain maximum results it is necessary to select the rope most suitable for the particular work it is to do . . . the one that can win under the existing conditions.

When the "right rope" is not used, you are losing both time and money because replacements will have to be made more often; and what is *more* to the point—steel urgently needed for ships and shells is being wasted.

The accompanying illustrations show a few of the many wire rope constructions that are available. These can be furnished in different grades—either Preformed or Non-Preformed. They can also be supplied with either a hemp core, or a wire center of the type best suited for the job. Our experienced Engineering Department is at the service of all wire rope users to help make the proper selection. Feel free to consult us.



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

Raise of Ross Dam Still Is Not Finally Decided

FINAL DECISION as to the fate of the Ross Dam height increase will be made early in September by the Seattle Board of Public Works. The only bid for the work—$6,146,214—was submitted by a combination of three contractors, including General Construction Co., Seattle, Wash., Morrison-Knudsen Co., Inc., Boise, Ida., and J. F. Shea Co., Los Angeles, Calif. Following the study of the bid, the Seattle Light Department declared that an additional $2,230,000 would be needed to complete this construction stage. The original estimate had been $8,300,000. Award or rejection of the contract is being withheld temporarily, pending action on a request to the Federal Government for an allotment to cover the increased cost.

WPB Issues a Call for Old, Idle Drafting Instruments

DRAFTING INSTRUMENTS owned by engineering graduates have been asked on behalf of Pacific Coast schools and colleges providing courses in war training, by the Priorities Division of the War Production Board. Extensive enrollment in war training courses at the various schools and colleges in the West has created a large demand for drawing instruments which cannot be secured by the schools because of the high priorities required. WPB officials have estimated that about 90 per cent of the drawing instruments purchased by engineering students during the past 40 or 50 years are not being used, and could be made available to war training students by loan of the instruments to the schools.

Arbitration Booklet Out

THE AMERICAN Arbitration Association has announced it has made its recently published booklet entitled *Labor Arbitration in Wartime* available without cost to corporations, unions, and attorneys. They may obtain copies at the organization's administrative offices, 9 Rockefeller Plaza, New York City.

Included in the publication is a series of seven labor arbitration clauses which are recommended to parties to labor agreements, these having been prepared after consultation with a group of Impartial Chairmen serving more than twenty of the largest industries. Also included are summaries of approximately two hundred typical grievances that have been submitted to arbitration.

Keswick Dam Completion Assured by Change Order

ANOTHER MOVE to expedite hydro power output has been made with the approval of an emergency change-order for additional construction work on Keswick dam on the Central Valley project in California. The change-order authorizes the present contractor, the Atkinson-Kier Construction Co., now building the dam under the direction of the Bureau of Reclamation engineers, to bring the greater part of the dam to its full height. Also, the powerhouse will be constructed to the generator floor stage.

Approval of the Secretary was based on authority granted to him by the First War Powers Act of 1941 and recommendations as to urgency of the construction by Commissioner of Reclamation John C. Page. The amount involved in the change-order is $1,492,946. Keswick dam will have a power plant with three generators, each of 25,000-kw. capacity. Under higher priority ratings just granted by the War Production Board, two of them are to go on the line in June and July, 1944.

Construction of the dam and power plant is about one-third completed.

Three Contracting Firms Incorporated in Canada

THREE construction firms have now been incorporated in British Columbia under the Provincial Companies Act. Grandview Construction Co. has been registered with offices at 2540 Commercial Drive, Vancouver, B. C., and authorized capitalization of $30,000. Pacific Construction Co., Ltd. has its registered offices as F. H. Parker, Qualicum Beach, B. C. and has authorized capital structure of $50,000.

Storms Contracting Co., Ltd., with paid up capital of $74,200 and with head office at 1109 Pigott Bldg., Hamilton, Ontario, has now been incorporated in British Columbia, as an extra-provincial company, to engage in the general contracting business in B. C. The registered offices of the firm are at 811-14 Rogers Bldg., 470 Granville St., Vancouver.

The Employment Information Corner

Testing engineers

Three ratings of physical testing engineer have been opened for examination by the California State Personnel Board. The junior grade has an entrance salary of $185 a month, and the final date for filing application is Sept. 23. The assistant grade has an entrance salary of $230 a month, and the final date for filing applications is Sept. 16. The associate grade has an entrance salary of $275 a month, and final filing date for application is Sept. 16. All applicants must be college graduates, with major work in engineering, and experience requirements varying from one year to three years. Applicants for the highest grade must hold a valid certificate of registration as a civil engineer.

Soils engineer

The U. S. Engineer Department has openings in Hawaii for qualified soils engineers, drawing a salary of $2,000 a year, with transportation to the Islands furnished. Applications should be made to the U. S. Civil Service Commission at the Federal Building in San Francisco, Calif.

Delineator

Applications may be filed until Oct. 17 with the California State Personnel Board in Sacramento for the position of delineator with the Division of Highways. Applicants must have completed the twelfth grade, and have three years' experience in an engineering office or some equivalent combination. The entrance salary is $185 per month.

Automotive mechanics

The motor transport maintenance section of the U. S. Army has a number of openings for automotive mechanics at the Presidio of San Francisco. Positions to be filled include senior auto mechanic, auto mechanic, machinist, sheetmetal worker, senior welder, welder, painter, and unskilled laborer. Applications should be made in person to the U. S. Civil Service Commission in the Federal Building, at San Francisco, Calif.

Sanitary engineer

Openings for assistant sanitary engineers at $2,600 per year are available at Sacaton, Ariz. and Tule Lake, Calif. A college degree in sanitary engineering, plus one year's experience, or an equivalent combination, is required, together with familiarity of methods, techniques and principles of sanitary engineering. Applicants should write or call the regional director of the Twelfth U. S. Civil Service Region in the Federal Office Building, San Francisco, Calif.

Irrigation engineer

An opening exists for an irrigation and conservation engineer at Sacaton, Ariz. The position pays $3,800 per year. Applicants should have a college degree in engineering, plus four years of responsible engineering experience, including two years as hydraulic engineer. Write or call the regional director of the 12th U. S. Civil Service Region in the Federal Office Building, San Francisco, Calif.

Electrical engineer

Positions for electrical engineers, paying $3,200 per year, are open at Tule Lake, Calif., and Sacaton, Ariz. Requirements include the graduation from a recognized engineering school, with a degree in electrical engineering, plus two years' experience in electrical engineering, including the development and operation of power projects and telephone systems or electrical engineering service. Write or call the regional director of the 12th U. S. Civil Service Region in the Federal Office Building, San Francisco, Calif.

Associate design engineer

Positions paying $3,200 per year are open at Sacaton, Ariz., and Tule Lake, Calif. Applicants should have a college degree in civil engineering and two years of diversified experience in design work,

31 FIRST AID STATIONS to help keep your LORAINS on the FIRING LINE

Lorain distributors are out where things are happening—they are our first line of defense to help you do more with what you've got. Acting as ***specialized*** first aid stations, they are working 24 hours a day to keep equipment at peak performance and to make it last longer. Call on the one nearest you. Here is what he is prepared to do—

Furnish spare parts: 31 distributors, strategically located throughout the country, carry a representative stock of factory-made parts on hand and can give you quicker service on deliveries.

Rebuild parts in which normal wear is apt to cause trouble. Many Lorain distributors have complete facilities for this work and employ expert service men who know Lorain equipment.

Give on-the-job service: Many distributors maintain service trucks for speedy delivery of parts and field service right to your job. Fewer working hours lost with on-the-job service like this.

Serve as a clearing house for information on rentable equipment or booms you may need for converting present machines.

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*LeRoi-Rix Machinery Co., Los Angeles, California; Cate Equipment Co., Salt Lake City, Utah; *Liberty Truck & Parts Co., Denver, Colorado; *Coast Equipment Co., San Francisco, California; Wilson Equipment & Supply Co., Cheyenne, Wyoming; A. H. Cox & Co., Inc., Seattle, Washington; *Columbia Equipment Co., Portland, Oregon, Spokane, Wash.; McChesney-Rand Equipment Co., Albuquerque, New Mexico; Bunting Tractor Co., La Grande, Oregon, Boise and Twin Falls, Idaho; State Tractor & Equipment Co., Phoenix, Arizona.

(*) Carries a representative stock of spare parts.

including highways, buildings, camps, electrical and hydraulic fields. Good draftsmanship is required. Write or call the regional director of the 12th U. S. Civil Service Region in the Federal Office Building, San Francisco, Calif.

Engineering aides

Two positions, paying $1,800 per year, are open at Manzanar and Tule Lake, Calif. Two years surveying experience and ability to use level and transit are required of the applicants. Write or call the regional director of the 12th U. S. Civil Service Region in the Federal Office Building, San Francisco, Calif.

Mechanic foreman

A position of chief garage foreman, paying $2,600 per year, is open at Tule Lake, Calif. Applicant must be a journeyman heavy duty auto mechanic, and have had five years' experience as a mechanic foreman, plus two years in charge of shop repairing heavy duty equipment, such as power shovels and diesel tractors. Write or call the regional director of the 12th U. S. Civil Service Region in the Federal Office Building, San Francisco, Calif.

Carpenter foreman

A position as senior carpenter foreman, paying $2,300 per year, is open at Manzanar, Calif. Write or call the regional director of the 12th U. S. Civil Service Region in the Federal Office Building, San Francisco, Calif.

UNIT BID SUMMARY

Sewerage . . .

California—Monterey County—District—V. C. Pipe

Oakland Sewer Construction Co., Oakland, at $218,727, submitted low bid to Alisal Sanitary District, Salinas, for constructing a sewage collection system. Construction of items 1 and 3 below were awarded to John Pestana, Oakland, as part of the trunk sewer, and were therefore eliminated from this contract when it was awarded to Oakland Sewer Construction Co. Bids submitted were as follows:

(1) Oakland Sewer Construction Co.....$218,727
(2) M. J. Lynch 265,000
(3) Leko & Bosnyak..... 279,142
(4) V. C. K. Construction Co.....$285,218
(5) Artukovich Bros. 331,304

		(1)	(2)	(3)	(4)	(5)
4,294	lin. ft. 15-in. Vit. clay pipe	4.72	3.757	4.00	4.90	4.75
1,711	lin. ft. 12-in. Vit. clay pipe	2.13	2.315	3.50	2.37	4.00
8,387	lin. ft. 10-in. Vit. clay pipe	1.91	2.093	3.00	2.44	3.00
33,977	lin. ft. 8-in. Vit. clay pipe	1.79	1.898	2.20	2.23	2.70
68,617	lin. ft. 6-in. Vit. clay pipe	1.34	1.742	1.60	1.82	2.20
30	each 4-in. tees on 15-in. pipe	2.00	5.63	12.00	6.00	3.50
20	each 4-in. tees on 12-in .pipe	1.50	3.38	9.00	3.80	2.50
100	each 4-in. tees on 10-in. pipe	1.25	2.63	7.50	2.80	1.50
770	each 4-in. tees on 8-in. pipe	1.00	1.88	6.00	2.00	1.25
1,700	lin. ft. 4-in. tees on 6-in. pipe	.75	1.05	4.00	1.15	1.00
169	each Conc. and brick manholes with C.I. frames and covers	110.00	149.50	150.00	125.00	140.00
102	each Flushing inlets with C.I. frames and covers	30.00	27.26	50.00	50.00	45.00
Lump sum	Pumping station, complete	$2,000	$2,300	$3,000	$6,000	$5,000
6	cu. yd. Conc. pipe blanket	20.00	10.00	20.00	25.00	25.00

Highway and Street . . .

California—San Diego County—State—Paving

Ralph A. Bell, Eureka, was the low bidder at $459,899 to the Division of Highways, Sacramento, on 3.7 mi. of grading, drainage, and paving with portland cement concrete on Harbor Drive in the city of San Diego, between the Civic Center and Rosecrans Street. The state is to furnish railroad rails for reinforcing and all other materials will be furnished by the contractor, a priority rating of A-1-e having been assigned to the project. The following submitted bids:

(1) Ralph A. Bell.....$459,899
(2) R. E. Hazard & Sons..... 492,870
(3) V. R. Dennis Construction Co.....$523,575

		(1)	(2)	(3)
260	cu. yd. rem. conc.	4.00	2.50	3.50
34,000	cu. yd. roadway exc.	.60	.60	.49
8,700	cu. yd. struct. exc.	2.50	2.65	4.00
2,000	cu. yd. ditch & chan. exc.	.60	.65	.75
114,000	sta. yds. overhaul	.015	.01	.015
124,000	cu. yd. imp. borrow	.52	.65	.49
7,000	cu. yd. imp. soil	1.50	1.10	3.20
92,000	sq. yd. prep. subgrade	.15	.18	.12
Lump sum	dev. W.S. & furn. wat. equip.	$8,000	$5,300	$3,500
5,200	M. gals. applying water	.50	.85	1.00
189	sta's finishing roadway	15.00	13.00	15.00
5,500	tons untrtd. rock base	3.00	3.30	4.00
31,500	sq. yd. prep., mixing & shap'g surf.	.15	.18	.14
260	tons liq. asp. SC-2, 3 or 4 (B.S.T.)	20.00	13.60	17.00
20	tons liq. asp. SC-2 (pr. ct.)	25.00	15.00	20.00
3,400	tons min. agg. (P.M.S.)	4.95	4.50	5.00
200	tons liq. asp. MC-3, 4 or 5 (P.M.S.)	20.00	17.00	18.00
15	tons asp. emul. (sl. ct.)	25.00	26.50	35.00
130	tons screenings (sl. ct.)	6.00	4.00	4.00
600	tons asp. conc. (base & lev. cse.)	5.30	4.80	5.00
300	tons asp. conc. (Type "A" surf.)	5.60	5.10	5.30
19,000	cu. yd. Cl. "B" P.C.C. (pav't)	10.00	11.35	12.25
90	cu. yd. Cl. "A" P.C.C. (structs.)	42.00	43.50	55.00
435	lin. ft. splitting R.R. rails	.35	.40	.75
6,500	lbs. placing R.R. rail reinf.	.03	.04	.03
2,000	cu. yd. heavy stone riprap	5.50	6.00	7.00
100	cu. yd. Cl. "A" P.C.C. (curbs, gutters, s'wlks)	30.00	28.00	22.00
210	ea. curb dowels	.50	.30	.35
47	ea. monuments	5.00	5.00	3.00
1,350	lin. ft. laminated gd. rail'g	2.00	1.70	1.50
170	ea. gnide posts	3.00	4.00	3.00
170	ea. roadway delineators	2.00	1.50	2.00
1,042	lin. ft. 18" unreinf. conc. pipe (2000-D)	3.60	3.30	3.50
1,440	lin. ft. 24" unreinf. conc. pipe (2000-D)	4.70	4.00	4.50
1,072	lin. ft. 30" R.C.P. (std. str.)	6.50	5.60	6.30
752	lin. ft. 36" R.C.P. (std. str.)	8.50	7.25	8.00
952	lin. ft. 54" R.C.P. (std. str.)	15.00	13.00	20.00
400	cu. yd. gravel backfill	5.00	5.00	4.00
39	ea. ruby reflectors	2.00	2.00	2.00
89,000	ea. Mesembryanthemum Edule cuttings	.04	.03	.03
Lump sum	miscell. items of work	$2,000	$1,500	$1,000

Washington—Thurston County—State—Grade and Surface

Goetz & Brennan, Seattle, were low bidders at $220,068 to the Director of Highways, Olympia, on clearing, grading, draining, surfacing, and manufacturing mineral aggregates on 5.7 mi. of Secondary State Highway No. 5-H between Tenino and Rainier. Bids were submitted by the following:

(1) Goetz & Brennan.....$220,068
(2) K. L. Goulter & Co..... 233,996
(3) Paine-Gallucci, Inc., and Harrison Bros. $287,183

		(1)	(2)	(3)
33.8	acres clearing	300.00	200.00	375.00
27.6	acres grubbing	230.00	150.00	375.00
223,300	cu. yds. unclassified excav. (incl. 600-ft. haul)	.45	.45	.60
970	cu. yds. common trench excavation (incl. 600-ft. haul)	1.40	.50	2.15

(Continued on next page)

"Here's how you can spot the 'criminals' that steal wire rope life...

Look for them regularly... to save your time and money... and America's steel

"IF YOU WANT to get every hour of safe service that's built into your ropes, tell your maintenance men to get up on the cranes and shovels regularly . . . up where the wire rope operates. Tell them how to inspect it . . . how to look for the clues to what is damaging your wire rope and how to establish *your own standards* for deciding when it's necessary and economical to replace your wire ropes.

As a first step, tell them a rope should be judged by the condition of the most severely damaged lay . . . one rope lay being that length of rope in which one strand makes one complete revolution around the rope...

And to select the worst lay, make a counting of the broken wires. Watch to see if the breaks are concentrated in one or two strands. If this is the case, the rope will be considerably weaker than if they are evenly distributed.

You'll probably find some breaks caused by *Abrasion.* In extreme cases they look like this . . .

and even when not worn through, any removal of metal due to wear weakens the rope in direct proportion. Abrasion breaks occur most frequently where rope goes over sheaves and drums.

There may be breaks caused by *Fatigue* which look like this . . .

and occur where the rope has been bent around too small a radius too often or has been subject to vibration or whipping. Fatigue breaks also occur after the wire has been damaged by *Corrosion* which shows up as pitting on the surface of the wire. Improper lubrication is to blame and contributes to tension and abrasion as well.

There may be breaks caused by *Mechanical Abuse.* This cut or gouged wire is one example . . .

Careless handling during installation or an accident on the job may cause cut wires like this or mashed wires with flattened or spread ends. Mechanical abuse sometimes may so weaken the wire that it will fail in tension.

Finally, if there are breaks caused by *Tension* they will look like this . . .

And will show one side of the broken wire cupped and the other coned. Tension breaks are always caused by an overload on the wires, which may or may not have been weakened by abrasive wear, by corrosion, or by mechanical abuse. When tension breaks are found, it is usually obvious that the rope is unfit for further duty and in any event should be discarded.

As a last step, have a record kept of the condition and the service life of each wire rope, cut out the worst section when the rope is taken off and send it on to the manufacturer for an ultimate strength test. This will complete your inspection record and form a basis for future inspection and condemnation decisions.

Then, you'll be on the way to getting the maximum useful rope life built into every inch of Roebling "Blue Center" Steel Wire Rope—without taking chances on untimely and dangerous breakdown of equipment vital to wartime production schedules."

