WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

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OCTOBER • 1946

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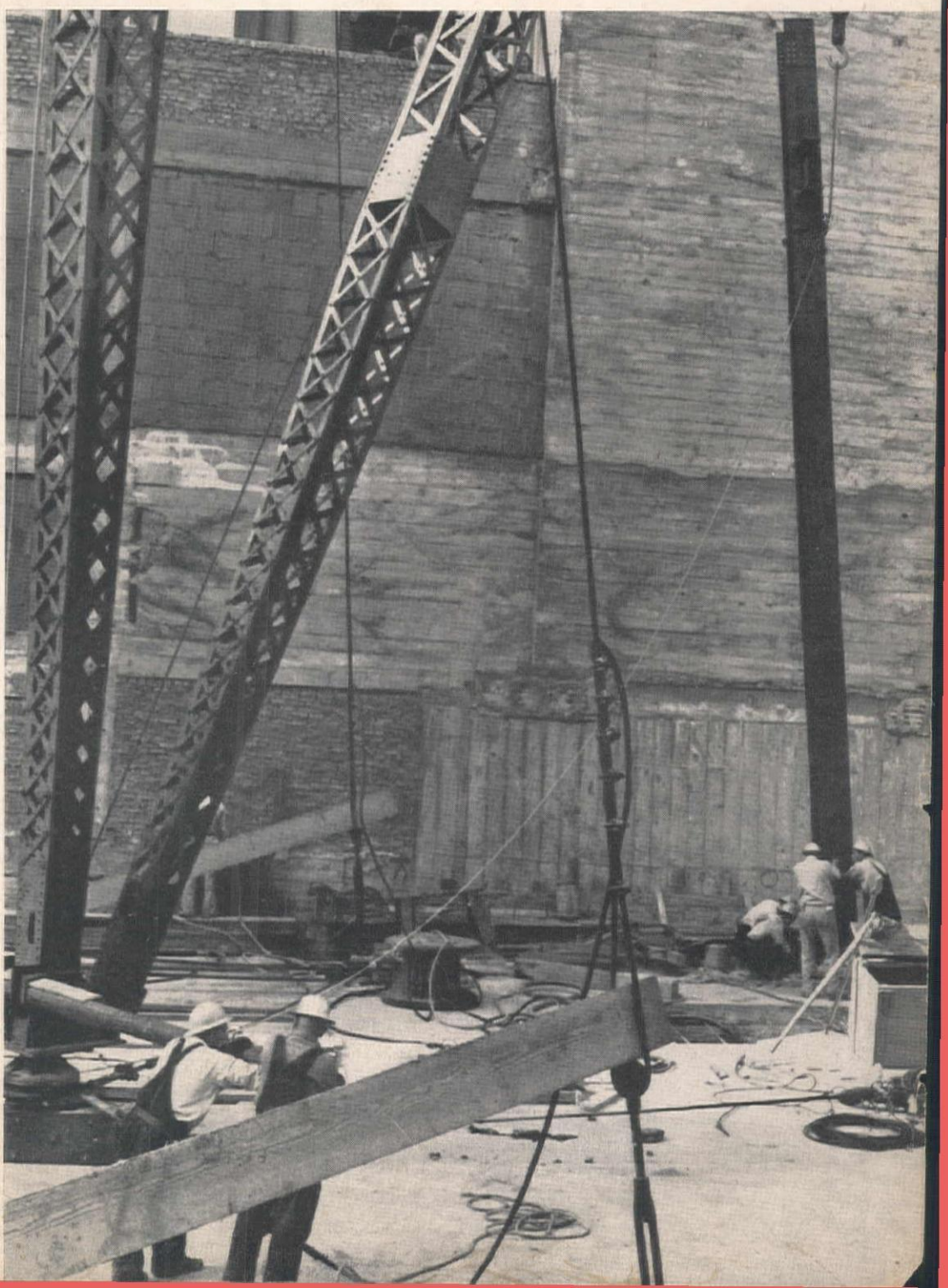
IN THIS ISSUE



FIRST STEEL H-column, 37 ft. long and weighing over 300 lbs. per ft., being maneuvered into place for the new Matson Building on Main Street, San Francisco. Swinerton & Walberg are the contractors on this first major steel frame building in the city since 1941. Steel is being fabricated by Bethlehem Pacific Coast Steel Corporation

PROTECT your Equipment against RUST

SIMPLY brush *Texaco Rustproof Compound* over exposed metal surfaces. The resulting soft, self-healing, *waterproof* film will give effective protection — usually for a year, at least. *Texaco Rustproof Compound* also removes easily, and is distinctly economical. The cost of Texaco rustproofing every piece of equipment in your yard is far less than the cost of the damage rust may cause to just one machine.

Texaco Rustproof Compound fights rust three ways. It 1) prevents rust from forming; 2) penetrates existing rust and stops further rusting; and 3) loosens existing rust, makes it easy to remove.

Use *Texaco Rustproof Compound* on all metal construction equipment, and on gas holders, water works, sewage disposal plants, bridges — wherever metal is exposed to weather or corrosive chemicals and fumes.

For prompt delivery of *Texaco Rustproof Compound* simply call the nearest of the more than 2300 Texaco distributing plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

FREE! This 36-page booklet tells all about *Texaco Rustproof Compound* — why it prevents rust, where and how to apply it, and how it can add extra years of life to your equipment. A single suggestion in this book may save you thousands of dollars. Write for your copy today.

TEXACO

TEXACO Rustproof Compound

TUNE IN THE TEXACO STAR THEATRE EVERY SUNDAY NIGHT — CBS

SIX ORDERS represent a lot of satisfaction!

All up and down the coast you can check the names of leading outfits that year after year, buy Northwests over and over again.

You are planning ahead for the big construction years that are coming — with an eye to the type and make of equipment that is going to make money for you. Now is the time to go into that matter of why so many Northwest owners continue to buy Northwests —even wait for them when they might get other equipment.

There can be only one reason why one out of every three Northwests is a repeat order — why outfits like McNutt Brothers of Eugene, Ore., buy Northwests over and over again. That reason is successful performance—the kind of Shovel and Crane performance you would like to have—the kind that makes money.

Check into it before you buy—follow the Northwest Crowd. Ask about Northwest advantages.

NORTHWEST ENGINEERING COMPANY

1736 Steger Building • 28 East Jackson Boulevard • Chicago 4, Illinois

INDEPENDENT CROWD plus AUTOMATIC CROWD
FOR GREATER DIGGING POWER
The DUAL CROWD

6 NORTHWESTS for McNutt Brothers Eugene, Oregon

Local NORTHWEST sales agents

BUTTE, MONT.
Hall-Perry Machinery Co.

PHOENIX, ARIZ.
State Tractor & Equip. Co.

SALT LAKE CITY, UTAH
Arnold Machinery Co. Inc.

PORTLAND, ORE.
Balzer Machinery Co.

Follow the Northwest Crowd

MOVING 700 CU. YDS. PER HOUR

ON 1,200,000 CU. YDS. GRADING CONTRACT

Coordinated control of crawler tractor and Loader is achieved by placing the three hydraulic control levers within convenient reach of the operator — eliminates need for additional operator on Loader.

Heaping loads of 10 to 11.5 bank yards delivered to Bottom-Dump Euclids in one-half minute — Loader maintains accurate grade.

Maneuverability and fast dumping of Bottom-Dumps reduced cycle time and kept Loader at full efficiency.

● On the Shirley Memorial highway extension southwest of Washington, D. C. in the Alexandria-Accotink area, the Nello L. Teer Company has been using a Euclid Loader and Bottom-Dump Euclids to move a major portion of the yardage on this big job.

On the section shown in the illustrations, the Loader delivered from 10 to 11.5 bank yards of sandy clay and gravel into Bottom-Dump Euclids in an average of 30 seconds and 80 feet of travel distance. Despite frequent turning made necessary by a very short cut, the Loader averaged 64 heaping loads per hour. On the 1500 ft. round trip, five Bottom-Dump Euclids hauled an average of more than twelve payloads each per hour. Actual production records of the contractor show from 6500 to 7000 bank yards moved per 10-hour day by this equipment.

The performance of the Euclid Loader and Bottom-Dump fleet has been a major factor in keeping this job ahead of schedule and has enabled the contractor to move dirt fast and efficiently. Your Euclid Distributor or Representative will be glad to furnish information and specifications on Euclid earth moving equipment best suited to your needs and can probably refer you to a job in your own locality where you can see "Eucs" at work.

The EUCLID ROAD MACHINERY Co.
CLEVELAND 17, OHIO

EUCLIDS *Move the Earth*

Brown, Fraser & Co., Ltd., Vancouver, B. C.; A. H. Cox & Co., Seattle, Wash.; Hall-Perry Machinery Co., Butte, Mont.; Lively Equipment Co., Albuquerque, New Mexico; Constructors Equipment Co., Denver, Colorado; Pacific Coast Branch: 3710 San Pablo Ave., Emeryville, Calif.; Intermountain Equipment Co., Boise, Idaho, and Spokane, Washington; Lang Company, Salt Lake City, Utah. REPRESENTATIVE: M. H. Johnson, W. 2411 Crown Avenue, Spokane, Washington.

WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

Covering the Western Half of the National Construction Field

Contents for October, 1946

J. M. SERVER, JR.
Editor

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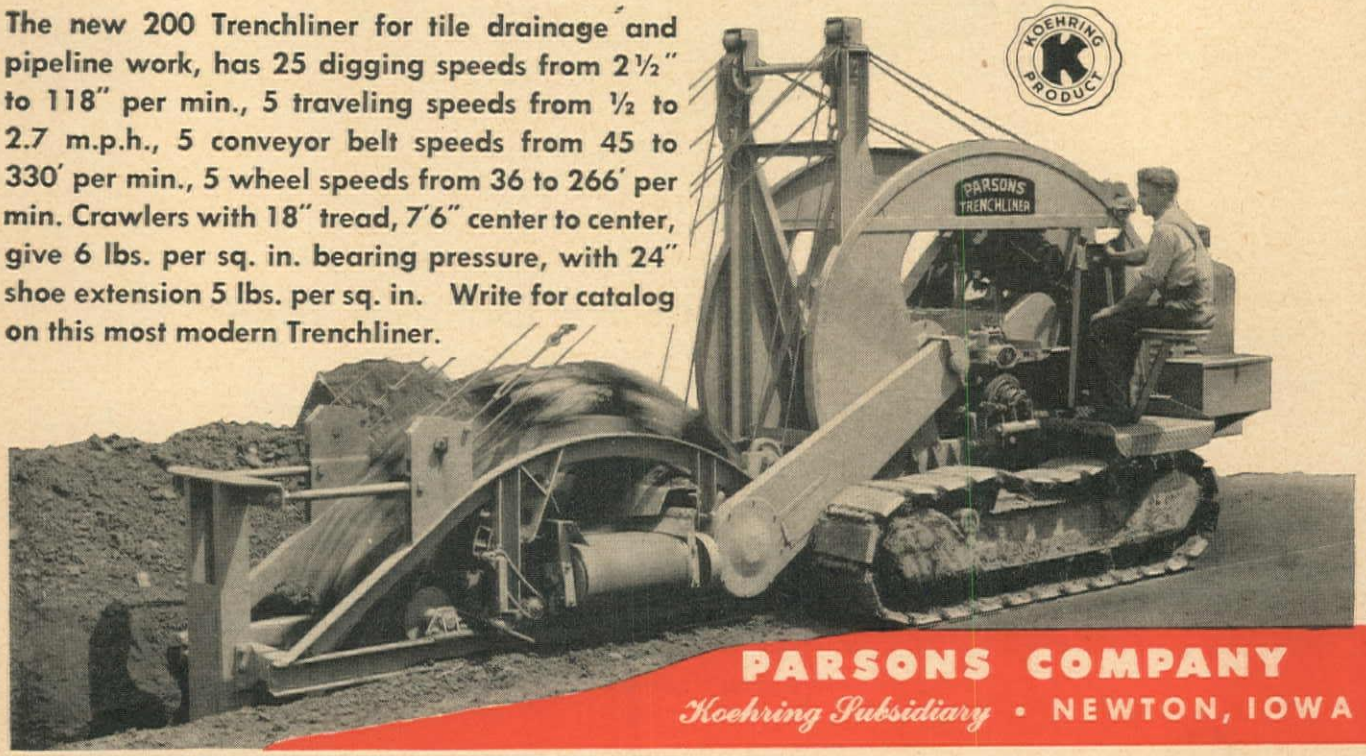
Parsons 200 TRENCHLINER

digs 15" to 26" wide, up to 5' 6" deep

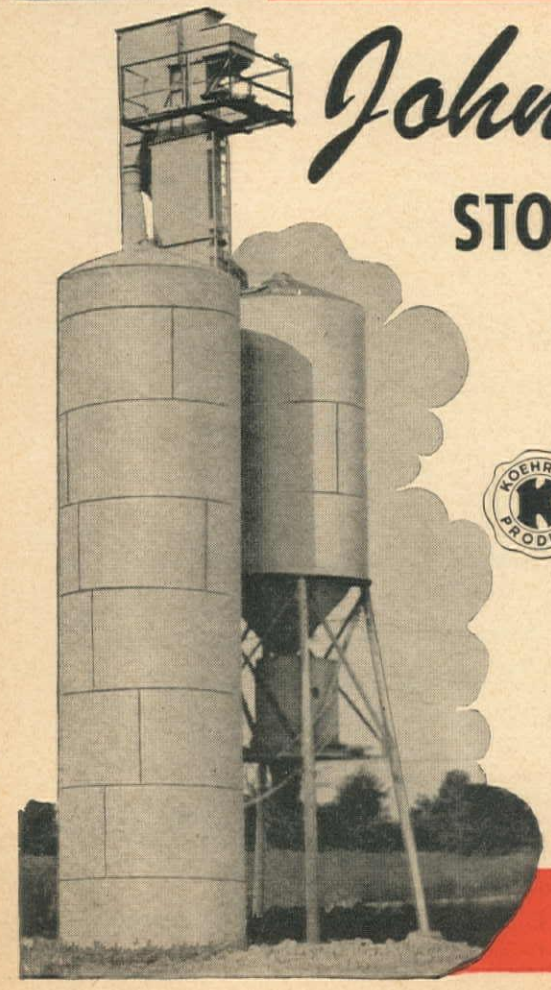
The new 200 Trenchliner for tile drainage and pipeline work, has 25 digging speeds from 2½" to 118" per min., 5 traveling speeds from ½ to 2.7 m.p.h., 5 conveyor belt speeds from 45 to 330' per min., 5 wheel speeds from 36 to 266' per min. Crawlers with 18" tread, 7'6" center to center, give 6 lbs. per sq. in. bearing pressure, with 24" shoe extension 5 lbs. per sq. in. Write for catalog on this most modern Trenchliner.



PARSONS COMPANY
Koehring Subsidiary • NEWTON, IOWA

Johnson PORTABLE TWIN SILO

STORES 1,550 BARRELS CEMENT



The largest of the Johnson Twin Silo Bulk Cement Plants stores 1556 barrels of cement. Smaller Johnson Twin Silo Bulk Cement Plants store 708, 990, 1274 barrels. Yet, their large storage capacity does not limit their portability. Disassembled units easily fit flat cars or flat bed trucks. Initial cost of the unit is low, with operating costs at a minimum.

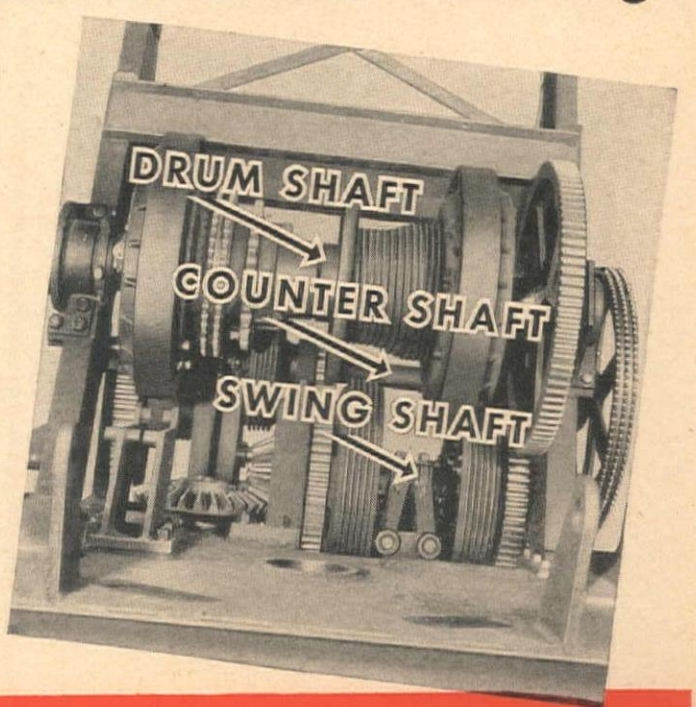
Other Johnson Bulk Cement Plants include the Portable Section Unit (storage capacities: 280 to 500 bbls.), the Dutchmill (storage capacities: 50 to 150 bbls.) and the Elevating Charger, an unloading transfer and batching plant.

THE C. S. JOHNSON COMPANY
Koehring Subsidiary CHAMPAIGN, ILLINOIS

More Yards MOVED PER H.P.

because every Main Shaft rolls on Anti-Friction bearings

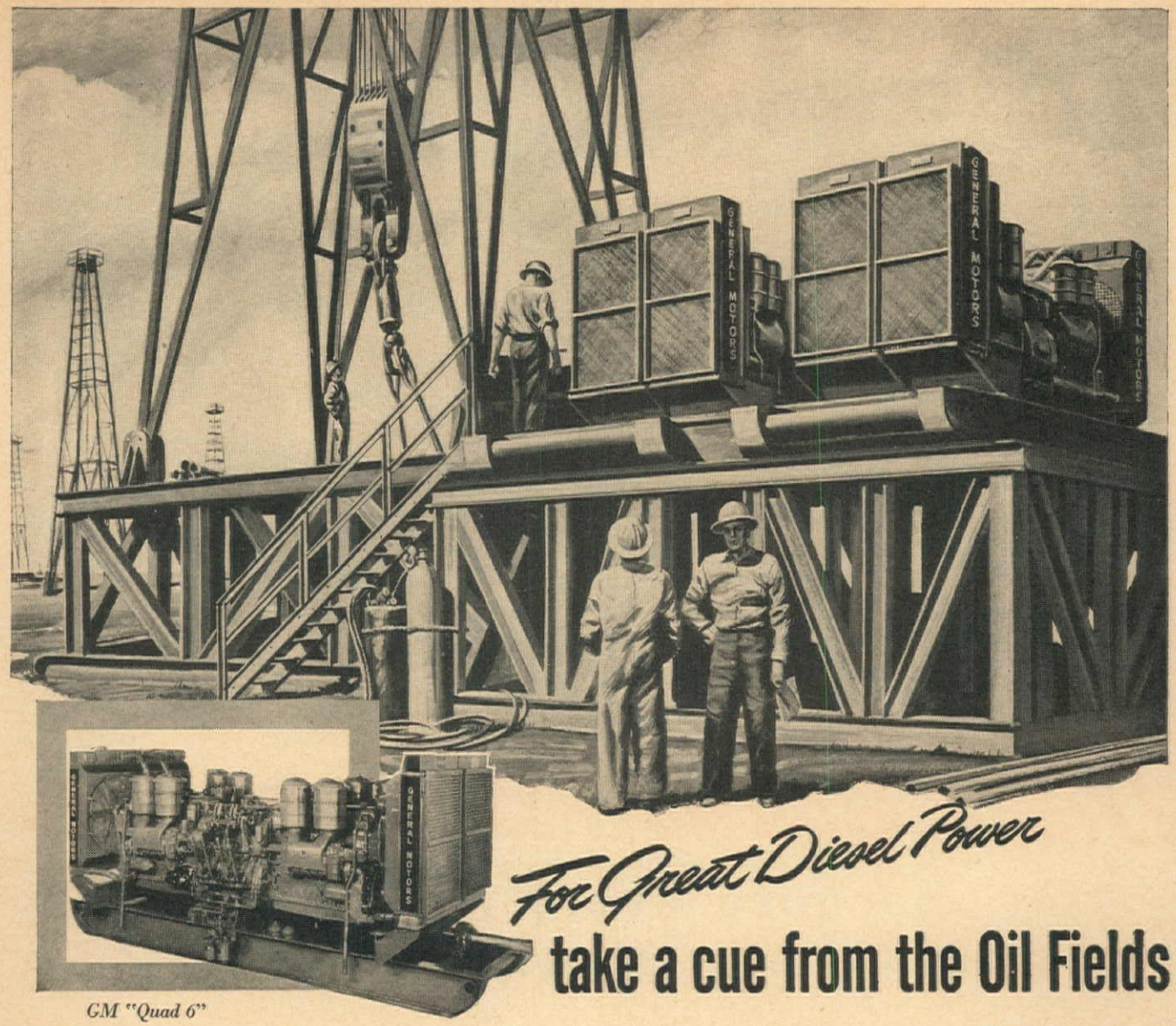
On the Koehring 205 engine horse power rides to work in style, on anti-friction bearings. All major shafts—drum shaft, counter shaft and swing shaft—are mounted on ball bearings. Because there's little friction to waste engine horse power, greater digging force gets to the business end. Power saved pays off in extra yardage. Lubricating time is reduced, because bearings are sealed tight to hold lubricant, to lock out dirt and moisture.



KOEHRING COMPANY
MILWAUKEE 10, WISCONSIN
Subsidiaries
JOHNSON • KWIK-MIX • PARSONS

KOEHRING HEAVY DUTY

HEAVY-DUTY CONSTRUCTION EQUIPMENT



GM "Quad 6"

For Great Diesel Power take a cue from the Oil Fields

WHY are more and more drillers turning to General Motors Diesel engines?

Drilling for oil is 24-hour-a-day work, so an oil man's power has to be dependable.

It has to be able to take on increasing loads as the well gets deeper. It has to be reliable and require the minimum of maintenance. And it has to be portable.

GM Diesels fill all the oil-drillers' musts—then give them more. They are compact and powerful. They can be moved into a job fast and out again when it's done.

So whatever needs for power you may have in road-making machinery, cranes, shovels or any other construction equipment—look to GM Diesels.

Features of GM Diesels Important to Every User of Power

- *QUICK TO START* on their own fuel
- *ECONOMICAL*—run on low cost fuel
- *EASY TO MAINTAIN*—clean design plus accessibility
- *LESS FIRE HAZARD*—no volatile explosive fuel
- *COMPACT*—readily adaptable to any installation
- *SMOOTH OPERATION*—rotating and reciprocating forces completely balanced
- *QUICK ACCELERATION*—2-cycle principle produces power with every downward piston stroke

GM
GENERAL MOTORS
DIESEL POWER

DETROIT DIESEL ENGINE DIVISION
DETROIT 23, MICH. • SINGLE ENGINES . . Up to 700 H.P. MULTIPLE UNITS . . Up to 800 H.P.
GENERAL MOTORS

Evans Engine & Equipment Co.
SEATTLE 9, WASH.

Moore Equipment Co.
STOCKTON, CALIF.

Fred M. Viles & Company
SPOKANE 8, WASH.

Mountain Tractor Co.
MISSOULA, MONT.

Gunderson Bros. Equipment Corp.
PORTLAND 9, ORE.

Olson Manufacturing Co.
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Capitol Tractor & Equipment Co.
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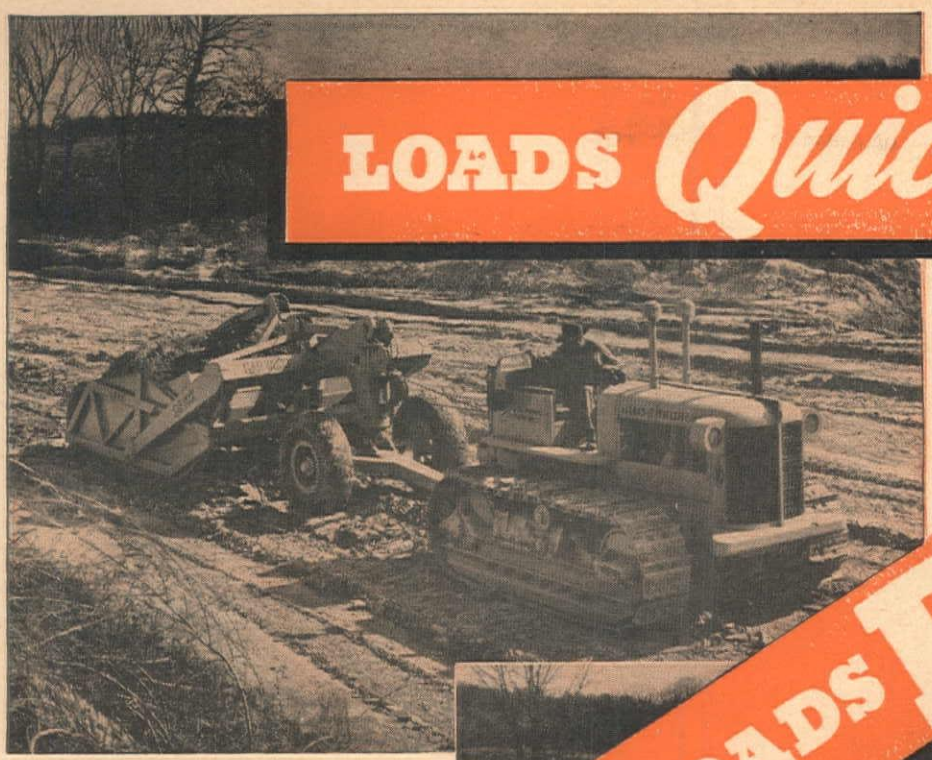
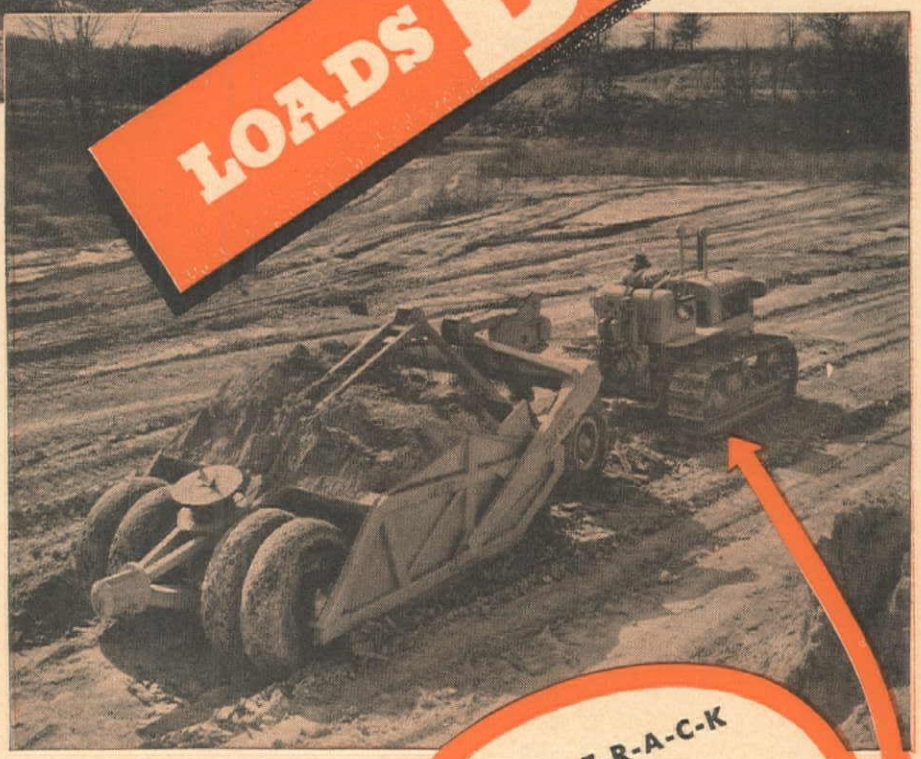
LOS ANGELES 21, CALIF.



LOADS *Quick* . . .

LOADS BIG!



PROPERLY BALANCED HD-10 INCREASES YARDAGE MOVED

There's more dirt on the move with an HD-10 on the scraper. You can get big loads quick with this properly balanced tractor. There's sure traction with the long tracks and heavy truck frame . . . operation is steady, smooth. These features plus addition of an extra heavy front spring makes it ideal, too, for operating front or engine mounted equipment.

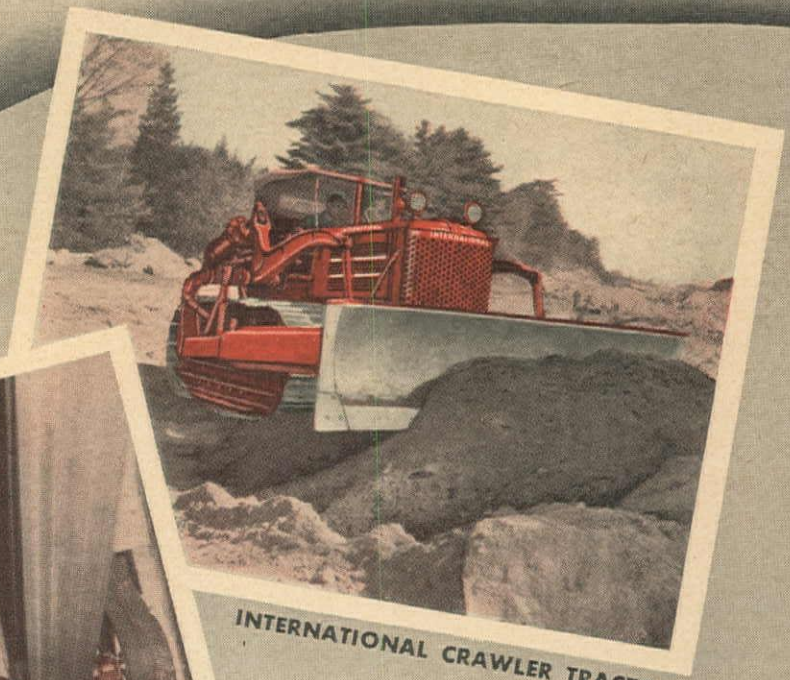
Whatever the job — scraper work, bulldozing or hauling . . . you will get more done at less cost with the HD-10. Whatever the soil condition . . . this ground-gripping tractor will give you better footing. It will pay you to get all the facts from your Allis-Chalmers dealer.

L-O-N-G T-R-A-C-K *Gives you:*
IMPROVED TRACTION
IMPROVED BALANCE
IMPROVED RIDING
IMPROVED PERFORMANCE!

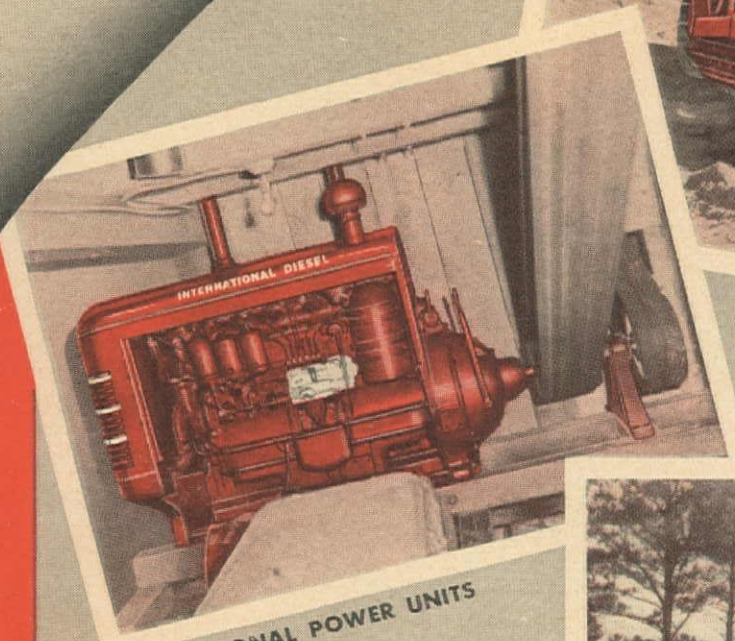
ALLIS-CHALMERS
TRACTOR DIVISION • • MILWAUKEE 1, U. S. A.

GASOLINE AND DIESEL CRAWLER TRACTORS—

This IH Symbol Means

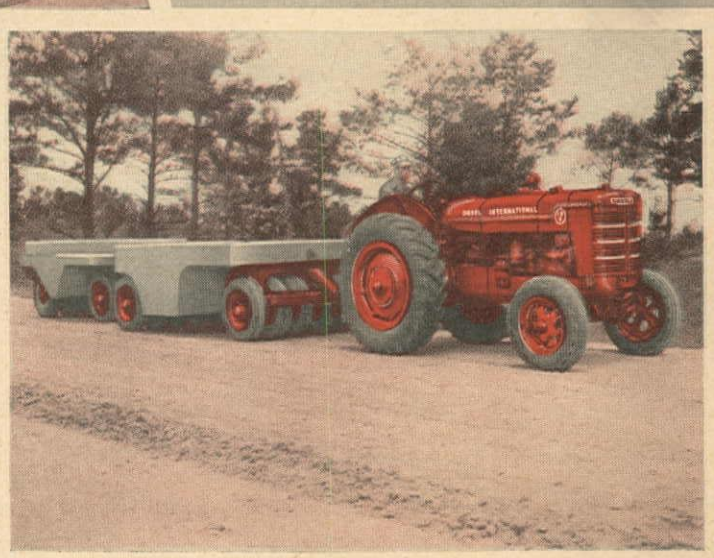


INTERNATIONAL CRAWLER TRACTORS



INTERNATIONAL POWER UNITS

INTERNATIONAL WHEEL TRACTORS



The TD-18 Diesel Crawler with bullgrader, clearing and grading a new highway right-of-way in the upper illustration, is one of four International Diesel models currently available. Several additional models will soon be announced.

The UD-18 Diesel Power Unit in the photograph immediately above is the largest of four International Diesel power plants currently available. In addition there are four carbureted models. Several new Diesels will soon be in production.

The ID-9 Diesel Wheel Tractor hauling the wobble-wheel road compacter, at right, is one of two Diesel and four carbureted International industrial wheel tractors currently available through distributors.

Product of INTERNATIONAL HARVESTER

This symbol, emblazoned on current models of International Industrial Tractors, Engines and Power Units, is your assurance of dependable products, sold and serviced by soundly financed and reputable distributors—and backed by the reputation, resources and facilities of the International Harvester Company.

It marks the establishments set up to serve you most efficiently. It marks the manufacturing works that produce these outstanding tractors and engines.

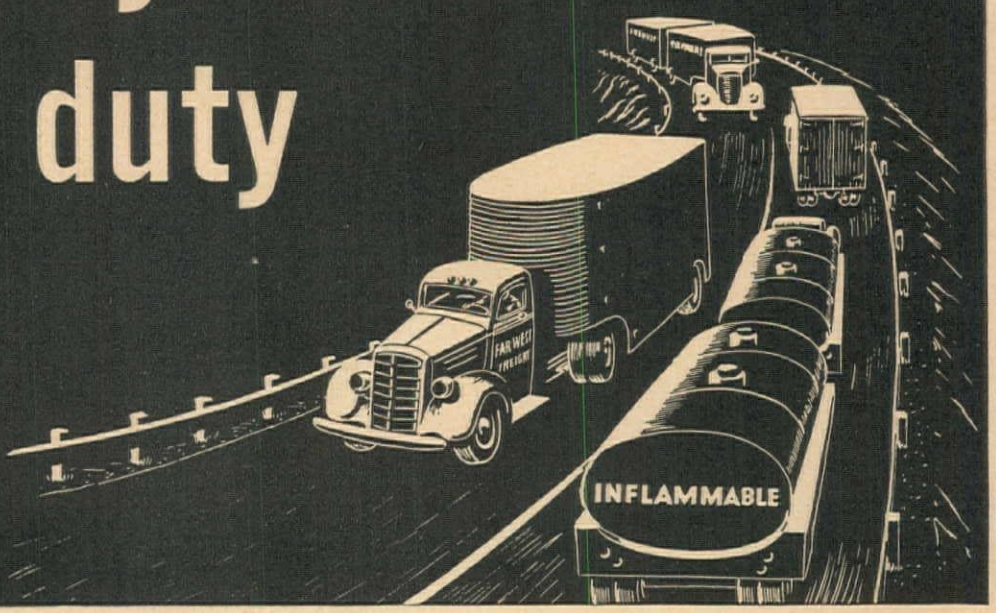
And when the *new* crawlers, wheel tractors and power units, soon to be offered, have satisfied all engineering requirements and passed exhaustive field tests, this symbol will be found upon their radiator grilles in bold relief.