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

★ PROMPT SERVICE
★ on essential orders
★ from warehouse
★ stocks or mill

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

205,880	cu. yd. stas. overhaul on above materials	.02	.01	.02
588.67	M. cu. yd. stas. overhaul on above materials	6.00	5.00	5.30
795	cu. yds. structural excavation	1.40	1.50	2.15
27,550	lin. ft. slope treatment	.15	.10	.11
302.9	Stas. (100) finishing roadway	12.00	10.00	11.00
33,150	cu. yds. selected roadway borrow in place	.77	1.00	.80
65	cu. yds. gravel backfill in place	4.40	2.00	3.00
5,620	cu. yds. shoulder material in place	1.40	1.68	1.90
4,790	cu. yds. cr. stone surfacing top course in place	1.75	2.37	2.63
7,480	cu. yds. cr. stone surfacing base course in place	1.75	2.26	2.46
1,750	cu. yds. cr. stone surfacing top course in stockpile	1.50	2.10	2.35
1,900	cu. yds. coarse cr. screenings (⅝-in. to ¼-in.) in stkp.	1.60	2.37	2.63
600	cu. yds. fine cr. screenings (¼-in. to 0) in stkp.	1.60	2.37	2.63
1,150	cu. yds. sand filler in place (including haul)	1.20	1.68	1.95
591	M. gals. water	2.50	3.00	3.75
22	cu. yds. hand-placed riprap in place	20.00	5.00	12.00
1	only concrete Federal aid marker in place	10.00	20.00	20.00
130	only conc. right-of-way markers in place	1.80	5.00	5.00
9,205	lin. ft. std. guard rail, Type No. 4, complete in place	.90	1.25	1.25
7,640	lin. ft. special wood gutter, des. No. 3, complete in place	.60	1.00	1.10
387	lin. ft. special wood spillway, complete in place	1.00	1.00	1.60
219	lin. ft. relaying concrete pipe 12-in. diam.	1.00	.50	1.00
63	lin. ft. relaying concrete pipe 18-in. diam.	1.50	.50	1.50
10	lin. ft. pl. conc. or V.C. drain pipe 8-in. diam.	1.00	.50	.55
348	lin. ft. pl. conc. or V.C. culv. pipe 12-in. diam.	1.10	1.00	1.60
942	lin. ft. pl. conc. or V.C. culv. pipe 18-in. diam.	2.20	1.75	2.65
234	lin. ft. pl. conc. or V.C. culv. pipe 24-in. diam.	3.20	2.75	3.95
390	lin. ft. std. rein. concrete culv. pipe 18-in. diam.	2.60	2.05	3.00
51	lin. ft. std. rein. concrete culv. pipe 24-in. diam.	3.60	3.25	4.25
108	lin. ft. std. rein. concrete culv. pipe 36-in. diam.	8.00	7.00	7.75
87	lin. ft. std. rein. concrete culv. pipe 48-in. diam.	12.00	12.00	14.50

California—Humboldt County—State—Grade and Surface

John Carlin Construction Co., Arcata, was low bidder at $327,827, to the Division of Highways, Sacramento, on 11.5 mi. of grading and surfacing between Arcata and the Eureka Section Base. Part of the project is to be surfaced with plantmix on gravel base, and part is to have a bituminous sealcoat applied to gravel base. Both timber and concrete piles are used in the structures required. Railroad rails to be split and used for reinforcing will be furnished by the state. The project was originally advertised in May, but was readvertised on a slightly changed basis for the present bidding. Priority rating for the job is A-1-c. Bids were received from the following:

(1) John Carlin Construction Co. $327,827
(2) Ralph A. Bell $381,942

		(1)	(2)
10	cu. yd. removing concrete	25.00	20.00
8	acres clearing and grubbing	150.00	400.00
10,700	cu. yd. roadway excavation	.50	.75
11,000	cu. yd. trench excavation (roadbed widen)	1.00	.60
2,050	cu. yd. structure excavation	2.00	3.00
15	cu. yd. ditch and channel excavation	2.00	1.00
80,000	cu. yd. imported borrow	.70	.70
2,200	cu. yd. top soil	2.00	2.50
24,300	sta. yds. overhaul	.01	.01
Lump sum	dev. W.S. and furn. wat. equipment	$1,000	$1,500
2,100	M. gals. applying water	2.00	3.00
609	sta. finishing roadway	10.00	20.00
48,000	tons gravel base	1.50	2.00
35	tons liq. asp. MC-2 (pen. trt.)	30.00	30.00
130	tons sand (pen. trt.)	4.00	5.00
59,300	sq. yds. asp. paint binder	.03	.05
106	tons liq. asp. MC-1 or 2 (pr. ct.)	25.00	30.00
114	tons asp. emul. (sl. ct.)	40.00	35.00
1,200	tons screenings (sl. ct.)	5.00	5.00
14,300	tons mineral aggregate (P.M.S.)	3.50	4.50
220	tons paving asphalt (P.M.S.)	25.00	26.00
420	tons liq. asp. ROMC-3 or 4 (P.M.S.)	22.00	30.00
213	tons rock and screenings (bit. mac.)	5.00	5.00
11	tons liq. asp. SC-6 (bit. mac.)	50.00	40.00
Lump sum	temp. timber const.	$1,000	$1,800
41	MFBM Port Orford cedar timber	200.00	170.00
144	MFBM salt. trtd. Doug. fir timber	200.00	170.00
24	M.F.B.M. redwood timber	150.00	170.00
32	cu. yd. Cl. "A" P.C.C. (structs.)	60.00	50.00
1,760	lin. ft. furn. timber piles	2.00	1.60
44	ea. driving timber piles	30.00	56.00
1,275	lin. ft. furn. conc. piles	4.00	3.00
37	ea. driv. conc. piles	100.00	150.00
940	cu. yd. rock bank prot.	5.00	4.50
48	ea. monuments	4.00	4.00
27	ea. culvert markers	4.00	4.00
20,540	lin. ft. timber fence	.25	.40
44	ea. timber drive gates	20.00	20.00
897	lin. ft. 18-in. R.C.P. (std. str.)	3.50	3.50
427	lin. ft. 24-in. R.C.P. (std. str.)	4.50	4.50
200	lin. ft. salv. pipe culvs.	1.00	1.00
1,700	lbs. bar reinf. steel	.11	.10
3,660	lin. ft. splitting R.R. rails	.30	.30
9,300	lbs. plac. R.R. rail reinf.	.03	.03
Lump sum	rem. existing bridge	$3,000	$2,500
Lump sum	misc. bridge items	$1,000	$1,500

Arizona—Greenlee County—State—Grade and Surface

Packard Contracting Co., Phoenix, submitted a bid of $426,255, which was low, to the State Highway Commission, Phoenix, for grading, draining and constructing an aggregate base course on the Clifton-Duncan Highway, between points about 1 mi. and about 3 mi. southeast of Clifton. A priority rating of A-1-e was assigned to the project, which is to be completed by Jan. 31, 1943. It is notable that on this job, the excavation amounts to nearly 83% of the total contract, the terrain traversed being very mountainous. Bids were received as follows:

(1) Packard Contracting Co. $426,255
(2) Pearson & Dickerson 434,140
(3) Tanner Construction Co. $443,231

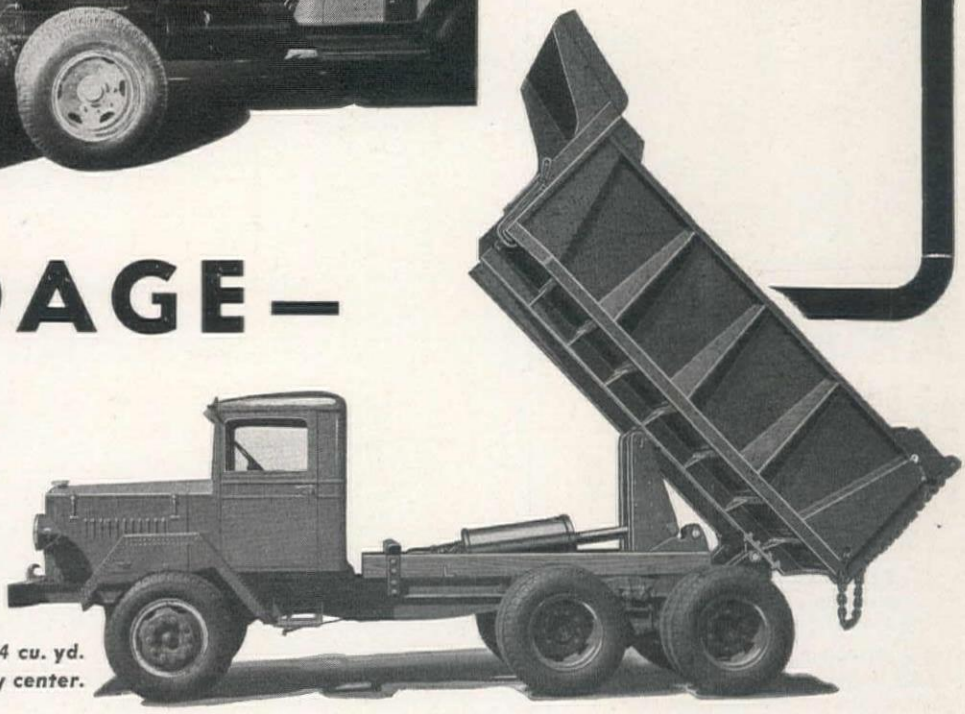
		(1)	(2)	(3)
2[illegible]5,410	cu. yd. roadway excavation (unclassified)	1.10	1.08	1.13
14,700	cu. yd. overbreakage	.825	.81	.8475
14,700	cu. yd. slides	.55	.54	.565
1,900	cu. yd. drainage excavation (unclassified)	.80	1.20	.40
6,850	lin. ft. grader ditches	.15	.20	.10
2,713	cu. ft. structural excavation (unclassified)	2.00	2.50	2.50
404,277	sta. yd. station yard overhaul	.02	.03	.03
3,888	cu. yd. mi. cubic yard mile haul	.35	.40	.30
8,232	ton fine aggregate base course (CIP)	.90	1.20	.90

(Continued on next page)

KEEP 'EM DUMPING WITH HERCULES "SPEEDRAULIC" HOISTS

8X SPEEDRAULIC Hoists and 6 cubic yard dump bodies used for heavy excavation work.

YARDAGE— PLUS



10X SPEEDRAULIC Hoist and 14 cu. yd. body. Note lift applied at body center.

YARDAGE—PLUS the ability to dump the load speedily and easily! That's why operators specify Hercules SPEEDRAULIC Hoists and Dump Bodies for grueling, steady service. Yardage carried by dump trucks is a real contribution to the war effort only when it is dumped on time, every time.

SPEEDRAULIC Hoists (only Hercules Hoists are SPEEDRAULIC) are brutes in strength as well as appearance. By lifting ahead of load center, the bridge type lift arms apply power where it is most effective, with a minimum of lifting effort.

SPEEDRAULIC Hoist action is controlled by a Balanced Piston Valve, which cannot bind under any conditions, and operates entirely independent of oil pressures. There is no high pressure oil piping. Hoist and Power Take-off may be operated by either Hercules "Button Ease" dash controls or conventional floor-board levers.

Make sure your equipment will serve you both now and during the post-war period. There's a fast acting 6″, 7″, 8″ or 10″ SPEEDRAULIC Hoist for every load capacity.

SPEEDRAULIC HERCULES HOISTS

HERCULES STEEL PRODUCTS CO.
GALION, OHIO

UTILITY TRAILER SALES, Seattle, Wash.; NEWELL TRUCK EQUIPMENT CO., Portland, Oregon; A. PASTERIS CO., Oakland, Calif.; STANDARD CARRIAGE WKS., INC., Los Angeles, Calif.; STANDARD IRON WORKS, San Diego., Calif.; SAWTOOTH CO., Boise, Idaho; WESTERN CONSTRUCTION CO., Billings, Montana; WYOMING AUTOMOTIVE SUPPLY CO., Casper, Cheyenne, Rock Springs, Sheridan, Wyoming; McKELVEY MACHINERY CO., Denver, Colo.; MORROW & CO., Albuquerque, N. M.

6,120	M. gal. sprinkling (CIP)	2.00	1.70	2.00
2,410	hours rollings	3.50	4.40	3.50
954	cu. yd. Class "A" concrete (including cement)	30.00	37.00	32.00
47	cu. yd. Class "B" concrete (including cement)	30.00	35.00	32.00
1,820	lb. reinforcing steel (bars) (CIP)	.10	.15	.08
905	lin. ft. 21-in. plain concrete pipe (CIP except excavation)	3.50	2.00	5.00
52	cu. yd. dry rubble masonry (CIP)	22.00	10.00	22.00
100	lin. ft. resetting 3-in. cast iron pipe (CIP) (Station 1444)	1.00	1.00	1.00
100	lin. ft. resetting 4-in. cast iron pipe (CIP) (Station 1444)	1.00	1.00	1.50
480	lin. ft. reconstructing cable road guard (CIP)	1.25	.50	1.50
66	ea. R/W markers (Type "B" or "E") (CIP)	4.00	4.00	3.50

New Mexico—Hidalgo County—State—Grade and Surface

Brown Bros., Albuquerque, submitted the low bid of $294,606 to the State Highway Department for grading, base surfacing and double penetration asphalt wearing top on 7.7 mi. of Highway No. 80 between Lordsburg and Road Forks. Included in the job are three creosoted timber box culverts, each over 20 ft. clear span, and other minor drainage structures. Bids were submitted by the following:

(1) Brown Bros. $294,606
(2) Martin & Cowart 320,389
(3) Skousen Bros. $333,330
(4) Engineer's Estimate 281,386

		(1)	(2)	(3)	(4)
	Lump sum removal of old drainage structures	100.00	500.00	$2,000	200.00
	Lump sum removal of obstructions	100.00	25.00	100.00	100.00
212,500	cu. yd. excavation unclassified	.18	.30	.40	.24
350	cu. yd. excavation for structures	2.00	2.00	2.00	1.50
320	cu. yd. excavation for pipe culverts	2.00	2.00	2.00	1.50
132,000	sta. yd. overhaul	.02	.03	.03	.02
761,000	¼-mi. yd. haul	.03	.03	.03	.03
1,819	hour rolling, sheepsfoot roller	6.00	5.00	4.00	4.00
40,870	ton base course surfacing No. 1 aggregate	.90	.80	.75	.60
43,159	ton base course surfacing No. 2 aggregate	.80	.70	.75	.75
3,528	M. gal. watering	3.00	3.50	2.50	3.50
172.460	MBM treated timber—box culverts	150.00	175.00	200.00	150.00
324	lin. ft. concrete pipe culverts, 24-in. dia., 4½-in. shell	5.00	7.50	9.00	4.50
240	lin. ft. concrete pipe culverts, 30-in. dia., 5¼-in. shell	7.00	9.00	10.00	6.60
2	each concrete monument and marker, unreinforced	25.00	25.00	50.00	15.00
4	each gates, Texas type	3.00	5.00	10.00	1.00
13	each bracing	5.00	4.00	2.00	3.50
80	each right of way and station markers	3.00	5.00	4.00	3.00
40,710	lin. ft. removing and rebuilding fence	.03	.04	.05	.04
7.000	mile obliterating old road	100.00	100.00	200.00	100.00
400	lin. ft. contour ditches	.10	.05	.25	.03
97,045	ton ballast	.60	.60	.55	.60
320	hour mechanical tamping	5.00	5.00	10.00	3.00
154	hour rolling, steel tired roller	7.00	6.00	5.00	4.00
7.718	mile preparation of base course	400.00	700.00	500.00	500.00
1,941	bbl. liquid asphaltic road oil, Type MC-3	7.00	5.50	5.00	5.00
3,434	ton cover material	4.00	5.00	4.00	3.50
1,855	bbl. asphalt	7.00	6.00	5.00	5.00
2,467	each new posts for rebuilding fence	.30	.35	.50	.35

Utah—Tooele County—State—Surfacing

Carl E. Nelson, Logan, at $297,950, was low bidder to the State Road Commission on application of a plantmix bituminous surface on 8.2 mi. of road between Knolls and Wendover. The largest item in the contract was the Class "B" overhaul. Bids were submitted as follows:

(1) Carl E. Nelson $297,950
(2) Reynolds-Ely Construction Co. 311,220
(3) W. W. Clyde & Co. $314,528
(4) Engineer's Estimate 232,878

		(1)	(2)	(3)	(4)
22,500	ton plantmix bituminous surf.	2.50	3.00	2.60	2.00
242,000	gal. bituminous material, Type SC-6	.10	.10	.085	.10
34,500	gal. bituminous material, Type RC-4	.12	.12	.10	.10
40,000	gal. bituminous material, Type MC-1	.12	.12	.11	.11
1,725	ton cover material	4.00	4.00	3.50	2.50
53,000	ton crushed rock or crushed gravel surf. course	1.35	1.25	1.40	.90
82,000	cu. yd. unclassified excavation	.30	.35	.30	.25
574,000	sta. yd. overhaul, Class "A"	.015	.02	.0175	.01
635,000	yd. mi. overhaul, Class "B"	.15	.15	.175	.12
250	1,000 gals. watering	3.00	5.00	4.00	2.50
150	hour rolling	6.00	5.00	4.00	5.00

California—San Diego County—State—Paving

R. E. Hazard & Sons, San Diego, bid low at $712,918, to the Division of Highways, Sacramento, on paving with portland cement concrete and asphaltic concrete, 3.5 mi. of Rosecrans St. and Mission Valley Road, between Lytton St. and 6th St. extension. Features of the job are the large quantity of imported borrow required, and the considerable amount of drainage structure work. A priority rating of A-1-e has been assigned to the job. Railroad rails to be split and used for reinforcing are to be furnished by the State. Bids were received from the following:

(1) R. E. Hazard & Sons $712,918
(2) Ralph A. Bell $746,073

		(1)	(2)
400	cu. yd. removing concrete	4.50	3.80
	Lump sum clearing and grubbing	$3,800	$2,500
30,000	cu. yd. roadway exc.	.38	.40
8,000	cu. yd. struc. exc.	1.00	1.90
6,800	cu. yd. ditch and chan. exc.	.75	.65
240,000	cu. yd. imp. bor.	.60	.60
31,000	sta. yds, overhaul	.01	.01
	Lump sum dev. W.S. and furn. wat. equip.	$5,000	$7,500
10,000	M. gals. applying water	.65	1.25
98,000	sq. yd. prep. subgr.	.16	.15
177	sta. finishing roadway	15.00	25.00
2,100	tons untrtd. rock surf.	3.15	2.85
34,000	sq. yd. prep., mixing and shap'g surf. (B.S.T.)	.18	.15
275	tons liq. asp. SC-2 (B.S.T.)	13.00	15.00
18	tons liq. asp. SC-2 (Pr. Ct.)	14.00	16.00
3,200	tons min. agg. (P.M.S.)	3.80	4.25
190	tons liq. asp. MC-3, 4 or 5 (P.M.S.)	16.00	18.00
215	tons screenings (Sl. Ct.)	3.50	5.00
28	tons asp. emul. (Sl. Ct. & Pt. Bdr.)	25.00	30.00
2,250	tons asp. conc.	4.90	5.45
1,450	cu. yd. P.C.C. base	10.40	9.00
19,200	cu. yd. Cl. "B" P.C.C. (pav't)	10.30	9.75
370	cu. yd. Cl. "A" P.C.C. (structs.)	44.00	38.50
3,300	cu. yd. heavy stone riprap	5.00	5.00
1,200	cu. yd. Cl. "A" P.C.C. (crbs., gutts., swlks., drwys.)	31.50	22.00
305	ea. curb anchors	.30	.50
500	lbs. bar reinf. steel	.12	.11

(Continued on next page)

100	ea. monuments	5.00	4.00
1,600	lin. ft. lam. guard rail'g	1.65	2.50
140	ea. guide posts	3.75	3.00
75	ea. roadway delineators	1.50	1.50
130	ea. mov. and resett. exstg. culv. mkrs. and gd. posts	1.50	1.50
376	lin. ft. 12-in. R.C.P.	2.50	2.55
2,720	lin. ft. 18-in. R.C.P.	3.15	3.55
236	lin. ft. 21-in. R.C.P.	3.45	4.15
912	lin. ft. 24-in. R.C.P.	3.75	4.50
440	lin. ft. 30-in. R.C.P.	5.30	6.20
2,832	lin. ft. 36-in. R.C.P.	12.50	12.15
172	lin. ft. 42-in. R.C.P.	8.50	9.80
360	lin. ft. 54-in. R.C.P.	17.60	14.00
40	lin. ft. 60-in. R.C.P.	14.40	15.60
84	lin. ft. salv. exst. pipe culvs.	.65	1.50
84	lin. ft. rel. salv. C.M.P. culvs.	.65	1.50
5	ea. rem. and reinstalling exst. spill. ass'b	6.50	15.00
3,000	sq. ft. placing P.M.S. down drains	.25	.20
140	ea. red reflectors	2.00	1.50
22	sec's pav't xing dev. (Ty. A)	90.00	65.00
3	ea. M.H. reinf. conc. cones	31.50	30.00
22	lin. ft. 24-in. R.C. rings	5.00	5.00
4	ea. M.H. frames and covers	31.50	30.00
11,000	cu. yd. storm dr. trench exc.	8.20	12.50
9,800	cu. yd. storm dr. trench backfill	2.20	1.50
170	lin. ft. 2-in. electrical conduit	1.10	1.50
555	lin. ft. 1½-in. electrical conduit	.95	1.25
950	lin. ft. 1¼-in. electrical conduit	.80	1.15
100	lin. ft. 1-in. electrical conduit	.75	1.10
500	lin. ft. plant mixed roll	.50	.30

Idaho—Elmore County—State—Grade and Surface

Tony Marrazzo, Boise, was low bidder at $261,756 to the Bureau of Highways, Boise, on construction of the roadbed, drainage structures and crushed gravel surfacing on 7.1 mi. of the Old Oregon Trail. His bid was $22,000 less than the engineer's estimate. The work is to be completed within 200 working days. Bids were submitted by the following:

(1) Tony Marrazzo $261,756
(2) Dan J. Cavanagh 278,331
(3) Nick Burggraf, Inc. 291,509
(4) Quinn Robbins Construction Co. $315,013
(5) Hoops Construction Co. 318,160
(6) Engineer's Estimate 283,422

		(1)	(2)	(3)	(4)	(5)	(6)
1	ea. removal of bridge	$1,500	$1,000	$ 500	$2,500	$1,500	$1,200
1	ea. remove concrete headwall	15.00	6.00	25.00	10.00	10.00	10.00
246,000	cu. yd. unclassified excavation	.41	.45	.42	.54	.60	.48
810	cu. yd. excavation for structures	3.00	3.00	2.00	3.50	3.00	2.50
8,800	cu. yd. borrow	.30	.22	.30	.30	.35	.28
107,400	sta. yd. overhaul	.02	.02	.02	.04	.02	.03
51,000	M. yd. haul	.15	.18	.20	.20	.20	.20
1,200	lin. ft. small ditches	.15	.10	.10	.10	.10	.10
26	stas. obliteration of old road	5.00	10.00	3.00	5.00	10.00	5.00
75	days rolling power roller	26.00	24.00	25.00	30.00	30.00	25.00
77	days rolling, tamping roller	28.00	40.00	25.00	30.00	30.00	30.00
7,360	M.G. watering embankments	.50	1.50	1.50	1.50	1.50	1.50
1,500	M.G. watering base and surf. courses	1.00	1.50	1.50	1.50	1.50	1.50
52,900	tons cr. gr. base course 2-in. max.	.75	.65	.80	.85	.75	.70
1,190	cu. yd. binder	.35	.25	.03	.40	.30	.35
35,900	tons cr. gr. surf. course ¾-in. max.	.85	.90	1.05	1.00	.89	.85
23,100	tons cr. gr. in stkpiles ¾-in. max.	.70	.75	.95	.75	.70	.65
2,100	tons cover coat mat'l in stkp.	2.25	2.50	2.50	2.00	2.50	2.00
1,150	cu. yd. conc. Class "A"	30.00	28.00	33.00	26.00	25.00	28.00
16.0	cu. yd. conc. Class "B"	28.00	35.00	30.00	25.00	30.00	24.00
15.6	MFBM sel. str. C.D. fir timbr. creo. tr.	175.00	200.00	225.00	150.00	200.00	175.00
72	lin. ft. 18-in. reinf. concrete pipe	3.20	3.50	2.00	3.00	3.50	3.00
94	lin. ft. 12-in. pipe	2.00	2.50	1.50	2.25	2.50	2.00
18	lin. ft. 15-in. pipe	2.70	4.00	2.00	3.00	4.00	2.25
1,080	lin. ft. 18-in. pipe	3.00	3.50	2.00	3.00	3.50	3.00
200	lin. ft. 24-in. pipe	4.65	4.50	3.00	4.50	5.00	4.50
74	lin. ft. 36-in. pipe	6.50	10.00	7.00	8.50	9.00	8.00
30	lin. ft. relay 18-in. C.M.P.	.50	1.00	1.00	1.00	1.00	.50
50	cu. yd. loose riprap	1.50	6.00	5.00	5.00	10.00	5.00
70	cu. yd. gravel backfill Class "A"	1.50	1.90	1.50	1.00	2.00	2.00
3	ea. project markers	15.00	14.00	15.00	10.00	15.00	15.00
82	ea. right-of-way markers	4.00	4.50	6.00	5.00	5.00	4.00
18	lin. ft. SP-1 4-in. cast iron pipe	1.50	2.95	2.00	2.00	3.00	2.00
1	ea. SP-2 move metal headgate	25.00	27.50	25.00	10.00	25.00	15.00

Oregon—Polk County—State—Grade and Surface

E. C. Hall, Eugene; McNutt Bros., Eugene, and J. C. Compton, McMinnville, jointly, submitted the only bid to the State Highway Commission, Portland, at $229,153 for grading 2.5 mi. and surfacing with bituminous macadam surfacing 4.9 mi. of section "B" of the Monmouth-Benton County line section of Pacific Highway West.