Look for this symbol when you buy power for earthmoving and construction equipment. It is your guarantee that the product bearing it meets all the exacting requirements and specifications that make International Industrial Power products outstanding.

Industrial Power Division
INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue • Chicago 1, Illinois

INTERNATIONAL *Industrial Power*

keeps those 'heavy duties' on duty



Cadel A.P. Heavy Duty Lubricant

An all-purpose engine oil for both gasoline and diesel power plants. Detergent, dispersive and inhibited for better lubrication, clean engines and oil lines, and longer bearing life. Available in grades best suited to your uses.

• • •

The worse the conditions under which your equipment must operate, the more you'll appreciate the performance of this already famous lubricant. In trucks of all weights—as in tractors, shovels or any piece of equipment with an internal combustion engine—Cadel A. P. will keep that engine clean, perfectly lubricated, its bearings uncorroded, and operating at top efficiency for longer periods between overhauls than you would have believed possible. Ask your Associated Lubrication Engineer for proof of Cadel's remarkable performance—and prices and drum sizes.

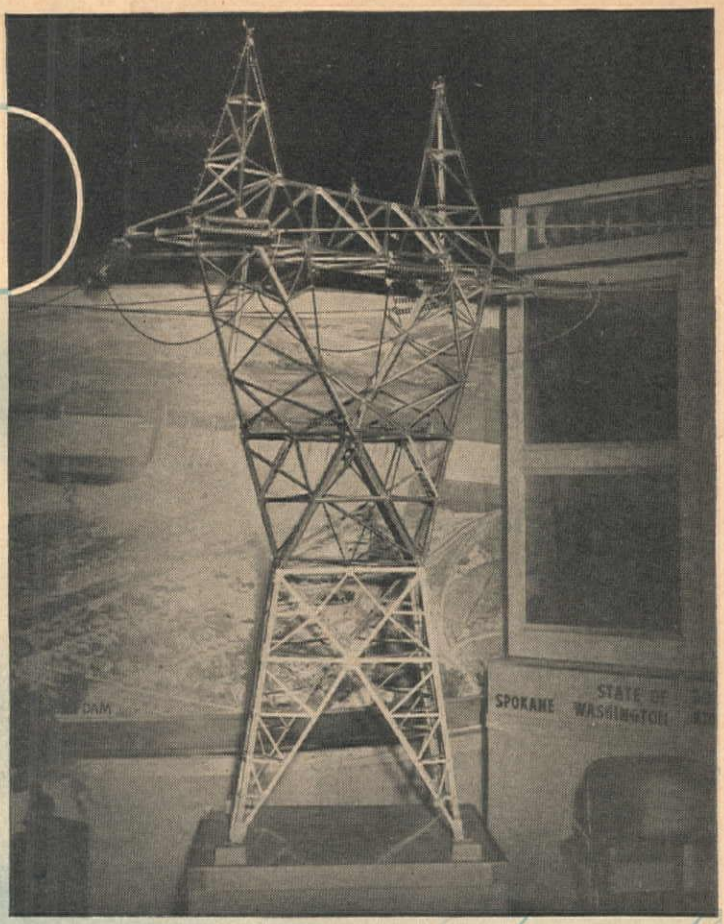
Tell Your Associated Dealer You Want a Credit Card

Free Football Schedules At Associated Dealers

TIDE WATER ASSOCIATED OIL COMPANY

Only a miniature,

but why not ALCOA ALUMINUM in the real towers?



Built of Alcoa Aluminum, a pair of these towers graced the Northwest Power Pool's exhibit (State of Washington) at the recent Metal Show

Alcoa Aluminum structural shapes are being used for substations and switchyard structures, as crossarms on H-frame structures. Being highly resistant to corrosion, the aluminum needs no protective painting. That expense, costly shutdowns, and this maintenance hazard are all avoided.

Aluminum structural shapes are light in weight, easy to transport in rough country, easy to erect. Why couldn't Alcoa Aluminum structural shapes be used for transmission line towers or for certain parts?

Alcoa Aluminum structural shapes are available for prompt shipment. Alcoa has the data your engineers will need to include aluminum in your structures. For this help and prices, call the nearby Alcoa office. Or write:
ALUMINUM COMPANY OF AMERICA,
1811 Gulf Building, Pittsburgh 19, Penna.

ALCOA (REG. T. M.) FIRST IN ALUMINUM

THIS 2-YD. EXCAVATOR
can be shipped without dismantling

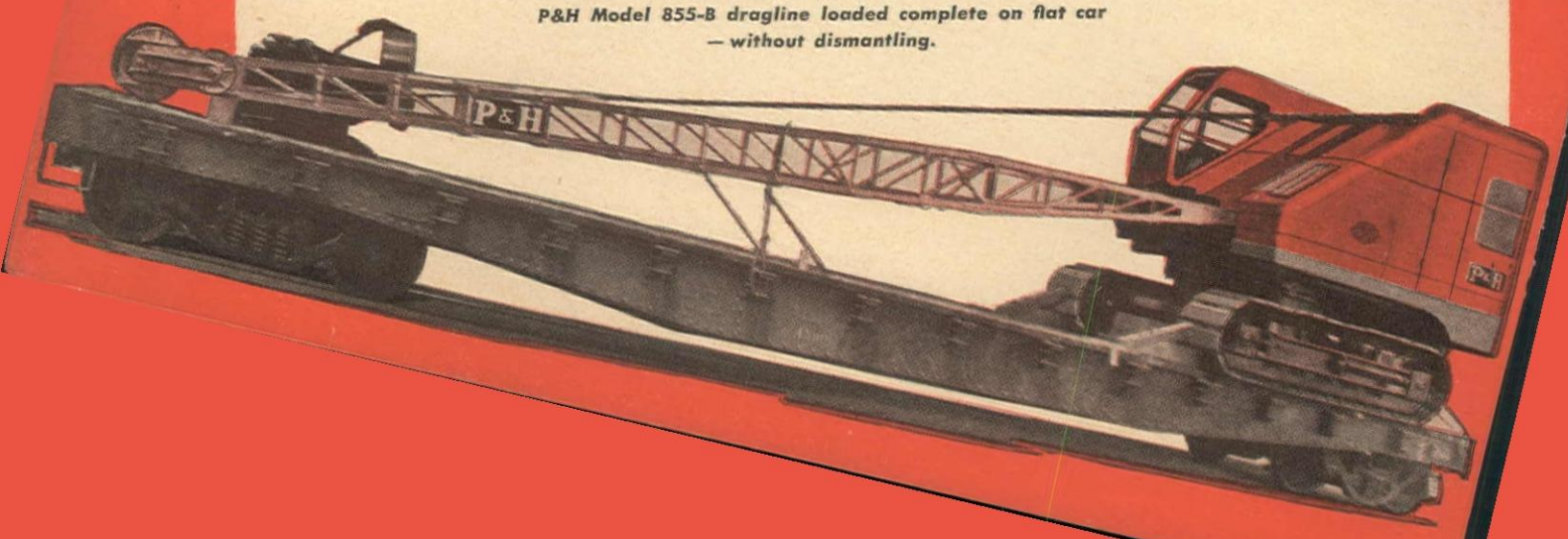
P&H Model 855-B! A full 2-yd. machine that's much easier to transport. You don't have to dismantle and re-assemble when you change job locations.

In addition, it's husky, compact, *welded throughout* of rolled alloy steels, without the penalty of dead weight.

It's a faster worker, too! Velvety-smooth low pressure *hydraulic control* is more responsive, more accurate, more dependable.

Here's the larger capacity you need to speed production, cut costs, on all kinds of jobs. It's fully convertible for service as shovel, dragline, crane, clamshell and pile driver. Ask for all the facts about its added values.

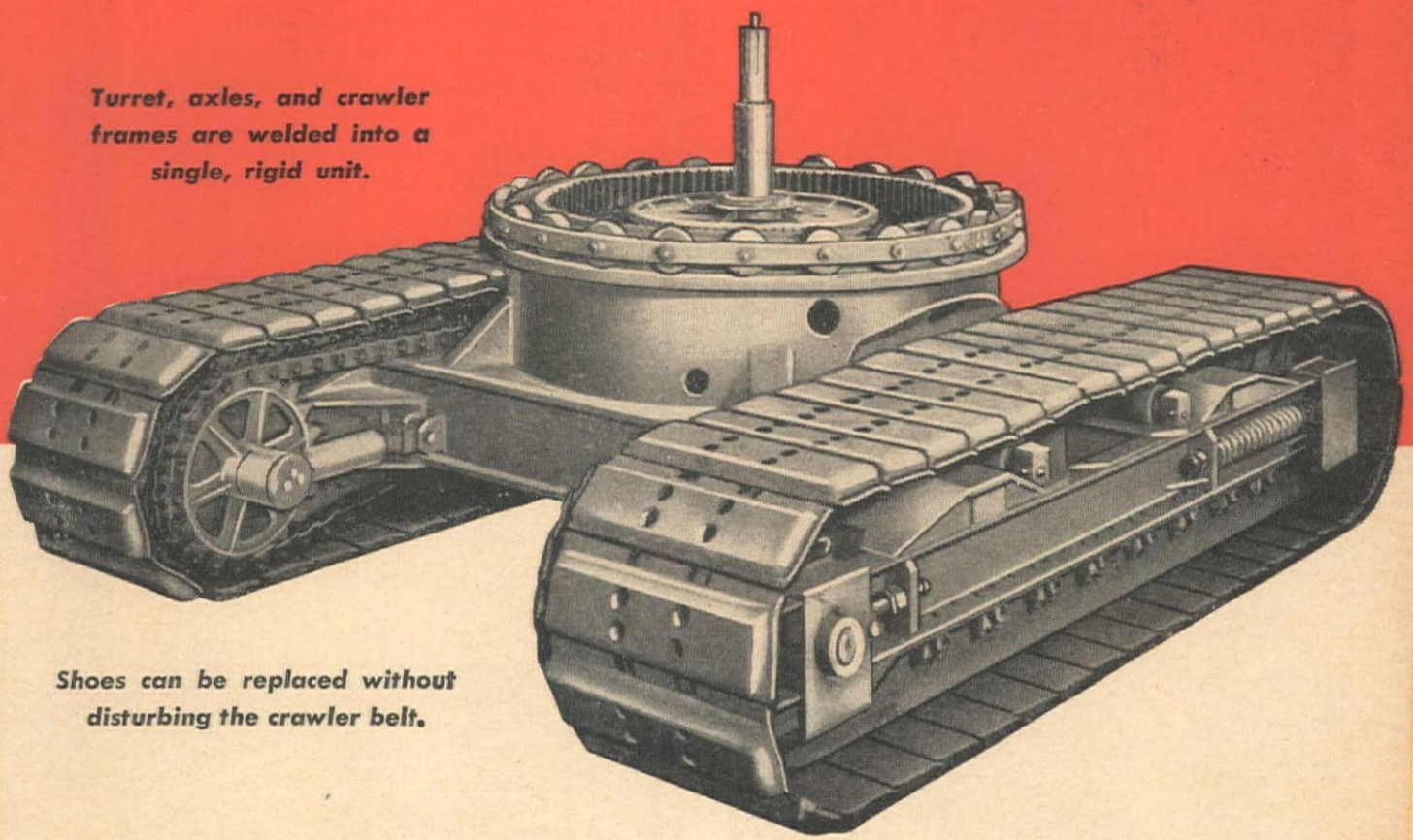
P&H Model 855-B dragline loaded complete on flat car — without dismantling.



for ADDED VALUES

THE *Only* 2-YD. EXCAVATOR WITH TRUE TRACTOR TYPE CRAWLERS

Turret, axles, and crawler frames are welded into a single, rigid unit.



Shoes can be replaced without disturbing the crawler belt.

Here's travel-ability never known before in a machine of this size. These true tractor type crawlers, the kind that have proved themselves in millions of miles of service, put an end to the usual traction troubles; reduce layup time. They're ready to travel under all ground conditions — in sand, gravel, deep mud — or over hard surfaces. Compensator springs keep crawler belts at proper tension, *always*. Maintenance costs are lower than for any other type of crawlers.

Maneuvering is easier, too. With P&H's easy steering, you can make gradual turns, sharp turns, or right-about-face without stopping. Independent double acting hydraulic brakes positively lock the machine against movement while digging.

You'll find still more added values in these new P&H's, such as rapid reversing planetary chain crowd for greater accuracy, longer life; live roller circle for faster, easier swings; double hook rollers which eliminate teetering under heavy loads. And for crane service, independent planetary boom hoist and planetary lowering device which permits the accurate "inching" of loads. They'll save you money *now* in faster production. And they'll save you repair bills for years to come.

P&H

EXCAVATORS

4490 West National Avenue
Milwaukee 14, Wisconsin

HARNISCHFEGER CORPORATION

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

P&H Excavators are built in sizes up to 6 cu. yds. capacity, gasoline, Diesel or electric power. Write for literature on the size you need.

HARNISCHFEGER CORPORATION: SAN FRANCISCO, California
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Warehouses Service Stations: Seattle, Los Angeles, San Francisco
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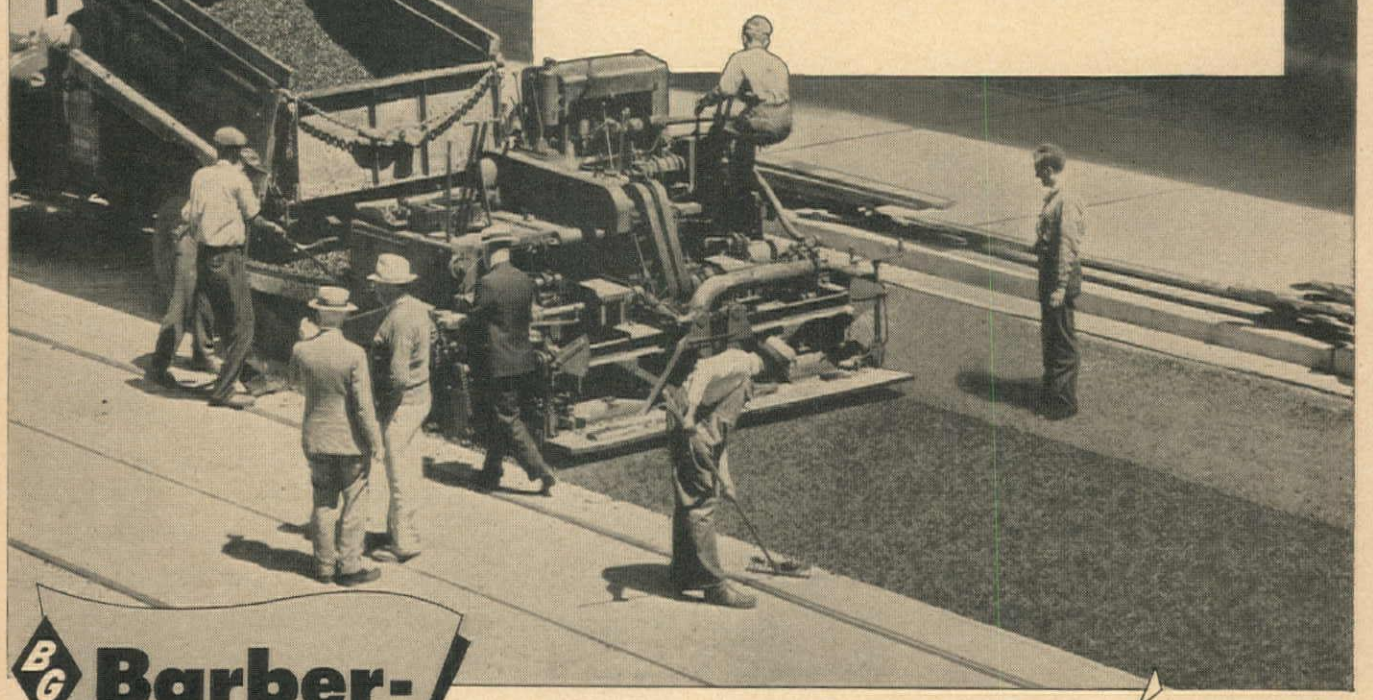
SEATTLE • LOS ANGELES • SAN FRANCISCO

How a B-G Finisher Eliminates New Construction

• Putting a smooth riding asphalt surface on top of neglected highways and streets is good business. Not only is the original cost of construction salvaged, thus effecting a saving to the tax payer, but a great reduction is made in construction time with minimum traffic interruption.

Equally important in the current construction picture is the possibility of starting such resurfacing programs with funds already available. Practically no engineering is required, releasing the Engineering Department for other vital problems. The Barber-Greene Finisher places the one- or two-course resurface directly on the original surface. It automatically levels and produces a ripple-free riding surface. The old paving is left in place and forms an ideal sub-base, resulting in an improved and more permanent street or highway.

Ask your B-G representative for more detailed information on the B-G Tamping-Leveling Finisher. Barber-Greene Company, Aurora, Illinois.



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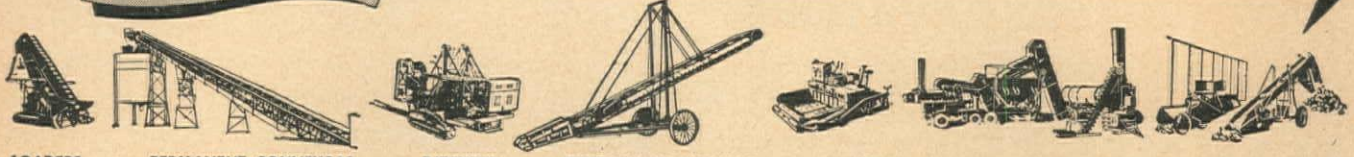
B-G Barber-Greene CONSTANT FLOW EQUIPMENT

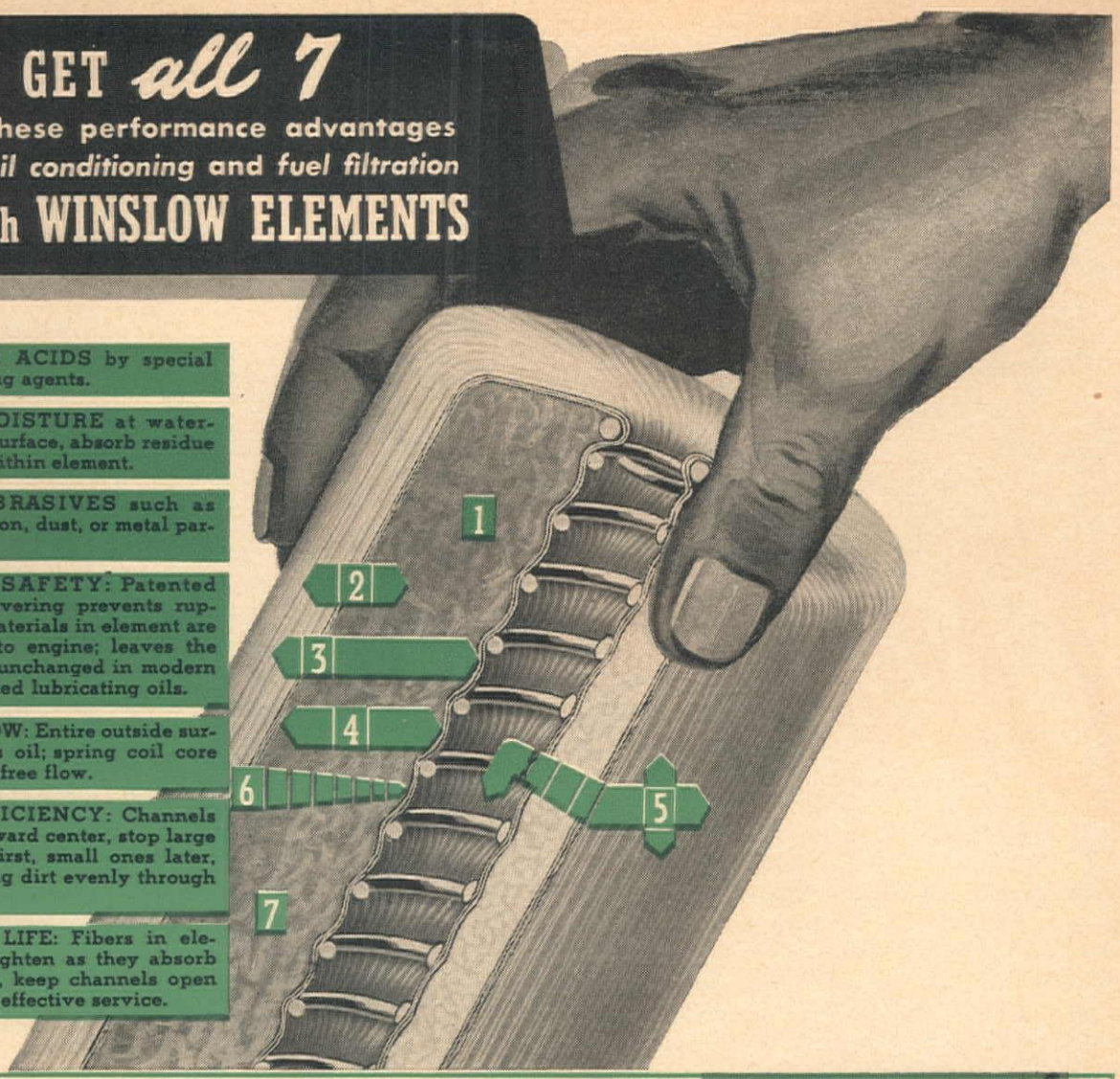


LOADERS • PERMANENT CONVEYORS • DITCHERS • PORTABLE CONVEYORS • FINISHERS • BITUMINOUS PLANTS • COAL MACHINES

Brown-Bevis Equipment Co., Los Angeles 11, California; Brown-Bevis Equipment Co., Phoenix, Arizona; Columbia Equipment Co., Spokane, Washington; Columbia Equipment Co., Seattle, Washington; Columbia Equipment Co., Boise, Idaho; Columbia Equipment Co., Portland 14, Oregon; Contractors Equipment & Supply Co., Albuquerque, New Mexico; Ray Corson Machinery Co., Denver 2, Colorado; Jenison Machinery Co., San Francisco 7, California; Western Construction Equipment Co., Billings, Montana; Western Construction Equipment Co., Missoula, Montana; Kimball Equipment Company, Salt Lake City 10, Utah.

GET *all 7*

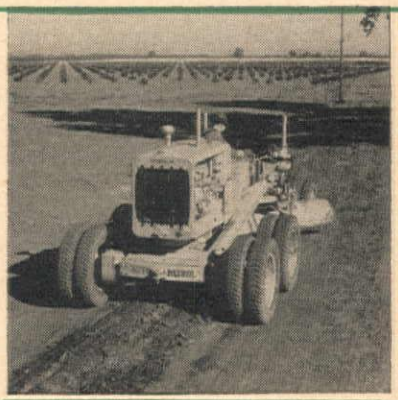
of these performance advantages
in *oil conditioning* and *fuel filtration*
with **WINSLOW ELEMENTS**



1. REMOVE ACIDS by special neutralizing agents.
2. STOP MOISTURE at water-repellent surface, absorb residue in fibers within element.
3. TRAP ABRASIVES such as gritty carbon, dust, or metal particles.
4. TRIPLE SAFETY: Patented double covering prevents rupture; all materials in element are harmless to engine; leaves the additives unchanged in modern compounded lubricating oils.
5. FREE FLOW: Entire outside surface filters oil; spring coil core maintains free flow.
6. TOP EFFICIENCY: Channels narrow toward center, stop large particles first, small ones later, distributing dirt evenly through element.
7. LONGER LIFE: Fibers in element straighten as they absorb impurities, keep channels open for longer effective service.

To fit any standard filter, there's a Winslow Replacement Element from among over 130 types and sizes. And there's a complete Winslow Oil Conditioner or Fuel Oil Filter for every marine, industrial or automotive power plant . . . for any capacity! Backed by 23 years of engineering research and experience, every Winslow product combines correct design with top quality. Send coupon today for details.

RIGHT: Depend on Winslow Oil Conditioners to remove grit, acid, and other impurities *before* bearings are damaged . . . even under hardest operating conditions.



WINSLOW
ENGINEERING COMPANY
4069 HOLLIS STREET, OAKLAND 8, CALIFORNIA

WINSLOW ENGINEERING COMPANY, Dept. 17
4069 Hollis Street, Oakland 8, California

Please send me, without obligation, the colorful 20-page booklet entitled *"The Case of the Dirty Drip* or *The Inside Story of Winslow."*

Name_____

Company_____

Street_____

City_____ Zone_____ State_____

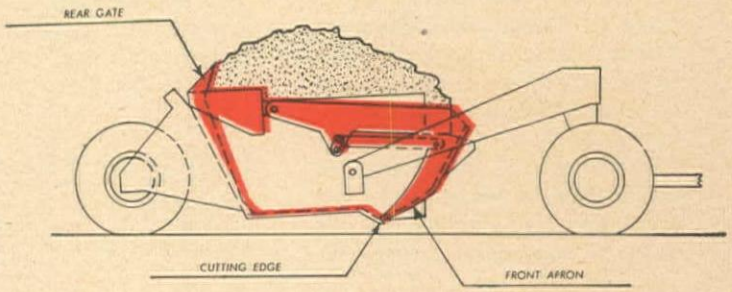
C-4602

FASTER . . .
. . . EASIER
CLEANER . . .

Dumping

Regardless of the kind of material you have to load, you can always be sure that it will be dumped positively and cleanly on every trip with a LaPlant-Choate "Carrimor." This is because the rear gate of the "Carrimor" not only bulldozes all material out of the bowl but the front apron moves ahead and out of the way at the same time. So there's no chance of jamming or sticking . . . no lost time or broken cables trying to get rid of that "last yard." With a "Carrimor" the full load is dumped quickly and easily and the rear gate is positively returned the full distance, ready for the next trip.

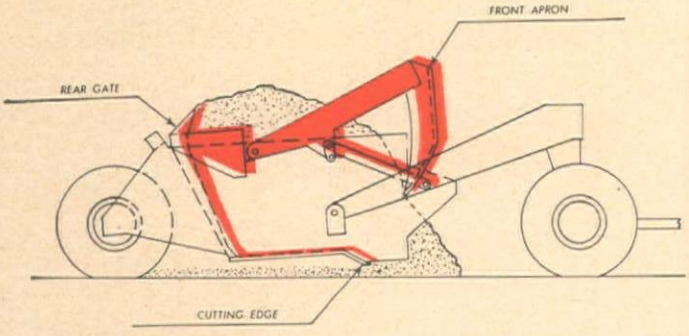
Moreover, these new LaPlant-Choate scrapers in 8- and 14-yard capacities will carry a uniform spread at consistently higher tractor speeds because the cutting edge is positively controlled and completely independent of other moving elements. Add to these advantages superior "load-ability," "grade-ability" and low horsepower requirements and you'll see why so many agree on LPC for lowest possible cost per yard. See your nearest LaPlant-Choate distributor, or write: LaPlant-Choate Manufacturing Company, Inc., Cedar Rapids, Iowa; 1022 - 77th Avenue, Oakland, California.



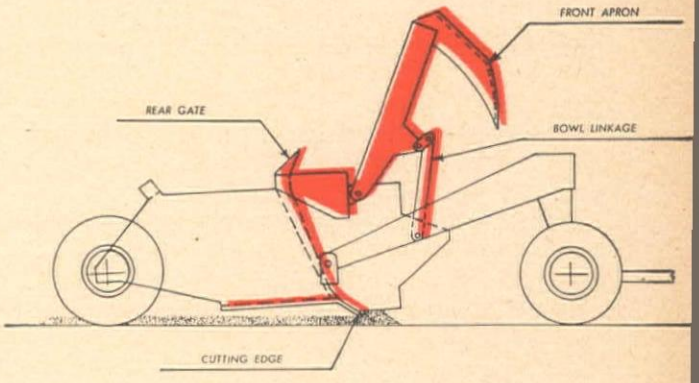
Here is an LPC "Carrimor" shown with a full heaped load, ready for dumping. Thanks to a newly designed cable arrangement, the cutting edge can now be lowered to any desired spreading depth and positively locked to insure a smooth, even spread, without further manipulation of the power control unit.

LaPLANT-CHOATE

Job-Proved Equipment... for Lowest Possible Cost in Moving Earth



This sketch shows you the generous initial opening of the front apron, which allows the material in the front of the bowl to spill out by gravity before the rear gate starts forward. Note how the front apron moves ahead as it travels up, thus assuring an absolutely free exit of material.



Here you see an LPC "Carrimor" in full dumping position, showing how LaPlant-Choate's patented linkage arrangement functions in emptying the scraper bowl completely, without any chance of jamming sticky or bulky material between the rear gate and front apron—an exclusive LaPlant-Choate feature!

OTHER LPC DISTRIBUTORS NEAR YOU

INDUSTRIAL EQUIPMENT COMPANY
San Francisco, Oakland, Los Angeles, Reno,
Sacramento, Fresno, San Diego, Phoenix.

COLUMBIA EQUIPMENT CO.
Portland Seattle
Boise Spokane

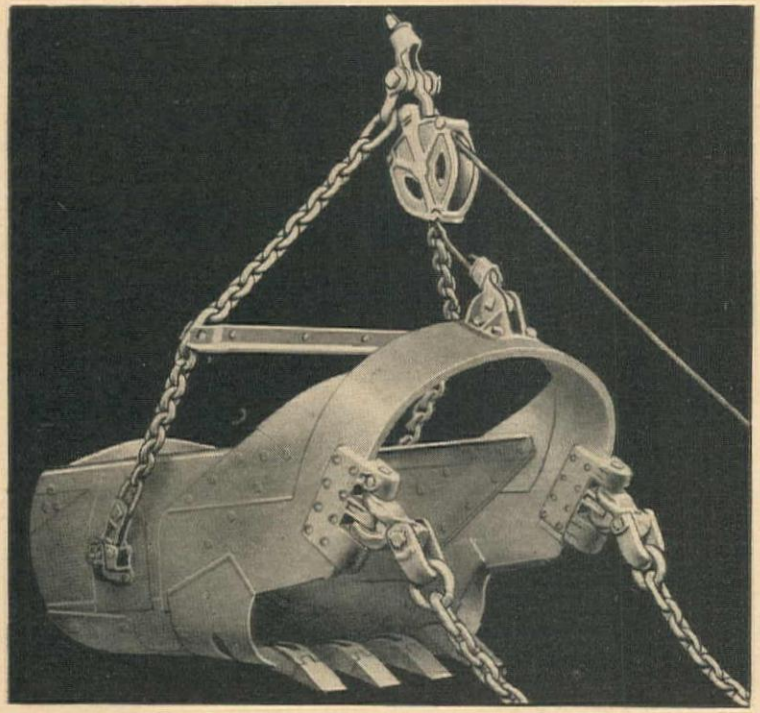
WESTERN CONSTRUCTION EQUIPMENT CO.
505 N. 24th Street, Billings, Montana
218 W. Pine Street, Missoula, Montana

HEINER EQUIPMENT CO.
209 W. Second South Street
Salt Lake City, Utah

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

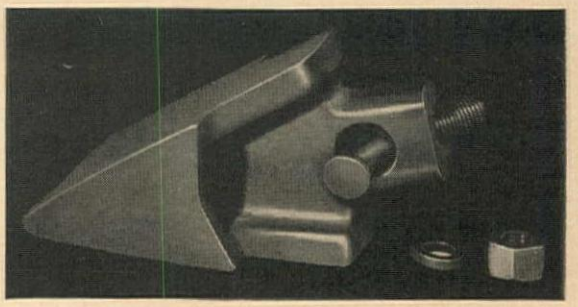
LIBERTY TRUCKS & PARTS CO.
690 Lincoln Street
Denver, Colorado

Another first . . .



for PAGE *Automatic* DRAGLINE BUCKETS

New and exclusive . . .



PAGE REVERSIBLE CENTER SHANK TOOTH POINTS *(secured by a hook bolt)*

Page Manganese reversible Tooth Points will stay absolutely *tight* on the lip. The new hook bolt fastening prevents wearing and tearing of the bolt and also allows quick and easy detachment of the Tooth Points. Page *Automatic* Buckets are now equipped with these new Tooth Points to insure the best digging in any type of material—a great advancement for the *Automatic*—a great saving for you!

WALKING DRAGLINES AUTOMATIC BUCKETS

PAGE ENGINEERING COMPANY
CHICAGO 38, ILLINOIS

For Dependable, Low-Cost Power

Specify Adams

★ There's power galore under the hood of an Adams Motor Grader . . . fast-starting power, available at the push of a button . . . flexible, easily-controlled power that handles every grading operation effectively, economically . . . rugged, dependable power that "hangs on" in toughest going, even under heavy overloads.

But power alone in a motor grader is not enough. Great strength and stamina are needed too . . . the very kind you find in Adams' all-welded, machine-finished construction—in the big, husky frames, axles, gears and operating controls. Little wonder that Adams Motor Graders are world-famous for always-dependable, long-life performance.

With all their tremendous power, strength and stamina, Adams Motor Graders are economical to operate and maintain . . . economical in fuel consumption—economical to service and repair. And Adams' world-wide dealer establishments guarantee constant availability of genuine factory parts, plus fast, efficient, reasonably-priced service. Let your local Adams dealer give you the complete story.

J. D. ADAMS MANUFACTURING CO., INDIANAPOLIS, IND.

LOCAL *Adams* DEALERS

CALIFORNIA—Western Factory Branch
J. D. ADAMS MANUFACTURING CO.
230 7th Street, San Francisco 3
Adams Distributors at: San Francisco, Los Angeles, Sacramento, Redding, Riverside, San Jose, Fresno, Stockton, Salinas, Santa Rosa, Modesto, Visalia, Merced, Bakersfield, Santa Maria and San Diego

ALASKA—Glenn Carrington & Co., Fairbanks
ARIZONA—O. S. Stapley Company, Phoenix
COLORADO—McKelvy Machinery Co., Denver
IDAHO—Intermountain Equipment Co., Boise, Pocatello
MONTANA—Industrial Equip. Co., Billings, Missoula
Hi-Line Equipment Co., Great Falls
NEVADA—Brown Motors, Reno

NEW MEXICO—Hardin & Coggins, Albuquerque
OREGON—Howard-Cooper Corp., Portland, Eugene
UTAH—The Lang Company, Salt Lake City
WASHINGTON—Howard-Cooper Corp., Seattle
Intermountain Equipment Co., Spokane
WYOMING—Industrial Equip. Co., Billings, Mont.
The Lang Company, Salt Lake City, Utah

No OTHER PIPE MATERIAL MEETS ALL THESE REQUIREMENTS

The one and only pressure pipe material that has proved its ability to meet all these requirements: service under ground for all pressures (any soil* or depth of fill)—service under water (salt or fresh)—service above ground (over a salt marsh, for instance)—service in a plant (water purification or sewage treatment)—is *good gray iron* of which cast iron pipe is made.

Because of its all-purpose adaptability, our members furnish cast iron pipe with joints for every service requirement, as shown on the page opposite.

What other pipe material offers you a comparable combination of long life, beam strength and impact strength, high resistance to internal and external pressure? Echo answers—none!

Cast iron pipe offers you, among other advantages—

(1) *A Century or more of useful life as a structure.* (The *proved* useful life of cast iron pipe is more than double the *estimated* life of other pressure pipe materials, under normal conditions.)

(2) *A Century or more of high capacity as a carrier.* (In locations where tuberculating waters are encountered, cement-lined cast iron pipe assures high carrying capacity for the life of the pipe.)

Does any other pressure pipe material offer you all the advantages of cast iron? Echo answers—no! Cast Iron Pipe Research Association, T. F. Wolfe, Research Engineer, Peoples Gas Bldg., Chicago 3.

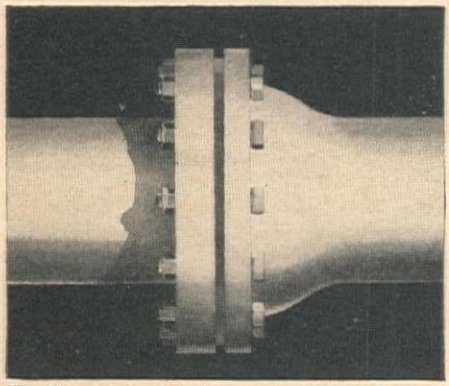
**For "super-hot" soils cast iron pipe is furnished with protective coatings.*

CAST IRON PIPE

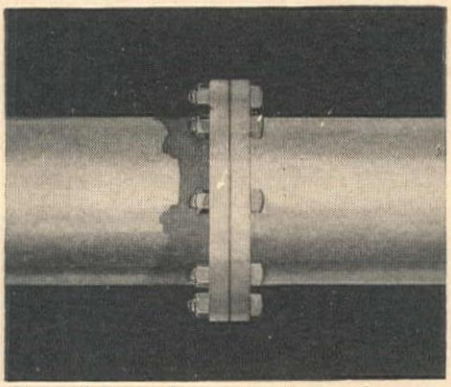
A JOINT FOR EVERY SERVICE NEED

Bell-and-spigot Joint—the time-tried and standard for water, gas and sewerage service.

Mechanical Joint—now standardized with interchangeable parts—for all pressures.



Flexible Joint—for river crossings and other sub-aqueous installations.



Flanged Joint—for water, steam, oil or gas lines generally used above ground.

Other joints are available for special purposes

Serves for Centuries

OWNERS OPERATORS

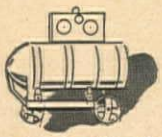
IMMEDIATE DELIVERY

ARC WELDERS...

RELATED EQUIPMENT

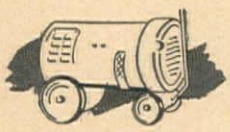
New and used arc welders of well known makes, including Hobart, Lincoln and Westinghouse, in 200, 300 and 400 ampere ratings, either AC or DC, are now included in government-owned surplus and are available for immediate purchase and delivery.

Here you will find the equipment to modernize your shop—to replace worn-out or obsolete welders—to expand your business.



Lincoln—In all models and most ratings. Hundreds in the popular 300-400 Ampere size.

Hobart—Standard models of this make available in large quantities and most ratings.



Westinghouse — Portable models available in limited quantities.

Electrodes and Welding Rods — Millions of pounds available in all types and sizes.

EXPORTERS: Most surplus property is available to the export market. Merchandise in short supply is withheld from export, and if such items appear in this advertisement they will be so identified by an asterisk.

All arc welders are subject to priority regulations. VETERANS OF WORLD WAR II are invited to be certified at the War Assets Administration Certifying Office serving their area, and then to purchase the material offered herein.

Prices are low, based on the type and condition of the equipment. The inventory is located at various points throughout the country. It is broad and includes the machines you need. To obtain complete information on the availability, location and condition of the equipment you want **fill out the coupon and send it to your nearest War Assets Administration Regional Office.**

For full information clip and mail this coupon to:

War Assets Administration:
Please send me complete information on the availability, condition and location of the following types of equipment.

....Hobart Arc Welders ....Westinghouse Arc Welders
....Lincoln Arc Welders ....Electrodes and Welding Rods

Arc Welding Equipment: AC.... DC....
Electric Motor Driven: Volts....Phase....Cycles....
Transformer Type: Volts....Phase....Cycles....

Name.....

Firm.....

Address.....

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

WAR ASSETS ADMINISTRATION

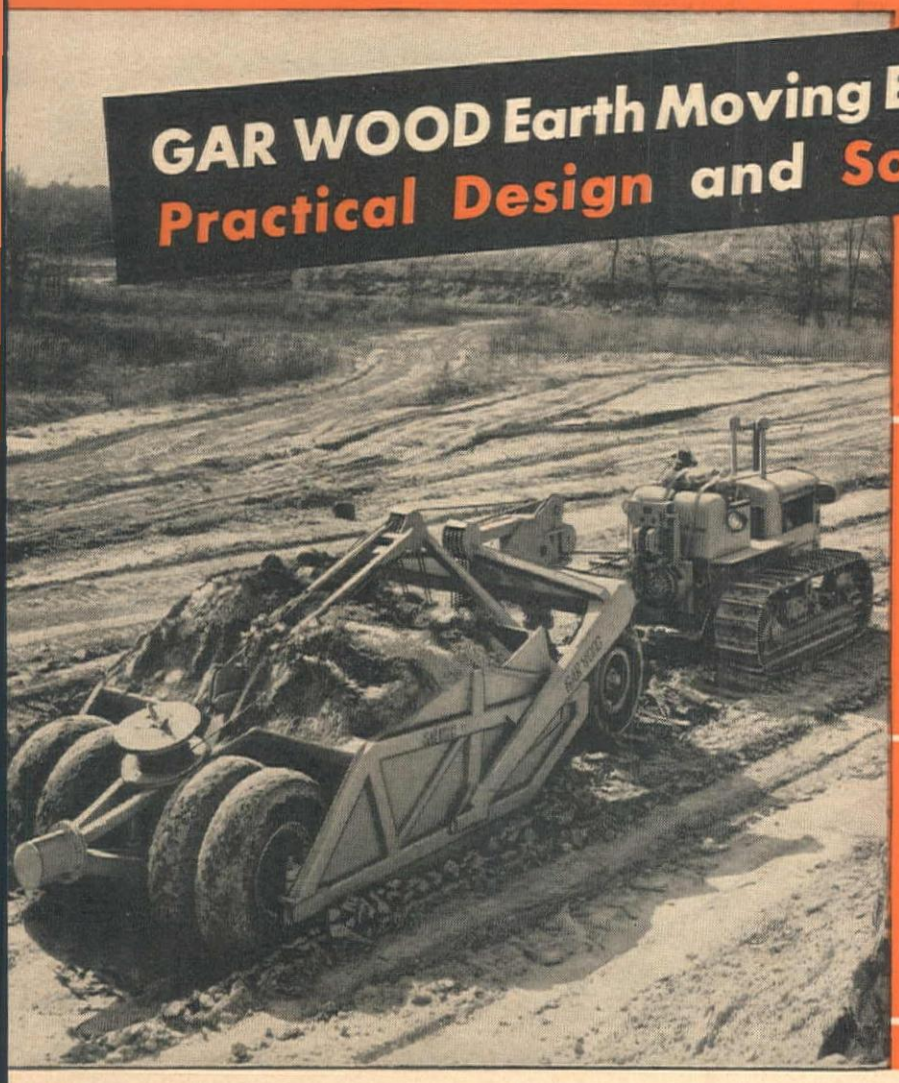
GOVERNMENT OWNED SURPLUS

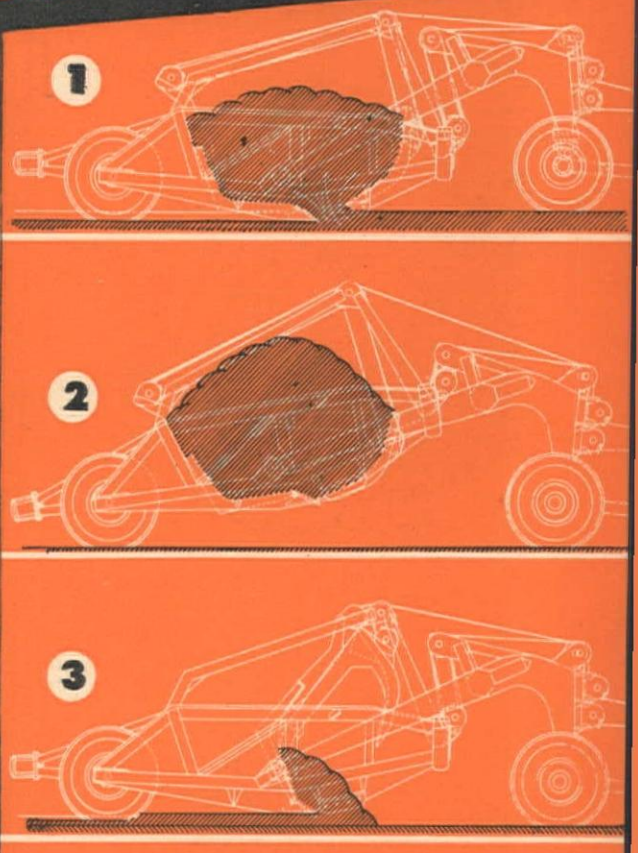
Offices located at: Atlanta • Birmingham • Boston • Charlotte • Chicago • Cincinnati • Cleveland • Dallas • Denver • Detroit • Fort Worth • Helena • Houston • Jacksonville • Kansas City, Mo. • Little Rock • Los Angeles • Louisville • Minneapolis • Nashville • New Orleans • New York • Oklahoma City • Omaha • Philadelphia • Portland, Ore. • Richmond • St. Louis • Salt Lake City • San Antonio • San Francisco • Seattle • Spokane

649-1

Down-to-Earth Engineering

GAR WOOD Earth Moving Equipment Features Practical Design and Sound Construction





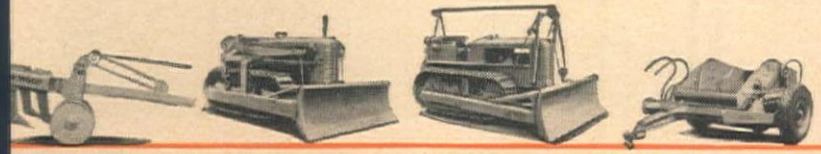
GAR WOOD 4-Wheel Cable Scrapers are *all scraper*, well engineered, honestly built of high quality materials, developed and proved over a period of many years—scrapers that *hold together* and get big yardage jobs done at consistently good speed with an absolute minimum of down time. Some of the many outstanding engineering features, as well as the rugged simplicity of the mechanism, are shown in the three drawings above:

1. LOADING: The self-loading is by positive digging to depths down to 12". "Boiling" action of dirt loads bowl and patented apron evenly by reason of proper angle of the cutting edge. Positive digging action is assured in all types of materials by proper location of draft point.

2. CARRYING: This position provides extremely high clearance of cutting edge, essential in traveling over uneven ground and in discharging sticky materials. Proper weight distribution with exceptionally low center of gravity assures stability—provides for maximum tire life.

3. DUMPING AND SPREADING: The first portion of the load dumps automatically when the apron is raised. The remainder is forced out by *positive rolling ejection.* Note extremely large apron opening to facilitate this ejection of all types of materials. Cutting edge remains stationary throughout cycle, providing for even, *accurate control* of the spread by the heavy duty *Gar Wood Cable Control Unit.*

Contact your Allis-Chalmers dealer. He will be glad to show you Gar Wood earth moving equipment and arrange for you to see on-the-job performance in your locality.



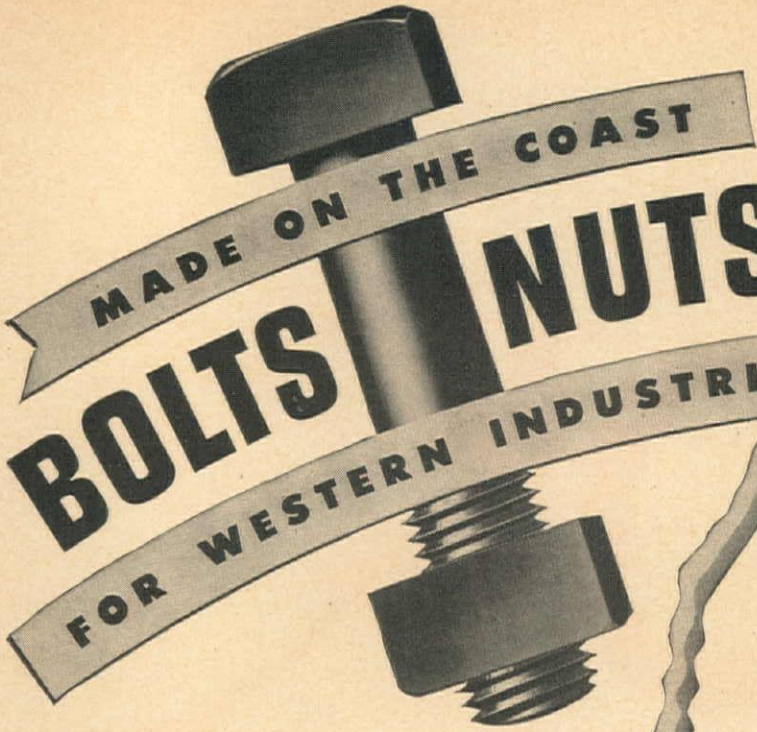
Heavy Duty Rippers | Hydraulic Dozecaster | Cable Dozecaster | 2-Wheel Hydraulic Scrapers

OTHER GAR WOOD PRODUCTS: HOISTS AND BODIES • TANKS • WINCHES AND CRANES • HEATING EQUIPMENT • MOTOR BOATS

GAR WOOD ROAD MACHINERY WITH ALLIS-CHALMERS DIESEL POWER

Sold Through
ALLIS-CHALMERS
Dealers Everywhere

ROAD MACHINERY DIVISION
GAR WOOD INDUSTRIES, INC.
DETROIT 11, MICHIGAN

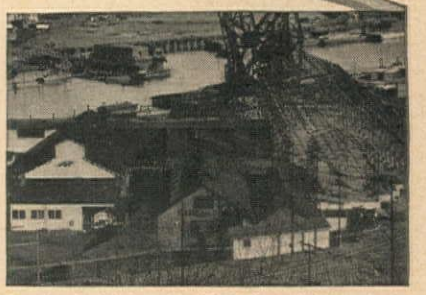


MADE ON THE COAST
BOLTS NUTS
FOR WESTERN INDUSTRIES

This map shows the plant locations of the Coast's largest full-line manufacturer of bolts and nuts—Bethlehem Pacific.

With these well-situated plants Bethlehem Pacific is an economical, dependable source for all types of fastenings needed by Western jobbers, manufacturers, builders and railroads.

★ Seattle



Seattle, Bethlehem Pacific Bolt and Nut plant serving the entire Northwest.

Interior of Bethlehem Pacific's South San Francisco Bolt and Nut plant, showing equipment for cold-heading, threading, pointing, and trimming bolts.

South San Francisco location of this Bethlehem Pacific Bolt and Nut Plant makes possible excellent service to the Central Coastal Area.

★ San Francisco

Bethlehem Pacific makes...

BOLTS NUTS RIVETS TRACK BOLTS
TRACK SPIKES PIPE BANDS
PLYWOOD BOLTS TIMBER BOLTS
CUT AND ROLLED THREADED RODS
HOT AND COLD FORGED SPECIALTIES
Miscellaneous Headed and Threaded Products

Los Angeles, Bethlehem Pacific Bolt and Nut plant for service to the South Coastal Area.

★ Los Angeles

Bethlehem Pacific Coast Steel Corporation

GENERAL OFFICES: SAN FRANCISCO

District Offices: Seattle: 3800 Iowa Ave.; Los Angeles: 3391 E. Randolph St., Vernon; Portland: 508 Pacific Bldg.; Salt Lake City: 919 Kearns Bldg.; Honolulu: Schuman Bldg.

BETHLEHEM PACIFIC

BETHLEHEM STEEL

GEARED TO THE EARTH —FOR FASTER LOADING

with MAXIMUM Traction and Weight on Drive-Wheel Centers

WOOLDRIDGE
EARTHMOVING EQUIPMENT
Includes

★ **SCRAPERS**
Tractor-drawn for handling heaping yardages from 6 to 28 cu. yards.

★ **POWER CONTROL UNITS**
Single and multiple drum with universal or roller fairleads.

★ **BULLDOZERS**
Tough and rugged design for standard makes of tractors.

★ **TRAILBUILDERS**
Adjustable angle-blades for standard tractor mounting.

★ **RIPPERS**
Available in light, medium and heavy duty models with two sizes to each model.

DISTRIBUTOR SALES & SERVICE FACILITIES IN ALL PRINCIPAL AREAS & FOREIGN TERRITORIES

The scraper unit of Wooldridge Terra-Cobra Earthmovers is suspended from a rigid yoke and frame which connects to the engine unit by means of the massive oscillating King Pin. This design concentrates maximum weight of the combined units, fully loaded or empty, directly over drive wheel centers which provides greatest possible traction for positive travel. At no time does this tractive weight shift—even when the bowl is dropped for loading. For fast, low cost earthmoving, gear your operations to Terra-Cobras. Get full details today.

WOOLDRIDGE
MANUFACTURING COMPANY
SUNNYVALE • CALIFORNIA • U. S. A.

TERRA COBRA
High-Speed Self-Propelled EARTHMOVERS

There's Gold *IN STEEL SCRAP*

HERE IS THE WAY TO GET IT

Steel producers urgently need scrap.

Millions of tons of steel products that have served their usefulness are piled throughout the country. Cut it to charging box size and start it moving. Idle scrap means idle mills and idle fabricating plants.

Linde can supply the oxygen, acetylene, cutting equipment, and technical help for any scrapping operation.

THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation

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

In Canada: Dominion Oxygen Company, Limited, Toronto

"Torque-Tailored" MOTORS

PULLED THIS FLOOD-CONTROL JOB "OUT OF A HOLE"

SIX big flood pumps were needed to lift the waters of Cincinnati's Mill Creek over the barrier dam when the Ohio River was in flood. Two factors dictated the use of synchronous motors for driving these pumps—the large amount of power required, and the low pump speed.

But, the pumps were below the flood level of the Ohio—literally "in a hole." This resulted in a siphoning action which caused an unusual peak in the starting torque required by the pumps (see white arrow below). To get over this peak with synchronous motors of conventional design would have required oversized motors with high starting currents which would have resulted in excessive voltage disturbances. The solution lay in "tailoring" the torque characteristics of the synchronous motors to meet the pumps' individual needs.

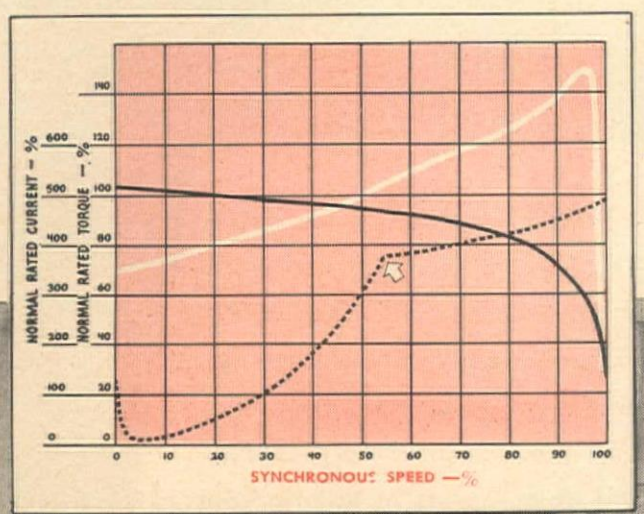
G.E. finds the answer

Our engineers prepared specifications for synchronous motors which convinced the flood-control engineers that these motors, as designed and built by General Electric, were right for the job *in advance* of installation. Our recommendation was for six specially built vertical synchronous motors, rated 6500 hp at 180 rpm, unity power factor.

The white line on the chart shows how these G-E motors provide ample starting, accelerating, and pull-in and pull-out torques. Motor torque continuously exceeds pump requirements by a safe but never excessive margin. Starting current (thin black line) is kept well within the capacity of the power system. Recently the pumps were called into action to divert flood waters, and the motors proved the soundness of their design for the job.

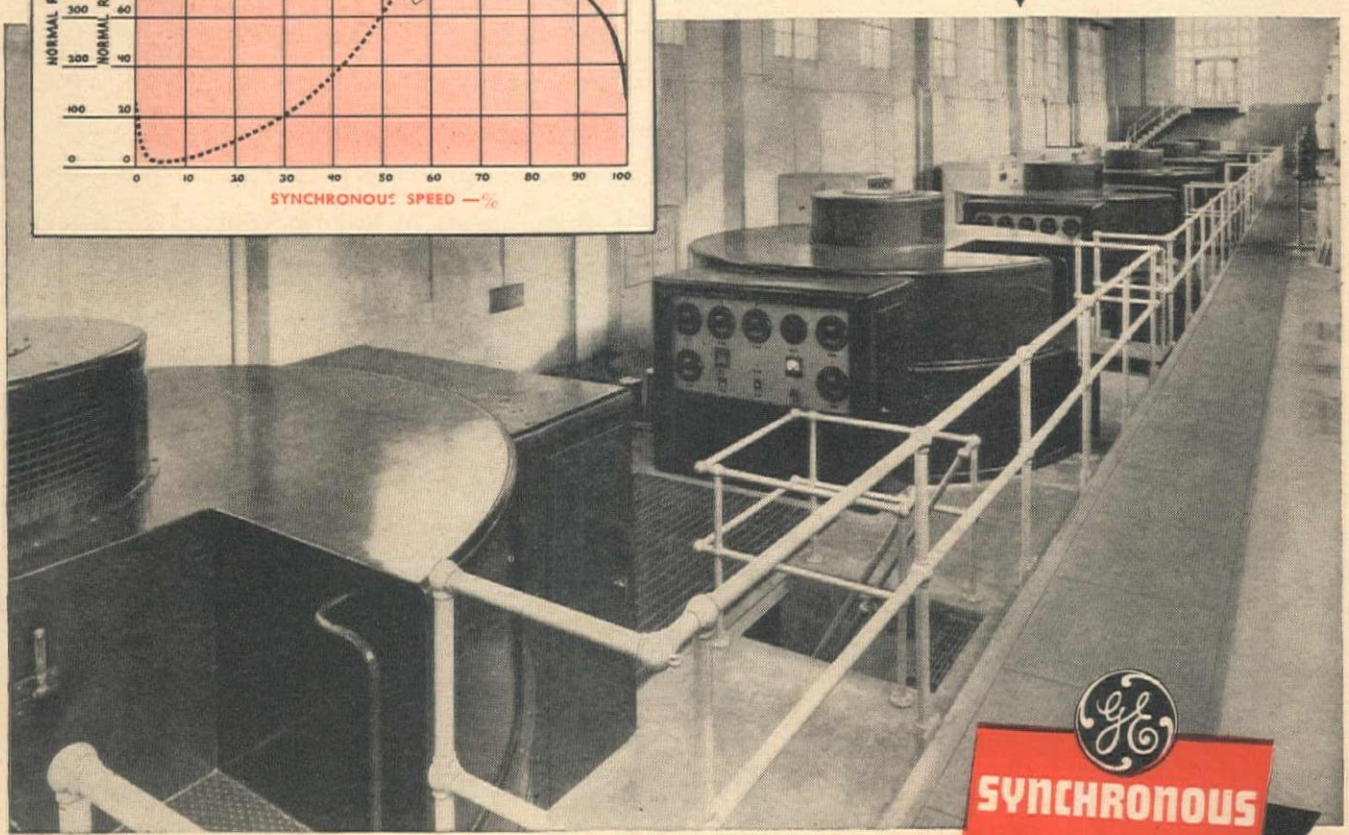
For jobs of every size

Whether your synchronous motor needs call for special engineering or a standard design, you will find definite advantages in coming first to General Electric for help in writing specifications, or for a quotation on the most suitable and economical unit. G.E. has the widest range of motors available—in vertical and horizontal construction, and in ratings from 20 to 65,000 hp. They combine reliability and durability with the trim good looks that can add much to the prestige of your job. *Apparatus Dept., General Electric Co., Schenectady 5, N. Y.*



◀ ***TEST RESULTS,*** showing how motor-torque and -current characteristics matched pump requirements and the characteristics of the power supply.

THE MODERN GOOD LOOKS of G-E synchronous motors match their outstanding electrical behavior. A feature of this installation is the use of built-in gage boards with instruments for recording bearing, winding, and cooling-water temperatures. ▼



GENERAL ELECTRIC

750-252-8030

SELECT TRAILMOBILES FOR EQUIPMENT HAULING

Hauling construction equipment is a specialized job which should be entrusted only to equipment specifically built for that service. TRAILMOBILE Low-Beds are used by many large contractors and machinery haulers to move tractors, bulldozers, power shovels, rock crushers, drilling rigs, and other heavy machinery from one location to another. TRAILMOBILES are built to pack heavy, concentrated loads. That's why they stand up for years in this rigorous service. If you have large sums tied up in heavy equipment, you want to keep it working as continuously as possible. You want to move it from job to job with the least loss of time. For that kind of work, you want a TRAILMOBILE LOW-BED.

THE TRAILMOBILE COMPANY • BERKELEY, CALIFORNIA

TRAILMOBILE

Los Angeles • Berkeley • Sacramento • Santa Rosa • Fresno • San Jose • Bakersfield • Stockton • Ogden • Seattle • Honolulu

EXCAVATORS

★

INSLEY

★

CONCRETE EQUIPMENT

for

LOW-COST YARDAGE

IN THE WEST

IN THE MIDWEST

IN THE EAST

IN THE WEST—In this operation a K-12 Insley Dragline is handling plaster sand with typical Insley speed and economy.

IN THE MIDWEST—"1000 feet in a good day" is the record of this K-12 Insley Hoe clearing and widening a drainage ditch.

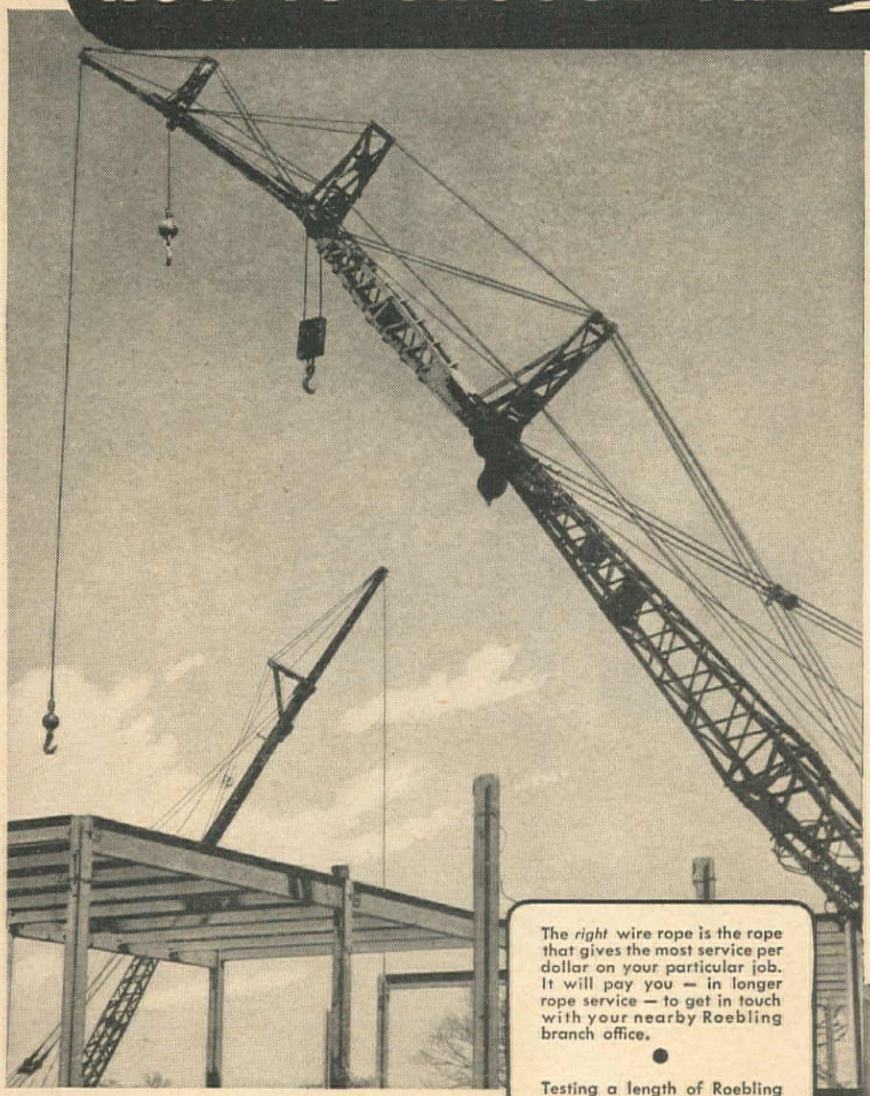
IN THE EAST—This K-12 Insley Shovel is loading anthracite coal directly from the vein after the stripping operation.

INSLEY MANUFACTURING CORPORATION • INDIANAPOLIS, INDIANA

FOR INSLEY SERVICE AND SALES IN YOUR TERRITORY

ANDREWS MACHINERY	404 N. W. Broadway, Portland 9, Oregon
ANDREWS EQUIPMENT SERVICE	126 South Walnut St., Spokane 9, Washington
CHOGUILL TRACTOR CO., INC.	1748 Grand Avenue, Phoenix, Arizona
CONSTRUCTORS EQUIPMENT CO.	3707 Downing St., Denver 4, Colorado
MOTOR EQUIPMENT CO.	507 N. 2nd Street, Albuquerque, New Mexico
H. H. NIELSEN COMPANY	541 W. 2nd Street, Salt Lake City 1, Utah
SERVICE EQUIPMENT CO.	300 Aurora Avenue, Seattle 9, Washington
SHAW SALES AND SERV. CO.	5100 Anaheim-Telegraph Rd., Los Angeles 22, Calif.

HOW TO CHOOSE THE *RIGHT* ROPE



. . . and get lowest handling cost!

YOU DON'T ALWAYS have the time to study the often obscure details affecting wire rope service on your installations. But your Roebling Field Engineer is constantly making such studies.

His daily contacts include tracking down the facts on practically every type of wire rope installation. He has specialized knowledge of wire rope usage . . . and of wire rope, too.

After careful study the Roebling Field Engineer can help you choose the *right* rope . . . the one that will give you top service per dollar. Of course, he will recommend Roebling "Blue Center" Steel Wire Rope. For here is a complete line—both preformed and non-preformed — where he can find the wire rope that combines the right balance of strength and flexibility, of fatigue and abrasion resistance.

Call or write our nearest branch office. Get in touch with your Roebling Field Engineer.

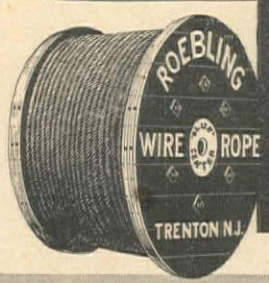
JOHN A. ROEBLING'S SONS COMPANY OF CALIFORNIA

San Francisco • Los Angeles • Seattle • Portland

The *right* wire rope is the rope that gives the most service per dollar on your particular job. It will pay you — in longer rope service — to get in touch with your nearby Roebling branch office.

Testing a length of Roebling "Blue Center" Steel Wire Rope is important—*to you.* It gives engineering data to your Roebling Field Engineer . . . information that can save your wire rope dollars.

Manufacturers of Wire Rope and Strand • Fittings • Slings • Suspension Bridges and Cables • Aircord, Aircord Terminals and Air Controls • Aerial Wire Rope Systems Electrical Wire and Cable • Ski Lifts • Hard, Annealed or Tempered High and Low Carbon Fine and Specialty Wire, Flat Wire, Cold Rolled Strip and Cold Rolled Spring Steel • Screen, Hardware and Industrial Wire Cloth • Lawn Mowers



PREFORMED • NON-PREFORMED

ROEBLING

PACEMAKER IN WIRE PRODUCTS

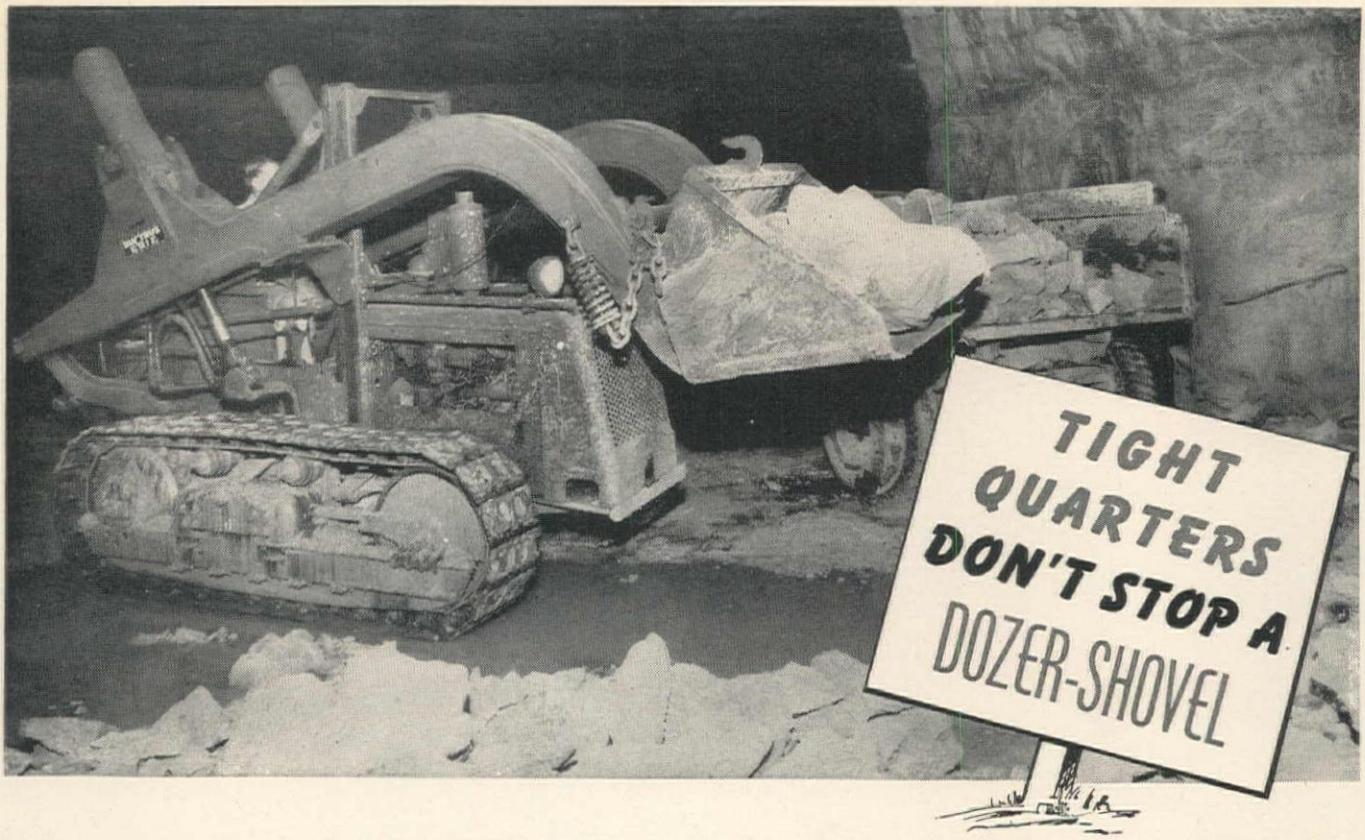
Paving the Way to Tomorrow

GOOD ROADS SYMBOLIZE AMERICA. And the men who build them have their sights set on new horizons. Their old skills and new techniques are ready to build highways that will, more than ever, make neighbors of us all... and customers of one another's farms and industries. • As a means to better living, good roads and city streets—engineered for safety and easy traffic flow—make quicker, cheaper transportation possible for nearly everything we eat, wear and use. And efficient motor trucks go hand in hand with them. Since long before the start of the "Good Roads Movement" after the first World War, White has furnished the pacemaking trucks of the industry. And the new Super Power Whites offer every industry greater opportunity for better service at less cost than ever before.