Lump sum	clearing and grading	$7,000	8,000	cu. yds. 4-in. - 2-in. rock in base	2.50
4,600	cu. yds. removal of pavement	.50	8,000	cu. yds. ¾-in. - 0-in. rock in base and shoulders	2.50
110	cu. yds. struc. excav., unclassified	3.00	500	cu. yds. salvaging surfacing matls.	1.00
63,000	cu. yds. general excav., unclassified	.60	1,000	M-gals. sprinkling	2.50
163,000	yd. stas. short overhaul	.03	4.93	miles preparation of base	150.00
2,200	cu. yd. stas. long overhaul	.50	6,500	cu. yds. furn. and placing aggregates	3.50
4.000	lin. ft. rounding cutbanks	.15	406	tons furn. and placing 121-150 asph.	30.00
2.52	miles finishing roadbed and slopes	500.00	74	tons furn. and placing RC-3 or emulsified asph.	30.00
200	lin. ft. 12-in. concrete pipe	1.05	Lump sum	obliteration of detour	500.00
120	lin. ft. 24-in. concrete pipe	3.05	700	cu. yd. ¾-in.-½-in. cr. rock in stkpl.	2.30
70	lin. ft. 30-in. concrete pipe	5.25	700	cu. yd. ½-in.-¼-in. cr. rock in stkpl.	2.30
130	lin. ft. salvaging culvert pipe	2.00	700	cu. yd. ¼-in.-0-in. cr. rock in stkpl.	2.30
1	only special type "B" manhole	200.00			
37,500	cu. yds. 4-in. - 0-in. matl. in subbase	2.30			

Utah—Utah County—State—Pavement

Olof Nelson Construction Co., Logan, submitted the only bid, $148,494, to the State Road Commission, for construction of a portland cement concrete pavement and natural rock asphalt surfaced road between Provo and Orem. The length of the project is 2.2 mi.

(1) Olof Nelson Construction Co. $148,493
(2) Engineer's Estimate $139,901

		(1)	(2)
20,630	sq. yd. concrete pavement (8-in. thick)	2.90	3.00
6,860	sq. yd. concrete pavement (7-in. thick)	2.70	3.00
2,480	ton natural rock asphalt	11.50	10.00
34,600	gal. bituminous material, Type SC-3	.12	.09

(Continued on next page)

5,400	gal. bituminous material, Type RC-4	.14	.11
1.482	mile scar. and mixing (26-ft. wide)	$1,200	$ 800
0.889	mile scar. and mixing (gutter sec. 4.5-ft. wide)	$ 800	$ 500
0.511	mile scar. and mixing (gutter sec. 10-ft. wide)	$1,000	$1,000
20,500	ton crushed rk. or cr. gr. surf. course	.98	.75
3,800	cu. yd. unclassified excavation	.75	.75
13,500	st. yd. overhaul, Class "A"	.03	.02
1,100	yd. mi. overhaul, Class "B"	.20	.20
225	1,000-gal. watering	2.00	1.25
110	hour rolling	5.00	3.50
400	cu. yd. channel excavation	1.50	.80
500	lin. ft. 12-in. sewer pipe	1.75	1.80
45	lin. ft. 12-in. concrete pipe	2.00	1.85
188	lin. ft. 30-in. concrete pipe	5.00	4.60
300	cu. yd. excavation for structures	2.00	1.00
25	cu. yd. concrete, Class "A"	40.00	30.00
70	cu. yd. concrete, Class "B"	35.00	25.00
3,300	lb. reinforcing steel	.12	.08
1,580	lin. ft. curb, Type 1-C	1.25	1.30
42	ea. guide posts	5.00	2.50
1	ea. F.A.P. markers	15.00	10.00

Nevada—Clark Co.—State—Grade and Surface

Wallace & Wallace, Las Vegas, at $147,132 submitted the only bid to the Department of Highways, Carson City, for construction of 5.6 mi. of feeder road from junction with Highway No. 93 to the Three Kids mine, by grading and surfacing with roadmix asphalt surfacing. The bid was rejected as being too high.

Lump sum	signs	$1,500
716	lin. ft. remove culvert pipe	2.00
71,400	cu. yd. roadway excavation	.85
179	cu. yd. drainage excavation	1.00
83	sta. V type ditches	10.00
98,620	yd. sta. overhaul	.03
1,829	yd. mile overhaul	.30
239	cu. yd. structure excavation	3.00
425	cu. yd. backfill	3.25
5.61	mile subgrade, Type B	650.00
1,996	M gal. water	3.00
5,306	ton Type 1 gravel base	1.10
21,055	ton gravel surface	1.00
39	ton liquid asphalt, Type MC-2 (seal)	30.00
466	ton liquid asph., Type SC-3 (rdmx)	30.00
5.61	mile roadmix	900.00
3	each roadmix intersections	100.00
122	cu. yd. Class B concrete	35.00
678	lin. ft. relay culvert pipe	2.50
623	cu. yd. grouted hand-laid riprap	20.00
28	each culvert markers	5.00
42	each guide posts	5.00
34	each monuments	7.00
4.9	MFBM Port Orford Cedar	175.00

California—Contra Costa County—State—Grade and Surface

N. M. Ball Sons, Berkeley, submitted the lone bid at $323,146 to the Division of Highways, Sacramento, for grading, surfacing with imported borrow, and application of armor coat on 1.9 mi. between 1½ mi. west and ¼ mi. east of Glenn Frazer Station. The work carries an A-1-j priority rating. Spillway assemblies, corrugated and perforated metal pipe, and band couplers are to be furnished by the state. A previous bid on this project was rejected, and it was readvertised on a somewhat reduced scale for the present contract.

2,400	cu. yd. remove conc.	4.00
Lump sum	clear. and grubbing	$7,000
180,000	cu. yd. roadway excav.	.43
36,000	cu. yd. trench and chan. exc.	.80
1,600	cu. yd. ditch exc.	1.50
5,000	cu. yd. struct. exc.	2.00
3,500,000	sta. yds. overhaul	.006
20,500	tons imp. borr. (Ty. "A")	1.40
8,500	tons imp. borr. (Ty. "B")	1.60
Lump sum	dev. W.S. furn. wat. equip.	$3,000
4,500	M. gals. applying water	2.00
99	sta. finishing roadway	8.00
65	tons liq. asp. SC-1 (pen. trt.)	20.00
25	tons liq. asp. SC-2 (pen. trt.)	20.00
80	tons liq. asp. SC-6 (arm. ct.)	25.00
1,370	tons screenings (arm. ct.)	5.00
3	tons liq. asp. ROMC-4 (P.M.S.)	17.00
50	tons min'l agg. (P.M.S.)	6.00
12	ea. redwood covers for D.I.	9.00
1,570	cu. yd. Cl. "A" P.C.C. (structs.)	35.00
40	cu. yd. Cl. "C" P.C.C. (chk. dms.)	30.00
750	cu. yd. rubble masonry	15.00
1,500	cu. yd. riprap	5.00
40	ea. monuments	3.00
85	ea. culv. mkrs. & gd. posts	4.00
320	lin. ft. 12-in. unreinf. conc. P. (2000-D)	1.50
1,040	lin. ft. 18-in. unreinf. conc. P. (2000-D)	2.40
260	lin. ft. 36-in. R.C.P. (std. str.)	7.00
100	lin. ft. 54-in. R.C.P. (std. str.)	16.00
6	ea. spillway assemblies	16.00
110	lin. ft. 8-in. C.M.P.	.60
2,500	lin. ft. 6-in. P.M.P.	.40
4,130	lin. ft. 8-in. P.M.P.	.55
1,700	cu. yd. rk. fil'g matl. (underdrns.)	6.00
8	tons straw cover	13.00
371	lin. ft. salv. exst. pipe culvs.	1.00
Lump sum	rem. exst. timb. bridge	$1,000
3	mi. mvg. & reset. fncs. & gd. rail	600.00
1,300	ea. furn. new timb. fnce. posts	.60
13	MFBM furn D.F. timb. (fencg.)	100.00

Arizona—Maricopa County—State—Paving

L. M. White Contracting Co., Tucson, submitting a bid of $313,058, was the lone bidder to the State Highway Commission, Phoenix, 7.6 mi. of grading, drainage, cement treated base and plantmix bituminous surfacing on the Prescott-Phoenix highway, running northwesterly from a point 27 mi. northwest of Phoenix. A priority rating of A-4 has been assigned to the project, and completion is scheduled by May 31, 1943.

600	hours constructing detour	9.50
7.589	miles mixing and relaying oil mix (on detour)	450.00
15,292	cu. yd. roadway excavation (unclassified)	.35
3,728	cu. yd. drainage excavation (unclassified)	.40
150	lin. ft. grader ditches	.10
2,075	cu. yd. structural excavation (unclassified)	2.50
24	cu. yd. removal of old concrete	15.00
6,820	sta. yd. station yard overhaul	.02
57,707	cu. yd. imported borrow (CIP)	.40
17,558	cu. yd. select material (CIP)	.50
7,626	ton fine aggregate base course (CIP)	.80
25,200	cu. yd. stripping pits	.25
5,000	M. gal. sprinkling (CIP)	3.00
2,070	hours rolling	4.00
687	cy. yd. Class "A" concrete (including cement)	30.00
4	cu. yd. Class "B" concrete (including cement)	30.00
2,050	lb. reinforcing steel (bars) (CIP)	.08
94	M.B.M. treated timber (CIP)	250.00
1,183	sq. yd. floor seal (CIP)	.70
90	lin. ft. 18-in. plain concrete pipe (CIP except excavation)	3.50
52	lin. ft. reset 36-in. C.M.P. (CIP including all materials and work)	4.00
2	each standard wire gates (Type 2) (CIP)	10.00
40,013	lin. ft. reconstructing fence (CIP)	.08
500	each line fence posts (for reconstructed fence only) (CIP)	.60
115	cu. yd. plain riprap (CIP)	4.50
30	cu. yd. special riprap (CIP)	6.00
64	each guide posts (CIP)	4.00
48	each right-of-way markers (Type "B") (CIP)	4.00
31,264	ton aggregate for cement treated base (CIP on road)	2.50
12,518	bbl. portland cement (for C.T.B. only (CIP)	3.00
4,080	ton plantmix (½-in. grading) (lower layer)	2.00
6,833	ton plantmix (¾-in. grading) (including haul)	1.75
204	ton road oil (SC-5) (for plantmix ½-in. grading) (CIP in mixer)	26.00
393	ton road oil (SC-6) (for plantmix ¾-in. grading and B.S.T.) (CIP)	26.00
84,772	gal. road oil (SC-2) (for B.S.T. and detour) (CIP on road)	.10

(Continued on next page)

You Win All the "Chips" with the Universal 27-G Porto-Plant!

The Efficient Screen Unit!

Double Deck Auxiliary Vibrating Screen shakes out chips which are conveyed to truck or stock pile—balance of crushed material is conveyed to main screen over mixing hopper.

Where there's a big demand for chips for seal coating airports and roads—and there's a lot of it being done these days—the 27-G gives you the winning cards.

A Western state road commission* reported:

"We purchased a Universal 27-G Portable Gravel Plant in May, 1941 and our experience with it has been very favorable compared to similar size plants of other makes operating in this territory. The production capacity of the Universal seems much higher. *On a 5-day test run, July 1st to 5th, production of chips alone averaged 210 yards per 8 hours.* This is exceptional capacity and we can highly recommend this plant for highway work."

This bonafide letter from our files was passed on to us by a prospective purchaser who inquired of this user what they thought of their 27-G. Every contractor, pit owner and highway commission using them has similar praise for them! Send for Specification Sheet 27-G detailing the 4 sizes.

*Name on request.

Ask These Progressive Sales-Service Organizations

Le Roi-Rix Machinery Company
Los Angeles

Morrow & Company
Albuquerque, N. M.

The Sawtooth Co.
Spokane, Wash.

O. C. Bell
Reno, Nevada

L. A. Snow Company
Seattle

Landes Tractor & Equipment Co.
Salt Lake City

The Rix Company, Inc.
San Francisco

F. W. McCoy Company
Denver, Colo.

O. S. Stapley Co.
Phoenix, Ariz.

Contractors Equipment Corp.
Portland, Ore.

J. D. Evans Equipment Co.
Casper, Wyo.

UNIVERSAL CRUSHER COMPANY

323 8th St. West **Cedar Rapids, Iowa**

UNIVERSAL

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

7.589	miles placing plantmix (¾-in. grading only)	450.00
800	ton screenings (CIP on road)	4.00
200	ton emulsified asphalt (Class "A")	35.00

Bridge and Grade Separation . . .

California—San Diego County—State—Timb., Conc., and Struc. Steel

Ralph A. Bell, Eureka, was low bidder at $341,479 to the California Division of Highways for construction of a bridge across Boat Channel in the city of San Diego, using precast concrete piles and salvaged structural steel, the latter being furnished by the state. The state will also furnish railroad rails to be used for reinforcement. A priority of A-1-e has been assigned to the job. The following submitted bids:

(1)	Ralph A. Bell	$341,479	
(2)	R. E. Hazard & Sons	346,275	
(3)	Carlo Bongiovanni	$348,631	
(4)	Byerts & Dunn	382,418	

		(1)	(2)	(3)	(4)
Lump sum	clearing and grubbing	$1,000	$ 500	$ 500	$2,000
100	cu. yd. struct. excav.	3.00	2.00	2.00	3.00
55	tons mineral agg. (P.M.S.)	9.00	7.00	6.00	5.00
3	tons liq. asp. MC-4 (P.M.S.)	25.00	30.00	25.00	20.00
395	tons rock and screenings (B.M.S.)	3.00	4.00	6.00	5.00
20	tons lig. asp. SC-6 (B.M.S.)	25.00	30.00	40.00	60.00
385	M.F.B.M. salt treated Doug. fir timb.	185.00	200.00	185.86	175.00
40	M.F.B.M. redwood timb. D.S.A.H. str. gr.	168.00	165.00	250.00	220.00
13	M.F.B.M. creosoted Doug. fir timb.	254.00	260.00	250.00	300.00
1,700	cu. yd. Cl. "A" P.C.C.	42.00	45.00	35.00	38.00
175,000	lbs. fabricating and erect'g salv. str. steel	.11	.09	.08	.12
1,900	lbs. miscellaneous iron and steel	.35	.40	.30	.25
2,600	lin. ft. furn. creosoted timb. piles	1.75	1.75	1.35	1.75
52	ea. driv. creosoted timb. piles	42.00	45.00	25.00	75.00
20,800	lin. ft. furn. precast conc. piles, incl. tst. A	4.00	3.90	3.29	4.50
364	ea. driv. precast conc. piles, incl. tst. A	87.00	90.00	145.00	125.00
64,000	lin. ft. splitting R.R. rails	.35	.30	.25	.50
390,000	lbs. plac. R.R. rail reinf.	.03	.03	.05	.03
1,950	sq. yd. wire mesh reinf. (10 ga.)	.40	.30	1.10	.50
750	sq. yd. wire mesh reinf. (6 ga.)	.60	.50	1.35	.75
13,000	lbs. bar reinf. steel	.11	.10	.10	.09
Lump sum	lighting and elec. equip.	$4,000	$5,000	$4,500	$2,500
Lump sum	miscell. items of work	3,000	4,000	15,000	14,000

Utah—Davis Co.—State—Timber and Concrete

Clifford Prince, Salt Lake City, was low bidder at $28,249, to the Utah State Road Commission, on construction of a 36-ft. 1-in. timber and concrete bridge across the Weber-Davis canal having a span of 20 ft., and surfacing 0.1 mi. of the Sunset-Ogden ordnance depot road with 2½-in. roadmix bituminous surfacing. The bridge constitutes about 75% of the total cost of the job. The low bid was $2,600 under the engineer's estimate. Bids submitted were as follows:

(1)	Clifford Prince	$28,249	(4)	J. W. Whiting Construction Co.	$36,502
(2)	Young & Smith Construction Co.	30,757	(5)	Engineer's Estimate	30,836
(3)	F. R. Knowlton	32,012			

		(1)	(2)	(3)	(4)	(5)
3,000	cu. yd. unclassified excavation	.45	.40	.40	.60	.50
8,000	st. yd. overhaul, Class "A"	.05	.02	.02	.03	.03
100	yd. mi. overhaul, Class "B"	.30	.30	.20	.40	.20
1,000	ton crushed rock or crushed gravel S.C.	1.25	2.00	2.50	1.50	1.50
150	cu. yd. excavation for structures	3.00	3.00	1.50	3.00	1.50
10	1,000 gal. watering	4.00	5.00	2.00	2.00	1.25
5	hour rolling	10.00	6.00	5.00	30.00	5.00
10	cu. yd. concrete, Class "A"	45.00	30.00	43.00	45.00	40.00
650	lb. reinforcing steel	.15	.10	.15	.20	.10
250	lb. structural steel	.50	.25	.50	.30	.20
0.072	MFBM lumber	300.00	200.00	190.00	250.00	200.00
192	l. ft. 12-in. concrete pipe	2.00	1.50	1.95	2.00	3.00
110	l. ft. 18-in. concrete pipe	2.50	3.00	3.50	3.00	4.00
36	l. ft. relaying 18-in. concrete pipe	1.50	2.00	1.50	2.50	1.00
1	Lump sum demolition of store	700.00	1,500	1,200	1,000	500.00
2	each F.A.P. markers	20.00	10.00	15.00	15.00	10.00
	(1) Bridge Over 20-ft. Span (36'1") Weber-Davis Canal Bridge (Timber and Concrete)					
4,750	cu. yd. channel excavation	.45	.40	.75	.75	.50
850	cu. yd. excavation for structures	1.50	2.50	1.50	2.50	1.50
560	cu. yd. concrete, Class "B"	26.00	28.00	28.00	35.00	30.00
25.5	MFBM lumber, treated	169.00	160.00	170.00	165.00	175.00
1	each removal of existing structures	250.00	400.00	300.00	300.00	250.00

California—Solano County—State—Repairs and Conc. Deck

Trewhitt, Shields & Fisher, Fresno, were low bidders at $247,865 on repairing an existing timber bridge over the Napa River at the west city limits of Vallejo, and constructing a new concrete deck on the existing piles. First step in the work is construction of a timber pile detour bridge. Steel Channels to be used in the work are to be furnished by the state, all other material by the contractor. Bids were submitted by the following:

(1)	Trewhitt, Shields & Fisher	$247,865	(3) A. Teichert & Son, Inc.	$345,088
(2)	E. E. Smith	292,950		

		(1)	(2)	(3)
100	cu. yd. structure excavation	3.00	9.00	5.00
45	cu. yd. rock and screenings (bit. mac.)	5.00	10.00	10.00
4	tons lig. asph. gr. SC-6 (pr. ct. & bit. mac.)	30.00	50.00	40.00
47	MFBM rdwd. tim. D. S. A. H. str. gr.	285.00	250.00	250.00
570	MFBM Douglas fir timber	119.00	135.00	185.00
480	MFBM timber and lumber (detour bridge)	129.00	133.00	170.00
23,256	lin. ft. furn'g tim. piles (detour bridge)	.45	.50	.50
342	ea. driving tim. piles (detour bridge)	100.00	56.00	50.00
Lump sum	remove and salvage ex'g br. deck	$10,500	$21,630	$32,000
1	lot falsework	6,500	11,000	15,000
115	ea. cut-off and stub piles	25.00	25.00	50.00
24	ea. portable timber barricades	40.00	50.00	40.00
380	lin. ft. temporary timber railings	2.50	4.00	3.00
915	cu. yd. Cl. "A" P.C.C.	20.00	30.00	22.00
208,000	lbs. bar reinforcing steel	.05	.065	.08
2,900	lbs. miscellaneous steel	.25	.15	.20
650	MFBM hauling lumber and timber	8.00	13.00	15.00
Lump sum	electrical equipment	$2,000	$4,000	$12,000
Lump sum	miscellaneous items of work	$1,000	$16,000	$2,500