THE WHITE MOTOR COMPANY
Cleveland, Ohio, U. S. A.
THE WHITE MOTOR COMPANY OF CANADA, LIMITED
Factory at Montreal

White

FOR MORE THAN 45 YEARS THE GREATEST NAME IN TRUCKS



The number of jobs you can handle efficiently automatically shoots upward when you get a Bucyrus-Erie DOZER-SHOVEL because this unit has the ability, unique among front end loaders, to get into and around in places where use of machinery was formerly considered impossible. The DOZER-SHOVEL'S low clearance (7'5" for TD-6; 8'1 ½" for TD-9) lets it squeeze through low narrow openings; its compactness and exceptional maneuverability permit it to swing fast and work at high speed in well ventilated tunnels, small mines, warehouses, shipholds, etc. It digs, lifts, swings, and dumps in places otherwise inaccessible — gets in where others can't to do the work you want done in a hurry. Between jobs, the DOZER-SHOVEL is easily, quickly transported on a trailer. Its low overall height enables it to clear highway obstructions with ease, lets you house the machine in a garage without special doors.

See your International TracTracTor Distributor for full details. He'll tell you about the many other DOZER-SHOVEL features too: Its versatility, retention of inherent tractor characteristics, balance, full front visibility, convertibility, easy control, oscillating tracks.

43T46

BUCYRUS-ERIE COMPANY
SOUTH MILWAUKEE, WISCONSIN

See Your INTERNATIONAL TracTracTor Distributor

ARIZONA: John P. Duncan, Yuma; Flagstaff Implement Co., Flagstaff; The Lines Co., Safford; Northern Arizona Supply Co., McNary; F. Ronstadt Hardware Co., Tucson; The O. S. Stapley Co., Phoenix. CALIFORNIA: J. G. Bastain, Redding; Braman-Dickerson Co., Riverside; Brown Tractor Co., Fresno, Madera and Reedley; Edgar Implement Store, El Centro; M. Eltiste & Co., Inc., Santa Ana and Anaheim; Exeter Mercantile Co., Visalia and Exeter; Farmers Exchange, Alturas; Farmers Mercantile Co., Salinas, Hollister, King City and Watsonville; Gallagher Tractor & Impl. Co., Merced; Hanson Equipment Co., Santa Maria; Kern County Equipment Co., Bakersfield and Wasco; L. G. Maulhardt Equipment Co., Oxnard; Smith Booth Usher Co., Los Angeles; Southern Equipment & Supply Co., San Diego; Stanislaus Implement & Hardware Co., Modesto; Stevenson Equipment Co., Santa Rosa; Sutton-Morf Tractor Co., Sacramento; Thompson-Sage, Inc., Stockton, Lodi and Tracy; Valley Equipment Co., San Francisco and San Jose. IDAHO: Intermountain Equipment Co., Boise and Pocatello. NEVADA: Brown Truck & Equipment Co., Reno; Clark County Wholesale Mercantile Co., Inc., Las Vegas. NEW MEXICO: Hardin & Coggins, Albuquerque. OREGON: Howard-Cooper Corp., Portland and Eugene. UTAH: The Lang Co., Inc., Salt Lake City. WASHINGTON: Howard-Cooper Corp., Seattle; Intermountain Equipment Co., Spokane and Walla Walla. WYOMING: Wilson Equipment & Supply Co., Cheyenne and Casper.

TRACTOR BUCYRUS ERIE EQUIPMENT TE-2

225 trips per 8 hours

nearly 2-mile round trip

with 5 TOURNAPULLS

To handle 230,000-yard fill for industrial sites in South San Francisco, Keeble and Brown, San Mateo, California contractors, used 5 fast-moving Tournapulls . . . with them, maintained a high rate of production.

Average 45 Trips per 8 Hour Shift

Working over hauls almost a mile one way, contractors records show each rig made a round trip every 10½ minutes . . . averaged 45 trips per 8-hour shift. Return trip was up long 4% grade, with last 300' of 15% grade entering borrow. Well maintained haul roads, plus the use of LeTourneau Rooter to speed loading of shale and serpentine, enabled Keeble and Brown to take full advantage of the production capacity of their high-speed, rubber-tired Tournapulls.

Drove Rigs 500 Miles to Job

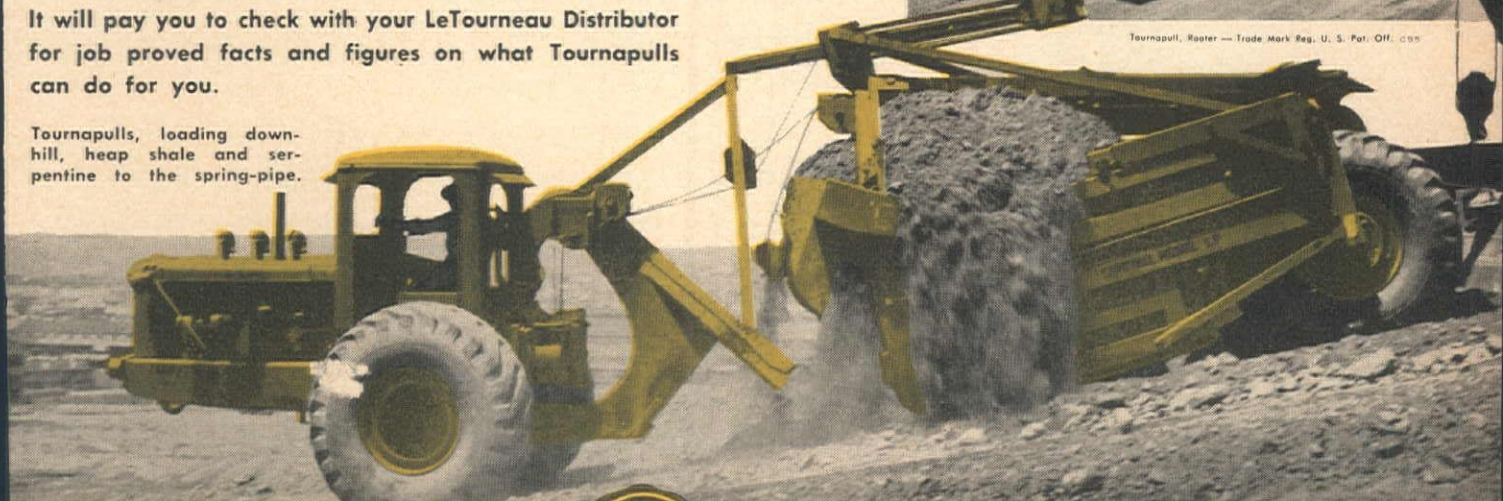
Typical of their time and money-saving ability, these rigs drove 500 miles to the job in 4½ days, during a recent transportation tie-up.

It will pay you to check with your LeTourneau Distributor for job proved facts and figures on what Tournapulls can do for you.

Tournapulls make close to 2 mile round trip in 10½ minutes . . . return up long 4% grade, with last 300' up 15% grade entering borrow area.

Tournapull, Rooter — Trade Mark Reg. U. S. Pat. Off.

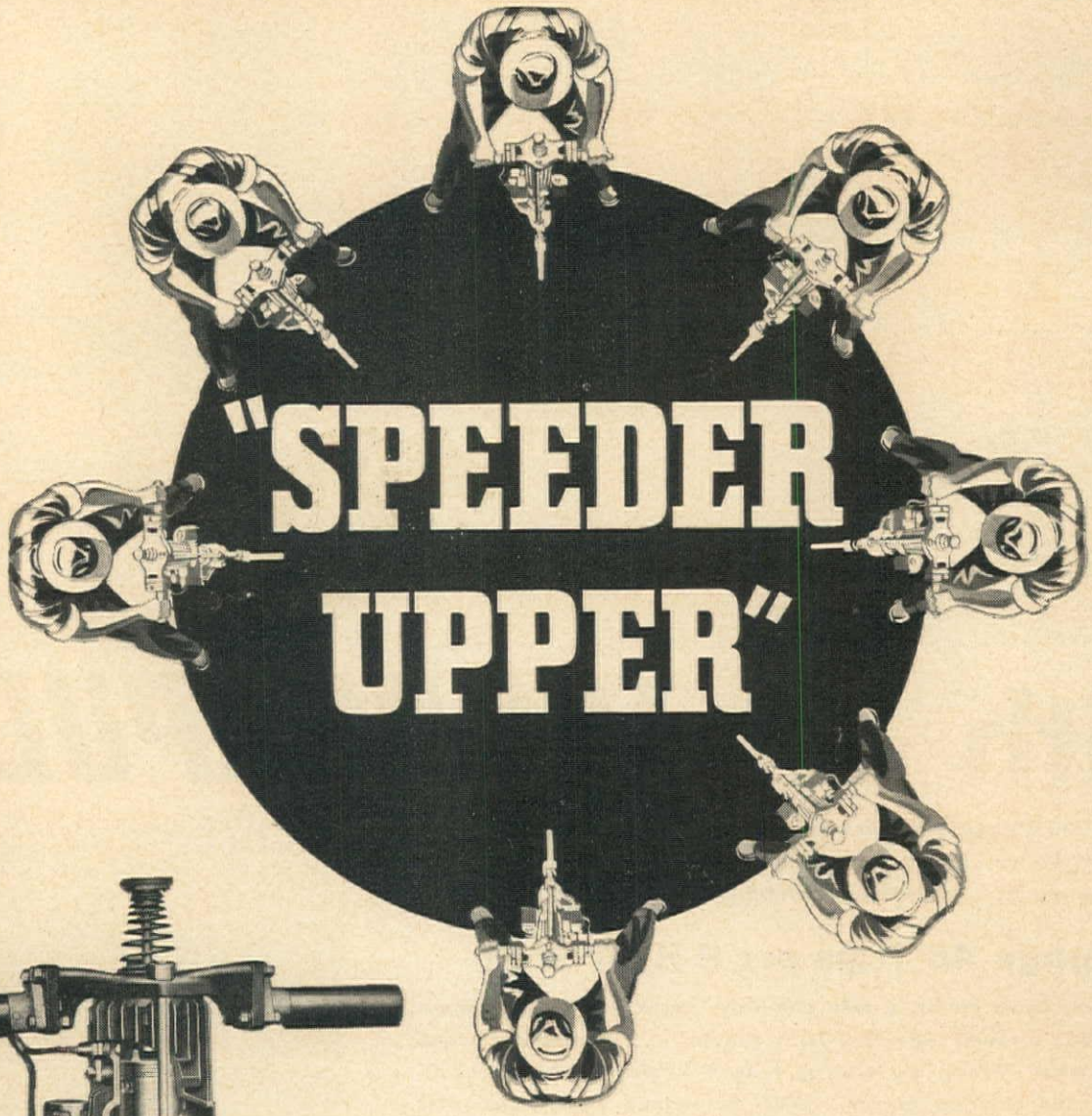
Tournapulls, loading downhill, heap shale and serpentine to the spring-pipe.

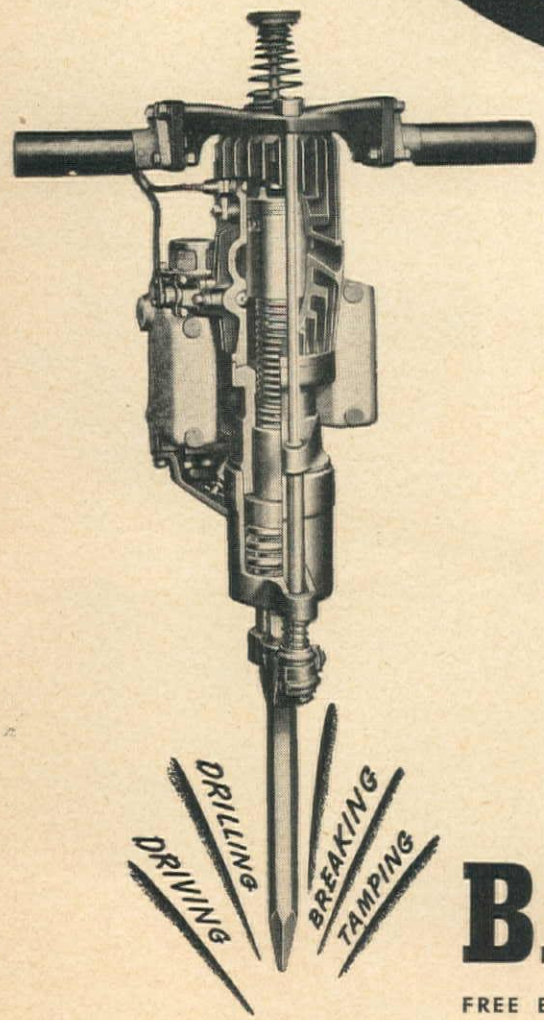


LETOURNEAU
PEORIA, ILLINOIS

JOB-PROVED
Over 4500 Built and Shipped

TOURNAPULLS





ON A THOUSAND AND ONE JOBS!

The all-around usefulness of Barco is lifting this Portable Hammer's popularity to new heights. Breaking, drilling, driving, tamping—there's almost no limit to the range of jobs Barco can do. Barco is easy to handle, easy to maintain and mighty difficult to do without. Send for complete details. Barco Manufacturing Co., Not Inc., 1819 Winnemac Avenue, Chicago 40, Illinois. In Canada: The Holden Co., Ltd., Montreal, Canada.

BARCO PORTABLE GASOLINE HAMMERS

FREE ENTERPRISE — THE CORNERSTONE OF AMERICAN PROSPERITY

Precisionbilt, like a balance scale, J&L Permaset Pre-formed Wire Rope is designed for balance and built for quality by men of experience and skill.

J&L Precisionbilt Permaset Pre-formed Wire Rope is made of J&L Controlled Quality steel—it has the strength and stamina for the toughest jobs.

J&L STEEL

JONES & LAUGHLIN STEEL CORPORATION

GILMORE WIRE ROPE DIVISION

PITTSBURGH 30, PENNSYLVANIA

J&L *Precisionbilt* PERMASET PRE-FORMED WIRE ROPE

YOU'RE ON TOP of the TOUGHEST JOBS WITH A MARION

The unquestioned performance of MARIONS is a challenge to the toughest digging —a real buy in big yardage production. MARION machines are built to stand the gaff of endless hours of operation. They have the power to meet all digging conditions. They have the speed to clean up jobs in a hurry. They should be working for you.

WHAT IS YOUR MATERIAL HANDLING PROBLEM?

CONTACT YOUR MARION DISTRIBUTOR

Edward R. Daley, Marion Power Shovel Company, 571 Howard St., San Francisco 5, Calif.; Joseph O. Reed, Marion Power Shovel Company, 2504 N. E. Hoyt St., Portland 12, Ore.; Star Machinery Co., 1741 First Ave., South, Seattle 4, Wash.; Shaw Sales & Service Co., 5100 Anaheim Telegraph Road, Los Angeles, Calif.; H. H. Nielson, 541 W. 2nd South St., Salt Lake City, Utah.

from ¾ cu. yd. MARION POWER SHOVEL COMPANY SINCE 1884 to 40 cu. yds.

MARION

POWER SHOVEL COMPANY

MARION, OHIO, U. S. A.

Offices and Warehouses in all Principal Cities

Union Oil Co. uses Peterbilt for Field Work

Here is one of the PETERBILTS owned and operated by the Union Oil Company in the Santa Maria Valley. The picture suggests the type of heavy hauling which is typical in the oil fields. In this industry trucks must be able to transport drilling rigs and machinery, drill stem and well casing, and all kinds of supplies right to the well location.

More often than not, nature did not put its oil reserves next to a paved highway, and trucks must lug these heavy loads over desert sands and through mountain passes. PETERBILTS are ruggedly constructed to haul these concentrated loads either on or off the highways, and they deliver the equipment quickly and safely. For heavy hauling—it's PETERBILT.

Peterbilt Motors Company

107th AVENUE AND MacARTHUR BOULEVARD · OAKLAND · CALIFORNIA

Wire drawing today in the modern Macwhyte wire mill not only *reduces* size to meet wire rope specifications, but also *increases* strength and toughness to give Macwhyte Wire Rope longer life.

Metal flows cold

TO INCREASE YOUR DOLLAR VALUE

in Macwhyte Wire Rope

You get a better, longer lasting Macwhyte Wire Rope, because we cold-draw rope wire from heat-treated wire rods.

Tungsten-carbide dies, polished to a satin-finish with diamond dust and oil, are used. The wire is p-u-l-l-e-d through the dies cold. This results in an extremely smooth round wire of practically double strength with great flexibility to resist bending fatigue.

Precision Wire drawing by Macwhyte (exclusively for Macwhyte Wire Rope) is another reason why Macwhyte PREformed internally lubricated wire rope is your best buy.

Here's a helpful wire rope buyer's guide: The 170-page, completely indexed Macwhyte G-15 catalog will be sent free if you are a wire rope user. Just write or call any Macwhyte distributor.

NO. 861

MACWHYTE COMPANY 50th Year 1896 – 1946

MACWHYTE WIRE ROPE

Manufactured by Macwhyte Company
2909 Fourteenth Avenue, Kenosha, Wisconsin

Mill Depots: New York • Pittsburgh • Chicago • Minneapolis • Fort Worth • Portland • Seattle San Francisco • Los Angeles • Distributors throughout the U. S. A. and other countries

MACWHYTE PREformed and Non-PREformed Internally Lubricated Wire Ropes . . . MONARCH WHYTE STRAND Wire Rope . . . Special Traction Elevator Rope . . . ATLAS Braided Wire Rope SLINGS . . . Hi-Fatigue Aircraft Cables, Assemblies, Tie-Rods . . . Stainless Steel Wire Rope . . . Monel Metal Wire Rope, Galvanized Wire Rope.

Make MACWHYTE your headquarters for WIRE ROPE and SLINGS

OWNERS EXPECT MORE FROM "CATERPILLAR" DIESELS— AND GET IT!

Part of Guy F. Atkinson Co.'s fleet of 18 "Caterpillar" Diesel D8 Tractors at work on the San Jacinto Navy reservoir contract.

When there's an extra-tough job to be done, "Caterpillar" Diesels get the call. That's natural, because owners expect more from these rugged machines.

In building the main equalizing reservoir for the U. S. Navy, near San Jacinto, California, Guy F. Atkinson Co. had 700,000 yards of earth to move—much of it heavy clay. A fleet of 18 "Caterpillar" Diesel D8 Tractors, with bulldozers, scrapers and tampers, did the bulk of the job, while 4 "Caterpillar" Diesel No. 12 Motor Graders maintained roads and finished the grade.

There are two important reasons why "Caterpillar" Diesels do all that's expected of them and more. They're built to take brutal punishment and keep on working dependably, day after day, month after month. And they're backed by the efficient service of a dealer organization with the finest reputation in the industry.

CATERPILLAR TRACTOR CO., San Leandro, Calif.; Peoria, Ill.

CATERPILLAR DIESEL

REG. U.S. PAT. OFF.

ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT

Built for Work

WARCO
MOTOR GRADERS

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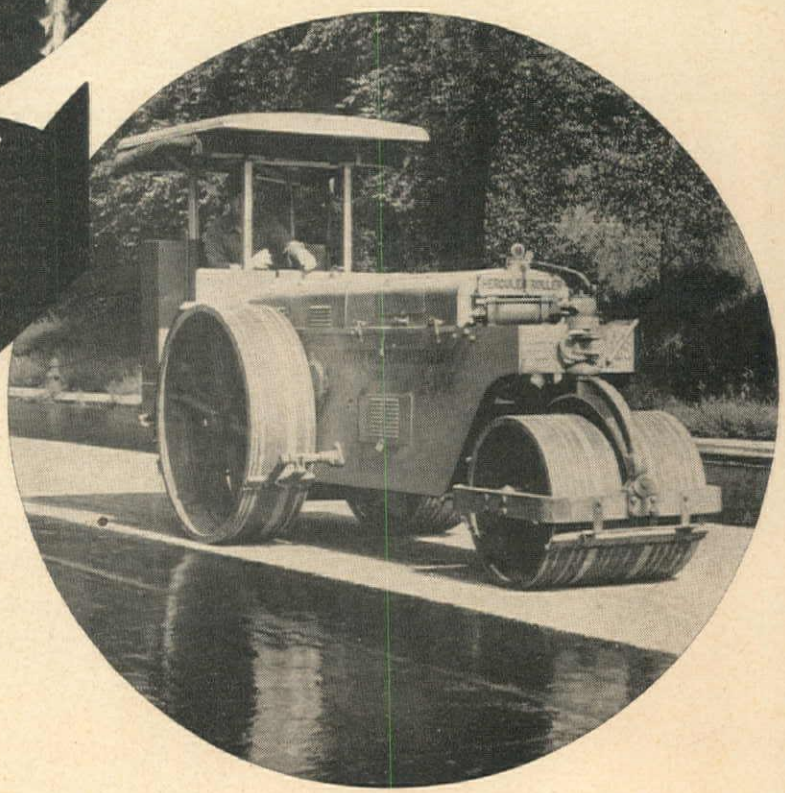

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ROAD ROLLERS

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HOWARD-COOPER CORPORATION—Seattle-Portland
SMOOT MACHINERY & SUPPLY CO., Salt Lake City 5, Utah

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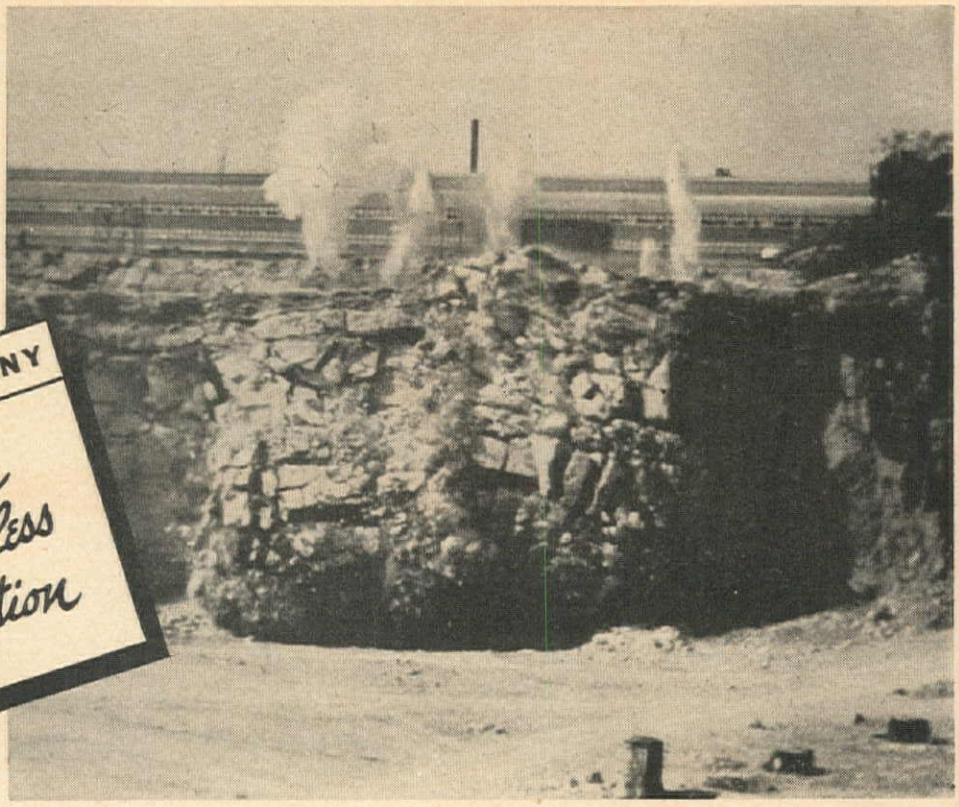
W. A. RIDDELL CORP.

BUCYRUS · · · OHIO



ATLAS POWDER COMPANY

Rx for better breakage...less noise and vibration

The **ROCKMASTER** Blast Prescription is Compounded Especially for Your Job

What is Rockmaster? It's a sensational new blasting system that enables you to time the delay elements of your shot in thousandths of a second—giving you a new degree of timing control never before possible.

More important, Rockmaster is a system that's *especially "compounded" to fit each job.* Drilling, spacing, type of explosives and timing of detonation are carefully selected to get the most from each shot. Explosives do more work on the rock, and less energy is expended in the air.

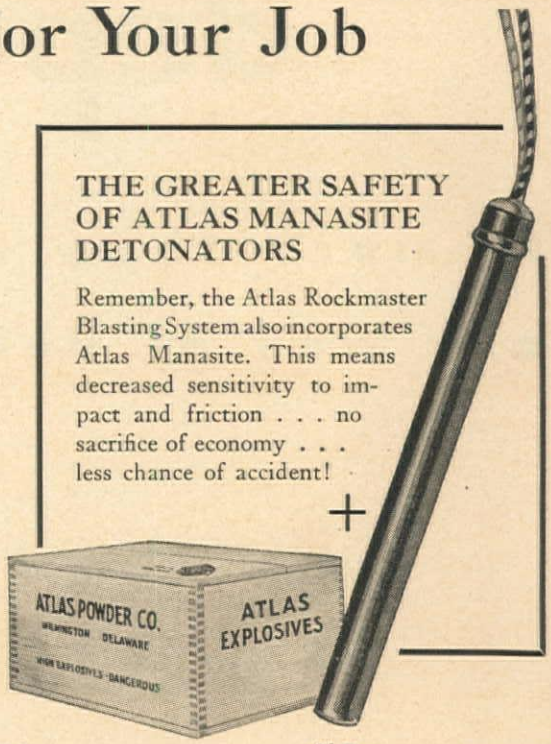
That's why your Atlas representative can refer you to users who have increased rock fragmentation by as much as 30% with Rockmaster. That's why, too, in many cases, Rockmaster has totally eliminated complaints about noise and vibration—even when more holes have been fired than formerly.

Frankly, the Rockmaster System is not the answer to every blasting problem. But with our knowledge of explosives and your knowledge of the job, the chances are that it will work for you. If so—you'll actually have to *see* the results to believe them possible! Call in the Atlas representative.

THE GREATER SAFETY OF ATLAS MANASITE DETONATORS

Remember, the Atlas Rockmaster Blasting System also incorporates Atlas Manasite. This means decreased sensitivity to impact and friction . . . no sacrifice of economy . . . less chance of accident!

+



ROCKMASTER: Trade Mark

Offices in Principal Cities

ATLAS EXPLOSIVES

"Everything for Blasting"

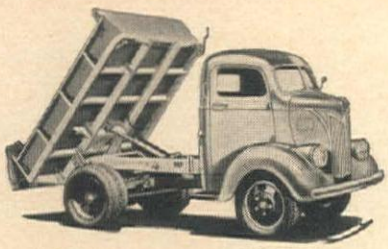
CHEMICALS ATLAS EXPLOSIVES

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

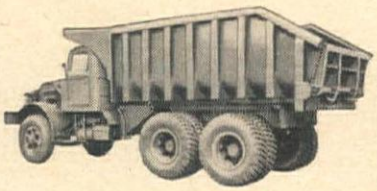
The BEST COSTS LESS

TRADE MARK

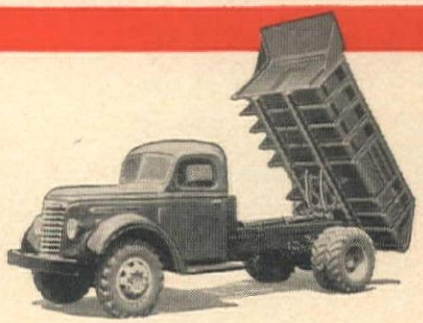
For years Gar Wood has consistently offered truck and trailer equipment of utmost utility and outstanding value. Leadership in this field resulted from this policy. Gar Wood equipment costs less in the long run because it is better built to give peak performance and lasting satisfaction.



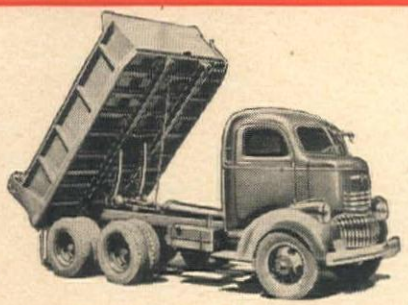
Type C12 Body and Model D6 or D7 Hoist. Dumping angle 55°.



Type X-112 Extra heavy duty Body with automatic downfolding tailgate.



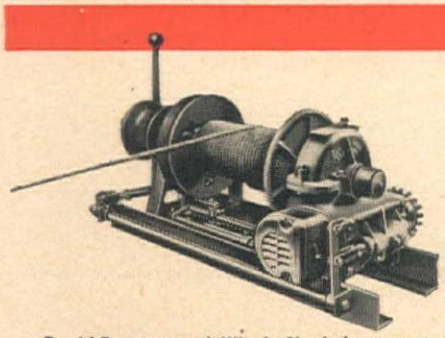
Special rock Body, scoop type rear end. Model F4CA cam and roller Hoist.



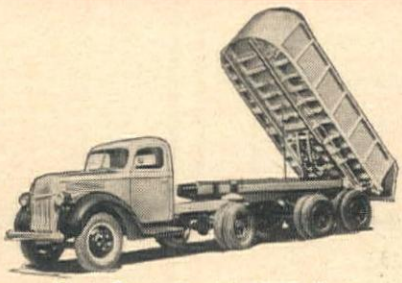
Type W12 Body. Model F4C cam and roller Hoist. Capacity 6 cu. yds.

Type X-112 Extra heavy duty Body, scoop end, with Model T-4440 Hoist. Capacity 19 cu. yds.

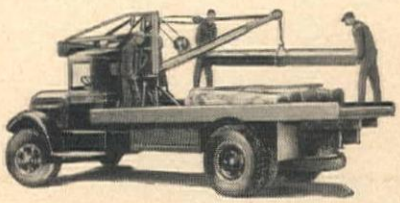
Type W12 Body, front recessed for Model TV83 Hoist. Capacity 15 cu. yds.



Rapid Reverse truck Winch. Single lever control. Capacities 15,000 to 60,000 pounds line pull.



West Coast Special W-12 Body, Model F8C cam and roller Hoist. Capacity 10 cu. yds.



Telescopic boom Crane. Radius 8 to 20 feet.

GAR WOOD INDUSTRIES, INC.

7924 RIOPELLE ST. • DETROIT 11, MICH.

WORLD'S LARGEST MANUFACTURERS OF TRUCK AND TRAILER EQUIPMENT

OTHER PRODUCTS: • TRUCK TANKS • ROAD MACHINERY • HEATING EQUIPMENT • MOTOR BOATS

TESTED AND PROVED IN THE FIELD!

3 TYPES DESIGNED FOR EVERY DIGGING CONDITION

LS . . . A lighter weight bucket designed for levee and drainage work.

TS . . . A medium weight bucket, classified as a general purpose bucket.

HS . . . A heavy duty bucket for moving shale or any hard formation.

3/8 to 30 Cubic Yds.

HENDRIX *Lightweight* **DRAGLINE BUCKETS**

Write for descriptive literature—
or ask your dealer.

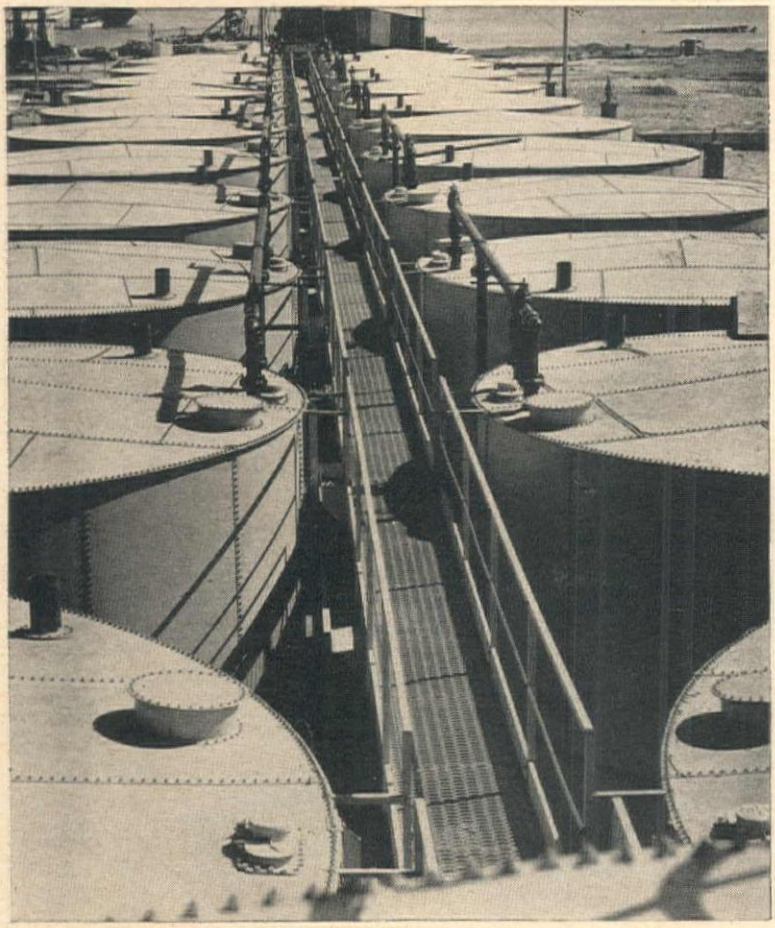
You automatically step up the YARDAGE of your dragline by hooking up a Hendrix Lightweight Bucket! It's 20% to 40% lighter than other buckets, type for type! Can be used on a machine designed for small operations and still maintain the allowable loaded weight. You'll get bigger payloads on operations requiring a long boom, and in wet digging you'll increase your payloads by leaving the water in the pit. We took the load ***out of the bucket...*** to let you put it ***inside!***

- ★ 20% to 40% lighter than other buckets, type for type.
- ★ All welded construction for greater strength and durability.
- ★ Manganese Steel chains, fittings, and reversible tooth points.
- ★ Full Pay Load every trip, even in wet diggings.
- ★ Perfect Balance; handles easier, fills faster, dumps cleaner.
- ★ Three Types; light, medium, and heavy duty. With or without perforations.

DESOTO FOUNDRY, INC. • MANSFIELD, LOUISIANA

Bolted and Welded STEEL TANKS

...BUILT TO STANDARD SPECIFICATIONS OR SPECIAL REQUIREMENTS



One of the West's most experienced staffs of tank fabricators and erectors is available to you through Western Pipe & Steel. Western-built tanks are today widely in use by agriculture, petroleum, chemical processing, food and distilling industries; and on municipal, county, state and federal water and power projects.

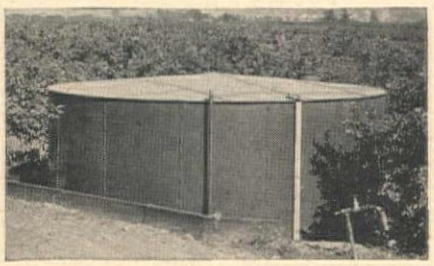
Western's man-power and facilities make it possible to handle large scale production or to tailor-make tanks to special designs. Bolted steel tanks, in capacities up to 10,000 barrels, can be economically disassembled, moved and reassembled many times in the course of their long life. Welded steel tanks, of heavier construction and with capacities ranging to 180,000 barrels—and up, are designed for permanent installations. Both types are erected on location by Western crews.

For information write or call your nearest Western office.

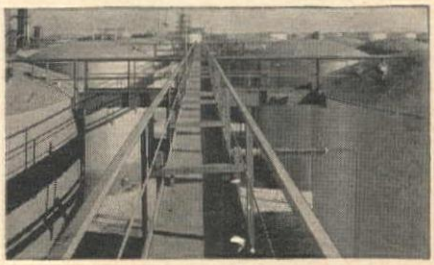
★

Western bolted and welded steel tanks are used in the storage of water, oil, gasoline, chemicals, foods and alcohol.

★



Bolted tanks, erected by Western crews, are available in sizes from 100 to 10,000 bbls.



Welded tanks are fabricated to standard or special designs in varying capacities.

WESTERN PIPE & STEEL COMPANY OF CALIFORNIA

Fabricators • Erectors

P. O. Box 2015, Terminal Annex
5717 Santa Fe Ave., Los Angeles 54

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BAKERSFIELD, FRESNO, SOUTH SAN FRANCISCO, TAFT, CALIF., PHOENIX, ARIZ.

For Tomorrow's Way . . .

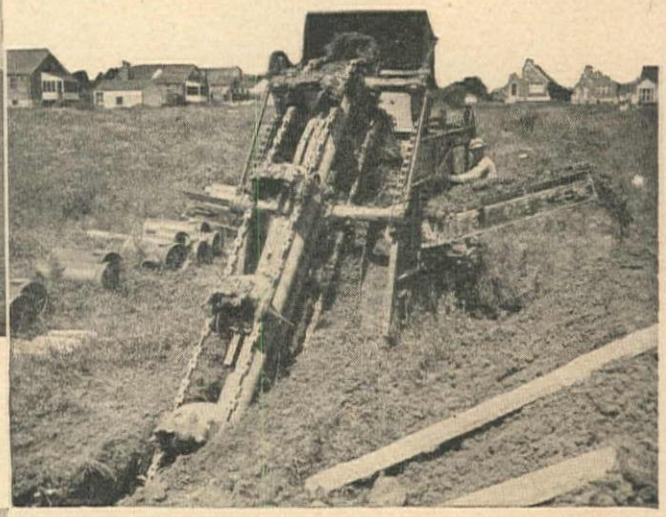
Use a Buckeye Today!

Road Building . . . Buckeye Material Spreaders, Fine-Graders and Road Wideners. Built in all standard sizes required by road construction work.

The greater operating speed . . . the easier handling and adaptability . . . the simplified maintenance . . . and the lower operating costs you look for in the improved equipment of tomorrow, can be yours today with a Buckeye. On-the-job field records prove this repeatedly. Such advanced performance is no accident but rather the result of an engineering policy . . . that Buckeye engineering must begin in the field wherever Buckeye equipment is used. This coupled with a manufacturing experience of over 50 years is your guarantee of Buckeye quality and dependability. If you want to do your job better and faster for less cost today, check with Buckeye. Write for bulletins on any or all of the equipment described below.

BUCKEYE TRACTION DITCHER CO.
Findlay, Ohio

Earthmoving . . . Buckeye Bulldozers and Trailbuilders with Buckeye Cable Power Control units, get more work out of the tractor.



Trenching . . . Buckeye Trenchers — ladder and digging wheel types — in sizes and types for all requirements.

Material Handling . . . Buckeye Shovels are built in ½ and ¾ yard sizes . . . for operation as a crane, dragline, or trench hoe. Every operation is vacuum power controlled.

"TOMORROW'S WAY IS YOURS TODAY"

Buckeye

CONVERTIBLE SHOVELS-BULLDOZERS-ROAD WIDENERS
TRENCHERS-MATERIAL SPREADERS-R-B FINEGRADERS

A Buckeye Model 48 "Mainliner" on a large gas line. The "48's" cut trench from 22" to 40" wide and 6½ ft., 7½ ft., or 8½ ft. deep. This is only one of a number of Buckeye Trenchers designed exclusively for low cost pipeline work.

Still King of the Pipeliners!

Buckeye Trenchers have easily held their position as the world's number one trench excavators for pipeline work through a solid list of achievements over the years. On *every* major pipeline project—"The Big Inch," "The Little Inch," " Tennessee," "The Plantation," and many others—*Buckeyes carried the load!*

These results could only have been achieved by trenchers that were designed for the toughest going, whose every part was made of the ideal material for the job it would be called on to perform.

Through more than half a century of trencher manufacturing, Buckeye engineers and craftsmen have made improvements constantly. It is this kind of thinking that has given Buckeyes their enviable reputation. This same complete attention to every detail of design and construction is assured in the new Buckeye you buy today or tomorrow.

Sole Northern California Distributors

INDUSTRIAL EQUIPMENT COMPANY

10911 Russet Street, Oakland 3, Calif. • SWeetwood 8877

From San Francisco (No extra toll) . . . Ask operator for Enterprise 1-0118

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Why

Construction Methods Demand

ISAACSON KABLE TRAC-DOZERS

Speed necessitated by today's demands for increased production, is responsible for many new, improved methods of operation. Short cuts introduced in the construction field demand the help of fast, positive controlled dozers.

They speed up work on cuts and fills. They roll big loads, uproot stumps and dig out boulders. They level, back-fill and grade as well as do lots of other time-saving jobs.

Isaacson Kable Trac-Dozers do all this because they give fast, positive control and smooth, powerful operation so necessary for all-out dozer performance.

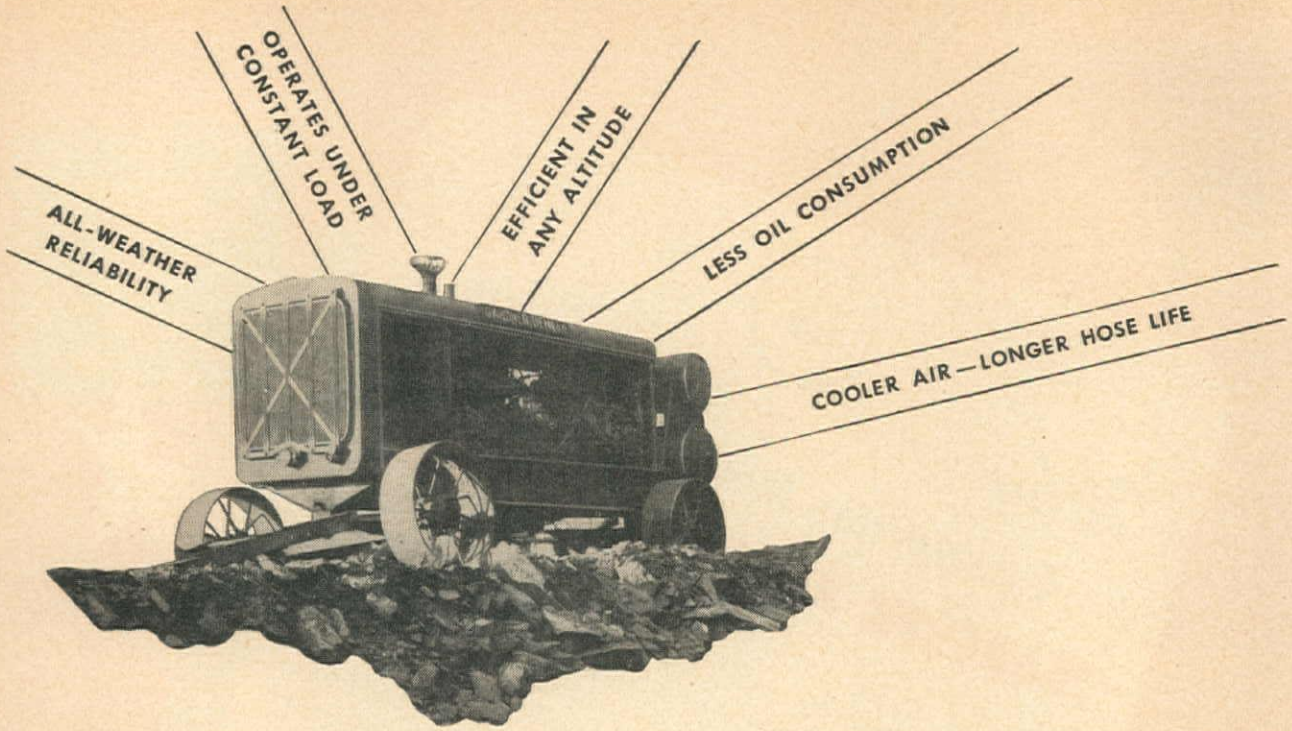
Heart of successful cable operation is the versatile Isaacson Power Unit. It's simple, dependable and easy to adjust. For short cuts that mean speed and profits, use a Kable Trac-Dozer.

See your INTERNATIONAL DEALER or write for full details

ISAACSON

Tractor Equipment

A PRODUCT OF THE ISAACSON IRON WORKS • SEATTLE



Add in these *Operating* Savings with a Gardner-Denver

All Water-Cooled Portable!

When you buy a Gardner-Denver All Water-Cooled Portable Compressor, you are buying long-term savings that can add up to a sizable sum on your jobs.

You are buying proved ability to do the work in any season—at any altitude—anywhere.

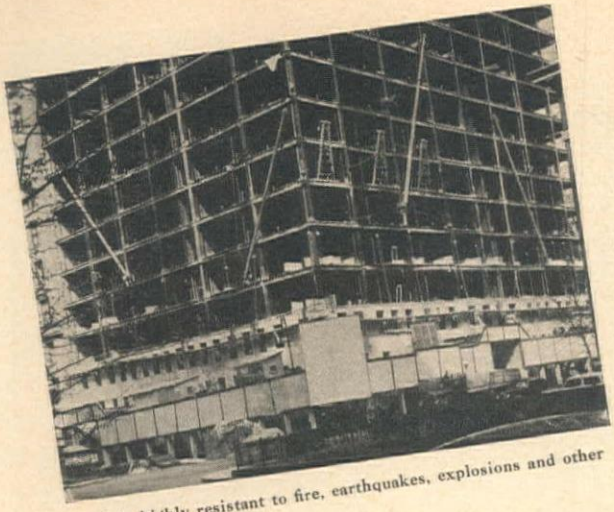
You are protecting yourself against costly delays and interruptions by assuring a constant and adequate supply of air at all times.

You are buying *cooler* air—and that means less lubricating oil consumption and longer hose life. In other words, you are getting the finest portable your money can buy—a portable with *completely* water-jacketed cylinders.

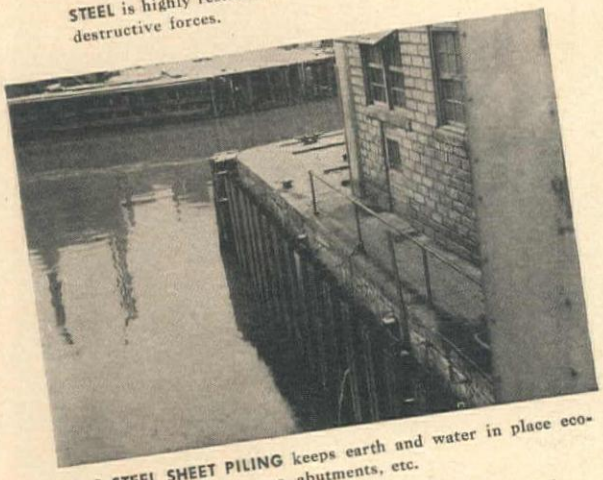
For complete information about Gardner-Denver Portables write Gardner-Denver Company, Quincy, Illinois.
Western Branch Offices: Butte, Mont.; Denver, Colo.; Los Angeles, Calif.; Portland, Oregon; Salt Lake City, Utah; San Francisco, Calif.; Seattle, Wash.; Wallace, Idaho; El Paso, Texas.

GARDNER-DENVER

Since 1859



STEEL is highly resistant to fire, earthquakes, explosions and other destructive forces.



U·S·S STEEL SHEET PILING keeps earth and water in place economically in dams, wharves, abutments, etc.

U·S·S I-BEAM-LOK OPEN FLOORING is strong and lightweight—reduces dead-load—goes down easily.

Insure the soundness of your new construction . . .

Build with *Steel*

For more efficient operation . . . for quicker installation . . . for surer profits, you can't beat steel. In the construction of roads, bridges, dams, buildings, it is the one material that meets all specifications and structural requirements.

Steel's ready adaptability to all kinds of construction, its great strength and resistance to destructive forces—fire, earthquakes, explosions, lightning—its speed of construction, its durability, its safety . . . all emphasize the good judgment of engineers and contractors who recommend, specify and work with it.

For details concerning specific applications of U·S·S Engineering Products, address the office nearest you. Our engineers welcome an opportunity to show you how you can advantageously use steel on your new jobs.

COLUMBIA STEEL COMPANY

San Francisco · Los Angeles · Portland · Seattle · Salt Lake City

Pacific Coast Distributors for
American Bridge Company · Carnegie-Illinois Steel Corporation
American Steel & Wire Company · National Tube Company
Tennessee Coal, Iron & Railroad Company
United States Steel Export Company, New York

USS STEEL UNITED STATES STEEL

Steel GIVES YOU
ALL OF THESE SEVEN ADVANTAGES:

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

U·S·S CONCRETE REINFORCING BARS provide sturdy, reliable, economical backbone for concrete.

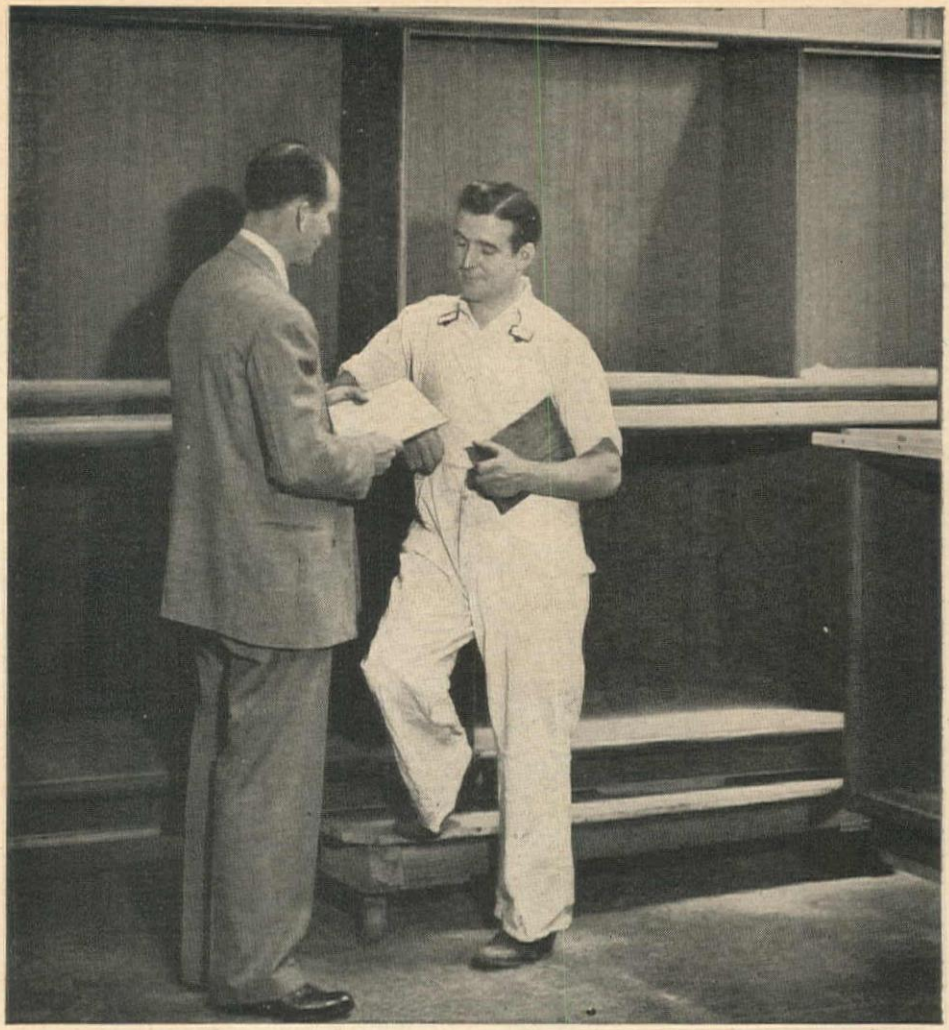
U·S·S CORRUGATED METAL PIPE provides low-cost, efficient drainage. Light, strong, easily handled.

UNITED STATES STEEL

FIXTURE-FINISHING FOREMEN

can't play hunches!

Fuller Finishes help them keep fast production on the profit side



It's a tough, fast-stepping business—fixture finishing! Every contract different, exacting, in a hurry! Whether it's counters, bars, desks, display cases, tables, shelving, rails, wainscoting, stands, cabinets or special furnishings, Mr. Foreman's got to *know in advance* that he can come up with the decorative effect specified on any wood, metal, composition or plastic; move fast enough to avoid tying up his shop, and complete the job on the profit side.

Fixture Finishing is another specialty field where Fuller's laboratory cooperation pays; where Fuller's man-on-your-job contact helps keep fast production on schedule, and profitable.

It's as true in other fields Fuller serves. Every Fuller formulation is job-tested for correct application and use-proved for unquestioned service—in your plant, on your equipment, in or on your business building or in or on your home.

W. P. Fuller & Co. Factories, San Francisco, Los Angeles, Portland. Branches, warehouses in principal Western cities.

FULLER *Industrial* FINISHES

PRODUCTION FINISHES

Fuller Industrial Finishes do double duty: Meet production demands; give products durability and sales appeal.

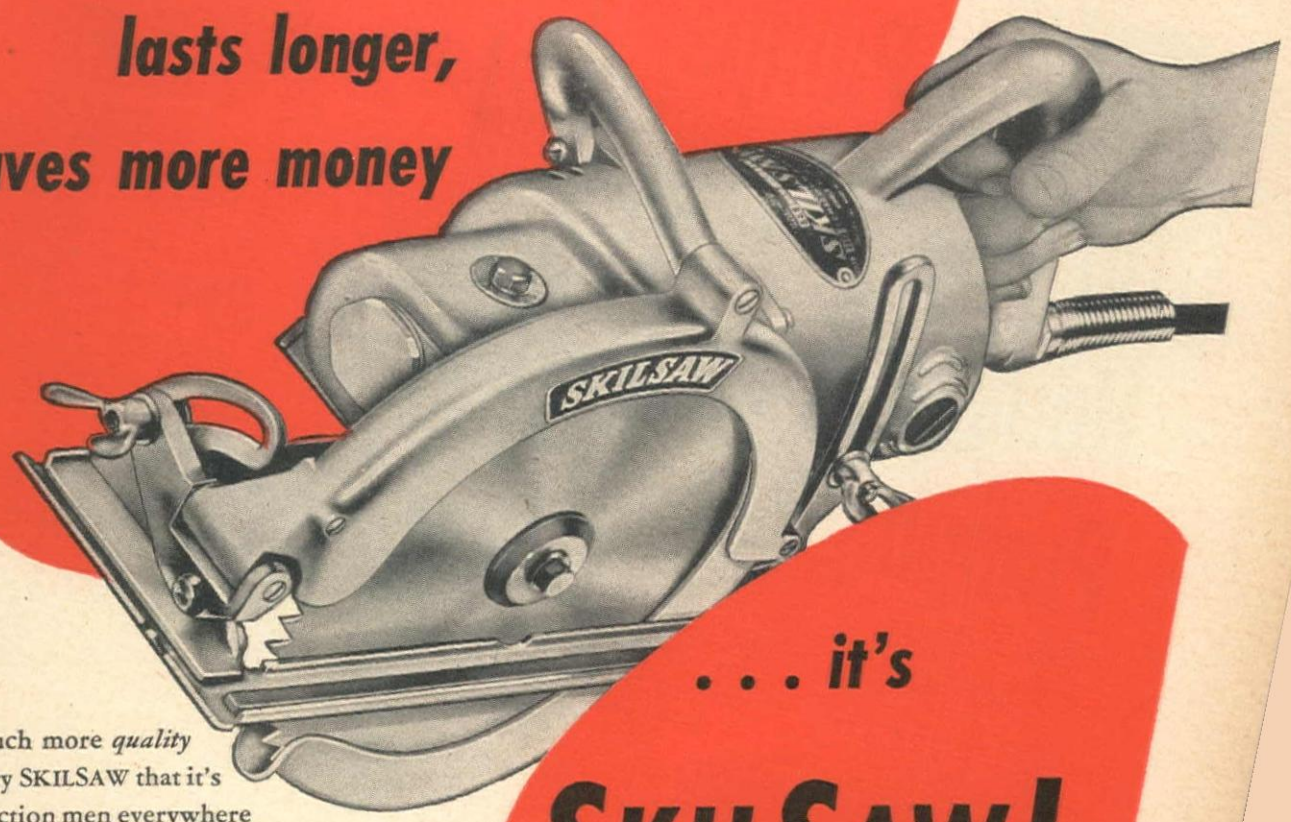
MAINTENANCE FINISHES

Whatever the surface, there's a Fuller product exactingly formulated to protect it or beautify it.

AIRCRAFT FINISHES

War-improved, flight-famed Fuller Aircraft Finishes now available for private plane use. See your Airport Refinisher.

GET THE SAW that handles easier, lasts longer, saves more money



. . . it's

SKILSAW!

ASK YOUR DISTRIBUTOR TODAY ABOUT A DEMONSTRATION

● So much more *quality* goes into every SKILSAW that it's no wonder construction men everywhere prefer SKILSAW for long-run economy. SKILSAW makes every cut in construction faster . . . stays at it longer . . . saves so much that you can bid lower on every job and make more money on each one. The demand for SKILSAWS is so great that your Distributor may not have every model you want . . . but more are coming through fast. So keep in touch with your SKILTOOL Distributor!

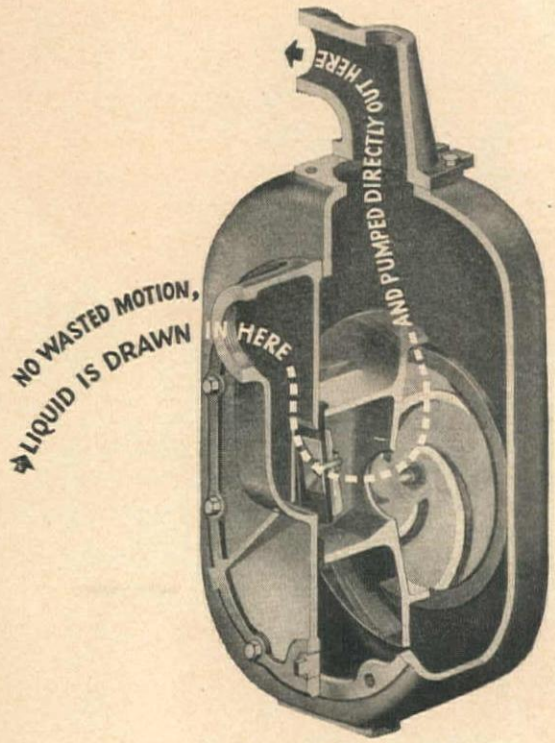
SKILSAW, INC.
5033-43 Elston Ave., Chicago 30, Ill.
Factory Branches in All Principal Cities

PORTABLE ELECTRIC

SKILTOOLS

MADE BY SKILSAW, INC.

Marlow Pumps Do An Honest Day's Pumping!



Do YOU choose equipment as you would a business partner?

A Marlow "Water Wizard" can pitch in on the toughest kind of assignment, absorb hours of overtime and like it—and come back for more. Efficient, trouble-free performance on the gruelling jobs that wring sweat from men and machines makes a "Water Wizard" the kind of partner it's profitable to have.

An honest day's work comes naturally to a "Water Wizard". The simplified design of a Marlow Self-Priming Centrifugal enables it to prime and reprime positively and automatically, even on suction lifts as high as 25 feet. A "Water Wizard" has no ports, by-passes or other auxiliary priming devices that reduce efficiency and cause troubles. There is nothing to adjust or manipulate.

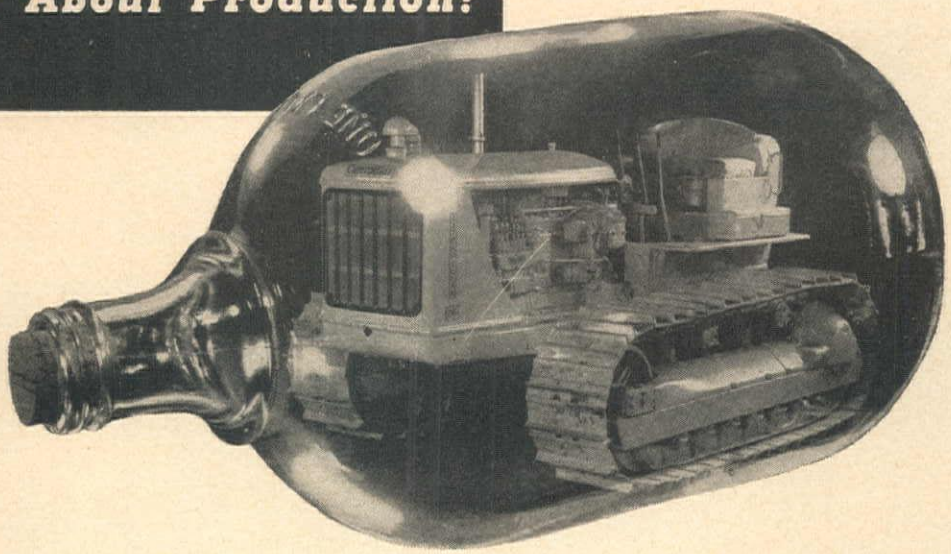
A Marlow "Water Wizard" is easy and economical to use and maintain. It is a working partner you can depend on.

Sizes 1½ to 10-inches—3,000 to 240,000 gallons per hour. Interesting Marlow literature will be forwarded promptly on request.

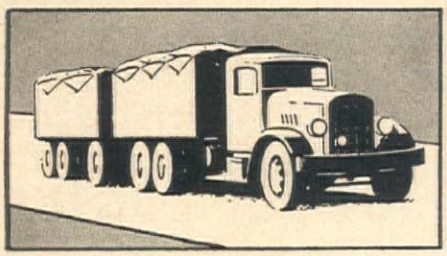
MARLOW PUMPS • RIDGEWOOD, N. J.

WAREHOUSED FOR WEST BY George M. Philpott Co., San Francisco, Calif. DISTRIBUTED BY: Glenn Carrington Co., Seattle, Wash. (For Interior Alaska); Alaska-Pacific Supply Co., Seattle, Wash. (For Alaska Coastal Regions); General Machinery Co., Spokane, Wash; Clyde Equipment Co., Portland, Ore., and Seattle, Wash.; Montana Powder and Equipment Co., Helena, Mont.; Nickerson Machinery Co., Salt Lake City, Utah; Le Roi-Rix Machinery Co., Los Angeles, Calif.; Burdick & Burdick, El Paso, Texas.

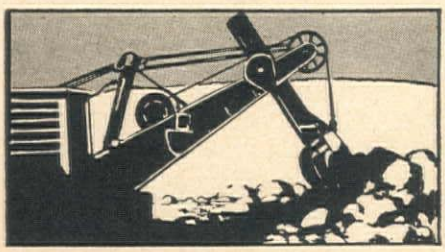
Complete Protection . . . Yes
But How About Production?



For all year production and complete protection use RICHFIELD TRACK ROLL GREASE



Richfield Track Roll Grease is also recommended for chassis lubrication on heavy-duty trucks and trailers.



Use Richfield Track Roll Grease for all-around lubrication of contractor equipment such as tractors, shovels, cranes hoists, carryalls, bulldozers, auto-patrols, etc.

Only the cameraman can shelter a tractor in a shroud of glass. It takes more than imagination: more than trick photography to seal vital bearings against the harsh abrasive action of dirt and water and the metal crushing pressures of heavy shock loads . . .

Richfield Track Roll Grease provides an extra lubricating oil film that will withstand high bearing pressures because its natural oiliness has been improved by compounding. The working texture of this fine lubricant seals bearings against dirt and other harmful substances. Richfield Track Roll Grease is now homogenized and filtered; its spreading and penetrating qualities prolong bearing life and provide complete mechanical protection. Richfield Track Roll Grease has corrosion preventive properties. It feeds in and "sticks" where it is needed. Use Richfield Track Roll Grease for constant and dependable protection.

THERE IS A SCIENTIFIC RICHFIELD LUBRICANT FOR EVERY MACHINE IN EVERY TYPE OF SERVICE

RICHFIELD

A Standard Line
with
Special Features
CHAPMAN
SLUICE GATES

Many, many sluice gates that once were *special problems* are now in the Chapman *Standard* Line. So, before going to any unnecessary expense in ordering special equipment, be sure first to see what Chapman offers.

And remember, too, Chapman Sluice Gates are simple to install—their interchangeable stems and couplings require no match-marking.

Chapman Sluice Gates may be obtained with any type of operating control—manual, hydraulic cylinder or motor unit.

Send for a copy of Chapman's Sluice Gate Handbook for complete information.

The Chapman Valve Manufacturing Co.

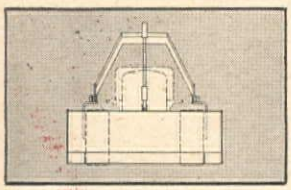
INDIAN ORCHARD, MASSACHUSETTS

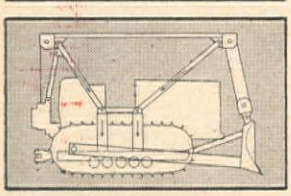
NOW-THE SOUTHWEST LOADOZER

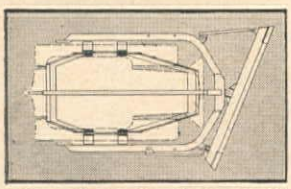
All this

SAVES ONE TRACTOR
30 MINUTE CHANGE-OVER
EASY OPERATION

Balance
Economy
Ruggedness
Speed
Versatility







"Over Center Track Mounted" design gives perfect balance

ANOTHER EXAMPLE OF *Southwest's* LEADERSHIP

All these features are "built-in" qualities of the new SOUTHWEST "LOADOZER"—Extra values that mean greater efficiency and economy in Loader and Bulldozer operations. Remember—you SAVE ONE TRACTOR—it takes only 30 MINUTES TO CHANGE OVER this combination Loader-Bulldozer unit.

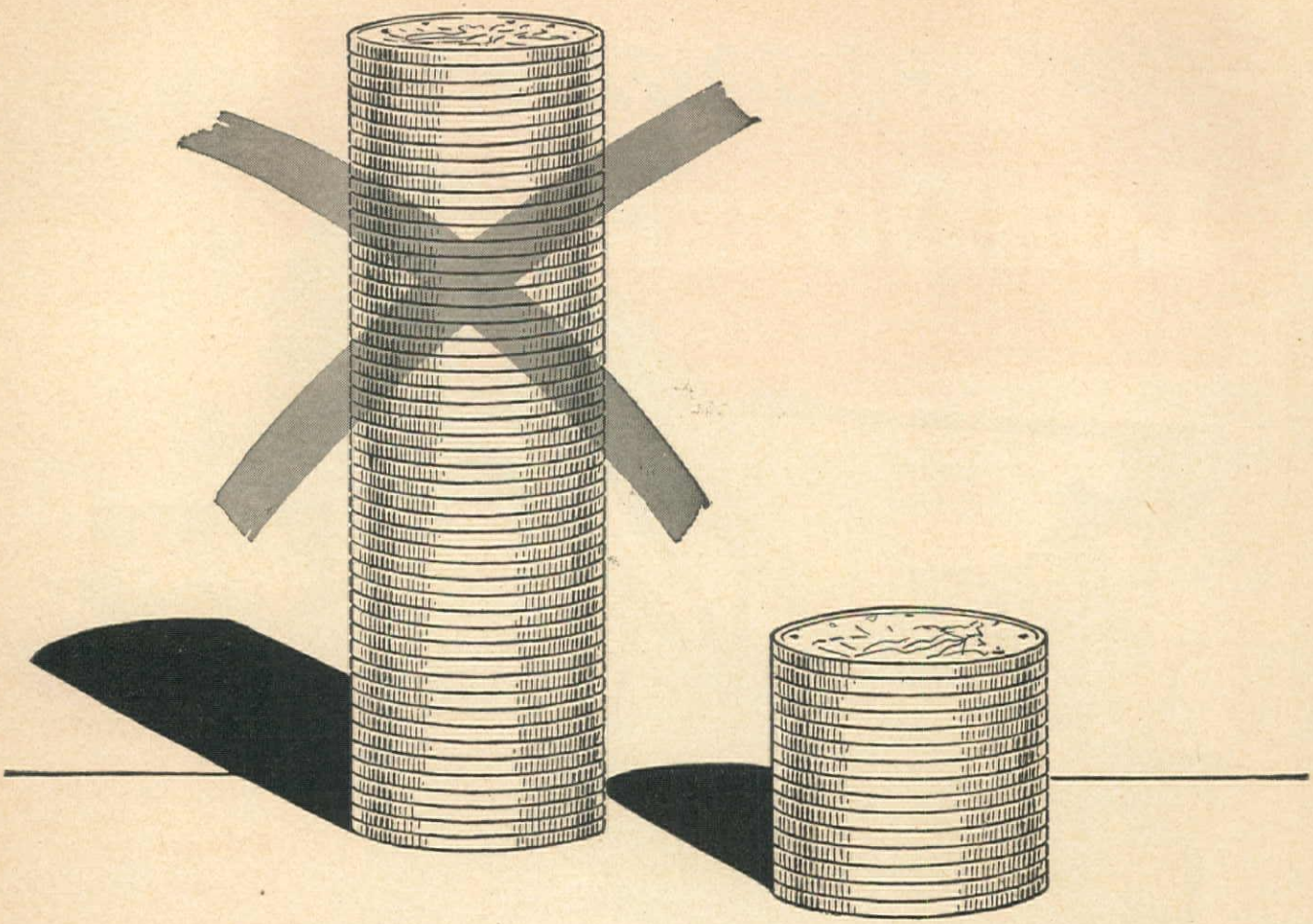
- Built for all four makes of track type tractors.
- See your equipment dealer about the complete line of SOUTHWEST CONSTRUCTION EQUIPMENT.
- For complete specifications on this Loader-Bulldozer combination unit—WRITE FOR BULLETIN CM-11.

CONSTRUCTION MACHINERY DIVISION

Southwest Welding & Manufacturing Co.

ALHAMBRA, CALIFORNIA

SCOOPS BULLDOZERS CRANES WINCHES DUMP WAGONS RIPPERS TAMPERS SCRAPERS



Reduction in Capital Investment

An Important Factor in

The Economics of Cathodic Protection

CORROSION-PROOF pipelines are now being built, and built economically by using modern protection systems. Because Coal-tar Enamels provide stable insulation to steel pipe, fewer Cathodic Protection installations are needed, thus reducing the capital investment and requiring a minimum amount of electrical current, maintenance and amortization annually.

With the use of Coal-tar Enamel, applied properly by modern methods of application in the mills or in the field, as much as 60 percent, or more, can be saved in the cost of the complementary Cathodic Protection.

Barrett Coal-tar Enamel, which possesses high dielectric strength, provides constant, uniform and long-lasting stable underground insulation, and retains electrical stability over a long period of years and under varying conditions of soil and climate!

The use of Barrett Coal-tar Enamel assures the economy of your investment in Cathodic Protection.

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION

40 RECTOR STREET, NEW YORK 6, N. Y.

FIELD SERVICE: *The Barrett Pipeline Service Department and staff of Field Service men are equipped to provide both technical and on-the-job assistance in the use of Barrett Enamel.*

Barrett
COAL-TAR
ENAMEL

here's the newest—

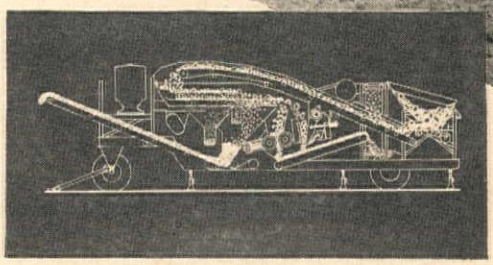
in *low cost* aggregate production

the Cedarapids PITMASTER

IT's also the smallest, complete portable crushing and screening plant that we offer. But there's nothing small about the records of low-cost aggregate production that these new models are making. Operators are reporting production of more than 50 tons per hour of ½" material with 55% crushing.

Every feature of the new Pitmaster is designed and built to assure low maintenance and low operating costs as well as an exceptionally low first cost. 10" x 16" roller bearing jaw crusher and 16" x 16" roller bearing roll crusher give you plenty of crushing output. Horizontal vibrating screen assures greater capacity, closer grading, higher efficiency and requires less head room. Available with chip screen, hopper and feeder or swivel feed conveyor. Fast, easy set-up and take-down minimize lost time between jobs. No drives to connect. Conveyors swing easily into position.

When buying a crushing plant — buy the best — buy Cedarapids. If your requirements are moderate — buy a Pitmaster.