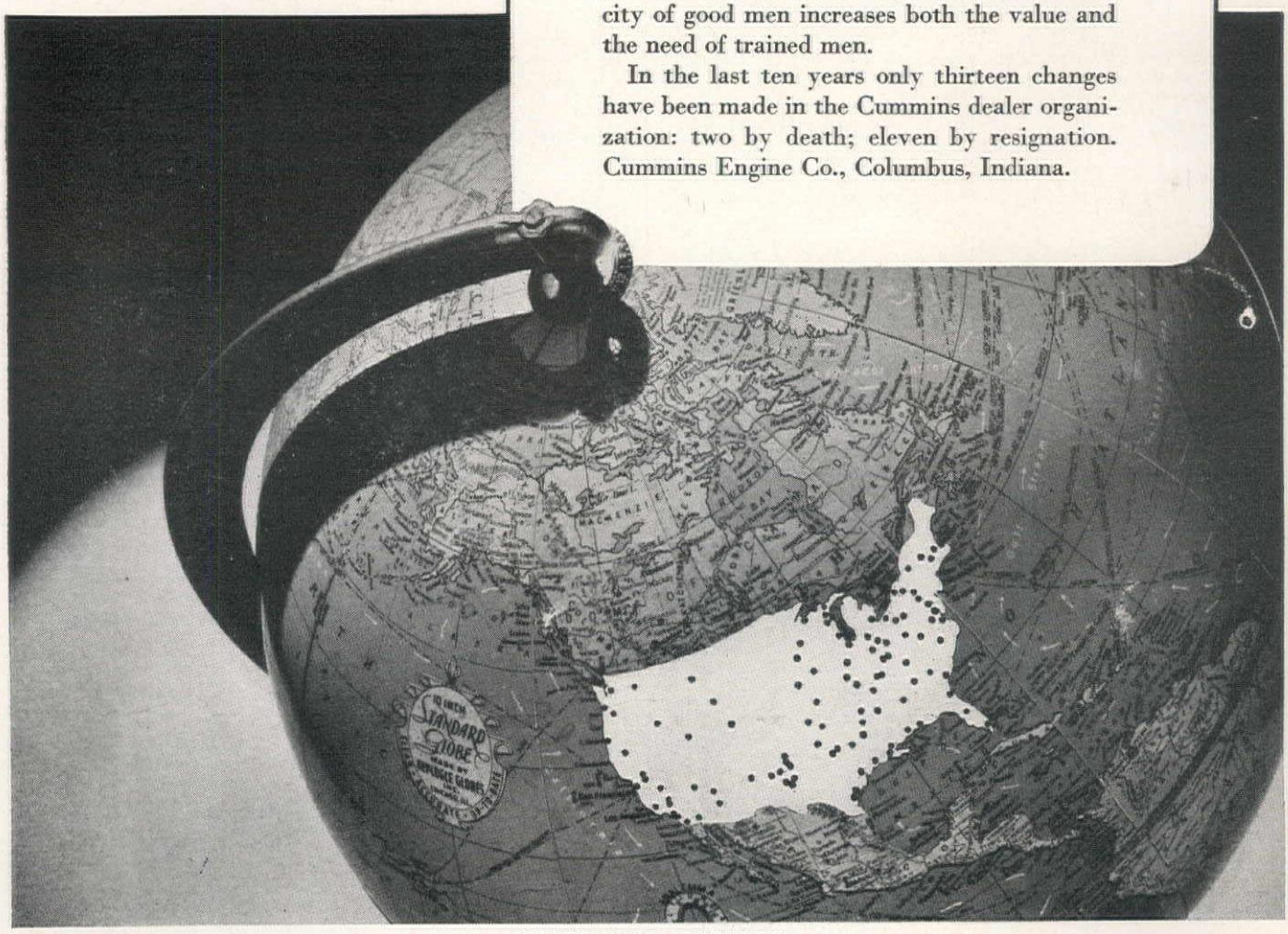
What CUMMINS Dependable DIESEL Service MEANS TO YOU

Cummins customer service policy, when it was inaugurated nine years ago, took into consideration both normal and abnormal conditions . . . that's why first consideration was given to the customer's needs and these basic principles adopted:

1. To save customer time, complete parts stocks were made available, at centrally located points, in the territories where Cummins Diesels were working.
2. To assure competent service, at a moderate cost, uniform methods and factory trained men were provided.
3. To attract an intelligent group of dealers, incentives were arranged that guaranteed a permanent organization.

The war has shown the soundness of this policy . . . the limited supplies and close controls set up by the government make it necessary to eliminate useless duplication of parts stocks—a policy Cummins *has always followed.* The scarcity of good men increases both the value and the need of trained men.

In the last ten years only thirteen changes have been made in the Cummins dealer organization: two by death; eleven by resignation. Cummins Engine Co., Columbus, Indiana.



SALES AND SERVICE

Fresno, California	Watson & Meehan
Los Angeles, California	Diesel Motor Sales & Service Corporation
Nanaimo, B. C.	Cummins Diesel Sales of B. C., Ltd.
Phoenix, Arizona	Watson & Meehan
Portland, Oregon	Cummins Diesel Sales of Oregon, Inc.
Salt Lake City, Utah	Cummins Intermountain Diesel Sales Corporation
San Francisco, California	Watson & Meehan
Seattle, Washington	Cummins Northwest Diesel Sales, Inc.
Spokane, Washington	Cummins Diesel Sales of Spokane
Vancouver, B. C.	Cummins Diesel Sales of B. C., Ltd.

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

V. R. Dennis Construction Co., San Diego, Calif., was awarded the contract at $694,167 for 4.7 mi. grading and asph. and cement concrete paving betw. San Diego and National City, Calif.

R. E. Hazard & Sons, San Diego, Calif., received the contract at $715,708 to grade and pave 3.5 mi. of Rosecrans St. and Mission Valley Rd. near San Diego.

Foundation Co., New York City, **Lindgren & Swinerton, and Associates,** Los Angeles, Calif., and **Martin Wunderlich Co.,** Jefferson City, Mo., have each received contracts for sections of the Pan-American Highway in Central America, in unannounced amounts.

Frank J. Haas, Great Falls, Mont., has a contract at over $1,000,000 for grading, paving, and fencing an airfield in Glacier Co., Montana. Contracts in similar amounts have been awarded to **S. Birch & Sons Construction Co.,** Great Falls, for similar work in Fergus Co., Mont., and to **Inland Construction Co.,** Omaha, Nebr., for work in Valley Co., Mont.

Valley Construction Co., Seattle, Wash., was awarded the contract at $245,000 for 18,500 ft. of 24-in. water main in West Bremerton, Wash.

Pacific Pipeline Construction Co., Los Angeles, Calif., over $500,000 for water, sewer, and sewage disposal systems in Riverside Co., Calif.

Barrett & Hilp, San Francisco, Calif., received contract at $4,038,-120 for additional drydock and other facils. at Hunter's Point, San Francisco.

Atkinson-Kier Construction Co., San Francisco, Calif., has received the contract for second stage construction of Keswick Dam, part of the California Central Valley project, at $1,492,946.

Rosoff Subway Construction Co., New York City, has been awarded contract for a 7-mi. water tunnel near the city of Puebla, Mexico, at $4,627,000.

Central Construction Co., Dallas, Tex., and **Thomas Bate & Son,** Denver, Colo., awarded contract at $30,000,000 for aluminum extrusion plant near Phoenix, Ariz.

Vinson & Pringle and **Del E. Webb Construction Co.,** both of Phoenix, Ariz., $10,528,000 for additional facilities at Marine Corps training stations in Kern and Imperial Cos., Calif.

Swinerton & Walberg Co., San Francisco, Calif., **A. S. Vinnell,** Alhambra, Calif., and **United Concrete Pipe Corp.,** Los Angeles, Calif., jointly received contract at $5,375,000 for reinf. conc. fuel storage facils. at the naval fuel depot at San Pedro, Calif.

Griffith Co., Los Angeles, Calif., awarded $1,000,000 to $5,000,000 contract for bldgs. and utils. at a general hospital in Riverside Co., Calif.

Engineers, Ltd., San Francisco, Calif., and **J. E. Haddock, Ltd.,** Pasadena, Calif., received joint award of $13,460,000 to construct a Marine Corps training station at Santa Margarita, Calif.

Lembke-Hearn Construction Co., Albuquerque, N. Mex., $4,200,-000 for warehouses, magazines, etc., near Pueblo, Colo.

Radich & Brown, Burbank, Calif., $2,408,000 contract for additional facils. at naval ammunition depot near Hawthorne, Nev.

Teufel & Carlson, Seattle, Wash., have been awarded contract at $3,720,000, formerly held by Los Angeles contractor, for 1000 permanent housing units at Vancouver, Wash.

Clifton & Applegate, Spokane, Wash., awarded $8,655,000 contract for air supply depot near Spokane, Wash.

Douglas Jardine, Pando, Colo., over $1,000,000 for plumbing and heating installations at an army training camp in Eagle Co., Colo.

J. Philip Murphy, San Francisco, Calif., and **Woodworth & Co.,** Tacoma, Wash., were awarded contract at $69,000 plus actual cost, for dismantling cables and towers of collapsed Tacoma Narrows bridge.

Highway and Street...

CONTRACTS AWARDED

Arizona

GREENLEE CO.—**W. E. Orr,** 302 W. Monte Vista Rd., Phoenix—$397,373, for grading, draining & aggr. base course, on Duncan-Clifton Hwy., betw. 1 mi. and 3 mi. southeast of Clifton —by State Highway Commission, Phoenix. 8-24

MARICOPA CO.—**Martin Construction Co.,** Box 934, Tucson —$59,945 for widening existing conc. pave., grading, draining, aggr. base course, & roadmix bitum. surf. on 4.6 mi. of the Luke Field-Glendale Hwy. west from Glendale city limits—by Arizona State Highway Commission, Phoenix. 8-3

MARICOPA CO.—**L. M. White Contracting Co.,** Box 2592, Tucson—$313,057, for 7.6 mi. grading, draining, cement base & plantmix bitum. surf. on Phoenix-Prescott Highway northwesterly from 27 mi. northwest of Phoenix—by Highway Commission, Phoenix. 8-24

California

ALAMEDA CO.—**Heafey-Moore Construction Co.,** 344 High St., Oakland—$25,373 for drain and pave Middle Harbor Rd. and Ferro St. in Oakland—by City Council, Oakland. 8-18

CONTRA COSTA CO.—**N. M. Ball Sons,** Box 404, Berkeley —$323,145, for 1.9 mi. grading and imported borrow, surf., and armor coat, betw. 1½ mi. west and ¼ mi. east of Glenn Frazer station—by Division of Highways, Sacramento. 8-21

KERN CO.—**Griffith Co.,** Los Angeles Railway Bldg., Los Angeles—$384,951, for 5.9 mi. widen with portland cement conc. pave. and plantmix surf. betw. Fort Tejon & 1.4 mi. N. of Grapevine Station—by California Division of Highways, Sacramento. 8-3

KERN CO.—**J. E. Haddock, Ltd.,** 3578 E. Foothill Blvd., Pasadena—over $100,000 for roadmix surf.—by U. S. Engineer Office, Sacramento. 8-4

LOS ANGELES CO.—**Basich Bros.,** 20530 S. Normandie Ave., Torrance—$349,950 for grade and plantmix surf. on cement treated base, an area betw. Madison St. and east city limits of Torrance—by Division of Highways, Los Angeles. 8-27

LOS ANGELES CO.—**Bohannan Paving Co.,** 13,236 Victory Blvd., Van Nuys—less than $50,000, for roads, parking aprons and grading at a factory training school—by U. S. Engineer Office, Los Angeles. 8-31

LOS ANGELES—**Griffith Co.,** 1060 S. Broadway, Los Angeles —$18,295 for paving Pacific Ave., betw. Torrance Blvd. & Diamond St.—by Redondo Beach City Council. 8-27

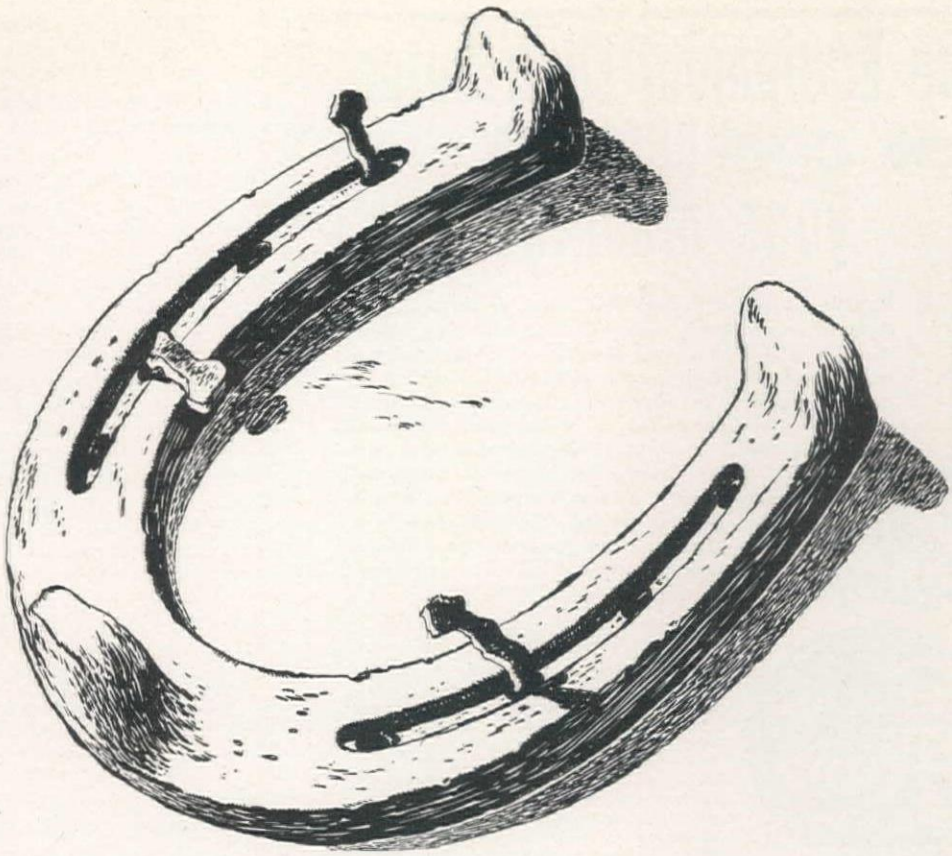
LOS ANGELES CO.—**Griffith Co.,** 1060 S. Broadway, Los Angeles—$13,342 for improving Alameda St., betw. Henry Ford Blvd. & Anaheim St.—by Board of Public Works, Los Angeles. 8-6

LOS ANGELES CO.—**Griffith Co.,** 1060 S. Broadway, Los Angeles—$76,861, for 1.3 mi. widen & pave with cement conc. and asph. conc. pave through Hermosa Beach on Sepulveda Blvd.—by California Division of Highways, Los Angeles. 8-3

LOS ANGELES CO.—**T. E. Sherlock,** 1103 W. 40th Pl., Los Angeles—$84,122, for widen & surf. Buena Vista St., betw. Olive Ave. and Burbank Blvd., & Burbank Blvd., betw. Victory Blvd. and San Fernando Rd.—by City Council, Burbank. 8-28

LOS ANGELES CO.—**Sully-Miller Contracting Co.,** 1500 W. 7th St., Long Beach—$14,189, for paving pier 2 & pier "A," Long Beach—by Long Beach Harbor Commission. 8-28

MERCED CO.—**Jack Shields,** Box 1137, Bakersfield—over $100,000, for road surf.—by U. S. Engineer Office, Sacramento. 8-26



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RIVERSIDE CO.—**Basich Bros.,** 20530 S. Normandie Ave., Torrance—over $100,000, for paving at a quartermaster depot—by U. S. Engineer Office, Los Angeles. 8-18

RIVERSIDE CO.—**Jack Wilcox,** 1625 - 3rd St., Alhambra—over $100,000, for street improvements at a staging area—by U. S. Engineer Office, Los Angeles. 8-7

SACRAMENTO CO.—**McGillivray Construction Co.,** Box 873, Sacramento—$25,281, for improvement of Muir Way, from Broadway to southerly boundary of "Wright and Kimbrough Industrial Tract"—by City Council, Sacramento. 8-17

SAN DIEGO CO.—**Ralph A. Bell,** 1615 Euclid Ave., San Marino—$459,919, for 3.7 mi. grade & conc. pave on Harbor Drive, betw. Civic Center & Rosecrans St., San Diego—by Division of Highways, Los Angeles. 8-17

SAN DIEGO CO.—**V. R. Dennis Construction Co.,** Box 'F,' Hillcrest Sta., San Diego—$694,167, for 4.7 mi. grade, asph. conc. & portland cement conc. paving, on 8th St. & Harbor Dr. betw. Roosevelt St. in National City & 'G' St. in San Diego—by California Division of Highways, Los Angeles. 8-28

SAN DIEGO CO.—**R. E. Hazard & Sons,** Box 1510, San Diego—$715,708, for 3.5 mi. grade and asph. conc. & portland cement conc. pave on Rosecrans St. & Mission Valley Rd., betw. Lytton St. & 6th St. Extension—by California Division of Highways, Los Angeles. 8-28

SAN LUIS OBISPO CO.—**Brown, Doko & Baun,** Dolliver St., Pismo Beach—less than $50,000, for conc. roadway—by U. S. Engineer Office, Los Angeles. 8-7

SAN LUIS OBISPO CO.—**A. J. Raisch,** 46 Kearney St., San Francisco—$264,738, for 28.8 mi. plantmix resurf. betw. Santa Margarita & northerly boundary—by California Division of Highways, Sacramento. 8-3

SANTA BARBARA & SAN LUIS OBISPO COS.—**Brown, Doko & Baun,** Dolliver St., Pismo Beach—$14,690, for 6.8 mi. bitum. seal coat to be applied to existing surf., shoulders, dikes & gutters, at various locations—by Division of Highways, San Luis Obispo. 8-10

SANTA CLARA CO.—**Union Paving Co.,** 310 California St., San Francisco—$23,750, for asphaltic conc. surf. on Stone Ave., betw. San Jose-Almaden Rd. and Monterey Rd.—by County Clerk, San Jose. 8-3

SISKIYOU CO.—**Poulos & McEwen,** Box 1017, Sacramento—$83,317, for 4.2 mi. grade & plantmix surf. betw. Edgewood Rd. and 4 mi. north—by California Division of Highways, Sacramento. 8-3

YUBA CO.—**Marshall S. Hanrahan,** Box 427, Redwood City—over $500,000 for roads—by U. S. Engineer Office, Sacramento. 8-26

Colorado

DENVER CO.—**J. R. Phillips,** Aurora—over $500,000, for walks & drainage—by U. S. Engineer Office, Denver. 8-28

Idaho

BUTTE CO.—**Morrison-Knudsen Co., Inc.,** Boise—$37,299 for bitum. surf. on 19.1 mi. of Idaho Central Hwy. betw. Arco and Craters of the Moon National Monument—by Dept. of Public Works, Boise. 8-18

BONNEVILLE CO.—**Dan J. Cavanagh,** Twin Falls—$98,321 for 6.4 mi. grade and surf. with crushed gravel on Twin Buttes and Shelley-New Sweden highways betw. Shelley and Idaho-Montana Hwy.—by Bureau of Highways, Boise. 9-1

BOUNDARY CO.—**D. A. Sullivan,** Parkwater, Wash, $51,603, for 9.7 mi. crushed gravel surf. on Kootenai Hwy., westerly from Montana state line—by Commissioner of Public Works, Boise. 8-31

Montana

LINCOLN CO.—**Union Construction Co.,** Great Falls—$104,840, for 6.8 mi. surf. with selected borrow & cr. gravel, and roadmix surf. on Sec. C of Kalispell-Libby Rd.—by State Highway Commission, Helena. 8-19

VALLEY CO.—**Inland Construction Co.,** 3867 Leavenworth St., Omaha, Nebr.—less than $50,000, for grade, drain facil. & surf. roads—by U. S. Engineer Office, Fort Peck. 8-26

Nevada

WASHOE CO.—**Union Paving Co.,** 310 California St., San Francisco, Calif.—$115,170, for paving 7 mi. of Route 9 betw.

Reno and Reno Air Base—by Dept. of Highways, Carson City. 8-12

New Mexico

COLFAX CO.—**Henry Thygesen & Co.,** Box 876, Albuquerque—$17,022, for asph. surf. on 6.7 mi. of Hwy. No. 85, betw. Raton and Colorado State line—by State Highway Dept., Santa Fe. 8-1

HIDALGO CO.—**Brown Bros.,** Box 1479, Albuquerque—$294,606, for 7.7 mi. grade and asph. surf. on Hwy. No. 80, betw. Lordsburg & Road Forks—by State Highway Department, Santa Fe. 8-1

SAN MIGUEL CO.—**R. C. Carrico,** Albuquerque—$88,024, for 12.9 mi. roadmix asph. surf. on Hwy. No. 85, betw. Santa Fe & Las Vegas—by State Highway Dept., Santa Fe. 8-1

SAN MIGUEL CO.—**Henry Thygesen & Co.,** Box 876, Albuquerque—over $50,000, for roads and drainage—by U. S. Engineer Office, Albuquerque. 8-3

Oregon

COOS CO.—**Tru-Mix Concrete Co.,** McAndrews Rd., Medford $34,034 for grade and surf. 6-mi. access road to Seven Devils mine west of Coquille—by State Highway Commission, Salem. 8-14

MALHEUR CO.—**Chester T. Lackey,** Ontario—$25,000 for 9,500 cu. yd. crushed gravel in stockpiles at Dead Ox Flat-Cairo Junct. Rock Prod. project on Old Oregon Trail and Central Oregon Hwy.—by Highway Commission, Portland. 8-31

Texas

BELL CO.—**M. E. Ruby** and **Wallace & Bowden,** 925 Littlefield Bldg., Austin—over $50,000, for road—by U. S. Engineer Office, San Antonio. 8-13

BELL CO.—**Southern States Construction Co.,** Houston—over $50,000, for road—by U. S. Engineer Office, San Antonio. 8-13

BEXAR CO.—**J. O. Mack, Jr.,** San Antonio—less than $50,000, for streets—by U. S. Engineer Office, San Antonio. 8-20

BEXAR CO.—**Dean Word,** 446 E. Rosewood St., San Antonio—less than $50,000, for roads, sidewalks, & fencing—by U. S. Engineer Office, San Antonio. 8-7

BROWN CO.—**Ernest Loyd,** Box 1077, Fort Worth—over $100,000, for grading & drainage—by U. S. Engineer Office, San Antonio. 8-26

COOKE CO.—**L. J. Miles Construction Co.,** 1901 Ft. Worth National Bank Bldg., Fort Worth—over $100,000, for training aids, roads & drainage—by U. S. Engineer Office, Denison. 8-21

DALLAS CO.—**Texas Bitulithic Co.,** P. O. Box 5297, Dallas—over $50,000, for grading, paving and culverts—by U. S. Engineer Office, Denison. 8-1

DALLAS CO.—**Uvalde Construction Co.,** Dallas—less than $50,000, for streets, walks, and drains—by U. S. Engineer Office, Denison. 8-4

PALO PINTO CO.—**Southern States Construction Co.,** Houston—less than $50,000, for roads and walks—by U. S. Engineer Office, San Antonio. 8-13

REEVES CO.—**Uvalde Construction Co.,** 920 Santa Fe Bldg., Dallas—over $100,000, for surfacing roads—by U. S. Engineer Office, Albuquerque, N. Mex. 8-27

TAYLOR CO.—**W. G. Drummond Construction Co.,** View—less than $50,000, for roads & walks—by U. S. Engineer Office, San Antonio. 8-26

TAYLOR CO.—**Southern States Construction Co.,** Houston—less than $50,000 for const. of roads—by U. S. Engineer Office, San Antonio. 8-1

Utah

DAVIS CO.—**Young & Smith Construction Co.,** 1678 Browning Ave., Salt Lake City—$11,722 for 0.1 mi. of 2½-in. roadmix bitum. surf. at main entrance to Ogden arsenal—by State Road Commission, Salt Lake City. 8-7

TOOELE CO.—**Carl E. Nelson,** Box 397, Logan—$297,950, for 8.2 mi. plantmix bitum. surf. road, betw. Knolls & Wendover—by State Road Commission, Salt Lake City. 8-10

UTAH CO.—**Olof Nelson Construction Co.,** Logan—$148,493 for conc. pave and natural rock asph. surf. betw. Provo and Orem—by State Road Commission, Salt Lake City. 8-18

WEBER CO.—**W. W. Clyde Co.,** Springville—over $100,000—

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It's an old American custom—the business of throwing things on the scrap pile. But today America needs every piece of construction equipment that can be turned out of our plants. You can do your part, and a plenty important part, by making sure that you get the last ounce of work out of the equipment you have.

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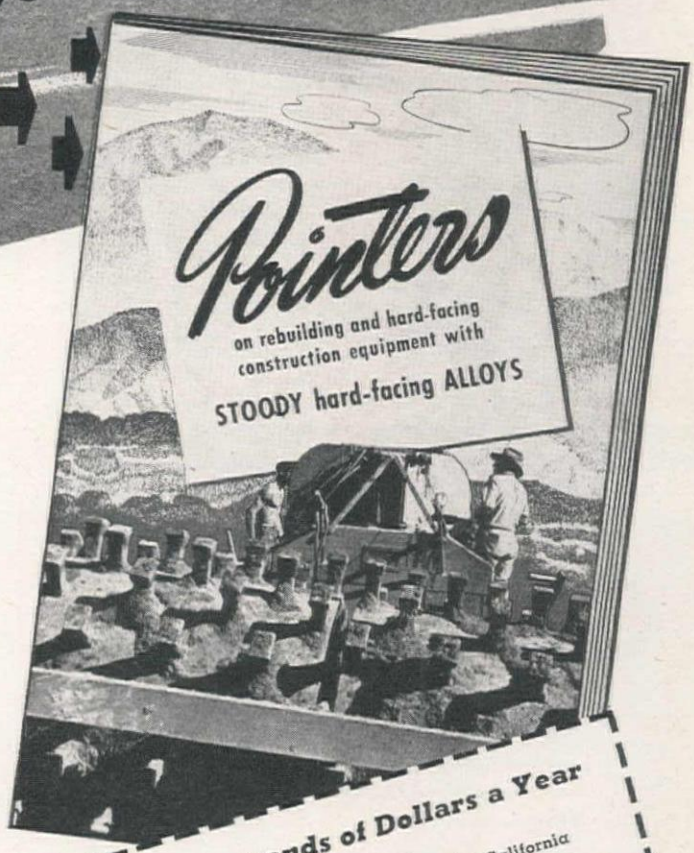

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for roads in combat equipment storage area—by U. S. Engineer Office, Salt Lake City. 8-19

WEBER CO.—**Gibbons & Reed Co.,** 259 W. 3rd St., S., Salt Lake City—over $100,000 for surf. roads—by U. S. Engineer Office, Salt Lake City. 8-11

Washington

CLARK CO.—**Kuckenberg Construction Co.,** 11104 NE Holman St., Portland, Ore.—$68,386 for 1.1 mi. grading and paving on access road to Kaiser shipyards at Vancouver—by Director of Highways, Olympia. 8-11

FRANKLIN CO.—**George C. Ensminger,** Box 678, Walla Walla—$32,666, for 2 mi. grading and roadmix bitum. surf. on access roads to Pasco naval base—by Director of Highways, Olympia. 8-13

KING CO.—**A. W. Johnson, Inc.** and **Goetz & Brennan,** 914 Seaboard Bldg., Seattle—over $50,000 for grading and surfacing roads—by U. S. Engineer Office, Seattle. 8-11

KING CO.—**Tony Romano,** 1833 Dearborn St., Seattle—$40,762 for removing car tracks repairing roadway on First Ave. btw. Denny Way and Atlantic St., Seattle—by Board of Public Works, Seattle. 8-14

LINCOLN CO.—**L. A. Woodward Co.,** Missoula, Mont.—$259,404 for grade, surf. and structures on relocation of Lincoln County road betw. Creston and Ft. Spokane—by Bureau of Reclamation, Coulee Dam. 8-13

PACIFIC CO.—**T. W. Thomas,** Portland, Oregon—$106,444 for clear, grade, drain and surf. 4.8 mi. state road 12 and secondary highway 13-A, Skinville cutoff to Chinook River, and Raymond west—by Director of Highways, Olympia. 8-26

PEND OREILLE CO.—**Carbon Bros.,** 3430 N. Cook St., Spokane—$51,815 for surf. on 3.4 mi. of State Highway No. 6, Cusick north—by Director of Highways, Olympia. 8-19

PEND OREILLE CO.—**Carbon Bros.,** 3430 N. Cook St., Spokane—$54,974 for stockpiling and bitum. surf. on 8.1 mi. of State Highway No. 6, betw. Blueslide and Tiger—by Director of Highways, Olympia. 8-19

SPOKANE CO.—**J. H. Collins & Co.,** Walla Walla—over $100,000, for conc. paving—by U. S. Engineer Office, Seattle. 8-31

SPOKANE CO.—**Erickson & Goulter,** Box 166, Spokane—less than $50,000, for grading & drainage structures on a road—by U. S. Engineer Office, Seattle. 8-19

Territories

ALASKA—**A. C. Kreidler,** Ketchikan—$47,988 for filling and paving 1600 ft. of Tongass Ave.—by City Council, Ketchikan. 8-17

Central America

UNANNOUNCED—**Foundation Co.,** New York City, N. Y.—over $100,000 for one section of the Pan American Highway—by Pan American highway project, Los Angeles, Calif. 8-31

UNANNOUNCED—**Lindgren & Swinerton, Inc., and Associates,** 605 W. Olympic Blvd., Los Angeles, Calif.—for one section of the Pan American Highway—by Pan American highway project, Los Angeles, Calif. 8-31

UNANNOUNCED—**Martin Wunderlich Co.,** 219 E. High St., Jefferson City, Missouri—for one section of the Pan American highway—by Pan American highway project, Los Angeles, Calif. 8-31

PROPOSED PROJECTS

Arizona

GREENLEE CO.—All bids received for grading, draining and aggr. base course from approx. 1 mi. to 3 mi. southeast of Clifton, on the Duncan-Clifton Highway, have been rejected by State Highway Commission, Phoenix. 8-3

California

LOS ANGELES CO.—Bids have been rejected for grade, & surf. Tweedy Blvd., & Hildreth Ave., by South Gate City Council, South Gate. 8-12

Idaho

LATAH CO.—Commissioner of Public Works, Boise, rejected only bid received for 12.5 mi. crushed rock surf. on Moscow-Bovill Hwy., betw. Troy & Deary. 8-31

GOODING & CAMAS COS.—Commissioner of Public Works, Boise, rejected only bid received for 16.2 mi. crushed gravel surf. on Gooding-Fairfield Hwy., betw. Selby & the summit. 8-31

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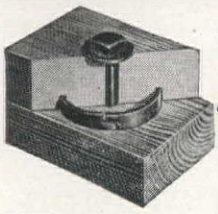

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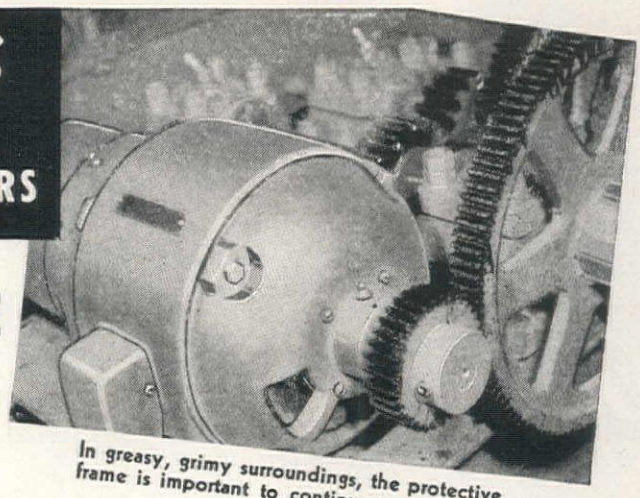

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TRI/CLAD MOTORS ARE EXTRA-TOUGH!

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NOW more than ever, you must be sure that the motors you buy will give you 24-hour operation, even on the *tough* jobs. Here's where the Tri-Clad motor becomes a real asset. Its cast-iron frame and end shields are a safeguard against accidental blows—they shield the motor from falling objects and dripping liquids. The stator winding, of Formex wire, is proof against damage from oil, moisture, and heat shock. Improved bearings are easily lubricated, and are sealed against the entry of dust or dirt by complete enclosure in cast iron. Tri-Clad motors are now available to 100 hp in standard, open construction. Ask your G-E representative about other types and sizes. *General Electric, Schenectady, N. Y.*

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GENERAL ELECTRIC

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LEWIS CO.—Commissioner of Public Works, received no bids for 10.8 mi. cr. rock surf. on Nez Perce Hwy., betw. Craigmont & Nez Perce. 8-31

Montana

LINCOLN CO.—State Highway Commission, Helena, Mont., rejected only bid received for 6.8 mi. selected borrow matl. & crushed gravel surf., and roadmix surf. on Sec. C. of Kalispell-Libby Rd. 8-3

Nevada

CLARK CO.—Dept. of Highways, Carson City, rejected only bid submitted for paving 5.6 mi. betw. junction with Route 93 and Three Kids mine. 8-12

New Mexico

EDDY CO.—State Hwy. Commission, Santa Fe, has rejected only bid for 5.3 mi. grading and oil processing, a timber bridge, and misc. const. on State Hwy. 206, betw. Loving & potash mines. 8-31

Washington

CLALLAM CO.—No bids were received by Director of Highways, Olympia, for 14.7 mi. reinf. existing roadbed with selected roadway borrow, & const. steel girder bridge, on State Hwy. No. 9-A, Twin to Clallam Bay Junction. 8-6

CLARK CO.—Federal Works Agency announced presidential approval of two sections of access road known as Grand Avenue from city limits south to 16th St., and 10th to 6th St., in East Vancouver. Estimated cost is $79,000. 8-10

OKANOGAN CO.—Director of Highways, Olympia, received no bids for 41.6 mi. of nonskid seal coat on Hwy. No. 4 betw. Tonasket and Republic. 8-19

SPOKANE CO.—Director of Highways, Olympia, rejected the lone bid for bitum. surf. on 1.5 mi. of Graves Rd., and 2.7 mi. of Crestline Rd., near Spokane. 8-19

Bridge & Grade Separation...

CONTRACTS AWARDED

California

LOS ANGELES CO.—**E. G. Perham,** 1128 Stearns Drive, Los Angeles—$9,896, for timber bridge on Compton Blvd., over Dominguez Channel—by County Board of Supervisors, Los Angeles. 8-5

LOS ANGELES CO.—**E. G. Perham,** 1128 Stearns Dr., Los Angeles—$17,093 for timber bridge across Los Cerritos flood control channel, 6 mi. E. of Long Beach—by California Division of Highways, Los Angeles. 8-6

SAN DIEGO CO.—**Ralph A. Bell,** Box 44, Eureka, $341,499, for timber, conc. and struc. steel bridge across boat channel in San Diego—by California Division of Highways, Los Angeles. 8-3

SOLANO CO.—**Trewhitt, Shields & Fisher,** 1501 Pacific Southwest Bldg., Fresno—$247,865, for repairs to bridge across Napa River at west city limits of Vallejo and const. new conc. deck for same—by California Division of Highways, Sacramento. 8-17

PROPOSED PROJECTS

Idaho

CASSIA & MINIDOKA COS.—Commissioner of Public Works, Boise, received no bids for 839-ft. timber bridge across Snake River & approaches, on the Burley-Paul Rd. 8-24

New Mexico

EDDY CO.—State Highway Commission, Santa Fe, has rejected only bid received for 30-25 ft. span conc. & treated timber bridge, 0.14 mi. long, on State Hwy. 206 betw. Loving & potash mines. 8-31

Airport . . .

CONTRACTS AWARDED

Arizona

GILA CO.—**Arizona Constructors,** 312 Luhrs Bldg., Phoenix

—less than $5,000,000, for landing mats at auxiliary fields 3, 4, & 5—by U. S. Engineer Office, Marana. 8-26

MARICOPA CO.—**Arthur Pinner, Jr.,** 116 W. 94th St., Los Angeles—over $100,000, for taxiways, runways, apron, hardstandings, and gunnery targets at a gunnery range—by U. S. Engineer Office, Los Angeles. 5-25

MOHAVE CO.—**Morrison-Knudsen Co., Inc.,** Boise, Idaho, and **M. H. Hasler,** Box 109, Kingman—for a landing field at a gunnery school—by U. S. Engineer Office, Los Angeles, Calif. 8-18

PIMA CO.—**Arizona Constructors,** Luhrs Bldg., Phoenix—over $1,000,000, for conc. landing mats at a basic flying school—by U. S. Engineer Office, Los Angeles, Calif. 8-3

PIMA CO.—**Arizona Constructors,** Luhrs Bldg., Phoenix—over $1,000,000 for taxiways, apron, and runways—by U. S. Engineer Office, Los Angeles, Calif. 8-31

PIMA CO.—**J. B. Morrison Construction Co.,** 1533 W. Willetta St., Phoenix—over $100,000, for auxiliary landing field and target at a gunnery range—by U. S. Engineer Office, Los Angeles, California. 8-27

PIMA CO.—**Pearson & Dickerson, Oswald Bros.,** and **J. A. Casson Co.,** Box 1464, Phoenix—over $100,000 for extending and addtl. taxiways at an airfield—by U. S. Engineer Office, Phoenix. 8-12

PIMA CO.—**M. M. Sundt Construction Co.,** and **L. M. White Contracting Co.,** Box 2592, Tucson—over $100,000, for hospital group at a basic flying school—by U. S. Engineer Office, Los Angeles. 8-26

PIMA CO.—**Tiffany Construction Co.,** Box 846, Phoenix—over $100,000, for taxiways, runways, apron, hardstandings, and gunnery targets at a gunnery range—by U. S. Engineer Office, Los Angeles. 8-25

YUMA CO.—**Tanner Construction Co.,** Box 1832, Phoenix—over $500,000, for landing mat and appurt. facil. at an advanced twin-engine school—by U. S. Engineer Office, Los Angeles, Calif. 8-6

California

BUTTE CO.—**Fredericksen & Westbrook,** 212 13th St., Sacramento—over $100,000 for runways, apron, taxiways, and hardstandings—by U. S. Engineer Office, Sacramento. 8-24

MERCED CO.—**Guerin Bros.,** 208 S. Linden Ave., So. San Francisco—$332,080, for surf. runways, etc., at Merced Airport —by Treasury Department, San Francisco. 8-19

MERCED CO.—**Guerin Bros.,** 208 S. Linden Ave., South San Francisco—$141,062, for clearing, grading, etc., on site of Merced Airport—by Treasury Department, San Francisco. 8-19

MERCED CO.—**Union Paving Co.,** 310 California St., San Francisco—over $100,000 for paving taxiways—by U. S. Engineer Office, Sacramento. 8-8

MONTEREY CO.—**J. A. Casson,** 22105 Meekland Ave., Hayward, and **N. M. Ball Sons,** Box 404, Berkeley—over $1,000,000 for grade and surf. runways, apron, and taxiways at an airport —by U. S. Engineer Office, San Francisco. 8-14

MONTEREY CO.—**Walter J. Wilkinson & H. B. Scott,** Bin 900, Watsonville—for taxiways and hardstanding areas, at an air support command base—by U. S. Engineer Office, San Francisco. 8-19

RIVERSIDE CO.—**Oberg Bros., Oscar Oberg, & Nathan Moore,** 3914 W. Slauson Ave., Los Angeles—over $500,000, for landing field & street system at an air support command base—by U. S. Engineer Office, Los Angeles. 8-27

SACRAMENTO CO.—**J. R. Reeves,** Box 1072, Sacramento—over $50,000, for taxiways, runways, aprons, & hardstandings—by U. S. Engineer Office, Sacramento. 8-14

SAN BERNARDINO CO.—**Osborn Co.,** Rt. 1, Box 624, Pasadena—less than $500,000, for resurf. runways & taxiways at an army flying school—by U. S. Engineer Office, Los Angeles. 9-1

SAN LUIS OBISPO CO.—**Doudell Construction Co.,** Box 488, San Jose—over $500,000 for runways at an air support command base—by U. S. Engineer Office, San Francisco. 9-1

Colorado

DENVER CO.—**Blanchard Bros. Co.,** Cheyenne, Wyo.—over $100,000 for grading—by U. S. Engineer Office, Omaha, Nebraska. 8-3

Idaho

BANNOCK CO.—**Morrison-Knudsen Co., Inc.,** and **Triangle Construction Co.,** Boise—over $500,000 for bitum. surf. on taxiways, runways, and apron—by U. S. Engineer Office, Portland, Ore. 8-7

Montana

FERGUS CO.—**S. Birch & Sons Construction Co.,** 314 Ford Bldg., Great Falls—over $1,000,000, for excavating, grading, const. drainage facil., paving & boundary fence—by U. S. Engineer Office, Fort Peck. 8-11

GLACIER CO.—**Frank J. Haas,** 512 - 9th Street, N. W., Great Falls—over $1,000,000, for excavating, grading, constructing drainage facil., paving & boundary fence—by U. S. Engineer Office, Fort Peck. 8-11

VALLEY CO.—**Inland Construction Co.,** 3867 Leavenworth St., Omaha, Nebraska—over $1,000,000, for excavating, grading, constructing drainage facil., paving & boundary fence—by U. S. Engineer Office, Fort Peck. 8-11

Nevada

CLARK CO.—**Gibbons & Reed** and **J. C. Compton Co.,** 259 W. 3rd St., South, Salt Lake City, Utah—over $500,000 for runways, taxiways & hardstandings at an auxiliary landing field—by U. S. Engineer Office, Los Angeles, Calif. 8-4

CLARK CO.—**Frank Pinkerton,** 108 Southwest Blvd., Corona, Calif.—over $100,000, for const. of auxiliary landing field and bldgs., at a camp—by U. S. Engineer Office, Los Angeles, Calif. 8-10

Oregon

MARION CO.—**Natt McDougall Co.,** 552 Sherlock Bldg., Portland—over $100,000 for taxiways, apron, and appurt. at an air corps support command base—by U. S. Engineer Office, Portland. 8-14

Texas

BEXAR CO.—**R. W. Briggs & Co.** and **M. B. Killian,** Box 1981, San Antonio—over $100,000, for apron extension—by U. S. Engineer Office, San Antonio. 8-26

BEXAR CO.—**R. W. Briggs & Co.,** and **M. B. Killian,** Box 1981, San Antonio—over $1,000,000, for runways, taxiways and apron—by U. S. Engineer Office, San Antonio. 8-10

BEXAR CO.—**Hays & Donathan,** Houston—over $50,000, for electric distribution system, taxiways & aprons, roads, sidewalks, etc.—by U. S. Engineer Office, San Antonio. 8-11

BEXAR CO.—**Jack Skelton,** San Antonio—over $100,000, for streets & hardstandings at an airport—by U. S. Engineer Office, San Antonio. 8-18

CAMERON CO.—**R. W. Briggs & Co.,** and **E. B. Darby,** Box 1981, San Antonio—over $100,000, for grading, paving and drainage—by U. S. Engineer Office, Galveston. 8-12

HUNT CO.—**Gray & Gravelle** and **Smith Bros.,** 733 Hightower Bldg., Oklahoma City, Oklahoma—over $500,000, for drainage and grading—by U. S. Engineer Office, Denison. 8-13

TRAVIS CO.—**Gulf Bitulithic Co.,** and **Texas Bitulithic Co.,** Box 5297, Houston—over $1,000,000, for runways, taxiways, conc. aprons, storm sewers and drainage—by U. S. Engineer Office, Galveston. 8-3

Washington

SPOKANE CO.—**J. H. Collins & Co.,** Colville—over $100,000 for extensions to runways and taxiways—by U. S. Engineer Office, Seattle.