THE IOWA LINE

of Material Handling Equipment is distributed by

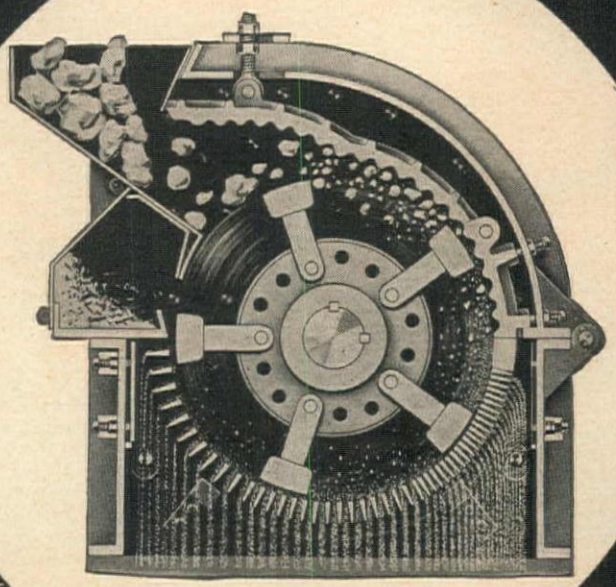
HOWARD-COOPER CORP., Seattle, Washington, and Portland, Eugene and Medford, Oregon; HALL-PERRY MACHINERY CO., Butte, Great Falls, Missoula, and Billings, Montana; INTERMOUNTAIN EQUIPMENT CO., Boise and Pocatello, Idaho, and Spokane, Washington; WORTHAM MACHINERY CO., Cheyenne, Wyoming; KIMBALL EQUIPMENT CO., Salt Lake City, Utah; BROWN-BEVIS EQUIPMENT CO., Los Angeles, California; H. W. MOORE EQUIPMENT CO., Denver, Colorado; EDWARD F. HALE CO., Hayward, California; ARIZONA-CEDAR RAPIDS CO., Phoenix, Arizona; R. L. HARRISON CO., INC., Albuquerque, New Mexico; SIERRA MACHINERY CO., Reno, Nevada

Iowa Manufacturing Company

Cedar Rapids, Iowa

Cedarapids Built by IOWA

It's the DIAMOND HEAVY DUTY HIGH TONNAGE *Self-Cleaning*



HAMMERMILL

Put this DIAMOND Hammermill up against your toughest jobs — compare it with any other hammermill you have ever used — and we're willing to abide by your verdict.

THE "CONTINUOUS" IMPACT principle of the DIAMOND Hammermill is obtained by the design of the top feed opening. All material as it is fed is engaged at once by the fast revolving hammers and repeatedly crushed against the extra long corrugated anvil. The result is extremely fast and uniform reduction.

THE "SELF-CLEANING" feature saves 2 or 3 hours' time if for any reason there is a power stoppage with feed continuing. The grates are mounted on a cam and can quickly be lowered from the outside (without opening cover) and the extra clearance permits centrifugal force to clean the machine in a few minutes.

DIAMOND ENGINEERS will gladly consult with you as to type and size of mill and production arrangement best suited for any material you need to reduce.

WIRE, PHONE or WRITE for Bulletin No. D-44-L on DIAMOND Hammermills or contact any DIAMOND Dealer.

"THERE'S NOTHING TOUGHER THAN A DIAMOND"

Look at This List of Features----

- Extra long adjustable anvil.
- Continuous crushing impact.
- Oversize balanced rotor shaft.
- Discs double keyed to shaft.
- Extra take-up holes for wear.
- Adjustable hammer arms.
- Interchangeable hammers.
- Hardened hammer retaining pins.
- Grates and anvil adjustable from outside.
- Self-cleaning feature.
- Structural steel, electric welded throughout.
- Accessible design.
- Heavy duty shock load roller bearings.
- Trap for uncrushable material.

DIAMOND DEALERS

Oakland	SOULÉ EQUIP. CO.
Los Angeles	GARLINGHOUSE BROS.
Seattle	A. H. COX & CO.
Portland	LOGGERS & CONTRACT'S MACH. CO.
Boise	WESTERN EQUIP. CO.
Salt Lake City	C. H. JONES EQUIP. CO.
Phoenix	O. S. STAPLEY CO.
Albuquerque	CONTRACTORS' EQUIP. & SUP. CO.
Missoula	MOUNTAIN TRACTOR CO.

DIAMOND

DIAMOND IRON WORKS, INC.

AND THE MAHR MANUFACTURING CO. DIVISION

1818 SECOND STREET NORTH MINNEAPOLIS 11, MINNESOTA

FOR TODAY'S TOUGHER JOBS, HERE'S A NEW TOUGHER MOTOR

WHERE IT'S WET Wet weather doesn't bother the new totally-enclosed Tri-Clad motor. Neither do frequent "washdowns" in food plants.

WHERE IT'S CORROSIVE Acids, alkalis, and fumes are kept out of these new Tri-Clads. Cast-iron enclosures are corrosion-resistant, extra strong.

WHERE IT'S DIRTY Dirt and dust can't get into these Tri-Clads to shorten their life. Smooth surfaces are convenient to clean.

WHERE IRON DUST FLIES Harmful iron dust and metal filings can't get past the inner wall. Bearings are protected from dust.

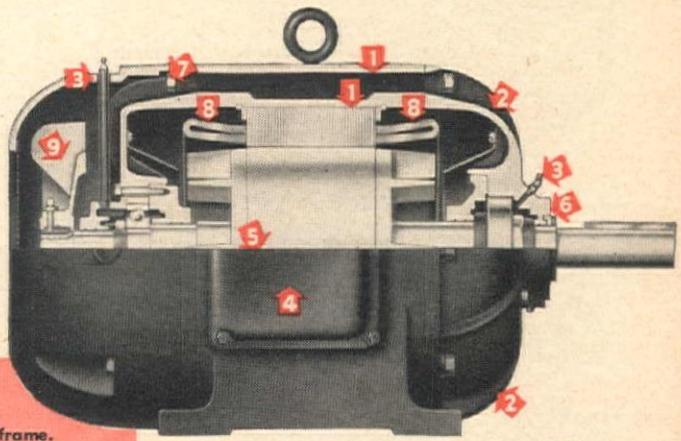
WHERE QUARTERS ARE CLOSE When space is limited for a totally enclosed motor, you'll like these trim, compact new Tri-Clads.

WHERE EXPLOSION HAZARDS EXIST The new Tri-Clad motors are available in explosion-proof constructions where needed.

THE G-E TRI-CLAD TOTALLY ENCLOSED MOTOR

(1 TO 1000 HP)

In 1940 you welcomed the Tri-Clad open motor with it's *extra protection features*. More Tri-Clads have since gone into service than any other integral-horsepower motor. Now G.E. is ready with a new line of tough, totally enclosed Tri-Clad motors for use in adverse atmospheres. *We believe they are industry's most dependable motors*. Their longer life and lower maintenance will make them a sound investment on almost every job. Apparatus Dept., General Electric Co., Schenectady 5, N. Y.



10-POINT PROTECTION

1. A cast-iron, double-wall frame completely encloses and protects the windings and punchings.
2. Corrosion-resistant cast-iron end shields are machined to provide a tight seal, and protect the motor from dust, dirt, and moisture. Primer and finish coat of Glyptal* varnish affords high rust-resistance.
3. A pressure-relief greasing system, which can be packed with long-life lubricant, protects the bearings.
4. The cast-iron conduit box is diagonally split for easy wiring. Boxes are independently explosion-proof on Class I motors.
5. Nonshrinking compound around motor leads protects motor interiors from dust and moisture at the point where leads pass through the frame.
6. Rotating labyrinth seal further protects motor interior from damage by foreign matter.
7. Large air passages provide adequate protection from overheating. They're easy to keep clean and open, too.
8. Modern, "ageless" insulation treatment includes windings of *Formex magnet wire.
9. The powerful external fan is removable to simplify maintenance; nonsparking type in explosion-proof motors.
10. Individual dynamic balance of rotors and external fans protects against vibration hazards, even under severe operating conditions.

*Trade-mark Reg. U. S. Pat. Off.

FOR THE COMPLETE STORY

Apparatus Department, Section 750-278C
General Electric Company
Schenectady 5, N. Y.

☐ Please send me GEA-4400, which describes the new Tri-Clad totally enclosed motors.

☐ Please send me GEA-4131, "Motors and Control for Hazardous Locations."

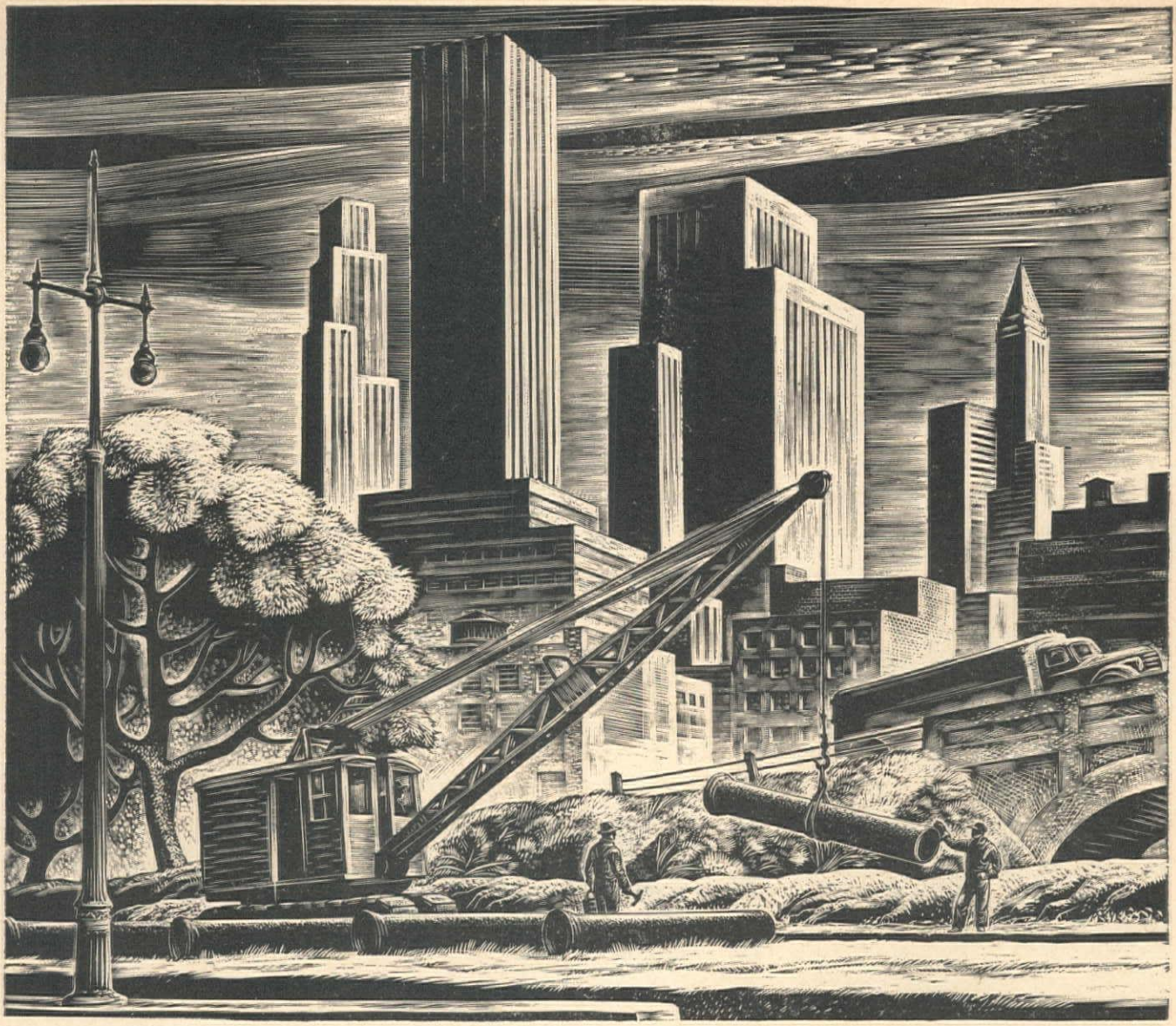
NAME.....

COMPANY.....

ADDRESS.....

8030

GENERAL ELECTRIC



Original Woodcut by Lynd Ward

More than 95% of the pipe in the water distribution systems of the 15 largest cities of the United States is cast iron pipe. And why not . . . when most of these cities have some or all of their original cast iron mains still in service? And, when records show that their cost of maintenance is far below that for other pipe materials? To these inherent advantages of long life and economy, U. S. Cast Iron Pipe adds *uniformity* of quality assured by rigid tests and controls, from raw materials to finished product.

U.S.
cast iron
PIPE

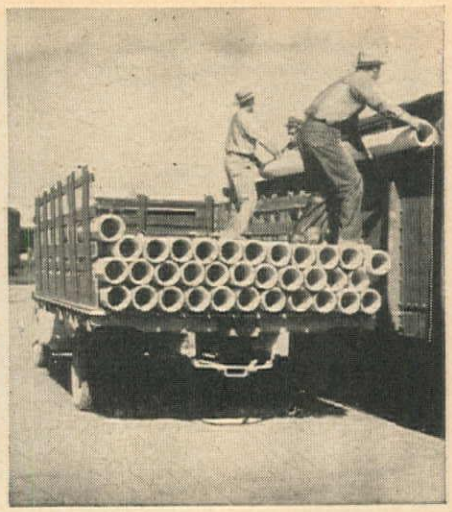
U. S. PIPE & FOUNDRY CO.
General Offices: Burlington, N. J.
Plants and Sales Offices throughout the U. S. A.

1. INTERNAL CORROSION

Asbestos-cement Transite Pipe cannot cause "red water." And its initial high flow rate is not affected by that most costly form of internal corrosion—tuberculation.

2. MAINTENANCE

In thousands of communities, Transite Pipe —with its advantages of tight joints, corrosion-resistance and immunity to tuberculation—provides low-cost water transportation.



3. HANDLING COSTS

Transite's light weight means more footage per truckload . . . easier handling all around. Mechanical handling equipment is not necessary except for the larger sizes.

7. TRENCHING COSTS

Trenching costs are low with Transite (as indicated above)! No bell holes are required at the joints—width of trenches and disturbance to pavement are kept to a minimum.

Which of these 12 WATER PIPE PROBLEMS are you faced with?

9. SOIL CORROSION

Many a user has found Johns-Manville Transite Pipe the answer to this vexing problem. In numerous installations—many in highly aggressive soils—it has proved stubbornly resistant to corrosion.

10. DELIVERY CAPACITY

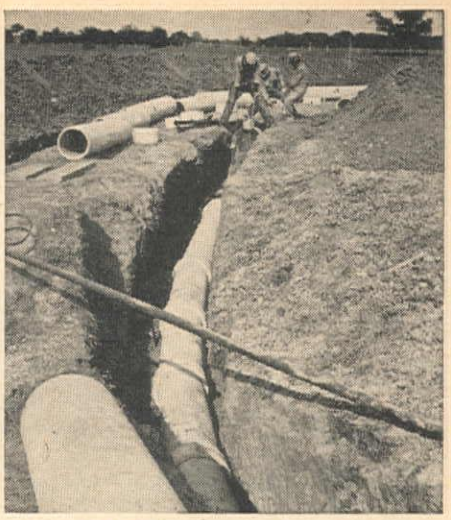
Because Transite is non-metallic, its initial high flow coefficient (C=140) is unaffected by tuberculating waters. Progressive reduction of delivery capacity due to tuberculation is never a problem in a Transite water line!

4. INSTALLATION COSTS

Fast assembly, with the Simplex Coupling, keeps installation costs low, minimizes traffic tie-ups. Transite can be tapped and drilled with standard waterworks equipment.

5. ELECTROLYSIS

Stray electric currents cannot damage this non-metallic pipe. As shown above, it can be laid near street railways and power lines with permanent freedom from electrolysis.



6. CURVES

Sweeps like that shown above present no problem with Transite Pipe. Flexible Simplex Couplings permit deflections up to 5° at each joint without use of fittings.

HERE are twelve problems frequently met in water transmission and distribution lines—twelve problems to which Johns-Manville Transite Pressure Pipe provides a practical answer. Check the list . . . and find out how this modern asbestos-cement pipe can help you get more efficient, more economical water transportation over the years.

For more complete information, write for Brochure TR-11A. Johns-Manville, 22 East 40th Street, New York 16, N. Y.

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An Asbestos Product

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Forming a tight yet flexible joint, the Simplex Coupling cuts down costly underground leakage . . . safeguards against washing away of supporting soil and undermining of the pipe.

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Three factors effectively guard against soil stresses in a Transite water line installation—the high, uniform strength of the pipe itself, its great resistance to corrosion, and the tight, flexible Simplex Couplings.

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Transite's flexible joints effectively absorb the vibration of heavy traffic—an especially important consideration wherever pipe is laid under busy streets and highways, or in the vicinity of railway and streetcar tracks.

You get economy... durability in

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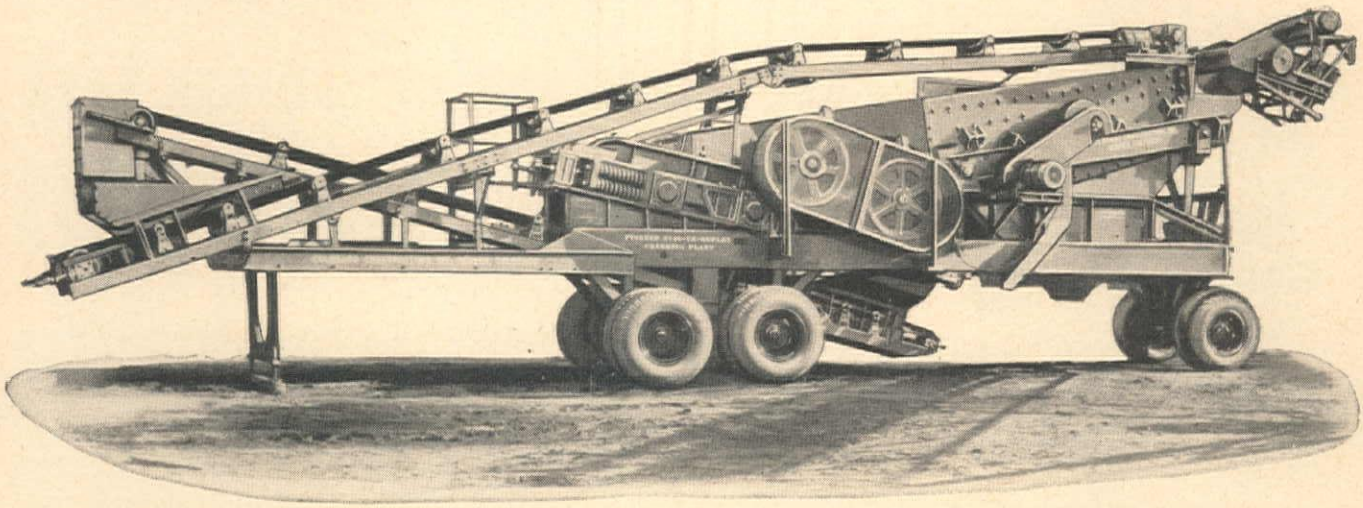

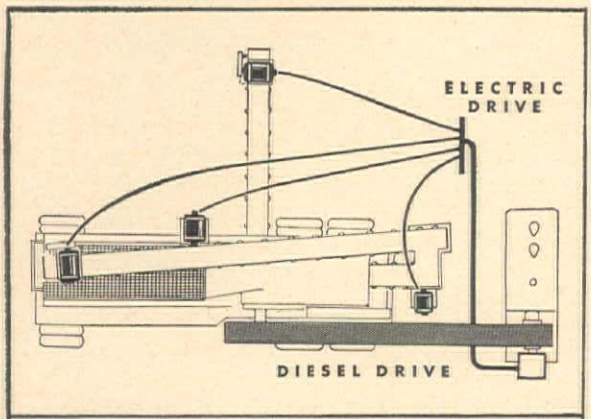

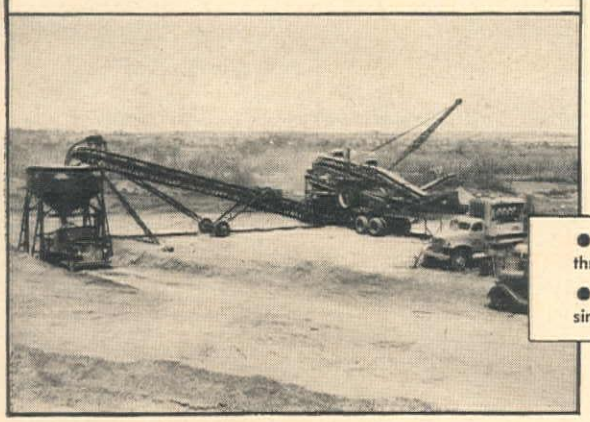

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● Here's a high capacity plant that is more portable and requires less set-up time than other big plants.

One 125 HP continuous duty diesel unit powers the entire plant. A flat belt direct from the diesel unit drives the jaw crusher which powers the roll crusher through V-belts.

A 50 KVA generator mounted on the diesel unit furnishes electricity for the motors on the heavy duty screen and on each conveyor.

The screen is 3½ deck with bottom deck feed and top deck return. There are 96 square feet of specification screen for producing finished material. Stone chips can be produced as a by-product without extra equipment.

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Jaw Crusher—10″ x 36″	Delivery Conveyor—30″ x 50′
Roll Crusher—40″ x 22″	Moving height—12′ 6″
Vibrator Screen—4′ x 12′, 3½ deck	Width—8′
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Write for complete information about this big plant . . . built with extra margins of performance for extra profits.

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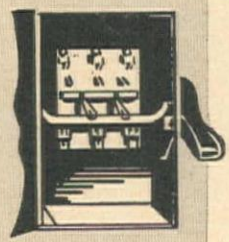

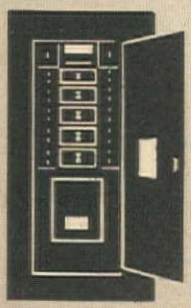

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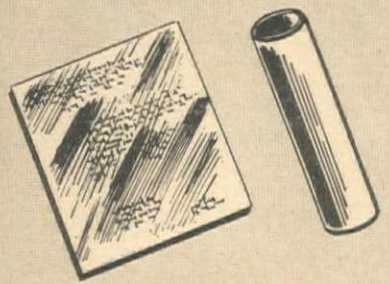

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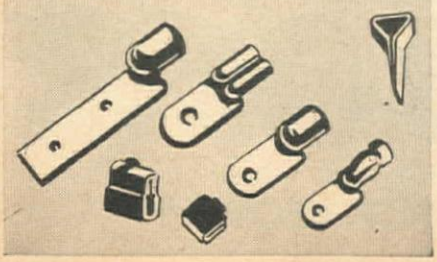

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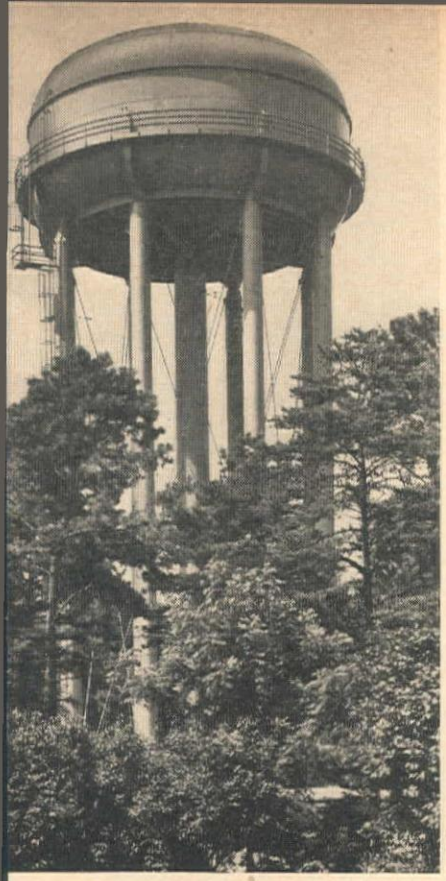

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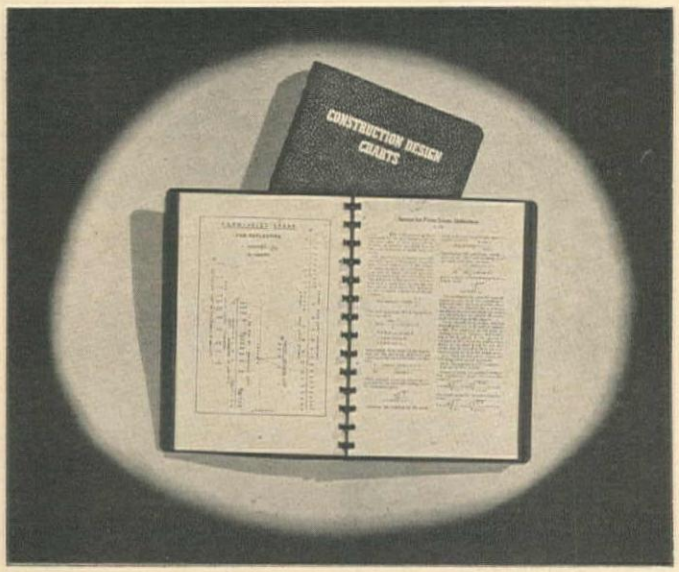

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The material is first fed into a 25″ x 36″ Telsmith Jaw Crusher with roller bearings for higher speed, greater capacity and lower power costs. Aggregate is conveyed to secondary crushing and washing plant alongside Columbia River. Here are two rugged high speed Telsmith Gyrasphere Crushers—one for intermediate, the other for fine crushing. As operated at present, the plant's output is 125 cu. yds. hourly of 2½″ to ¾″ ballast. However, this combination of Telsmith Crushers is capable of a far greater output, or much finer sizing when needed. Telsmith Gyraspheres insure finer crushing, wider range of sizes, uniform cubical products, as well as bigger tonnage and lower upkeep.

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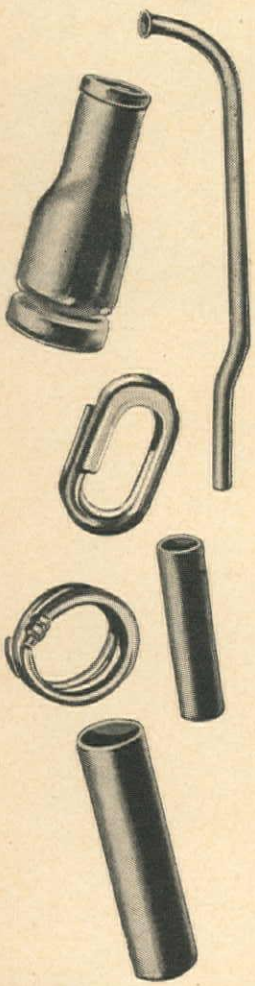

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Where to buy: Write, Wire or Phone Your Nearest War Assets Regional Office Below, indicating the type, size and specifications in which you are interested.

Orders received by 5 P.M. November 4, 1946 will be filled in the following sequence, as provided by law: (1) Certified Veterans of World War II; (2) Subsequent priority claimants in proper sequence; (3) Non-priority purchasers. Veterans of World War II should apply to their nearest War Assets Administration certifying office for certification. The case number shown on certification and the location of the certifying office must be stated in a veteran's offer to purchase.

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That's the way the Mack balanced bogie and the exclusive Mack Power Divider handle any job. No bogie hopping, unequal tire wear, or hard steering. Torque reaction is balanced out, eliminating weight transfer and assuring equal traction on all wheels.

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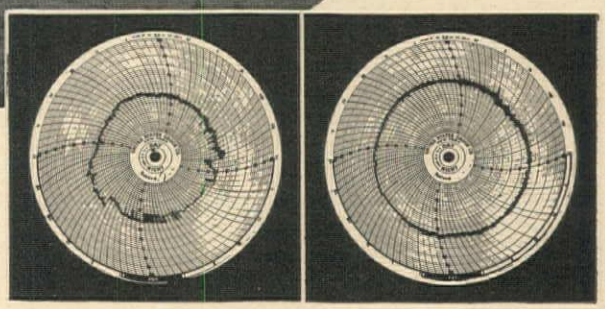
BETTER MUNICIPAL WATER SUPPLY SERVICE

ONE of the first steps in improving water pressure and fire protection in a water supply system is often the erection of an elevated water storage tank. The Maywood Mutual Water Co. No. 3 at Maywood, California, installed the 200,000-gal. Horton elevated tank shown above to maintain adequate pressure and to provide fire protection to meet underwriters' requirements in an area of approximately 2½ sq. mi. The water system, which serves portions of two cities and an unincorporated area, has 1,275,000 gals in reservoirs in addition to the 200,000 gals. in elevated storage. The system supplies 1660 domestic customers and 40 industrial users. Daily average consumption is about 1,750,000 gals.

We design, fabricate and erect many types of Horton elevated water storage tanks for both municipal and industrial uses. When figuring on jobs that require elevated water storage, we invite you to write our nearest office for quotations.



THE RESULTS

How the Horton elevated tank improved pressure in the system at Maywood, California, is shown by the charts above. The chart at the left taken before the tank was installed shows pressure varying from approximately 48 lbs. to 23 lbs. The chart at the right indicates that after the tank was installed, pressure is maintained at approximately 50 to 56 lbs. Here is "graphic" evidence of one of the prime benefits of elevated water storage.

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***Plants in* BIRMINGHAM, CHICAGO, and GREENVILLE, PENNSYLVANIA**

WESTERN CONSTRUCTION NEWS
WITH WHICH IS CONSOLIDATED WESTERN HIGHWAYS BUILDER
October, 1946 Vol. 21, No. 10

Ceilings on Bureaucrats

THE NATIONAL convention of the American Legion is meeting in San Francisco as we write this editorial, and its great parade is passing our door. In his opening address, National Commander John Stelle made a statement which might well serve as a rallying point for government reform. He said, "Has anyone heard of a ceiling on bureaucrats? No, comrades, only a ceiling on veterans!" He referred to the top earning limit placed on veterans in the apprenticeship training program of $200 per month, a ridiculously low figure when compared to modern living costs, and which Gen. Omar Bradley, chief bureaucrat for veterans, defended a couple of days later in a brave, direct, and slightly unconvincing speech to the convention.

Of course Stelle was wrong in stating that a ceiling had been placed only on veterans, for an even more serious ceiling has been placed on construction, (by a probably unconstitutional Presidential decree) whereby much absolutely essential development and rehabilitation work has been halted or delayed to make political capital for the November elections.

But his closing demand, the appropriate rallying call referred to above, was this: "Back of the scenes where the knife that prunes is manipulated are the entrenched forces of bureaucracy. TAKE THE CEILING OFF THE VETERANS (and construction—Ed.) AND PUT IT ON THE BUREAUCRATS!" Whether or not Stelle's charges are accurate in regard to Gen. Bradley personally, they are certainly most appropriate to the degraded condition of our government today.

In the box at the bottom of this page is an inside and self-confessed picture of the training of a typical bureaucrat. The most soul-saddening part of the situation is that without doubt neither Mr. Lipkowitz or any of the thousands like him, sees anything out of place in a restaurant cashier being made chief of international studies on minerals.

Since it is obviously impossible for one man to be an expert simultaneously in mines, labor relations, securities, tariff, and compensation—and restaurant cashiering—the inescapable conclusion is that not his knowledge, but his political and ideological background is what fitted him to be a bureaucrat. Mr. Lipkowitz is but one sorry example of literally thousands. Yes, Mr. Stelle, let's put a ceiling on bureaucrats.

We might name a few: Naturally the thousands of employees in OPA come first, since they control every phase of life today, creating shortages in food, clothing, machinery, building materials, etc., and could very well be returned to the labor market, currently so seriously short of skilled men and women; you thought the Public Works Administration was liquidated in 1944—the estimated expenditure during 1947 fiscal year, according to the budget, is $7,100,000; the Agricultural Adjustment Act administrators, according to the budget, will spend $241,000,000 on payments to farmers, in other words to subsidize and control their activities, and will employ over 3,000 persons to do it, at an administrative expense of $10,137,235; the Securities and Exchange Commission, which controls financing of new enterprises, will employ 1,307 persons and spend $5,241,000; Tennessee Valley Authority hopes to spend $42,329,000 ($28,791,000 cash appropriation for this "so successful" pork barrel) and keeps the number of employees quietly to itself; the State Department will contribute nearly a half million dollars to the International Labor Board, and presumably some foreign bureaucrat will direct spending of that money; and it goes on and on and on.

There's so much room for Mr. Stelle's ceiling on bureaucrats and wasteful spending of the taxpayer's money, that we are obliged to urge every voter to cast his vote for the Congressional candidates (Democratic or Republican—party loyalties should be completely subordinated this year) who pledge themselves to overthrow the huge national bureaucracy, and re-establish the federal government as a representative, rather than paternalistic scheme. Federal payrolls can be reduced by at least a third without any noticeable effect on services rendered; maintenance of useless, and oftentimes actually harmful bureaus must be discontinued; Congress, not the Executive, should dictate policies and projects; "emergency" operation should end, and honest efforts be made to get our economy on a normal, non-inflated basis by encouraging production; ceilings should be put on waste and inefficiency, and taken off progress.

The remedy is to vote in November, but to do so only after serious, mature, and studious consideration. Vote for the Republican or Democrat who will stand for solid American business efficiency in government and against regimentation by starry-eyed pinks and restaurant-cashiers-become-bureaucrats.

Education of a Bureaucrat

Exchange at a Congressional Hearing

Mr. Engle: What did you do prior to the time you were with the Labor Section of the War Production Board?
Mr. Lipkowitz: I was with the United States Tariff Commission.
Mr. Engle: And prior to that?
Mr. Lipkowitz: With the National Labor Relations Board.
Mr. Engle: And prior to that?
Mr. Lipkowitz: I was with the Securities and Exchange Commission.
Mr. Engle: And prior to that?
Mr. Lipkowitz: I was with the Employees' Compensation Commission.
Mr. Engle: And prior to that?
Mr. Lipkowitz: I was going to college in the evening and working in the daytime in a variety of jobs, one of which was restaurant cashier and further back messenger and things like that.
Mr. Engle: What is your present occupation?
Mr. Lipkowitz: I am now Chief of the Minerals Section of the International Resources Division of the Department of State.
Mr. Engle: Have you ever had any qualified experience in mines or mining?
Mr. Lipkowitz: Do you mean was I ever employed in mines?
Mr. Engle: Yes.
Mr. Lipkowitz: No.

P. S.—To Miners (with apologies to Gilbert and Sullivan).

He polished up the handle of the big front door,
He polished up the handle so carefully
That now he is the ruler of our foreign policy.
So harken you miners and take heed from me,
Just sit at your desks and a mine never see
And you can be the ruler of our foreign policy.

—*Mining World, Aug., 1946*

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Steel-Cement Pipe—
Denver Replaces Wood-Stave Conduit

Fifty-three year old wood-stave water line is now being replaced at Denver by 30-in. welded steel cylinder pipe with precast concrete lining and reinforced concrete cover—Some 34,207 ft. of pipe must be renewed—Construction problems are numerous as it passes for its entire length along public rural and urban highways

By NELSON R. LOVE
Chief Engineer
and
N. M. DODD
Denver Tramway Corp.
Denver, Colo.

REPLACEMENT OF 34,207 ft. of 34-in. wood-stave pipe extending from Littleton, Colo., to the Chas. M. Einfeldt pumping station situated in the southeasterly part of Denver has recently been started by the Board of Water Commissioners of the City and County of Denver. The new pipe will be a 30-in. inside diameter welded steel cylinder type with precast concrete lining and reinforced concrete cover, made at the Denver plant of the Lock Joint Pipe Co. of Ampere, N. J.

The old wood-stave pipe, installed in 1893, is badly deteriorated. Plans had been made and contract awarded in 1942 for the replacement, but war shortages of both labor and material made postponement necessary until a new contract was negotiated in 1946 for completion early in 1947. During the war and previously, many repairs had been necessary, and four short sections had to be replaced as emergency measures, so that the present replacement is in five sections. The previously replaced sections will remain as a part of the new line.

The new conduit will be interconnected with four other existing conduits to assure a continuous water supply to all parts of Denver. With the completion of the new pipe, it will be possible to deliver an additional 4,000,000 gal. of water daily through this conduit line thru increased pressures and consequent higher velocity.

Contract

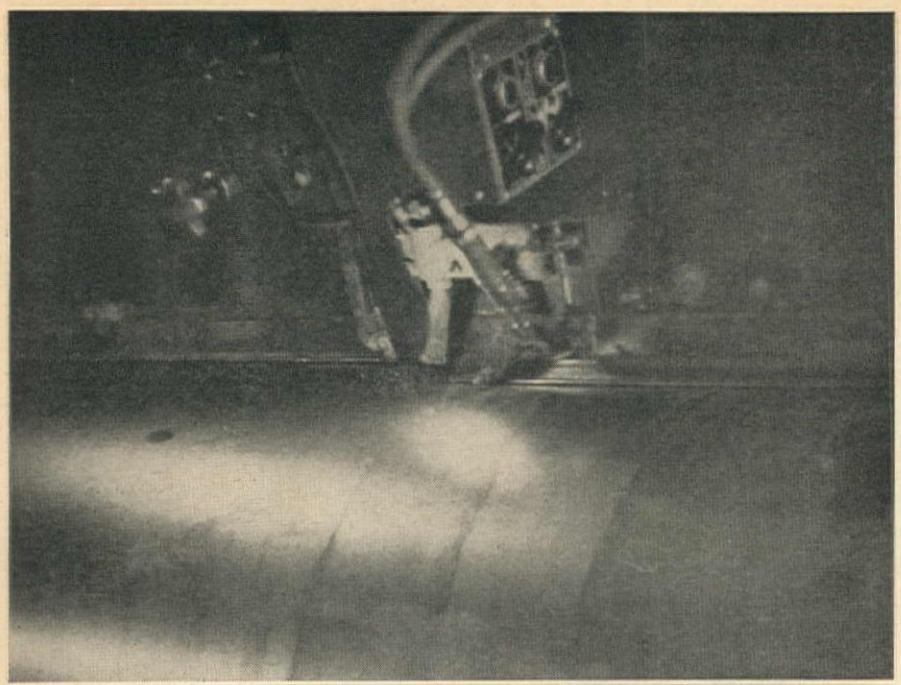
The general specifications were prepared and the original contract for fabrication and installation of the new pipe was awarded to the Lock Joint Pipe Co. in 1942. Because of the war it was necessary to postpone rebuilding the conduit line. The Board of Water Commissioners awarded a new contract in January 1946 to the same contractor. The work was started in September of this year and will be completed early in 1947.

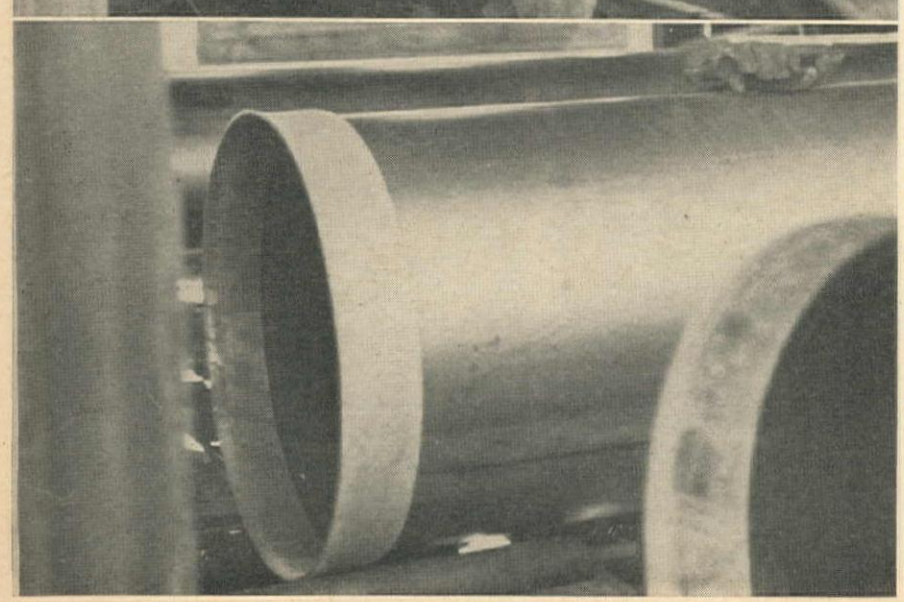
The contract as let in 1946 calls for installation of 24,524 ft. of new pipe in Arapahoe County at $11.50 per ft. and 7,794 ft. in the City of Denver for $12.50 per ft., or a total cost of approximately $380,000. There will be additional expense for fittings and expenses of the engineering department amounting to approximately $65,000. Subsequent emergency replacements have altered these figures slightly.

Construction problems

The conduit passes for its entire length along public highway thru territory ranging from dense rural population to light urban population, consequently a not inconsiderable portion of the contractor's work will consist of protecting, lowering or relocating gas and water mains, telephone conduits, sewers, and service connections to all such classes of underground structures. Certain parts

EXCAVATING TRENCH for removal of wooden pipe is pictured at left, while at right the hoe shovel is used as a crane to lift old pipe from the trench and lower the heavy sections of concrete pipe into place. Pipe is laid in place with the gasket installed on the spigot one section at a time.





of the territory are irrigated farm land, and flow of water in irrigation ditches may not be interrupted without permission of the owner.

One double track street car line must be crossed near the Einfeldt pumping station. This will be accomplished with the cooperation of the Tramway Company by placing temporary crossovers and using one track only while pipe is being laid under the other. In order to avoid any possibility of subsequent track settlement, the contractor will place longitudinal timbers under each rail, with supporting posts alongside the pipe reaching to undisturbed ground at the bottom of the trench.

Old conduit will be removed almost in its entirety, as the new pipe follows the line of the original installation almost in its entirety. However, where the old conduit will not interfere with the operations of the new one, and the distance between exteriors of the two pipes is more than 2 ft., the old wood-stave pipe will be left in place.

Because much of the work will be done during the winter, it will be necessary that the contractor protect exposed water and sewer services from freezing.

The new conduit line begins at Windemere Avenue in Littleton, Colorado, the county seat of Arapahoe County at an elevation of 224.75 ft. (Denver datum) and ends at the Charles M. Einfeldt pump station located at Buchtel Parkway and South University Boulevard in Denver, at an elevation of 176.50. The new pipe when carrying normal flow operates at a pressure of 49 to 50 psi thru its entire length. Static pressure with flow shut off will be about 70 psi.

Concrete-lined steel pipe

The new pipe, fabricated in 16-ft. sections net length, is steel reinforced concrete pipe, using a 16-ga. steel cylinder around which is wound a spiral cage of 23/64-in. diameter round reinforcing rod and covered with a layer of concrete, inside and out. Provision is made for a rubber gasket to be placed in a groove in the steel ring on the spigot end to seal the joint.

The concrete used is mixed in the following proportions: Concrete is 1 : 1.58 : 2.2 mix by weight. Coarse aggregate is ⅜-in. maximum, and the fine aggregate will carry 15 per cent or more passing a No. 50 screen. Not less than 6 gal. of total water is required per sack of cement. This provides an extremely workable concrete as required by the very long thin sections poured. All forms are vibrated during pouring to increase density and eliminate air voids. Weight of a single 16-ft. section of the completed 30-in. diameter pipe used on this job averages about 3 tons.

A careful check of the moisture content of the aggregate is made at the time of its deposition in the hopper of the mixer. Allowance is also made for loss

AUTOMATIC submerged arc welder above welds steel section, while at middle is shown the head of the pressure testing jig. Below, hub fitting is slipped over assembled steel core before welding. Pipe is manufactured in Denver by the Lock Joint Pipe Co.

of moisture in the aggregate if it remains in the hopper over the week-end when the plant is idle. Test cylinders made from samples removed from batches of concrete show seven day test of from 3,600 to 4,800 lb. per sq. in. In the production of concrete, 1.91 bbl. of cement are used per cu. yd., or 1.17 yd. of mix are produced per barrel.

Pipe manufacture

The steel cylinder is rolled from three sheets of 16-ga. U.S.S. steel. After third-cylinder sections are rolled to the proper curvature, they are "tacked" with one-inch lap. The galvanized end rings for hub and spigot, which are manufactured at the main factory of the contractor in New Jersey, are clamped in place and arc welded by hand to the cylinder. The cylinder with end rings then goes to an automatic submerged arc welder in which the longitudinal seams are welded.

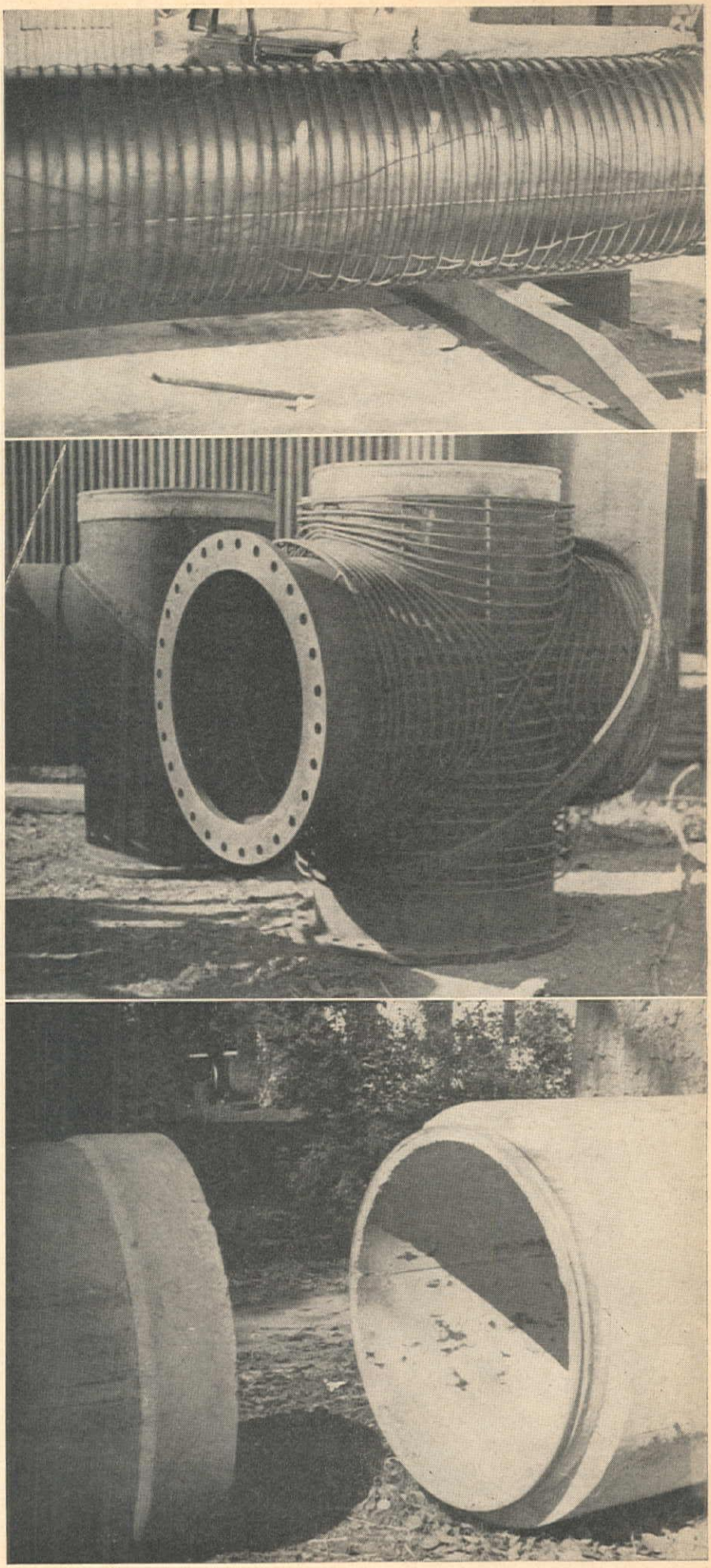
Following seam welding the cylinder is placed in a device for hydraulic testing, which consists of a cylinder slightly smaller in diameter than the steel cylinder, with closed ends. The cylinder under test is sealed at each end by clamp fixtures with rubber gaskets. Test pressure used at this point is 92 psi. Any pinhole leaks are revealed by this test and hand-welded until pipe core is completely watertight.

Cylinder reinforcement

The cylinder is then rotated on a machine to which is fed a continuous 23/64-in. round rod to form a spiral cage around the cylinder. No. 8 tie wires are then laid diagonally from end to end over the first cage, a second helix of 23/64-in. rod is wound with its turns lying half way between the turns of the first helix making a completely interlaced double helical cage with the number of turns and spacing to conform with the design. The cage is held the required distance from the cylinder by short pieces of the reinforcing rod welded to the cylinder and to which the cage is welded after it is stretched in place.

To prepare the pipe for casting, the steel cylinder is set vertically on a base form, the inner form is dropped inside, the outer form is set in place and both are held in place by a top form which is a metal cap clamped in place. The concrete is then poured from a 1-cu. yd. special bucket which is carried from the concrete mixer by a 25-ton track mounted crane with special 40-ft. boom and special goose neck fixture to handle empty buckets or other light duty while carrying a loaded bucket. The bucket is set over a hopper which has been previously set on top of the prepared pipe. Concrete lining is 1¼ in. in thickness and the reinforced concrete covering 2¼ in. in thickness, or a total wall thickness of 3½ in. plus the thickness of steel core.

Smaller specialties such as service out-



AFTER PIPE passes tests it is wrapped with 23/64-in. reinforcing rod and tied with interlaced #8 tie wire, above. Tee fabricated, ready for concrete lining and casing (center) has two-lock joint spigots. Below, finished joint is ready for gasket.

lets, and minor lateral connections are welded into the side of the steel core. Any combination of tees, crosses, et cetera, are readily fabricated by welding the steel cores as required. Openings are cut with an oxy-acetylene torch after welding, after which reinforcing rods are placed as necessary.

Fittings may in this way be flanged, lock-joint, or standard hub and spigot, as the case may require, providing means of establishing satisfactory joints to any other type of contiguous pipe.

Curing

Concrete remains in forms for 16 to 24 hrs. After stripping the forms the pipe remains standing on end in air for the remainder of the day, and is then steam cured for 72 hr. before placing in storage. Further curing in storage takes a minimum of 7 days.

Construction

The principal piece of equipment to perform the work is a gasoline power hoe shovel of ¾-cu. yd. capacity mounted on crawler treads. This is used also as a crane to handle the heavy sections of concrete pipe as well as to remove old pipe after the trench has been excavated. Only sufficient trench is opened at one time to accommodate a single length of pipe, which is laid in place with the gasket installed on the spigot.

An internal grout is placed in advance of the gasket, protecting metal parts from water in the pipe, and outside of the joint is covered with paper until it is ready to grout, the paper serving also as a retainer for grout. The spigot ring is held away from the bell a short distance, and this space and the space to the gasket is filled with a thin grout which is poured in the joint and settled with wires forced around the joint to release entrained air bubbles.

GLEN WILSON, field inspector, holds curved tamping bar which reaches to the bottom of trench. Rod is used for backfilling and hand tamping to the spring line. Backfilling above is done with a small bulldozer, and pneumatic tampers are used to obtain sufficient compaction.

Backfilling and tamping to the spring-line is done by hand using a special curved tamping tool which reaches to the bottom of the pipe. Backfilling above the spring-line is done with a small bulldozer and puddling the trench is required where water is available. Otherwise pneumatic backfill tampers are used to secure sufficient compaction to prevent further settlement of the trench after the street is resurfaced. Track crossings are made by trenching under the tracks and installing temporary bridging where necessary to permit continuous transportation service over the rail lines. Temporary crossovers are used when feasible to permit open trench work and avoid rail travel while work is in progress.

Personnel

Design and specifications of the conduit and appurtenances were prepared under the direction of D. D. Gross, chief engineer for the Board of Water Commissioners, and construction is supervised for the Board by H. R. Oliver, resident engineer; Glen Wilson, field inspector, and L. Link, inspector of fabrication. The construction is carried under the immediate direction of R. W. Jones, job manager for the Lock Joint Pipe Co., who is assisted by J. B. Matthews, in charge of pipe laying, and George Short, superintendent of plant.

Johnson Acquires Case Interest Name Now Johnson Western Co.

WILLIAM A. JOHNSON, prominent West Coast contractor, has acquired the interest of his former associate, Vern D. Case, in Case Construction Co., and the firm name becomes Johnson Western Company.

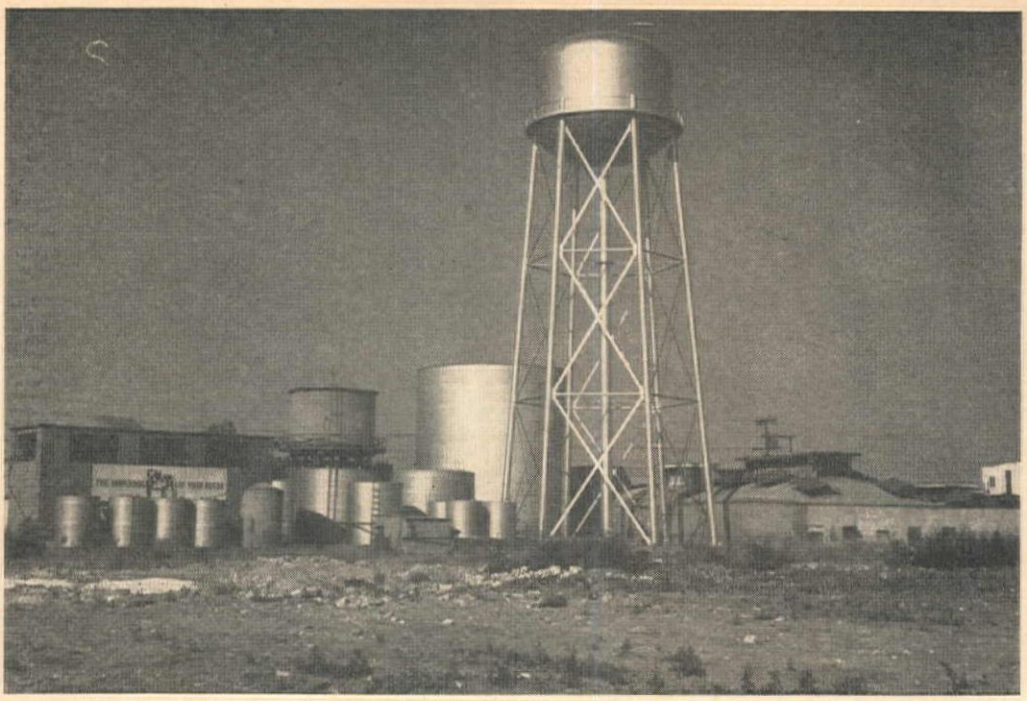
Elden Smith, formerly vice-president at the head office of Security-First National Bank of Los Angeles, will be president of the new firm, and Harry Gast, general manager for Case since 1938, remains as vice-president and general manager.

Key personnel and operating plant of the organization remain unchanged. Eldred Northrup who has served Case for 14 years, continues as operations manager. L. J. Sullivan, D. W. Shupp and E. E. Jackson will, as heretofore, manage the Los Angeles, San Francisco and San Diego divisions respectively.

The new company will continue and expand its operations in general and marine contracting, gunite construction, hydraulic and clamshell dredging, deep sea diving and salvage, tugboat, derrick barge and lightering service.

The name of Case American Construction Company which performs dredging activities has been changed to Johnson Western American.

NEW OFFICERS of Johnson Western Co. are top, l. to r.: Smith, Gast, Northrup; bottom, l. to r.: Sullivan, Shupp, Jackson.



All-Welded Tank for Maywood

First all-welded steel water tank on the Pacific Coast has been erected by the City of Maywood to increase the storage capacity of the municipal utility system and to regulate pressure head in the distribution system—The structure has been especially designed to resist earthquakes

By M. W. ANDERSON
Santa Monica, Calif.

MAYWOOD, CALIF., has recently installed a new 200,000-gal. elevated water tank of a design not usually seen on the West Coast. Chicago Bridge and Iron Co. designed, fabricated and erected this tank for the Maywood Mutual Water Co. No. 3, and believes that it is the first all-welded structure of this kind on the Pacific Coast. Another new feature is the column supports. They are cylindrical columns made of mild steel plates and are now standard for all water tanks constructed by this company. Previously, structural columns made up of two channels with a riveted cover plate on one side and riveted lattice bars on the other were used.

Principal dimensions

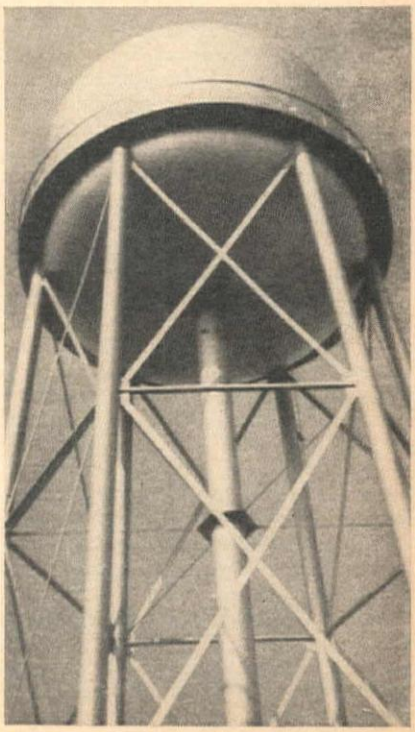
The following dimensions will help to give a clear picture of the new container. The tank proper is 36 ft. in diameter. The shell is 16 ft. high, and the depth of water at maximum capacity is 28 ft. Both the bottom and roof are ellipsoidal in shape. This cross-section was adopted for the bottom, in preference to hemispherical shape, so that the distance between the bottom of the tank and the high water line would be minimized, thus reducing the variation in water pressure between the upper and lower limits of the tank capacity. The ellipsoidal roof is used because it gives maximum capacity with minimum cost of construction.

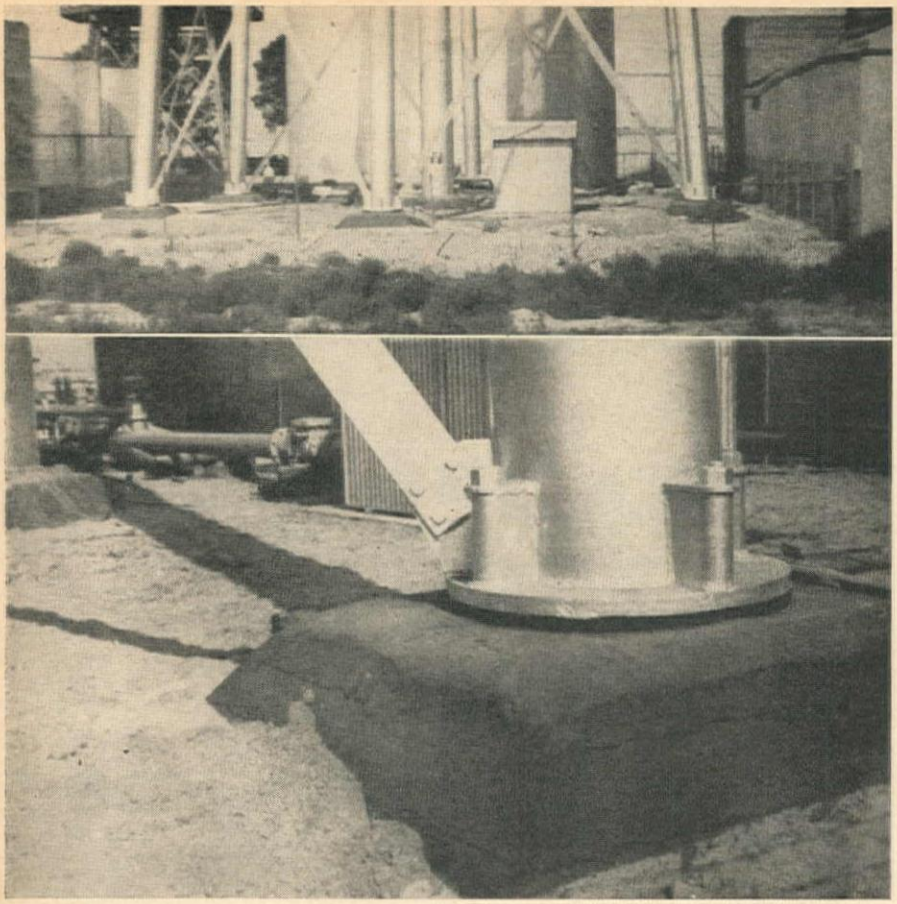
The tank is set on a 3-ft. circular balcony, which acts as a girder. The tank and balcony are supported by 6 cylindrical columns, 22 in. in diameter. Flat bars are used for bracing between the columns, and are fastened by bolts. They are welded around the ends and at the center where the members cross each other. The horizontal bracing members are 4-in. diameter rods. Radial rods run from the columns to the 3-ft. diameter center riser pipe at two places on the pipe. The length of this pipe itself is 100 ft. It is made from steel plates and is welded directly to the tank bottom.

This center pipe is embedded in a concrete pier which is 7 ft. deep and 16 ft., 10 in. square at the base. The 6 column piers are also 7 ft. deep but they are 15 ft., 6 in. square at the base. Each column is held to the pier with 4 anchor bolts. In order to provide shear members, fins at the base of each post are embedded in the concrete. All of the posts are tied together with concrete struts near the top of the piers for earthquake protection.

Earthquake forces at the Maywood location are of considerable importance. The force was calculated at 181,000 lb., which is 10 per cent of the dead weight of the water and steel. Therefore the columns are heavier than usual and at a greater pitch than normal. Instead of a pitch of ⅜-in. in one ft., this tank has a pitch of 1 in. horizontally to 12 in. vertically. The balcony around the tank

LOOKING UP at the tank to show the radial rods running from the columns to the center riser pipe, and the flat bar cross bracing and round horizontal bracing on the cylindrical columns.





The upper photo shows the entire tank base and restricted working area. The lower picture gives detail of the base of the column showing concrete pier and anchor bolts. The concrete pier of the center pipe is 7-ft. deep and 16-ft., 10-in. square at the base. Column piers have the same depth, but are 15-ft., 6-in. square at the base.

also helps to carry some of the earthquake stresses. The water load is, of course, another stress to be considered. Per post it is 1,444,800 lb. and the total load in the tank is 1,711,000 lb.

Pressure control

A steady pressure of 54 lb. per sq. in. is maintained in the distribution system. G. D. McCann, engineer for the Maywood Mutual Water Co., reports that pressure fluctuations have been cut to a minimum since the old pumping system has been replaced.

This new tank operates on a simple principle. When the water in the mains is being pumped at a pressure greater than the head supplied by the elevation of the tank, the surplus water flows into the tank. When the opposite situation prevails, water flows from the tank to maintain pressure in the mains. The only auxiliary equipment required is a shut-off valve on the stand pipe near the riser pipe and an altitude valve to shut off the line when the tank is full. The shut-off valve is, of course, used to take the tank out of service for cleaning and inspection.

Another interesting feature of this elevated tank is the method of corrosion prevention. The method is called "cathodic protection" and has been used on the West Coast only in the last 4 or 5 years. Previously it was necessary to coat the inside of a tank every 8 to 10 years, at a relatively high cost, but with the cathodic method the cost is much reduced. In the cathodic system 6 large, platinum-alloy electrodes are suspended above the water. When the water rises up to them an electric current passes through the water to the sides of the tank. This reverses the normal flow of current and reduces the electric potential of the metal below that of the grounded electrodes. This method almost entirely prevents corrosion and also reduces bacterial contamination.

Construction progress

The elevated tank was constructed in 5 weeks and was completed in June, 1946. The work progressed smoothly. The area in which the erecting was done was very restricted, which constituted the principal difficulty involved in the job. The tower and tank were constructed in the usual manner. After the foundations were laid, the lower sections of the tower panels were put in place with a portable truck crane. Next the riser pipe was fastened to the center pier. Then the upper sections of the tower panels were raised with a basket pole and welded in place. After the twelve sections of the tank bottom were welded together in groups of three, they were raised by the basket pole and welded to the center section around the riser pipe. The crew of 8 to 10 welders then fastened the balcony to the tank bottom and welded the sides and top together to complete the job.

The Maywood utility supplies 1800 users, who consume 1,250,000 gal. of water in 24 hours. Not all these consumers are individuals. Included are a number of industries and it is imperative that they have an adequate water supply for fire protection, and this was one of the strongest reasons for choosing the elevated water tank system for the city.

The tank was erected under the supervision of Dean Stephan, district engineer for Chicago Bridge & Iron Co., and G. D. McCann, water company engineer.

Texas Company Exports Natural Gas to Mexico

THE REYNOSA Pipe Line Co., a Texas corporation, has been authorized to export and sell to Gas Industrial de Monterrey, S. A., a Mexican corporation, up to 50,000,000 cu. ft. of natural gas per day in a Federal Power Commission order. The authorization is contingent upon the filing of an application with the Commission for a certificate of public convenience and necessity for the construction of approximately 30 mi. of pipe line from the Hidalgo County, Texas, gas fields to the Mexican border.

A Presidential Permit has been issued to authorize the construction, operation, maintenance and connection at the international border of facilities necessary for the transportation of such gas.

Gas Industrial de Monterrey will purchase the gas at the border from Reynosa under a ten year contract and pipe it to Monterrey for use by a limited number of industrial consumers who are subscribers to Gas Industrial's stock. The Commission's order limits the gas exported by Reynosa to gas produced in La Blanca, North Weslaco and South Weslaco fields in Hidalgo County, from reserves owned by La Gloria Corp., parent company of Reynosa.

Idaho Labor Agreement Effective Until 1947

ACCEPTANCE of a labor agreement effective until the end of this year was announced in a joint statement from the Idaho branch of the Associated General Contractors of America and A. F. of L. building and construction trades unions and councils.

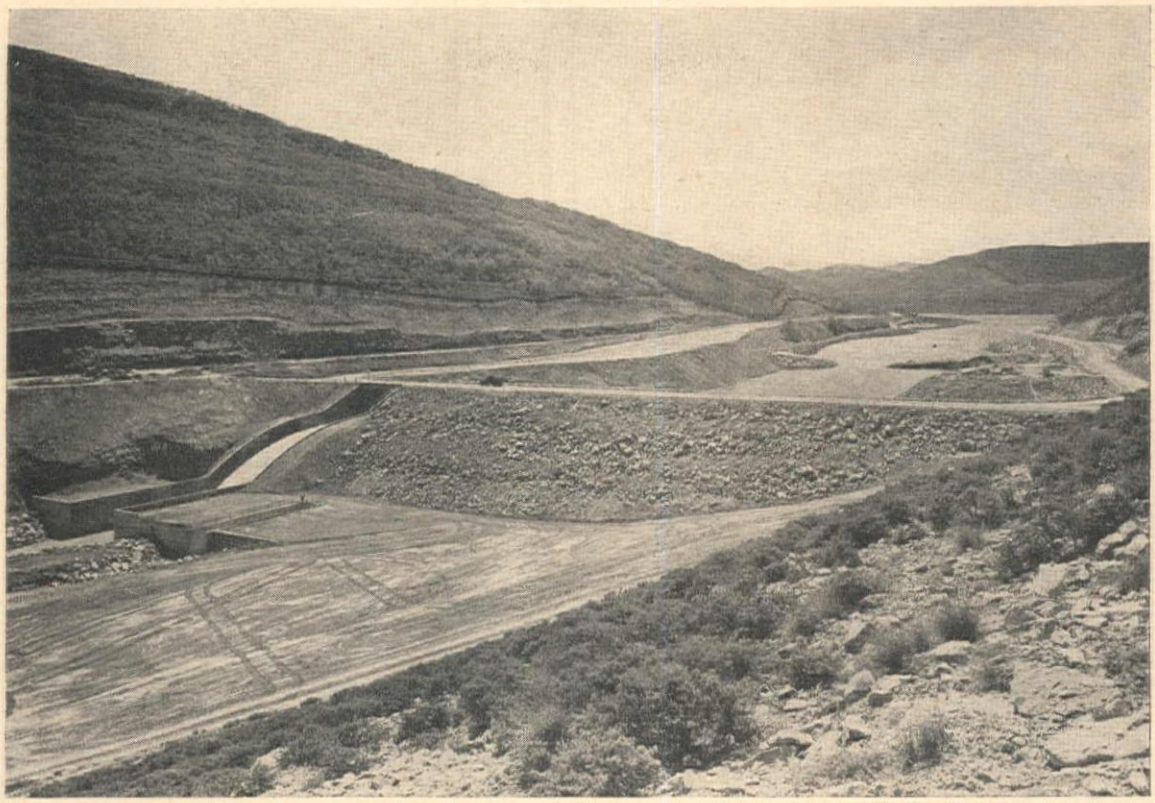
The agreement sets aside the first two months in 1947 as the renewal period during which time it will remain in full force and effect, according to Fred McCabe, secretary of the Boise building trades council.

The agreement provides for the following:

"Collective bargaining for the establishment of uniform wages, hours and working conditions for the building and construction industry in the area covered.

"To prevent strikes, lockouts and other avoidable delays or interferences with the progress of work by providing means for the settlement of labor disagreements by conference and arbitration."

Collapsed Utah Dam Replaced



GENERAL VIEW of Scofield Dam and reservoir, which have just been completed in the Price River Valley in Utah shows downstream face of the rolled-fill structure. Old dam, partially inundated, can be seen at back, spillway and outlet works lower left. Upstream side of dam is faced with three feet of dumped riprap. Crest length is 575 ft. and dam rises 121 ft. from cut-off trench.

Irrigation dam which will protect vital coal mine and transportation facilities in Utah from flood damage is completed after three years work—Built to Bureau of Reclamation specifications it replaces old structure that had partially failed—Narrow canyon limited contractor to "single file" operations

By PARLEY R. NEELEY
Construction Engineer
Bureau of Reclamation
Scofield Project, Utah

CULMINATING 66 years of irrigation development in Price River valley, situated in east central Utah, construction of Scofield Dam was commenced at the height of the war effort and completed this year under priorities granted as an emergency measure to protect vital coal mines and transportation facilities from the threat of flood damage.

The modern Scofield Dam, built to Bureau of Reclamation specifications, replaces an old structure that had partially failed.

W. W. Clyde & Co. of Springville, Utah, was the contractor for the job which was undertaken in September 1943, and required three years to complete. This was nearly twice the time originally scheduled. War-time labor and material shortages together with cramped working conditions contributed to the unavoidable delay. The narrow canyon in which the dam is located limited the contractor's activities to "single file" operations, precluding work on several features concurrently.

Except for minor clean-up work and clearance of ground that will eventually be inundated, the dam was formally completed in mid-year.

Situated on Fish Creek or Upper Price River, the new dam is a rolled-fill structure with downstream section of rock fill and upstream side faced with three feet of dumped riprap.

The crest length is approximately 575 ft., the dam rising 121 ft. from the bottom of the cutoff trench. The back slope is 1:1 for the earth section and 2¼:1 for the rock section. The front face slopes are 2:1 above the crest elevation of the spillway, 3:1 from the elevation of the inlet lip elevation of the outlet works to the spillway crest and 5:1 below the lip of the outlet works. The outlet works and spillway are located at the right abutment. The reservoir has a capacity of 65,000 ac. ft. of live storage and 8,000 ac. ft. of dead storage for protection of fish and wildlife.

Cutoff trench

The cutoff trench from the original ground surface was of two types. An open cut trench with side slopes of 1½:1 was made to bed rock from the left abutment to near the right abutment having a 20-ft. bottom width and a maximum cut of 59 ft. A vertical side trench four feet in width was excavated to bed rock at the right abutment under the outlet works and spillway and filled with concrete.

It was apparent that a considerable quantity of water would be encountered in the excavation of the cutoff trench. It was also anticipated that materials would be encountered in the excavation which would likely be unstable due to water saturation. A condition described as quicksand was encountered in the attempted excavation of a cutoff trench for the old dam and as a result the cutoff trench was not completed to bed rock for this old structure. The contractor investigated the possibilities of using a well point system and making the excavation in the dry; the equipment for installation of the well point system was delivered to the job but not used. The contractor started excavation with a dragline and used electrically driven

pumps mounted on a floating platform for unwatering.