Canada

BRITISH COLUMBIA—**E. G. Baynes,** 1010 Seymour St., Vancouver—$120,000, for instal. & provision of ground services at the R.C.A.F. station at Jericho Beach—by Department of Munitions & Supply, Ottawa. 8-30

PROPOSED PROJECTS

California

RIVERSIDE CO.—The War Department has announced authorization for an air force installation, to cost in excess of $4,000,000. 8-22

Water Supply . . .

CONTRACTS AWARDED

Arizona

MARICOPA CO.—**Roscoe Moss Co.,** 4360 Worth St., Los Angeles, Calif.—less than $50,000 for drilling, casing & developing a water well at an airfield—by U. S. Engineer Office, Los Angeles, Calif. 8-4

PINAL CO.—**Roscoe Moss Co.,** 4360 Worth St., Los Angeles, Calif.—less than $50,000 for drilling and developing 2 water wells to a depth of 400 ft.—by U. S. Engineer Office, Los Angeles. 8-15

YUMA CO.—**Roscoe Moss Co.,** 4360 Worth St., Los Angeles, Calif.—less than $50,000, for drilling water well No. 2, at an advanced twin engine school—by U. S. Engineer Office, Los Angeles, Calif. 8-21

California

MARIN CO.—**M. J. Lynch,** Barneveld & Oakdale Ave., San Francisco—$83,131, for 12-in. cast iron pipe line from Ross Reservoir to Sausalito for water system—by Federal Works Agency, San Francisco. 9-1

ORANGE CO.—**Hood Construction Co.,** 3326 E. Florence Ave., Huntington Park—less than $50,000, for water and sewer lines at an airport—by U. S. Engineer Office, Los Angeles. 8-11

RIVERSIDE CO.—**Roscoe Moss Co.,** 4360 Worth St., Los Angeles—less than $3,500 for drilling water well at an air support command base—by U. S. Engineer Office, Los Angeles. 8-10

INYO CO.—**Werner & Webb,** 1116 N. Mansfield Ave., Los Angeles—over $50,000, for water & sewer systems at an airport —by U. S. Engineer Office, Los Angeles. 8-27

KERN CO.—**Roscoe Moss Co.,** 4360 Worth St., Los Angeles —less than $50,000, for drilling a water well—by U. S. Engineer Office, Los Angeles. 8-18

KERN CO.—**Edward R. Siple Co.,** 2545 San Fernando Rd., Los Angeles—less than $50,000, for water distribution & sewer system, by U. S. Engineer Office, Los Angeles. 8-1

SACRAMENTO CO.—**Walter L. Kirchgater,** 3992 14th Ave., Sacramento—less than $50,000 for drilling and proving water wells—by U. S. Engineer Office, Sacramento. 8-7

SAN BERNARDINO CO.—**E. W. Brockman,** 918 W. 6th St., Corona—less than $50,000, for drilling, casing & developing a water well at a municipal airport—by U. S. Engineer Office, Los Angeles. 8-7

SAN BERNARDINO CO.—**MacIsaac & Menke,** 3440 E. 22nd St., Los Angeles—for water treatment plant at the site of the steel mill in Fontana—by Kaiser Co., Inc., Oakland. 8-5

SAN BERNARDINO CO.—**Roscoe Moss Co.,** 4360 Worth St., Los Angeles—less than $50,000, for drilling of an addtl. well at a modification center—by U. S. Engineer Office, Los Angeles. 9-1

SAN FRANCISCO CO.—**Macnsons,** San Francisco—less than $50,000, for water and sewer lines—by U. S. Engineer Office, San Francisco. 8-12

SAN JOAQUIN CO.—**Food Machinery Corp.,** 217 W. Julian St., San Jose—less than $50,000, for water supply system & wells —by U. S. Engineer Office, Sacramento. 8-11

SAN LUIS OBISPO CO.—**Smees Plumbing & Heating Co.,** 717 Higuera St., San Luis Obispo—$52,000, for water supply pipeline and appurt. for water system at San Luis Obispo—by Defense Public Works, Los Angeles. 8-20

SOLANO CO.—**D. W. Nicholson Corp.,** 1701 San Leandro Blvd., San Leandro, and **John J. Moore Co.,** 354 Hobart St., Oakland—over $100,000 for addtl. water distribution facil. at an arsenal—by U. S. Engineer Office, San Francisco. 8-15

TULARE CO.—**Andrew A. Pollia,** 105 18th Ave., San Francisco—less than $50,000 for water, gasoline and waste water disposal systems—by U. S. Engineer Office, Sacramento. 8-7

Colorado

PUEBLO CO.—**Burt & Binford Contractors,** 507 N. 2nd St., Hutchinson, Kansas—over $50,000, for water supply & storage facil.—by U. S. Engineer Office, Denver. 8-18

PUEBLO CO.—**Driscoll Construction Co.,** Pueblo—less than $50,000 for water and sewage disposal installations—by U. S. Engineer Office, Denver. 8-18

Idaho

ADA CO.—**John Cowe,** Boise—$3,000, for drilling a well—by U. S. Engineer Office, Portland, Oregon. 8-26

ADA CO.—**John Cowe, Boise**—less than $50,000, for drilling a well—by U. S. Engineer Office, Portland, Oregon. 8-11

ADA CO.—**Intermountain Plumbing & Heating Co.,** Boise—$2,200 for water and sewer systems—by U. S. Engineer Office, Portland, Oregon. 8-28

Montana

FERGUS CO.—**W. P. Roscoe Co.,** Box 633, Billings—over $50,000, for water distribution & sewage collection systems—by U. S. Engineer Office, Fort Peck. 8-15

GLACIER CO.—**Glacier Construction Co.,** Cut Bank,—less than $50,000, for water distribution system—by U. S. Engineer Office, Fort Peck. 8-15

GLACIER CO.—**Walter A. Hale,** Cut Bank—less than $50,000 —for drilling water well—by U. S. Engineer Office, Fort Peck. 8-15

VALLEY CO.—**Glacier Construction Co.,** Cut Bank—over $50,000 for water distribution and sanitary sewer systems—by U. S. Engineer Office, Ft. Peck. 8-24

New Mexico

CURRY CO.—**R. I. Willson,** Roswell—less than $50,000, for water supply wells—by U. S. Engineer Office, Albuquerque. 8-15

SAN MIGUEL CO.—**M. M. Sundt Construction Co.,** 440 S. Park St., Tucson, Ariz.—over $50,000 for water, electric and sewage systems—by U. S. Engineer Office, Albuquerque. 8-8

Oregon

BENTON CO.—**B. H. Sheldon,** Corvallis—over $100,000, for water and sewer systems—by U. S. Engineer Office, Portland. 8-8

MORROW CO.—**A. A. Durand & Son,** Walla Walla, Wash.—less than $50,000, for drilling well—by U. S. Engineer Office, Portland. 8-13

Texas

BELL CO.—**Hays & Donathan,** Houston—less than $50,000 for water and sewage systems—by U. S. Engineer Office, San Antonio. 8-6

BROWN CO.—**J. E. Dickey,** Box 296, San Antonio—less than $50,000 for water and sewage systems—by U. S. Engineer Office, San Antonio 8-6

CHILDRESS CO.—**Lippert Bros.,** 827 Monona St., Boone, Iowa—over $100,000 for water storage and pumping plant and sewage plant—by U. S. Engineer Office, Denison. 8-6

COOKE CO.—**Cunningham & Wingrove,** Fort Worth—over $50,000, for water storage and pumping plant—by U. S. Engineer Office, Denison. 8-29

COOKE CO.—**Sherman & Everett, Associated,** Houston—over $50,000, for water and sewage systems—by U. S. Engineer Office, Denison. 8-13

DALLAS CO.—**Parrott-Oldt Co.,** Dallas—under $50,000, for water and sewage systems—by U. S. Engineer Office, Denison.

JOHNSON CO.—**Wiegand Bros. Drilling Co.,** San Antonio—less than $50,000, for water well—by U. S. Engineer Office, San Antonio. 8-13

PALO PINTO CO.—**M. F. Fischer & Son,** San Antonio—less than $50,000, for water and sewage systems—by U. S. Engineer Office, San Antonio. 8-18

REEVES CO.—**Smith Contracting Co.,** Odessa—less than $50,000, for extension of city water line—by U. S. Engineer Office, Albuquerque, N. M. 8-1

TAYLOR CO.—**T. S. Armstrong** and **J. Lucian Webb,** Abilene —less than $50,000, for water and sewage facil.—by U. S. Engineer Office, San Antonio. 8-12

TAYLOR CO.—**David Vickers Co.,** Sweetwater—over $50,000 for water and sewage systems—by U. S. Engineer Office, San Antonio. 8-13

WARD CO.—**Bill Purcell,** Monahans—less than $50,000, for water supply wells—by U. S. Engineer Office, Albuquerque, New Mexico. 8-13

Washington

GRANT CO.—**R. S. McClintock,** 418 W. Second Ave., Spokane—less than $50,000, for a water supply well—by U. S. Engineer Office, Seattle. 8-31

KING CO.—**Oak Sheet Metal Works** and **J. R. Dunden,** Oak Harbor—over $100,000 for construction and completion of a water system—by U. S. Engineer Office, Seattle. 8-11

KITSAP CO.—**Valley Construction Co.,** 4354 Henderson St., Seattle—$245,000 for 18,500 ft. of 24-in. water main in West Bremerton—by City Council, Bremerton. 8-8

SPOKANE CO.—**Henry Hagman,** Spokane—over $100,000 for water storage tanks—by U. S. Engineer Office, Seattle. 8-19

SPOKANE CO.—**R. L. Moss & Co.,** Zenith—over $100,000, for a water distribution system—by U. S. Engineer Office, Seattle. 8-24

Sewerage . . .

CONTRACTS AWARDED

California

ALAMEDA CO.—**Ben C. Gerwick, Inc.,** 112 Market St., San Francisco—less than $50,000 for sewer protective structure in the San Francisco Bay area—by U. S. Engineer Office, San Francisco. 8-14

ALAMEDA CO.—**John Pestana,** 4039 Fruitvale Ave., Oakland (Sched. A), and **McGuire & Hester,** 796 66th Ave., Oakland (Sched. B)—$9,199 (A) and $2,422 (B) for drainage structures in Jones Ave., Ashton Ave., and other streets in Oakland—by City Council, Oakland. 8-14

KERN CO.—**Stroud Bros.,** 1500 Union Ave., Bakersfield—$3,226, for conc. pipe sanitary sewer along 23rd St., betw. "O" and "S" Streets in Bakersfield—by City Clerk, Bakersfield. 8-5

LOS ANGELES CO.—**City of Glendale**—less than $50,000, for installing 500 gpm. sewage plant and appurt. at an airport—by U. S. Engineer Office, Los Angeles. 8-13

MARIN CO.—**Paul C. Gibson,** 372 Velarde St., Mountain View—less than $50,000, for sanitary sewer system—by U. S. Engineer Office, San Francisco. 8-21

MARIN CO.—**Peter Sorensen,** 919 Arguello St., Redwood City—over $100,000 for addtl. drainage facil. at an air base—by U. S. Engineer Office, San Francisco. 8-31

MONTEREY CO.—**Oakland Sewer Construction Co.,** 9915 Walnut St., Oakland—$194,139, for sewage collection system—by Alisal Sanitary Board, Salinas. 8-15

MONTEREY CO.—**John Pestana,** 4039 Fruitvale Ave., Oakland—less than $50,000, for trunk line sanitary sewer—by U. S. Engineer Office, San Francisco. 8-10

NAPA CO.—**Helwig Construction Co.,** 115 South Main St., Sebastopol—6 contracts totaling $11,617, for vitrified sewers in streets of the Spencer District, Napa—by City Council, Napa. 8-5

RIVERSIDE CO.—**G. E. Kerns,** 3712 Gaviota Ave., Long Beach—over $100,000 for sewage treatment plant and outfall sewer at a general hospital (contract originally awarded to Griffith Co.)—by U. S. Engineer Office, Los Angeles. 8-14

RIVERSIDE CO.—**Pacific Pipeline Construction Co.,** 3732 Juniper St., Los Angeles—over $500,000, for sewer, water and sewage disposal systems—by U. S. Engineer Office, Los Angeles. 8-3

SAN BERNARDINO CO.—**Henry Gonzalez,** 819 S. Central Ave., Chino—$21,000 (approx.), for sewage treatment plant in Ontario—by Cal-Aero Academy, Glendale. 8-26

SAN BERNARDINO CO.—**MacIsaac & Menke,** 3440 E. 22nd St., Los Angeles—for sewage, electrical, cooling, etc., systems at Fontana steel mill—by Kaiser Co., Oakland. 8-20

SAN DIEGO CO.—**J. S. Barrett,** 455 Spreckels Bldg., San Diego—$314,133, for 4 mi. of sanitary sewer in 11th St., San Diego—by City Council, San Diego. 8-15

SOLANO CO.—**Campbell Construction Co., D. W. Nicholson Corp.,** and **J. J. Moore,** 1701 San Leandro Blvd., San Leandro—less than $50,000 for addtl. drainage facil. at an arsenal—by U. S. Engineer Office, San Francisco. 8-31

UNANNOUNCED CO.—**McGuire & Hester,** 796 - 66th Ave., Oakland—for sewage collection and water distribution systems in the San Francisco Bay area—by U. S. Engineer Office, San Francisco. 8-25

Montana

GLACIER CO.—**Frank J. Haas,** 512 - 9th St., Great Falls—

less than $50,000, for sewage collection system—by U. S. Engineer Office, Fort Peck. 8-15

New Mexico

SAN MIGUEL CO.—**M. M. Sundt Construction Co.,** Tucson, Ariz.—over $100,000, for sanitary sewers and sewage disposal plant—by U. S. Engineer Office, Albuquerque. 8-7

Texas

BEXAR CO.—**F. M. Reising Construction Co.,** Edinburg—over $100,000, for a drainage system—by U. S. Engineer Office, San Antonio. 8-27

BEXAR CO.—**Luther A. Turner,** Kyle—over $100,000, for conc. storm drain—by U. S. Engineer Office, San Antonio. 8-20

HAYS CO.—**J. H. Blackmore & Sons,** Austin—over $100,000, for surf. storage reservoir and sewage disposal system—by U. S. Engineer Office, San Antonio. 8-29

VAL VERDE CO.—**Williams & Whittle, Inc.,** and **Williams & Broughton, Inc.,** Dallas—over $100,000, for storm sewers—by U. S. Engineer Office, San Antonio. 8-13

Washington

KING CO.—**L. Coluccio,** 512 - 21st South, Seattle—over $50,000, for sewers and sewage pumping station—by U. S. Engineer Office, Seattle. 8-24

KING CO.—**Nelse Mortensen & Co.,** 1021 Westlake No., Seattle—less than $50,000, for sanitary facil.—by U. S. Engineer Office, Seattle. 8-31

KING CO.—**Superior Construction Co.,** 3821 - 36th Ave., S.W., Seattle—over $50,000, for a sewer system—by U. S. Engineer Office, Seattle. 8-11

KING CO.—**C. V. Wilder Co.,** 2006 State St., Bellingham—$109,950, for a municipal sewage treatment plant at Kirkland—by City Council, Kirkland. 8-10

SNOHOMISH CO.—**Chisholm & Eiford,** Box 64, Bellingham—over $50,000, for a sewer system—by U. S. Engineer Office, Seattle. 8-19

Waterway Improvement...

CONTRACTS AWARDED

California

LOS ANGELES CO.—**Los Angeles County Flood Control District,** 751 S. Figueroa St., Los Angeles—$176,410, for design and const. of the Burbank-Western Channel—by U. S. Engineer Office, Los Angeles. 8-5

SACRAMENTO CO.—**Hemstreet and Bell,** 12th and "F" Streets, Marysville—for furnishing and delivering riprap at various places along the Sacramento River—by U. S. Engineer Office, Sacramento. 8-20

SAN FRANCISCO CO.—**Barrett & Hilp,** 918 Harrison St., San Francisco—$4,038,120, for addtl. drydock and other facil. at Hunters Point—by Bureau of Yards & Docks, Washington, D. C. 8-24.

YUBA CO.—**Piombo Bros.,** 1517 Turk St., San Francisco—over $100,000, for north levee, Yuba River, from "D" Street bridge to Valley Meat Co.; and north levee, City of Marysville, from Valley Meat Co., to Western Pacific R. R.—by U. S. Engineer Office, Sacramento. 8-3

Oregon

WASCO CO.—**S. S. Montague,** Rt. 8, Box 1821, Portland—$40,000, for floating fender guide wall at The Dalles-Celilo canal, 11 mi. east of The Dalles—by U. S. Engineer Office, Portland. 8-18

Washington

CLATSOP CO.—**John Helstrom,** Astoria—$25,000, for rebuilding 450-ft. segment of dock, incl. piling and deck—by Port Commission, Astoria. 8-14

PIERCE CO.—**Hart Construction Co., Inc.,** Box 1096, Tacoma—$44,618, for a ferry slip and approach trestle, and reconstructing cradle and dolphins, on Primary State Hwy. No. 14, Tacoma Narrows Ferry, Point Fosdick Terminal—by Director of Highways, Olympia. 8-6

Dam . . .

CONTRACTS AWARDED

California

SHASTA CO.—**Atkinson-Kier Construction Co.,** 662 Russ Bldg., San Francisco—$1,492,946, for second step of construction of Keswick Dam, near Redding—by Dept. of Interior, Washington, D. C. 8-14

Tunnel . . .

CONTRACTS AWARDED

Mexico

STATE OF PUEBLA—**Rosoff Subway Construction Co.,** 50 E. 42nd St., New York City—$4,627,000, for a 7-mi. water tunnel near the City of Puebla, 100 miles south and east of the City of Mexico—by Mexican Irrigation Commission, Mexico City. 8-4

Building . . .

CONTRACTS AWARDED

Arizona

COCHISE CO.—**Ed. F. Bridgeman,** 1728 N. 8th St., Albuquerque, New Mexico—less than $200,000, for housing and facil. at a cantonment—by U. S. Engineer Office, Albuquerque, New Mexico. 8-20

MARICOPA CO.—**Central Construction Co.,** Dallas, Texas, and **Thomas Bate & Son,** 2311 - 10th St., Denver, Colorado—$30,000,000, for aluminum extrusion plant near Phoenix—by Defense Plant Corp. 9-1

MARICOPA CO.—**Del E. Webb Construction Co.,** 302 S. 23rd Ave., Phoenix—over $50,000, for 3 ward bldgs. and covered walks at an airfield—by U. S. Engineer Office, Los Angeles. 8-25

MOHAVE CO.—**C. T. & W. P. Stover,** 116 N. Alexander Ave., Claremont, Calif.—$150,000 (approx.), for a yucca processing plant near Kingman—by General Fiber Products Corp., Los Angeles, Calif. 8-28

MOHAVE CO.—**Del E. Webb Construction Co.,** 302 S. 23rd Ave., Phoenix—over $1,000,000, for temporary frame bldgs. at an air force flexible gunnery school—by U. S. Engineer Office, Los Angeles. 8-24

PIMA CO.—**J. F. Sundt and L. M. White,** Box 2592, Tucson—over $100,000, for a group of cantonment type bldgs. at a flying school—by U. S. Area Engineer, Marana. 8-31

PINAL CO.—**E. W. Duhame Construction Co.,** 3719 N. Central Ave., Phoenix—over $100,000, for warehouses and sheds at a reception center—by U. S. Engineer Office, Los Angeles. 8-28

California

CONTRA COSTA CO.—**Standard Building Co.,** 1500 Judah St., San Francisco—over $50,000, for temporary frame bldgs. and facilities—by U. S. Engineer Office, Sacramento. 8-11

IMPERIAL AND KERN CO.—**Vinson & Pringle** and **Del E. Webb Construction Co.,** Box 930, Phoenix, Ariz.—$10,528,000, for addtl. facil. at the Marine Corps air station, Mojave, and the Imperial Valley air operational training station at Salton Sea—by Bureau of Yards & Docks, Washington, D. C. 8-18

KINGS CO.—**C. B. Cameron & Son,** Box 244, Merced—over $100,000, for 30 duplex units defense housing, at a flying field—by U. S. Engineer Office, Sacramento. 8-14

KINGS CO.—**Carl T. Lightner,** 313 C St., Lemoore—$105,000, for a milk condensing plant in Lemoore—by Kings County Creamery Association. 8-25

LOS ANGELES CO.—**D. E. Metzger,** 3045 Gilroy St., Los Angeles—over $50,000, for temporary frame bldgs.—by U. S. Engineer Office, Los Angeles. 8-3

LOS ANGELES CO.—**D. E. Metzger,** 3045 Gilroy St., Los Angeles—over $50,000, for temporary frame bldgs. and electric, water and sewage systems—by U. S. Engineer Office, Los Angeles. 8-25

LOS ANGELES CO.—**J. S. Metzger & Son,** 3045 Gilroy St., Los Angeles — over $50,000, for factory training school and appurt. facil.—by U. S. Engineer Office, Los Angeles. 8-24

LOS ANGELES CO.—**J. S. Metzger & Son,** 3045 Gilroy St., Los Angeles—over $100,000, for bldgs. and util. for factory training school—by U. S. Engineer Office, Los Angeles. 8-27

ORANGE CO.—**Griffith Co.,** 1060 S. Broadway, Los Angeles—over $500,000, for expansion of hospital group at an air force training camp—by U. S. Engineer Office, Los Angeles. 8-19

RIVERSIDE CO.—**Griffith Co.,** 1060 S. Broadway, Los Angeles—over $1,000,000, for bldgs. and utilities at a general hospital group—by U. S. Engineer Office, Los Angeles. 8-4

RIVERSIDE CO.—**J & B Construction Co.,** 5572 Valley Blvd., Los Angeles—over $100,000, for field hospital unit at a general hospital—by U. S. Engineer Office, Los Angeles. 8-25

SAN LUIS OBISPO CO.—**Engineers, Ltd.,** 225 Bush St., San Francisco, and **J. E. Haddock, Ltd.,** 357 E. Foothill Blvd., Pasadena—$13,460,000, for Marine Corps training station at Santa Margarita—by Bureau of Yards and Docks, Washington, D. C. 8-27

SANTA BARBARA CO.—**Gorelnik Co.,** 117 S. Poinsettia Ave., Los Angeles—over $1,000,000, for temporary frame bldgs., and railroad spur—by U. S. Engineer Office, Los Angeles. 8-3

SANTA BARBARA CO.—**Jackson Bros.-Le Sage,** 549 S. Fairfax Ave., Los Angeles—over $500,000, for temporary frame bldgs. and railroad spur—by U. S. Engineer Office, Los Angeles. 8-3

SANTA BARBARA CO.—**Harvey A. Nichols,** 936 E. Slauson Ave., Los Angeles — over $1,000,000, for temporary frame bldgs. and railroad spur—by U. S. Engineer Office, Los Angeles. 8-3

SOLANO CO.—**Barrett & Hilp,** 918 Harrison St., San Francisco—$3,385,563, for addtl. facil. at air depot, hospital, and master radio station, Mare Island—by Bureau of Yards and Docks, Washington, D. C. 8-27

Colorado

DENVER CO.—**H. K. Ferguson Co.,** Hanna Bldg., Cleveland, Ohio—over $100,000, for conc. and steel bldgs.—by U. S. Engineer Office, Denver. 8-18

DENVER CO.—**N. R. Nielsen,** 632 Detroit St., Denver—$100,000 (approx.), for adds. and alterations to power house in Denver—by U. S. Engineer Office, Denver. 8-3

EAGLE CO.—**Brown-Schrepferman & Co.,** 240 Washington St., Denver—over $50,000, for foundation excavation and conc. —by U. S. Engineer Office, Denver. 8-8

EAGLE CO.—**Al Johnson Construction Co.,** and **Leck Construction Co.,** 608 Foshay Tower, Minneapolis, Minn.—over $100,000, for temporary frame bldgs.—by U. S. Engineer Office, Denver. 8-8

EAGLE CO.—**Al Johnson Construction Co.,** and **Leck Construction Co.,** 608 Foshay Tower, Minneapolis, Minn.—over $1,000,000, for temporary frame bldgs.—by U. S. Engineer Office, Denver. 8-8

EAGLE CO.—**Stull Construction Co.,** Glenwood Springs—over $500,000, for temporary frame bldgs.—by U. S. Engineer Office, Denver. 8-8

EAGLE CO.—**Harry G. Worsham & Associates,** 319 Lafayette St., Denver—less than $500,000, for approx. 11 cantonment bldgs.

in the vicinity of Pando—by U. S. Engineer Office, Denver. 8-19

PROWERS CO.—**Lambie, Moss, Little & James,** Box 2008, Amarillo, Texas—over $100,000, for temporary frame bldgs.—by U. S. Engineer Office, Albuquerque, New Mexico. 8-14

PUEBLO CO.—**Lembke-Hearn Construction Co.,** Box 144, Albuquerque, New Mexico—$4,200,000, for warehouses, bldgs. and magazines near Pueblo—by U. S. District Engineer Office, Denver. 8-19

Idaho

ADA CO.—**H. J. McNeel,** Caldwell—over $100,000, for temporary frame bldgs.—by U. S. Engineer Office, Portland, Ore. 8-24

BANNOCK CO.—**Morrison-Knudsen Co., Inc.,** Boise, and **J. W. Brennan,** Pocatello—over $50,000, for temporary frame bldgs.—by U. S. Engineer Office, Portland, Ore. 8-21

Montana

FERGUS CO.—**Askevold & Rund Co.,** Great Falls—over $100,000, for temporary frame bldgs.—by U. S. Engineer Office, Fort Peck. 8-13

GLACIER CO.—**Askevold & Rund Co.,** Great Falls—over $100,000, for temporary frame bldgs.—by U. S. Engineer Office, Fort Peck. 8-13

VALLEY CO.—**McLaughlin Construction Co.,** Livingston—over $100,000, for temporary frame bldgs.—by U. S. Engineer Office, Fort Peck. 8-13

Nevada

MINERAL CO.—**Radich & Brown,** 3000 Empire Ave., Burbank, Calif.—$2,408,000, for addtl. facil. at naval ammunition depot, Hawthorne—by Bureau of Yards and Docks, Washington, D. C.

WASHOE CO.—**MacDonald & Kahn, Inc.,** 200 Financial Center Bldg., San Francisco—over $50,000, for conc. and steel storage facil.—by U. S. Engineer Office, Sacramento, Calif. 8-11

New Mexico

EDDY CO.—**E. S. McKittrick Co.,** 7839 Santa Fe Ave., Huntington Park, Calif.—over $100,000, for temporary frame bldgs., at an air force training school—by U. S. Engineer Office, Albuquerque. 8-20

McKINLEY CO.—**Denison, Martin & Cowart, Albuquerque**—over $50,000, for concrete safety shelters—by U. S. Engineer Office, Albuquerque. 8-8

OTERO CO.—**Neill Singleton,** Box 2130, Amarillo, Texas—over $100,000, for temporary frame bldgs. and electric, water and sewage systems—by U. S. Engineer Office, Albuquerque. 8-29

SANTA FE CO.—**Bradbury & Marchant,** 1217 N. 1st St., Albuquerque—over $1,000,000, for temporary frame bldgs. and steam distribution system—by U. S. Engineer Office, Albuquerque. 8-20

Oregon

BENTON CO.—**MacDonald Building Co.,** 1517 S. Tacoma Way, Tacoma, Wash.—over $100,000, for temporary frame bldgs.—by U. S. Engineer Office, Portland. 8-14

CLATSOP CO.—**Austin Co.,** Dexter Horton Bldg., Seattle, Wash.—$4,091,700, for addtl. facil. at naval air station, Tongue Point; radio station at Astoria; and naval supply depot, Seattle, Wash.—by Bureau of Yards & Docks, Washington, D. C. 8-27

JACKSON CO.—**M. O. Bessonette,** Medford—over $100,000, for temporary frame bldgs.—by U. S. Engineer Office, Portland. 8-14

MULTNOMAH CO.—**Wegman & Son,** 1123 Board of Trade Bldg., Portland—for 3,000 housing units and a school and recreation bldg., in Portland—by U. S. Maritime Commission, Washington, D. C. 8-31

Texas

BELL CO.—**E. F. Crain** and **H. L. McBride,** Dallas—over $50,000, for temporary frame bldgs.—by U. S. Engineer Office, San Antonio. 8-29

BEXAR CO.—**Lee A. Christy,** 503 Builders Exchange Bldg., San Antonio—over $50,000, for temporary frame bldgs.—by U. S. Engineer Office, San Antonio. 8-31

BEXAR CO.—**Wm. G. Farrington,** Houston—over $50,000, for temporary frame housing—by U. S. Engineer Office, San Antonio. 8-10

BEXAR CO.—**Ideal Home Builders,** San Antonio—over $100,000, for temporary frame bldgs.—by U. S. Engineer Office, San Antonio. 8-15

BEXAR CO.—**F. A. Nunnelly,** San Antonio—over $50,000, for temporary frame bldgs.—by U. S. Engineer Office, San Antonio. 8-10

BEXAR CO.—**J. H. Rayburn,** San Antonio—over $50,000, for temporary frame bldgs.—by U. S. Engineer Office, San Antonio. 8-20

BEXAR CO.—**A. E. Rheiner & Co.,** and **A. P. Rheiner & Son,** San Antonio—over $100,000, for addtl. temporary frame bldgs. —by U. S. Engineer Office, San Antonio. 8-1

BROWN CO.—**Rex D. Kitchens Construction Co.,** Austin—over $1,000,000, for temporary frame bldgs.—by U. S. Engineer Office, San Antonio. 8-20

CAMERON CO.—**McGough Brothers,** Bankers Mortgage Bldg., Houston—over $100,000, for temporary frame bldgs.—by U. S. Engineer Office, Galveston. 8-12

CAMERON CO.—**Miller & Rossom,** Kerrville—over $100,000, for temporary frame bldgs.—by U. S. Engineer Office, San Antonio. 8-29

CHILDRESS CO.—**Star Construction** Co., Oklahoma City, Oklahoma—over $50,000, for temporary frame bldgs.—by U. S. Engineer Office, Denison. 8-21

COOKE CO.—**Robert E. McKee,** Box 217, El Paso—over $100,000, for temporary frame bldgs.—by U. S. Engineer Office, Denison. 8-28

COOKE CO.—**Russ Mitchell, Inc.,** 2302 Jefferson Ave., Houston—over $100,000, for temporary frame bldgs.—by U. S. Engineer Office, Denison. 8-5

DALLAS CO.—**A. J. Rife Construction Co.,** Dallas—over $500,000, for temporary frame bldgs.—by U. S. Engineer Office, Denison. 8-1

EL PASO CO.—**R. D. Lowman,** El Paso —over $50,000, for temporary frame bldgs. and electric, water and sewage systems—by U. S. Engineer Office, Albuquerque. 8-20

EL PASO CO.—**J. E. Morgan & Sons,** 210 N. Campbell St., El Paso—over $100,000, for temporary frame bldgs.—by U. S. Engineer Office, Albuquerque, N. M. 8-21

EL PASO CO.—**J. E. Morgan & Sons,** 210 N. Campbell St., El Paso—over $50,000, for temporary frame bldgs. and hardstandings—by U. S. Engineer Office, Albuquerque, N. M. 8-4

PALO PINTO CO.—**Allied Construction Co.,** Dallas—over $100,000, for temporary frame bldgs.—by U. S. Engineer Office, San Antonio. 8-5

TAYLOR CO.—**W. G. Drummond Construction Co.,** View—over $50,000 for temporary frame bldgs.—by U. S. Engineer Office, San Antonio. 8-8

TAYLOR CO.—**Rose Construction Co.,** Abilene—over $100,000, for temporary frame bldgs.—by U. S. Engineer Office, San Antonio. 8-1

VAL VERDE CO.—**R. W. Briggs & Co.,** and **E. B. Darby,** Box 1981, San Antonio—over $1,000,000, for temporary frame bldgs. —by U. S. Engineer Office, San Antonio. 8-3

WARD CO.—**Suggs Construction Co.,** Big Spring—over $500,000, for temporary frame bldgs.—by U. S. Engineer Office, Albuquerque, N. M. 8-29

WARD CO.—**Uvalde Construction Co.,** 920 Santa Fe Bldg., Dallas—over $1,000,000, for taxiways, runways, apron and hardstandings, road and drainage—by U. S. Engineer Office, Albuquerque, N. M. 8-29

WICHITA CO.—**Skyline Builders, Inc.,**

Dallas—over $100,000, for addtl. temporary frame bldgs.—by U. S. Engineer Office, Denison. 8-28

Utah

SALT LAKE CO.—**Intermountain Securities Corp.,** Salt Lake City—over $50,000, for alterations to temporary frame bldgs.—by U. S. Engineer Office, Salt Lake City. 8-31

SALT LAKE CO.—**Vernon C. Tolboe,** Provo—over $50,000, for temporary frame post office, commissary and refrigerating unit at a military site—by U. S. Engineer Office, Salt Lake City. 8-26

TOOELE CO.—**L. F. Dow Co.,** 8743 Sunset Blvd., Los Angeles, Calif.—over $50,000, for temporary frame bldgs. and electric, water and sewage systems—by U. S. Engineer Office, Salt Lake City. 8-20

TOOELE CO.—**Harrison and Dorman,** 13 South St. and 4 West St., Salt Lake City—for three AC hangars at an air base—by U. S. District Engineer, Salt Lake City. 8-31

TOOELE CO.—**Harrison & Dorman, Inc.,** 13 So. St. and 4 West St., Salt Lake City—over $50,000, for navigation and bomb trainer bldg. at a Utah airbase—by U. S. Engineer Office, Salt Lake City. 8-11

TOOELE CO. — **Intermountain Constructors,** 36½ W. 2nd St., So., Salt Lake City—over $100,000, for 12 above ground steel and conc. magazines at Tooele Ordnance Depot—by U. S. Engineer Office, Salt Lake City. 8-11

WEBER CO.—**Enoch Chytraus Co.,** 778 E. 9th St., So., Salt Lake City—over $50,000, for 3 brick and conc. storage bldgs.—by U. S. Engineer Office, Salt Lake City. 8-12

WEBER CO.—**MacIsaac & Menke,** 3440 E. 22nd St., and **Pozzo Construction Co.,** 2403 Riverside Drive, Los Angeles, Calif.—less than $2,000,000, for civilian housing at an air depot—by U. S. Engineer Office, Salt Lake City. 8-31

WEBER CO.—**Wade Bros. Co.,** 457 15th St., Ogden—over $50,000, for frame lunch houses and office additions—by U. S. Engineer Office, Salt Lake City. 8-19

WEBER CO. — **George H. Whyte, Jr.,** 1870 Carlyle Dr., Alhambra—over $100,000, for temporary frame bldgs.—by U. S. Engineer Office, Salt Lake City. 8-24

Washington

CLARK CO.—**A. T. Beckett,** Board of Trade Bldg., Portland, Oregon—$271,585, for an administration bldg., community house, health bldg., etc., for the McLoughlin Heights housing center—by Vancouver Housing Authority, Vancouver. 8-26

CLARK CO.—**Clarence A. Gilmer,** Portland, Oregon—over $50,000, for temporary frame bldgs.—by U. S. Engineer Office, Portland, Oregon. 8-12

CLARK CO.—**Teufel and Carlson,** 1141 Henry Bldg., Seattle—$3,720,000, for 1,000 permanent housing units at Vancouver—by Federal Public Housing Authority, Seattle (contract previously held by Lewis W. Hunt & Associates, Los Angeles, Calif.). 8-6

FRANKLIN CO.—**L. C. Havstad,** Pasco—over $50,000, for temporary frame bldgs.—by U. S. Engineer Office, Portland. 8-24

KING CO.—**Austin Co.,** Dexter Horton Bldg., Seattle—$5,277,310, for addtl. facil. at Seattle Naval Air Sta. Rearmament Base, Neah Bay Sec., Whidby Island—by Bureau of Yards and Docks, Washington, D. C. 8-27

KING CO.—**Sound Construction & Engineering Co.,** 1017 Northern Life Tower, Seattle—over $100,000, for hospital bldgs.—by U. S. Engineer Office, Seattle. 8-11

KING CO.—**Sound Construction & Engineering Co.,** 1017 Northern Life Tower, Seattle—over $100,000, for temporary frame bldgs.—by U. S. Engineer Office, Seattle. 8-3

PIERCE CO.—**A. G. Homann,** Olympia—over $50,000, for temporary frame bldgs.—by U. S. Engineer Office, Seattle. 8-6

SNOHOMISH CO. — **Sam Bergesen,** Wick & Dahlgren, 1362 30th St., So., Seattle—over $50,000, for temporary frame bldgs.—by U. S. Engineer Office, Seattle. 8-11

SNOHOMISH CO.—**Gaasland Construction Co.,** 1161 Ellis St., Bellingham—over $100,000, for a shop bldg.—by U. S. Engineer Office, Seattle. 8-11

SNOHOMISH CO.—**Gaasland Construction Co.,** 1161 Ellis St., Bellingham—over $100,000, for temporary frame housing—by U. S. Engineer Office, Seattle. 8-20

SPOKANE CO.—**Anderson Building Co.,** E. 4409 Sprague St., Spokane—over $100,000, for a headquarters bldg.—by U. S. Engineer Office, Seattle. 8-19

SPOKANE CO.—**Clifton & Applegate,** Hutton Bldg., Spokane—$8,655,000, for air supply depot at Spokane—by Bureau of Yards and Docks, Washington, D. C. 8-22

SPOKANE CO.—**Hawkins & Armstrong,** Box 4, Spokane—over $100,000, for a training bldg.—by U. S. Engineer Office, Seattle. 8-11

SPOKANE CO.—**Charles R. House,** 314 Ziegler Bldg., Spokane—over $50,000, for bldgs. at a military site—by U. S. Army Engineers, Seattle. 8-5

SPOKANE CO.—**Clyde M. Ludberg Co.,** W. 326 First Ave., Spokane—over $50,000, for four bldgs.—by U. S. Engineer Office, Seattle. 8-24

SPOKANE CO.—**Clyde M. Ludberg Co.,** W. 326 First Ave., Spokane—over $50,000, for quartermaster bldgs., and over $100,000 for warehouses and storage bldgs.—by U. S. Army Engineers, Seattle. 8-18

SPOKANE CO.—**Clyde M. Ludberg Co.,** W. 326 1st Ave., Spokane—over $100,000, for hospital facilities—by U. S. Engineer Office, Seattle. 8-19

SPOKANE CO.—**Ford J. Twaits Co.,** Box 3159, Terminal Annex, Los Angeles, Calif.—over $500,000, for housing—by U. S. Engineer Office, Seattle. 8-19

UNANNOUNCED CO. — **Norge Construction Co., Inc.,** and **A. J. Goering Construction Co.,** 305 Lloyd Bldg., Seattle—over $100,000, for const. of bldg.—by U. S. Engineer Office, Seattle. 8-31

Canada

BRITISH COLUMBIA — **Carter-Halls-Aldinger Co., Ltd.,** 670 Taylor St., Van-

couver—$1,000,000 (approx.), for new headquarters bldg. at a west coast station for the R.C.A.F.—by Department of Munitions & Supply, Ottawa. 8-30

Miscellaneous . . .

CONTRACTS AWARDED

Arizona

MOHAVE CO.—**Palmer & Berger Construction Co.,** 1633 W. Jefferson St., Phoenix—over $100,000, for elec. distribution system at an air force flexible gunnery school—by U. S. Engineer Office, Los Angeles. 8-11

YUMA CO.—**Robert A. Conyes, Ralph O. Dixson,** and **Werner & Webb,** 116 N. Mansfield Ave., Los Angeles, Calif.—over $500,000, for sewage, water, and street systems at an air force flying school—by U. S. Engineer Office, Los Angeles, Calif. 8-27

YUMA CO.—**H. B. Nicholson,** 572 Chamber of Commerce Bldg., Los Angeles, Cal.—over $50,000, for railroad spur and crossover at Airfield 7—by U. S. Engineer Office, Los Angeles. 8-20

California

ALAMEDA CO. — **Eaton & Smith,** 715 Ocean Ave., San Francisco, and **Swinerton & Walberg,** 225 Bush St., San Francisco—for extending street railroad system from Oakland to Richmond—by Key System, Oakland. 8-24

ALAMEDA CO. — **Macco Construction Co.,** Freight and Ferry Sts., Alameda—over $50,000, for const. of dry fill—by U. S. Engineer Office, San Francisco. 8-12

BUTTE CO. — **Wonderly Construction Co.,** 2694 Lime Ave., Long Beach—over $50,000, for gasoline fueling system—by U. S. Engineer Office, Sacramento. 8-24

LOS ANGELES CO.—**Swinerton & Walberg Co.,** 225 Bush St., San Francisco, **A. S. Vinnell,** 1145 Westminster Ave., Alhambra, and **United Concrete Pipe Corp.,** Box 1, Sta. H, Los Angeles—$5,375,000, for reinf. conc. fuel storage facil. at the naval fuel depot, San Pedro—by Bureau of Yards & Docks, Washington, D. C. 8-27

LOS ANGELES CO.—**Gail A. Bell,** 3554 Meade Ave., San Diego—over $100,000, for protective concealment at an aircraft mfg. plant—by U. S. Engineer Office, Los Angeles. 8-4

LOS ANGELES CO.—**Pacific Crane & Rigging Co.,** 6800 S. Alameda St., Los Angeles—over $100,000, for protective concealment at an aircraft mfg. plant—by U. S. Engineer Office, Los Angeles. 8-10

RIVERSIDE CO. — **Shannahan Bros.,** 6193 Maywood Ave., Huntington Park—over $50,000, for railroad spur at a staging area—by U. S. Engineer Office, Los Angeles. 8-4

RIVERSIDE CO.—**Fritz Ziebarth,** 820 W. Esther St., Long Beach—over $100,000, for electric, water and sewage systems, etc., at a quartermaster depot—by U. S. Engineer Office, Los Angeles. 8-18

SACRAMENTO CO.—**Harvey Holland,** 1715 P St., Sacramento—less than $50,000, for water, electrical, and waste water disposal systems—by U. S. Engineer Office, Sacramento. 8-24

SAN BERNARDINO CO.—**Clifford C. Bong,** 2413 Baldwin Ave., Temple City—over $50,000, for railroad system—by U. S. Engineer Office, Los Angeles. 8-13

SAN BERNARDINO CO. — **Byrne Doors, Inc.,** 666 Mission St., San Francisco—over $100,000, for fabrication and erection of hangar doors for the transport squadron and flight test hangars at an air depot—by U. S. Engineer Office, Los Angeles. 8-18

SAN DIEGO CO.—**Griffith Co.,** 1060 S. Broadway, Los Angeles—over $50,000, for conc. walls at an aircraft mfg. plant—by U. S. Engineer Office, Los Angeles. 8-27

SAN JOAQUIN CO.—**A. Teichert & Son, Inc.,** Box 1113, Sacramento—over $100,000, for concrete floors—by U. S. Engineer Office, Sacramento. 8-31

SANTA BARBARA CO.—**Peter Gadd,** 2173 Colorado Blvd., Los Angeles—less than $500,000, for gasoline fueling system at an air base—by U. S. Engineer Office, Los Angeles. 9-1

SHASTA CO.—**A. D. Schader,** 144 Spear St., San Francisco—over $50,000, for removing rails, switches and track accessories—by U. S. Engineer Office, Sacramento. 8-24

Colorado

EAGLE CO.—**Douglas Jardine,** Pando—over $1,000,000, for plumbing and heating systems—by U. S. Engineer Office, Denver. 8-28

EAGLE CO.—**Lym Engineering Co.,** Salt Lake City, Utah—over $100,000, for

hospital boiler plant and steam distribution system—by U. S. Engineer Office, Denver. 8-20

Montana

CASCADE CO.—**Central California Construction Co., Inc.,** 115 Burrows St., San Francisco — over $100,000, for gasoline fueling and oil storage systems—by U. S. Engineer Office, Ft. Peck. 8-4

Nevada

WASHOE CO. — **MacDonald & Kahn, Inc.,** Financial Center Bldg., San Francisco, Calif.—over $50,000, for gasoline fueling and oil storage system—by U. S. Engineer Office, Sacramento, Calif. 8-26

New Mexico

EDDY CO.—**De Luca & Son,** 1745 Filbert St., San Francisco, Calif.—over $50,000, for gasoline fueling systems and oil storage—by U. S. Engineer Office, Albuquerque. 8-20

LEA CO.—**Wonderly Construction Co.,** 2694 Lime Ave., Long Beach, Calif.—over $50,000, for gasoline fueling system, pumping, and oil storage unit—by U. S. Engineer Office, Albuquerque. 8-15

LUNA CO.—**Flotation Systems, Inc.,** 4031 Goodwin Ave., Los Angeles—over $50,000, for gasoline fueling system and oil storage —by U. S. Engineer Office, Albuquerque. 8-19

SANTA FE CO.—**Denison & Shotwell,** Albuquerque—over $100,000, for water, gas, and sewer systems, grade, drain, and pave —by U. S. Engineer Office, Albuquerque. 8-8

Oregon

DESCHUTES CO. — **Halvorson Construction Co.,** and **E. B. Halvorson,** Billings, Mont.—over $100,000, for temporary frame bldgs., water, sewer, and railroad systems—by U. S. Engineer Office, Portland. 8-31

Texas

BEXAR CO. — **Wilder Kenan, A. E. Searles** and **D. J. Sullivan,** San Antonio—over $100,000, for dismantling temporary structures—by U. S. Engineer Office, San Antonio. 8-1

BROWN CO.—**Investment Service Corp.,** Dallas—over $100,000, for temporary frame bldgs., electrical distribution system and water and sewage systems—by U. S. Engineer Office, San Antonio. 8-10

HAYS CO.—**Jas. P. Nash,** Austin—over $100,000, for gasoline and oil storage and dispensing system—by U. S. Enginer Office, San Antonio. 8-7

VAL VERDE CO.—**Flotation Systems, Inc.,** 4031 Goodwin Ave., Los Angeles, Calif.—over $100,000, for gasoline and lubrication oil storage and dispensing systems—by U. S. Engineer Office, San Antonio. 8-20

Washington

CLALLAM CO. — **Olympic Shipbuilders Inc.,** Port Angeles—$4,431,032, for eight 274-foot wooden barges—by U. S. Maritime Commission, Washington, D. C. 8-6

GRAYS HARBOR CO.—**Grays Harbor Shipbuilding Co.,** Aberdeen — $2,400,000, for five sea-going tugs—by Maritime Commission, Washington, D. C. 8-19

KING CO.—**A. F. Mowat Construction Co.,** 1331 Third Ave. Bldg., Seattle—over $100,000, for miscellaneous facilities—by U. S. Engineer Office, Seattle. 8-11

PIERCE CO.—**Foster & Kleiser Co.,** 1675 Eddy St., San Francisco—over $100,000, for miscellaneous const.—by U. S. Engineer Office, Seattle. 8-12

PIERCE CO.—**J. F. Graham,** 808 Ainsworth St., Tacoma—over $50,000, for a stand-by power plant—by U. S. Engineer Office, Seattle. 8-19

PIERCE CO.—**J. Philip Murphy,** 3901 Mission St., San Francisco, and **Woodworth & Co.,** 1200 E. D St., Tacoma—$69,000 plus actual cost of operations for dismantling cables and towers of collapsed Tacoma Narrows bridge—by Director of Highways, Olympia. 8-19

SKAGIT CO.—**Edlund Shipbuilding Co.,** Anacortes — $6,456,000 for twelve 274-ft. wooden barges—by U. S. Maritime Commission, Washington, D. C. 8-6

SPOKANE CO.—**Roy L. Bair,** 1220 Ide Ave., Spokane—over $100,000, for roads, walks, and sanitary facil.—by U. S. Engineer Office, Seattle. 7-24

Wyoming

NATRONA CO. — **Black-Sewall-Bryson** and **Connor Tank Co.,** Oklahoma City, Oklahoma—$125,000 for reconditioning of surplus oil storage tanks at the Naval Petroleum Reserve No. 3, Casper—by Bureau of Yards and Docks, Washington, D. C. 8-11

TRADE WINDS

News of Men Who Sell to the Construction West

CALIFORNIA

A. E. Hitchner, Los Angeles manager for *Westinghouse Electric & Manufacturing Co.,* and more recently commercial assistant to the Pacific Coast manager, has been named assistant to the industry sales manager, with headquarters at East Pittsburgh, Penn. He had represented the company in Los Angeles since 1926.

* * *

The Hercules Equipment & Rubber Co., manufacturers of molded rubber goods, gaskets, rollers, and other rubber products, have built and are now occupying a new building at 435 Brannan St., San Francisco. The company also handles B. F. Goodrich Co. products, as well as belting, packing, valves, and fire fighting equipment. The new building has three main-floor service offices, and executive and general offices occupy the second floor. This is the third home of the company since its organization in 1919.

* * *

F. H. Lindus, who has been handling various advertising assignments for *Timken Roller Bearing Co.,* in Canton, Ohio, is now in the sales department of the organization, located in San Francisco.

* * *

C. V. Roseberry is sales engineer for *Westinghouse Electric & Manufacturing Co.* at Fresno, having replaced **Bob Richey.**

* * *

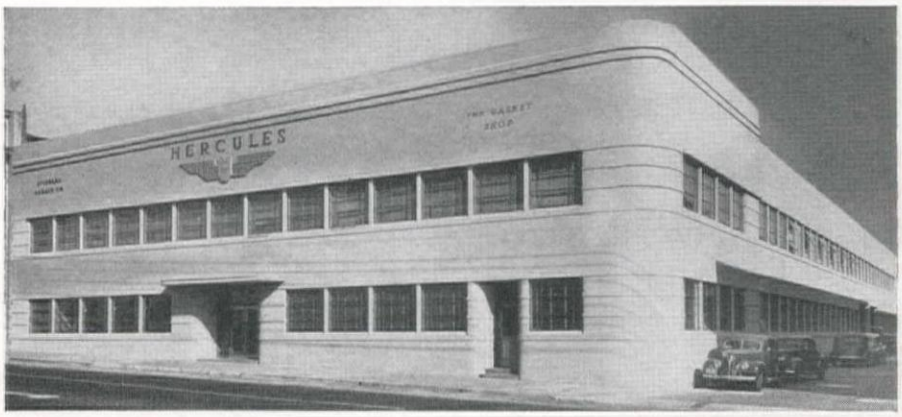
J. B. CHAMBERS is regional manager for the Cummins Engine Co., at Fort Worth, Tex., where the increased use of diesel-powered equipment has necessitated enlargement of the company's offices. He has been with the company since 1925, at Fort Worth since 1935.

INTERMOUNTAIN

J. G. Farmer, engineer for the *Golden Cycle Corp.* on driving of Carlton tunnel in Colorado, is now with the *Ingersoll-Rand Co.,* and has been traveling to the far places for them, being at present in Mexico, assisting mining operators there in getting the highest efficiency from their equipment, war demand having immensely increased activities in that field.

* * *

A roster of the entire membership of the Associated Equipment Distributors has been prepared, as of July 15, 1942, and is ready for distribution. The book lists 435 members and



HERCULES EQUIPMENT & RUBBER CO. has just completed this new building at 435 Brannan St., San Francisco, and it is now occupied by service and executive departments.

PACIFIC NORTHWEST

Eugene Caldwell of the *Willamette Hyster Co.,* Portland, Ore., has been appointed on the WPB Advisory Committee for the Industrial Power Truck Industry, with 6 representatives from other parts of the country. **Graeme Darling** is the government presiding officer of the committee.

1151 manufacturers. Cost of the roster is $3.00, and may be obtained from **George J. Boesch,** 105 S. 9th St., St. Louis, Mo.

AMONG THE MANUFACTURERS

Marmon-Herrington Co., Indianapolis, has had a reorganization in the executive department, **Bert Dingley,** formerly executive vice-president, becoming president, and the following vice-presidents being elected to the Board of Directors: **R. C. Wallace, Seth Klein, C. Alfred Campbell,** and **George E. Reynolds. A. W. Herrington** continues as chairman of the Board.

* * *

Harry J. Leschen, president of *A. Leschen & Sons Rope Co.,* died August 2 at St. Louis, Mo.

Deloss Cummins has been appointed factory service manager of the *Cummins Engine Co.,* Columbus, Ind. His two immediate predecessors in this position, **David Cravens** and **Robert Stratton,** have both been called into the service of the U. S. government. Cummins was formerly factory superintendent for the company.

* * *

Max W. Babb, chairman of the board of *Allis-Chalmers Manufacturing Co.,* a member of the American Industries Salvage Committee, has special responsibility for companies in the machinery industry, and has written to all such companies urging full and complete cooperation with the WPB's junk collection drive.

Ray Hanspeter has been appointed western division sales manager of *J. D. Adams Co.,* Indianapolis, Ind., and will handle all territory west of the Mississippi River. He has been with the company more than eighteen years and is well-known among Western construction men. His headquarters will be at Indianapolis.

RAY HANSPETER

* * *

R. G. LeTourneau, Inc., Peoria, Ill., produced its 25,000th heavy duty power control unit on July 25. It was mounted on a LeTourneau bulldozer, and is now in active service with the U. S. army.

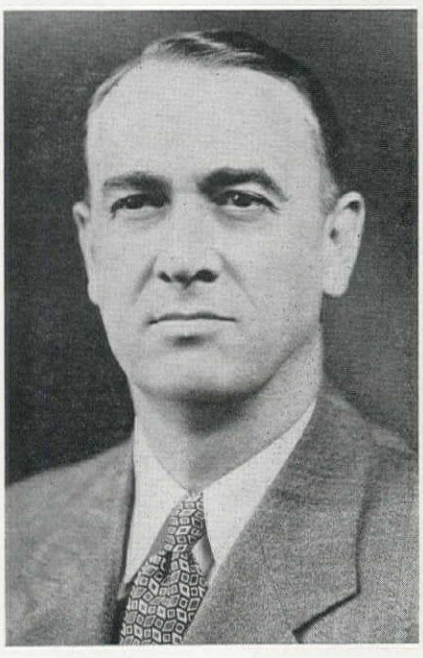
* * *

E. N. Brooks, of *Brooks Equipment & Mfg. Co.,* **Kenneth Lindsay,** of *Iowa Manfacturing Co.,* **Gerald Smith,** of *Smith Engineering Works,* **L. W. Yerk,** of *Pioneer Engineering Works,* and **W. P. Gruendler,** of *Gruendler Crusher & Pulverizer Co.,* are members of the portable rock crusher manufacturers' industry advisory committee of the WPB. **Ralph H. Dano** of WPB's construction equipment section is the government presiding officer.

* * *

Howard S. Welch, formerly vice-president and general manager of *Bendix Aviation Export Corp.,* has been named president of the *Eisemann Magneto Corp.,* New York City, manufacturers of magnetos and other parts for aircraft engines.

G. A. BASSETT recently became president of Gar Wood Industries, Inc., Detroit, Mich. He has been in the employ of the company in various capacities steadily for the past 28 years.



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.

Rubberless Welder Trailer

Manufacturer: Harnischfeger Corp., Milwaukee, Wis.

Equipment: Heavy-duty welder trailer mounted on steel wheels.

Features claimed: Vehicle has two all-steel wheels, axle and heavy-duty springs, suitable for either field work or highway towing. Wheels have 24-in. diameter and 4-in. face; changeover to pneumatic tires may be made when rubber becomes available later. All P & H portable gas engine welder units are now being mounted on this trailer.

Band Clamp for Pipe

Manufacturer: Dresser Manufacturing Co., Bradford, Pa.

Equipment: Repair clamp for pipe leaks.

Features claimed: Simple construction, easy and fast to apply, prevents further damage and contents loss where small defects appear in straight runs of pipe. Is one-piece steel band clamp of split construction with riveted bolt lug at each end. Special cone gasket with rubber molded tabs to aid in positioning is also available. Pipes from 1 in. to 26 in. O. D. may be repaired with these clamps.

Fleet-fillet Electrode

Manufacturer: Lincoln Electric Co., Cleveland, Ohio.

Equipment: New arc welding electrode.

Features claimed: Called "Fleetweld 11," this electrode is specially designed to use in "Fleet-fillet" technique, recently announced by the company. Electrode is fast flowing, shielded arc type, heavily coated to exclude oxides and nitrides from the weld. This technique and electrode speed up production 100%, reduce worker fatigue, and use less electrode per foot. "Fleetweld 11" comes in 18-in. length, $\frac{3}{16}$ and $\frac{1}{4}$-in. diameter.

Welders' Clothing

Manufacturer: American Optical Co., Southbridge, Mass.

Equipment: Welders safety clothing.

Features claimed: Made of highest grade chrome-tanned cowhide, backed with fire-resistant duck, has few seams, double-stitched. Complete outfits of safety clothing available. Will keep hot sparks away from skin and normal work clothes.

Wire Cutter-Retriever

Manufacturer: Pack-Rite Machine Corp., Milwaukee, Wis.

Equipment: Long-nose cutter-retreiver; adjustable wrench.

Features claimed: Alpert long-nose cutter-retreiver resembles pistol, cutting and gripping edges at end of barrel. One-handed, one-finger operation will cut wires or retreive small objects in inaccessible places; 15-to-1 leverage ratio makes required pressure very small. "Spreedgrip-automatic" adjustable wrench is adjusted by moving sliding zipper in handle, with no screw-action required. Comes in sev-

eral different sizes, both nut and pipe wrench styles.

Welding Electrode

Manufacturer: Wilson Welder & Metals Co., Inc., New York, N. Y.

Equipment: AC welding electrode.

Features claimed: For all position use, gives high quality deposited metal fully comparable to best DC electrodes. Available in 1/16, 3/32, 1/8, and 5/32-in. diameters.

Safety Cloth

Manufacturer: Colloid Equipment Co., New York, N. Y.

Equipment: Safety cloth.

Features claimed: A tough cotton fabric, woven in 10 mesh, with openings filled with transparent plastic, it is shatterproof, weather-resistant, and easily applied. It can be used instead of window glass, or to cover inside existing glass to prevent shattering. Eighty-nine per cent of light is admitted.

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.

Washington Concrete Co., New York, N. Y.—Booklet on laying of heavy duty industrial floors lists necessary characteristics of such floors, how they are obtained, and examples of floors now in service, and also explains the duties of floor engineers.

Young Radiator Co., Racine, Wis.—Catalog No. 13638 shows detail drawings, specifications and descriptions of Young engine jacket water coolers, and shows graphs of fan speed, pump performance, and other factors. In addition, tables of dimensions, sheave combinations and capacities are given.

Firestone Tire & Rubber Co., Akron, Ohio—Twenty-two page booklet on tires in the construction field, outlining traction problems of off-the-road vehicles, such as graders, scrapers, dump trucks, tractor wagons and trailers, and illustrates and describes Firestone tires suitable for each type of equipment, and variety of ground encountered. Also indicates common roadway hazards, and common causes of tire failure in this type of operation. Gives tables of tires placed on various items of heavy construction equipment by manufacturers.

Keystone Asphalt Products Co., Chicago, Ill.—Leaflet listing advantages of Kapco sewer jointing compounds, shows saving due to convenient fiber packaging, and describes application of both hot pouring compound and cold troweling compound.

I. F. Laucks, Inc., Seattle, Wash.—Leaflet tells uses found for glues in wartime construction, giving illustrations of use in boatbuilding, aircraft manufacture, and defense plant furniture making; indicates that laminated woods are being used more and more extensively, and that specially developed glues are essential to durability.

Chain Belt Co., Milwaukee, Wis.—Bulletin No. 409 shows many uses for newly developed flat spray nozzle, with action pictures of operation in food processing, stone cleaning, lumber pulp manufacture, steel mills, and other types of use. Three sizes available are illustrated and described.

R. D. Werner Co., Inc., New York, N. Y.—Booklet printed in patriotic colors gives considerable information on general properties, uses, and available shapes of plastic materials. Detailed qualities are listed on six of the more common varieties. A tabulation of the qualities in plastics that make them good substitutes for other materials is given, as are minimum and maximum specifications for the more common shapes.

Air Reduction, New York, N. Y.—A six-section chart illustrating use of welding electrodes to secure maximum efficiency and reduce waste. The six sections are on the following subjects: Bending electrodes, using entire electrode, fitting joints, fillet welding, fillet faces, and keeping electrodes dry. Chart can be placed in shop for operators to study.

Wallace & Tiernan Co., Inc., Newark, N. J.—Letter-style pamphlet on priorities and allocation procedure, with enclosures of copies of WPB orders concerning application and extension of preference ratings, and special orders dealing with utilities, also list of uses and preference ratings for chlorine.

American Manganese Steel Division, Chicago Heights, Ill.—Bulletin No. 742-CN gives some technical data on properties of manganese steel, and chain made from it. Twenty-five common questions about the steel are answered, and illustrations of various kinds of chain made from it are shown. Special designs of chain for elevators, conveyors, dredgers, the steel industry, the lumber industry, and other machines are described and photographed.

B. F. Goodrich Co., Akron, Ohio—Booklet describing a new motion picture, "Keep 'Em Rolling," produced by Sound Masters, Inc. for the Goodrich Co. to display at schools, clubs, and industrial plants, showing briefly the development of the rubber tire, the making of Ameripol, the company's substitute rubber, and wartime uses to which tires are being subjected.

Garlinghouse Bros., Los Angeles, Calif.—Catalog No. 70 listing concrete handling equipment manufactured by Gar-bro, with pictures, specifications, and brief descriptions of each. Items mentioned include buckets, hoppers, barrows and carts, chutes, gates, weighing hoppers, and bucket attachments.

Blackmer Pump Co., Grand Rapids, Mich.—Bulletin No. 400 covering "Ezy-Kleen" strainers, stresses importance of protecting pumps, and illustrates with cross-sectional views. Specifications are also given for four types of strainers to be used in intake lines.

International Nickel Co., Inc., New York, N. Y.—Publication on Heat Transfer through Metallic Walls includes discussion on physics of such transfer, and factors which resist it, graphs for various metals showing relation of wall thickness to heat transfer, and examples of advantage of

using nickel plating, which has a very high transfer factor.

Porcelain Products, Inc., Findlay, Ohio —Installation manual and data book on porcelain protected wiring systems, is handy size guide for those installing electrical systems. Many drawings illustrate the application of insulators and tubes, sockets and switchboxes. Uses of porcelain fittings, especially important during critical metal shortage, are helpfully described.

Ideal Commutator Dresser Co., Sycamore, Ill.—Bulletin showing machine tool accessories manufactured by the company. Live centers, metal etchers, demagnetizers, wheel dressers, and other items frequently needed in a war-time machine shop are noted, with brief descriptions of each.

Elastic Stop Nut Corp, Union, N. J.—A wall chart explaining the use of self-locking nuts has an illustrated description of the basic principles of the action, uses of the nuts, methods of application of most generally used types. Chart measures 21x27 ins., and is reinforced at top and bottom.

Ever Ready Label Corp., New York, N. Y.—Two one-page bulletins on use of labels in the production of war materials, illustrating many now in use in various plants, for warning, expediting, identifying, shipping, and many other uses.

New York Belting & Packing Co., Passaic, N. J.—A 24-page pocket manual on the care of industrial rubber products contains considerable data on this presently very important subject, some of it being common knowledge, but other suggestions less well-known are also included.

Chain Belt Co., Milwaukee, Wis.—Bulletin No. 404 is a profusely illustrated publication on the use of Pumpcrete, the pump that moves concrete to the job thru pipe. The machines used are described and pictured, both full view and cross-section, various fittings are shown, and many applications are illustrated. Specifications are also given for several types of Pumpcretes. Cost and other data are given in question and answer form.

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