The procedure in excavating was to dig a sump approximately 10 ft. deep near the upstream slope of the trench and work a layer approximately 8 ft. in depth at a time, starting at the pump sump and completing the lift over the entire cutoff trench area before deepening of the sump and starting another lift. This method of excavation worked very well. It was found that by leaving approximately a 10-ft. berm against the side slopes, which drained very slowly, and keeping the excavation of this berm approximately one lift behind the main excavation of the trench, there was no sloughing of the sides of the trench. The contractor was able to excavate the open cutoff trench to bed rock by this method.

The exposed bed rock consisted of shale and sandstone in layers of varying thickness. A large quantity of water came into the excavation along the contact of the bed rock and overlying gravels and clay as well as from the bed rock. It was estimated that approximately 1,000 gal. of water per minute flowed into the excavation, the largest quantity coming from the upstream side of the excavation.

A key trench was excavated in the bed rock to provide for a cutoff wall footing and to seat the grout pipe for drilling and grouting. A reinforced concrete cutoff wall ten feet high was placed to water surface elevation from right to left abutment.

Grouting

The foundation grout system was laid out with the holes at approximately 10 ft. intervals along the center of the cutoff trench and drilled generally normal to the slope for a maximum of 50 ft.

The drilling and grouting procedure was as follows: Drill and grout every third hole to the first stage to completion before grouting the intermediate holes. Next one of the intervening holes was drilled and grouted to the same stage and finally one third or closing hole was drilled and grouted. The take of the closing hole was used as an indication of the success or completeness of the grouting operations of the group to the stage. The drilling and grouting was done by stages to approximately 10, 30 and 50-ft. depths.

Exceptions were made in regard to the depths drilled in the event the drill water was lost, in which case drilling was stopped and the hole grouted to refusal. Prior to injection of grout, it was customary to test all holes at full water pressure, the purpose being to determine the possibility of taking grout, and to lubricate the grout lines, seams or crevices in the foundation rock. Neat cement grout having a 4:1 water-cement ratio by volume was generally used to start on each hole and this mixture was continued unless conditions indicated that thicker grout was needed. Where holes were grouted to refusal at the pressures desired the grout was allowed to set from four to five hours before washing out and resuming drilling. In a few instances a small quantity of bran was added to the grout and appeared to be effective in sealing off small surface leaks. Pressures of from zero to 40 lb. per sq. in. at the top of the grout holes were used.

Drilling was done for the 10-ft. cap grouting with jackhammer and the deeper stages drilled with a core-drilling machine making a 1½ in. diameter hole.

Grouting was done with two air-operated, duplex slush pumps with three-inch piston bore and 10-in. stroke. The pumps were set so that a quick switch could be made from one pump to the other in case of a breakdown. A quantity of 14,466 cu. ft. of grout was placed in the foundation.

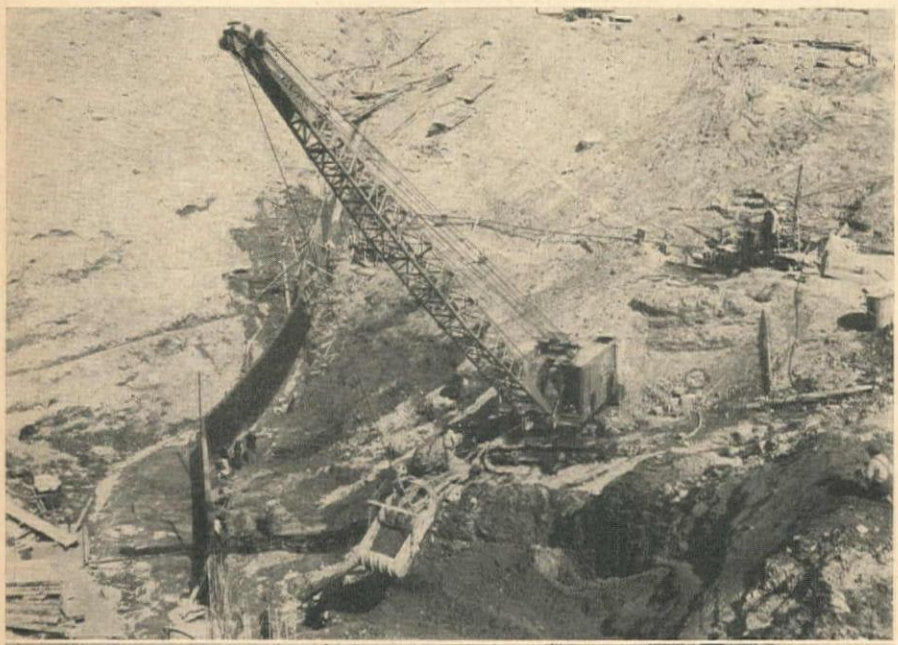
Foundation drains

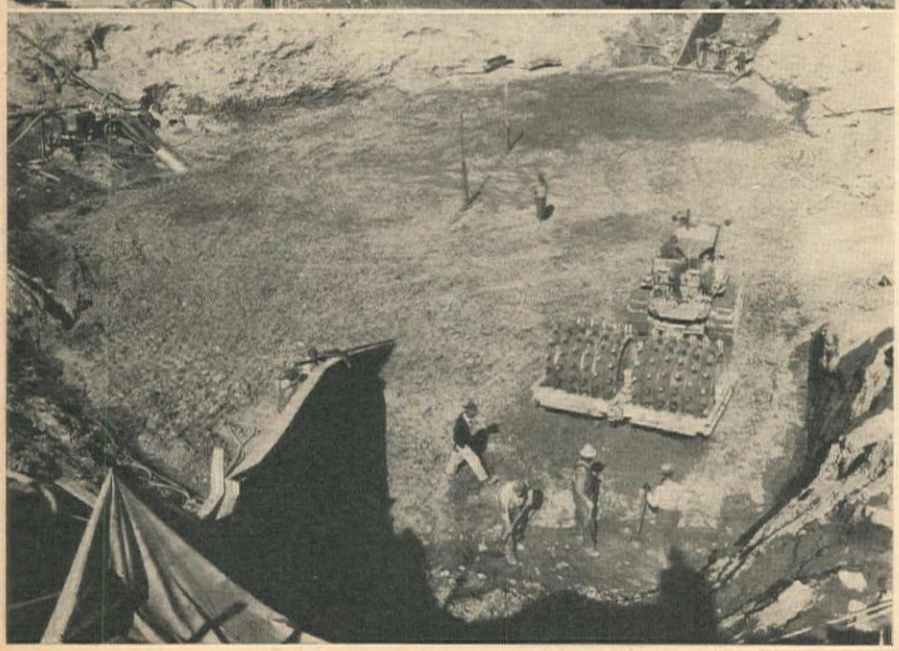
The foundation grouting, while sufficient for the purpose and forming a cutoff curtain, could not seal off the water coming into the excavated cutoff trench. In order to start the compacted embankment on the bed rock in the dry the contractor installed a drainage system of four-inch, six-inch and eight-inch concrete tile embedded in gravel. The system was connected to a pump sump and grout pipes installed to grout the drainage system after the embankment had reached an elevation above the ground water surface.

The water was allowed to raise in the sump to approximately 12 ft. lower than the elevation at which compacted embankment was being placed. The suction lines of the electric pumps were placed in a 24-in. corrugated metal pipe following up the slope of the cutoff trench. Sections of pipe were added as the height of the fill progressed.

A total volume of 1,867 cu. ft. of grout was pumped into the drain tile system.

CONSTRUCTION OF trench for the dam foundation shows the concrete cutoff wall in place on north abutment, above. Sheepsfoot roller tamper, below, compacts bottom layer of fill, well below the natural stream bed level. Work in the cutoff trench area was especially difficult, owing to water percolation, requiring bench excavation.





Outlet works

The outlet works are located at the right abutment and are entirely of concrete construction built in open cut much the same as a conduit. The structure is 395 ft. long and consists of an inlet section with trashracks for 15.75 ft.; five-foot diameter horseshoe section on a .00403 grade, with four equally spaced cutoff collars for 115.0 ft.; gate tower 64 ft. high with two 3.2x4-ft. gates in tandem and transitions at each end for 30.25 ft.; five foot diameter horseshoe section on slope of .035714 with four equally spaced cutoff collars, 164 ft.; stilling basin with hydraulic jump and dentates for 70 ft. The right wing wall is of concrete and the left wing wall of concrete crib construction.

The conduit section was poured in sections 33 ft. long with a four-foot closure plug between each section. These plugs were poured when the sections had reached maximum shrinkage. The invert was placed first and the arch poured later making a construction joint at the springline. Cutoff collars were separated from the main barrel by a ¾-in. joint filler. No water stops were provided for any of the construction joints.

The four-foot closure plugs were poured during the first week in July. It was found that the maximum contraction occurred at approximately 6:00 a. m. and the observed contraction was approximately .0035 of a foot with a variance in temperature from 70 deg. to 49 deg. F. It was also found that by continuously sprinkling the sections with spring water that at a temperature of 49 deg. F., this same contraction could be made during the daytime. The pouring of the four-foot closure plugs was started at 4:00 a. m. and completed at 8:00 a. m. Continuous watering of the 33-ft. sections was continued until the concrete in the plugs had set. Upon examination of the joints at the closure plugs after curing, it was found that very fine hair cracks appeared at a temperature of 47 deg. F., but closed when the concrete reached a temperature of 55 deg. F., which is the approximate temperature of the water diverted from the reservoir.

Spillway

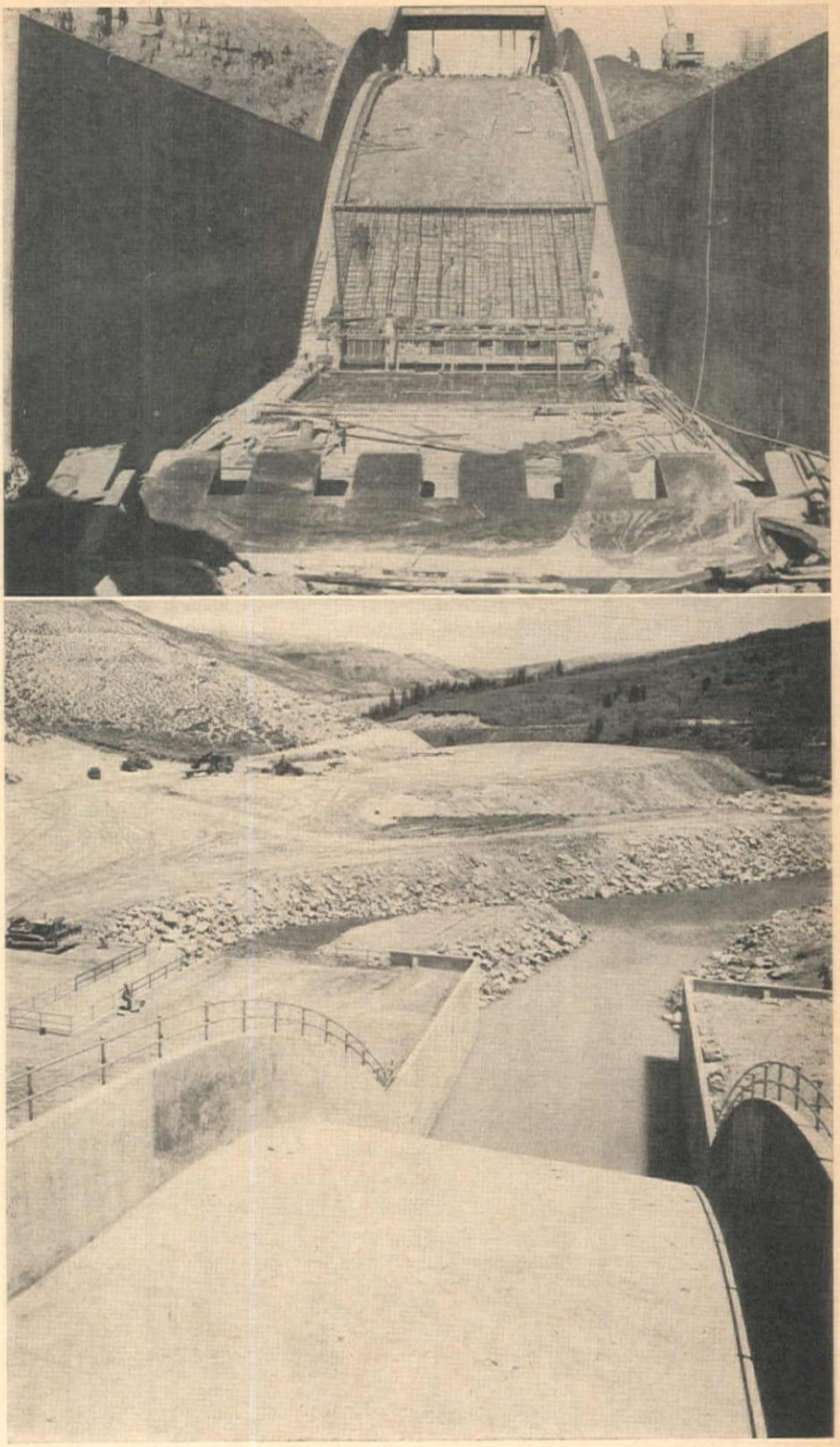
The spillway is located on the right abutment. The overflow crest is at the normal water surface elevation of the reservoir, 7617.50 above sea level and is uncontrolled. The capacity is 6,200 c.f.s. with a maximum reservoir water surface of 7630.0 above sea level.

The structure is a concrete-lined open channel 260 ft. long, with rock riprapped inlet and outlet channels. The walls are vertical and of counterfort and cantilever construction and except for the curved walls of the inlet transition are 40 ft. apart. The slope of the chute section varies from .10 near the crest structure to 1½:1 above the stilling basin. Water passing through the structure drops approximately 46 ft. and the energy developed is dissipated in the stilling basin by the action of two rows of dentates.

The walls of the structure were placed in advance of the floor sections with construction joints without water stops at intervals of 20 to 25 ft. and the reinforcing steel did not extend across the joints. A 25-ft. highway bridge crossed at the inlet end of the structure.

The spillway foundation consisted of natural earth to approximately halfway down the drop section and soft sandstone and shales from this point through the stilling basin. A 6-in. layer of screened gravel and extensive lateral and cross drainage system were installed where the structure was on earth and the drainage system continued through the rock section under the stilling basin floor. Anchor bars of 1⅛-in. square reinforcing steel were installed in the area of the rock at 6-ft. centers both ways.

The sub-grade for the stilling basin was in shale which air slacked very rapidly. To protect the sub-grade from slacking, the shale over a small area was



LOOKING UPSTREAM into spillway during construction (top) shows walls in place and forms and reinforcement ready for the floor. Two rows of dentates visible in foreground dissipate energy developed by 46-ft. fall to stilling basin, shown below.

LOOKING UPSTREAM from below the reservoir, the railroad track is on left of the abutment. While construction was still under way the old dam and spillway at the back were still in use. The first Scofield Dam partially failed in 1928 and despite subsequent repairs the storage capacity was cut to less than half original amount.

cleaned with brooms and air-water jets and immediately covered with a three-inch layer of concrete, continuing this process until the entire area was protected. Where the sub-grade was in earth material, it was moistened and compacted with air hammers.

The floor sections on the steep slopes were formed to insure complete consolidation of the concrete in the sloping sections. Studs were cut to the parabolic curve or the straight floor section as required and placed parallel to the axis of the structure; the studs were held in place by cross walers tied by she-bolts to anchor bars of 1⅛-in. square steel grouted into the sub-grade foundation. The studding thus placed and anchored were sheathed with ship-lap for approximately four feet and the section poured, then another four-foot section was sheathed and poured, continuing to the end of the floor section being placed. The placement of concrete was very closely watched; and when sufficient set had occurred, the first and successive four-foot section was removed, floated and troweled to a smooth hard finish.

Where gravel was placed between the sub-grade and the concrete and covered with a layer of tarpaper, a layer of fine mesh chicken wire was placed over the tarpaper and tied down to the previously grouted anchor bars. This method worked very well in holding the 6-in. layer of gravel in place during concrete placement.

Concrete

The total concrete work consisted of approximately 3,542 cu. yd. The greater part of the reinforced concrete required form work, and construction joints were provided at intervals, breaking the structure down into relatively small pours, the maximum pour being some 190 cu. yd.

Concrete materials were furnished by the government. Modified Portland cement in paper bags was received from the Idaho Portland Cement Co. and Union Portland Cement Co. Concrete aggregates consisted of sand and ¾ and 1½-in. gravel from the Salt Lake Valley Sand & Gravel Co.

The contractor used a screening and batching plant to dry batch the mix, hauled the dry batch approximately ½ mi. to a paver located at the pour and hoisted the concrete in 1-cu. yd. buckets by a crawler crane to the forms.

Concrete having 0.49, 0.53 and 0.56 water-cement ratios were required depending on the severity of exposure to the elements. The standard mix used with adjustments to fit the required W/C ratios and slump desired and adjustment to field conditions was 1:2.05:1.60:1.61 clean separation having 0.49 W/C ratio and a three-inch slump. The consistency of the concrete was controlled by visual inspection and by slump tests. The strength of the concrete placed was indicated by breaking 6 x 12-in. cylinders cast from samples obtained during concrete placement and varied from a high average of 6,045 p.s.i. to 5,215 p.s.i., depending on the W/C ratio and mix used.

Embankment

The materials for the compacted embankment and earth fill sections were in general obtained from required excavation. It was necessary to borrow some 35,000 cu. yd. of the total of 153,693 cu. yd. of embankment materials, and 2,500 cu. yd. of the total of 37,250 cu. yd. of rock fill and rock facing material. The embankment materials contained an excess of oversize rock above 5-in. in diameter, in some areas as much as 20 per cent, so the contractor constructed a grizzly to screen out the oversize.

The contractor handled the embankment materials with a 1½-cu. yd. shovel in the excavation loading to dumptors, which hauled to the grizzly for separation of the oversize, and from the grizzly to the fill. Here they were dumped and spread with a dozer to the required thickness so that a 6-in. maximum layer after compaction was obtained. Compaction was by sheep foot rollers passing 16 times to obtain the desired density. A motor grader equipped with scarifier was used to break up the areas made smooth by the passage of hauling equipment over the embankment before the next layer was placed. Water was added as required by sprinkling and jetting the piles before spreading.

Compaction around the structures and the rock on the abutments was accomplished by paving breakers equipped with a round tamper head and a 3,700-lb. pile driver hammer handled with a crane, dropping the hammer three feet. The pile driver hammer worked very well, giving excellent compaction, eliminating much labor and saving time for compaction around structures and on the abutments.

Field control was accomplished by use of the proctor needle and sand density tests were made of each compacted lift. Complete moisture-density curves were run on each sample of material taken as a density test. The compacted fill was not "zoned" as there was only one class of material available.

Average results for the entire fill are as follows:

Average dry weights
- Fill ..... 117.8 lb. (179 tests)
- At optimum moisture ..... 116.6 lb. (172 tests)

Average penetration resistance
- Fill ..... 810 p.s.i.
- Optimum ..... 590 p.s.i.

Average moisture
- Fill ..... 12.7 per cent
- Optimum ..... 13.7 per cent
- Material from pit ..... 11.0 per cent

Railroad and highway

A total of 3,500 lin. ft. of railroad track of the Denver & Rio Grande Western Railroad was relocated involving 190,352 cu. yd. of excavation.

With an excavation of 47,780 cu. yd., 7,500 lin. ft. of State highway was relocated.

History

Irrigation development in this area began in the early 1880's when settlement of the valley was begun by the Mormon pioneers. In 1908 the Price River Irrigation Company started construction of the Mammoth Dam on Gooseberry Creek, a Price River tributary, above the present Scofield Dam. This structure failed in 1917 when partially completed and caused considerable damage in the Price Valley. The dam was not rebuilt, and in 1921 the Price River Water Conservation District, a municipal corporation, was organized and under its authority the first Scofield Dam was built in 1925 and 1926. This dam, a structure of rolled clay, gravel and rock fill with a puddled clay cutoff trench carried to bedrock, partially failed in 1928. The failure was first noticed in the form of an opening of a pear-shaped hole 6 ft. in diameter at the top and about 30 ft. deep. In spite of subsequent repairs the allowable storage capacity was cut to less than half of the original capacity.

The Clyde contract was for $503,903, but the ultimate cost of the new dam was closer to $1,000,000.

California Highway—
Wettest Job Is Ahead of Schedule

Flowing springs on the right-of-way of U. S. Highway 101, and extremely unstable foundation conditions, make job a tough one to handle—But road is being turned into a four-lane divided highway months ahead of schedule

By V. E. PEARSON
Resident Engineer
California Division of Highways
Salinas, Calif.

THE FIRST of two units on an important California postwar highway project—between 6 mi. and 14 mi. north of the city of Salinas on U. S. Highway 101—is due to be completed months ahead of schedule by A. Teichert & Co., Inc., of Sacramento, contractors. It has been an unusually difficult operation because of numerous flowing springs on the right-of-way, and extremely unstable foundation conditions.

Original construction of the present highway was completed in 1932, and eliminated the tortuous curves and narrow road of the old San Juan grade by crossing a flat mesa to the north of Salinas, intercepting Langley Canyon over the old Crazy Horse grade, through the Pinacate Rocks, to the San Benito River.

This section of highway is known as the Prunedale cutoff, and two projects are contemplated by the State to develop this cutoff on existing alignment and grades, which are adequate for four lanes with a central dividing strip. The two additional lanes are being constructed because the faster, light traffic, which has reached the saturation point, is in continual danger by passing the slow moving trucks.

The first contract, 8.4 mi. in length, awarded to Teichert, covers the construction of two additional lanes to the foot of the Crazy Horse grade, at a cost of $830,000. Another contract soon to be advertised will complete the project to the San Benito River, an additional 6.66 mi. These two contracts will convert the existing hazardous two-lane pavement into a beautiful and safe four-lane divided highway.

New construction

New construction therefore consists of widening existing cuts and fills to provide an additional 23-ft. pavement consisting of one 11-ft. and one 12-ft. traffic lane. To complete the design there will be an 8-ft. shoulder on the outside and a 16 to 23-ft. parting strip on the inside. The pavement surfacing is to be 3 in. of SC-6 plantmix, laid on a 12-in. crusher run base over a 6 to 9-in. bed of granular material selected for its high bearing ratio from a 150,000-cu. yd. cut at the north end of the project.

Cut and fill slopes, in general, are being constructed on 1½:1 slope and are to be top soiled and planted to prevent erosion. Excavation slopes are being covered with 3 in. of top soil and fertilized with a commercial fertilizer. Barley straw applied at a rate of 4 tons per ac. is being worked into the cover material with a light sheepsfoot roller unit operated on a yoke and cable from a tractor and winch at the top of the slope. Mesembryanthemum edule (ice plant) is then being planted on the slope area with a spacing of 3-ft. centers. Embankment slopes are to be topsoiled and seeded with barley only. The parting strip will be topsoiled, fertilized and planted with Mesembryanthemum edule for a central width of 6 ft.

Crossovers are being paved at all important road intersections and farm crossings. Portland cement concrete curbs are being constructed at the junction of route 122 to provide adequate channelization.

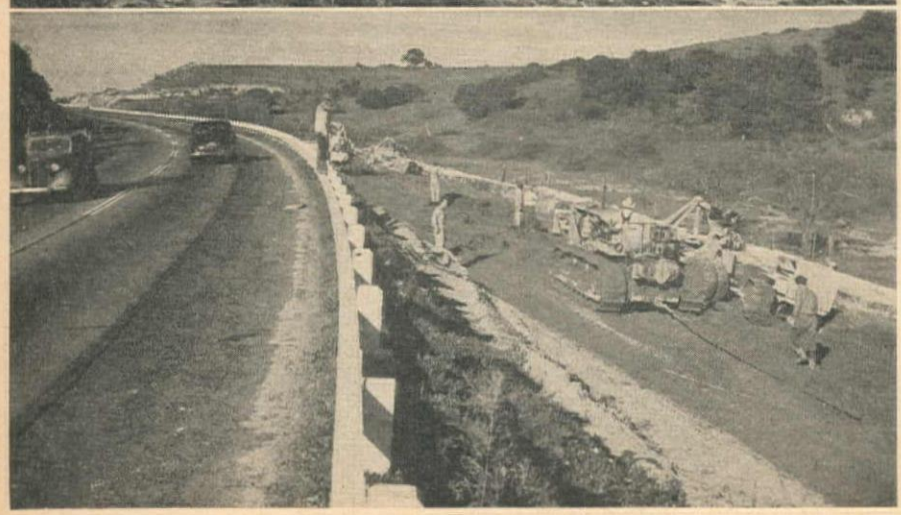
For drainage, drop inlets with cast iron grates are being constructed along the central dividing strip, connecting to corrugated metal pipes that have been placed or that were in place and have been extended. Eleven existing rein-

IN ADDITION to extremely soft fill foundation areas on U. S. 101 widening job near Salinas, the contractor was faced with the necessity of cut excavation immediately adjacent to heavily travelled highway. In some instances cuts were also very wet, and installation of drains was required.

forced concrete boxes are being extended and two timber bridges and one inadequate structure are being replaced with reinforced concrete boxes with inlet throats specially designed to handle 100-year floods.

Contract quantities include 430,000 cu. yd. roadway excavation, 83,000 cu. yd. fill treatment excavation, 625,000 mi. yd. of overhaul, 10,000 cu. yd. of structure excavation, 1,255 cu. yd. Portland cement concrete, 160,000 lb. bar reinforcing steel, 90,000 tons crusher run base, 38,500 tons mineral aggregate and 1,750 tons SC-6 asphaltic road oil (plantmix surfacing) and 5,050 lin. ft. of reinforced concrete and corrugated metal pipes of various sizes.

WET EXCAVATION was the biggest obstacle for A. Teichert & Co., Inc., Sacramento contractors who had the job of building an additional two lanes of highway on the Prunedale cutoff. At top dragline bucket excavates some of the wet marsh land which had to be drained and filled before the highway could be stabilized. In center, trucks haul additional yardage for fill while a sheepsfoot roller packs the earth at right. At bottom, extra tractors were required to move carryalls in soggy material.



The wettest job constructed by the Division of Highways in many years, this project has again successfully employed swamp excavation and stabilization methods employed fourteen years ago when the original two-lane pavement was constructed.

Wet excavation

The many peat bogs and marshes existing along the route through Langley Canyon are due to springs that are so numerous as to require almost continuous sub-excavation. The water appears to be rising through the overlying sandy silt from a faulted structure below. Langley Canyon apparently follows a rift that off-shoots from the San Andreas fault which the highway crosses near San Juan Bautista.

All of the springs are flowing under considerable pressure and in addition to water exude a white sand or silt. Adjacent to these springs many wells have been bored to considerable depths without striking good water-bearing strata. The ground for a radius of approximately 100 ft. around the springs is very unstable for depths of from 6 to 14 ft., with a tight grey sandy clay bed underlying the muck. Where stream gradients are slack, heavy tule growth has given rise to alternate layers of black peat muck and fine-grained quicksand.

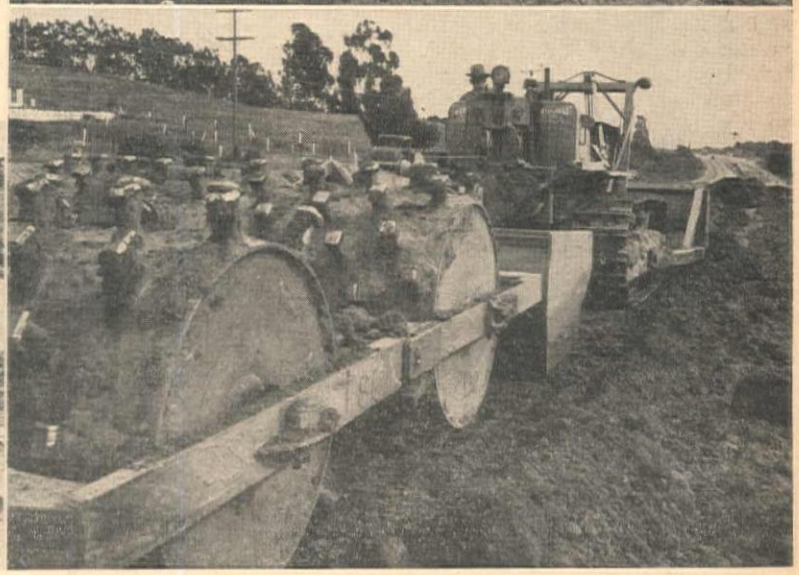
One large spring area was encountered in a 30-ft. deep side hill fill near the north end of the job. In excavating for a perforated metal pipe drain at this location the typical blue slide muck was encountered in the trench. A slide developed during this sub-excavation which endangered the existing two-lane pavement and work was discontinued. Extensive borings were then made in this area with No. 2 soil tubes, hand driven. Samples were studied and water-bearing formations were platted on cross sections.

These studies indicated that the water was coming through the existing light fill of the old highway and into the new embankment foundation area from the opposite side above. The existing pavement is constructed on a —6 per cent grade to the north and the hard underlying strata on which the water was flowing was found to be dropping on a —1 per cent grade.

A perforated metal pipe drain was therefore constructed parallel to the upper shoulder of the existing pavement. Starting at hardpan near the surface at Sta. 674, this drain was carried back to about Sta. 670, where a depth of 20 ft. was attained. Extensive cave-ins made it impossible to continue further. This drain tapped the water along the westerly gutter and developed a flow of over 400 gal. per hour. It so successfully dewatered the new embankment foundation area that when the fill was ready to be placed it was possible to sub-excavate the blue slide muck with a carryall.

Foundation backfill

The foundation sub-excavation was backfilled with granular material and a blind rock drain was constructed at the contact of the water bearing formation to carry off the minor seepage exuding.



HEAVY EQUIPMENT at work on the Teichert contract to widen Highway 101 north of Salinas, Calif. Top left, bulldozer works carefully behind a berm to prevent spoil from cut widening operation from rolling onto existing roadway; top right, material from widened cut is shovel-loaded into Mississippi Wagons for transport to fill areas; center, rubber-tired tractor pulls wagon to fill where dirt will be spread; bottom right, fill-levelling train . . . tractor with dozer blade down spreads material after dumping from trucks, then comes a levelling scraper blade, followed by pair of sheepsfoot rollers in tandem; bottom left, for more readily handled material, the conventional carrier scraper was used to good effect. Another contract is soon to be let for an additional 6.6 mi. of Highway 101 which will complete the widening to the San Benito River.

The blue spoils muck was placed just outside of the toe of the embankment to form a 12-ft. wide strut.

Between Sta. 645 and 654 the new embankment foundation to the right of the existing pavement lay on a silty base so wet and unstable that loaded carryalls could not operate. A trench 12 ft. wide was therefore excavated just inside the toe of the slope to hardpan at depths of from 4 to 7 ft. This trench was then backfilled with sandy material consolidated in 8-in. layers and a perforated metal pipe underdrain constructed at the contact of the water bearing strata with the stabilized area. This successfully dewatered the remaining fill footing area. Dewatering at the fill foundation produced sufficient consolidation to allow the carryalls to place the fill.

Muck excavation

Excavating this toe trench was an exceptionally difficult job, and generally required one extra tractor to drag the empty carryall into the trench and two extra tractors in front with a pusher behind to bring it out loaded. The soupy material at times flowed like water 50 to 75 ft. ahead of the load on its way out.

Between Sta. 577 and Sta. 578, after excavation of the tule muck to a depth of 14 ft. in the fill foundation area to the left of the existing highway, a slide developed in the remaining fill bank which began to undermine the existing traveled way on the right. The removal of the slide muck from the water filled trench excavation and subsequent stabilization of the existing embankment was accomplished by hauling in 750 cu. yd. of beach sand.

This sand was placed in the area of the trench remaining open beyond the toe of the slide and served as a working

platform for the 2½-cu. yd. dragline and a bulldozer which then cast out the muck and pushed in the sand, increment by increment, until the entire area was cleaned out and stable. The existing embankment, which by this time stood vertical from the pavement edge, was then backed up with suitable material pending the completion of the stabilization treatment planned.

Cable realignment

One of the most interesting developments of the entire job occurred between Sta. 549 and 551. The main telephone and telegraph circuit between Los Angeles and San Francisco crosses under the highway at this location.

New construction lies on the left in a 16 to 18-ft. side hill cut section. It was therefore necessary to relay this cable to a depth sufficiently below the new grade to be safe from any subsequent grading operations. A deep trench was therefore excavated for the purpose with the 2½-cu. yd. dragline. A typical spring area was encountered and a flood of water developed that soon filled the trench with mud and water. The trench, however, was later re-excavated and the cable spliced out and relaid to a depth of 5 ft. below grade, the trench being backfilled with coarse sand.

Soil tube borings were made to indicate the limits of the water bearing area and to locate hardpan. The roadway section was widened to provide a 12-ft. wide open gutter and excavation slopes were flattened from 1½:1 to 1¾:1 to reduce possibilities of slides.

Carryalls removed the firm overlying soil. A dragline then sidecast the excavation along the slope line to the established line and grade of the open ditch to allow the soil to dry out and the water to flow out of the area by gravity.

The contractor removed a considerable load of the overburden on the cable under supervision of a representative of the Pacific Telephone & Telegraph Co., but one slide developed overnight in the cut bank which disrupted service and necessitated immediate installation of an overhead connection.

The stabilization of this slide was accomplished by first excavating the muck 7 ft. below subgrade to the solid underlying clay in the roadbed area and backfilling with granular material. The adjacent slide area was then sub-excavated and backfilled increment by increment to the perpendicular back wall or slide plane. This porous backfill material in a saturated condition allowed the water free passage, and being stable, held back the soupy sliding stratum. This then checked the further breaking back of the hard and dry top layers of soil on the cut bank and stabilized the slide.

An intricate system of perforated metal pipe and blind rock drains is now being installed in the granular select material in order to lower the water table and prevent its seepage into the area of select underlying the roadway. These drains will prevent hydrostatic pressure from building up in the select and will permit laying back the soil that came in with the slide. They will also prevent damage to adjacent property.

Timber mat support

Between Sta. 380 and Sta. 624 all spring and tule areas were sub-excavated to solid foundation with the 2½-cu. yd. dragline supported on timber mats. Commencing on Feb. 27, 1946 and working continuously until May 23, and on a two-shift basis per day after May 1, this equipment moved about 1,200 cu. yd. per shift.

Timber mats were each constructed from sixteen 4x12x16-ft. timber planks interlaced with 1-in. steel cable in four groups of four planks per group. This type of mat served very effectively and efficiently, incorporating the qualities of strength and flexibility required to preserve lasting qualities of timbers and keep replacements at a minimum. Each mat was furnished with an 8-ft. long ¾-in. steel cable sling on each end, and a special hook that could be attached at will to the yoke chain of the drag bucket furnished the means of swinging the mats into position as the excavation progressed.

The area to be excavated was in general too wide to make in one pass. The outside 35 to 40 ft. was therefore first excavated and sidecast as far as possible into the swamp. Pumps were then installed to dewater this excavation and a coarse granular material from a 150,000-cu. yd. cut at the north end of the job was hauled in and placed in 8-in. layers by a fleet of trucks and tractor-drawn 10-cu. yd. bottom dump Mississippi Wagons. This was rolled to required compaction with a tractor-drawn double sheepsfoot roller and a 5-cu. yd. scraper leveling and compacting unit.

In many instances where cave-ins endangered the existing highway embankments, the granular material was end-dumped into the water-filled excavation. Subsequent dewatering by construction of perforated metal pipe drains and blind rock drains, standard construction through these unstable areas, resulted in sufficient consolidation of the select material to comply with specifications.

Meeting existing facilities

The second stage of excavation, to recompact loose outer layers of existing embankments and final removal of underlying peat muck, was then carried out with the dragline operating on the area stabilized in the first operation.

All drains installed in the original embankment foundation areas were interconnected with the drains constructed on this contract and properly protected outlets were excavated to disperse the water into the swamps. All perforated metal pipe and blind rock drains uncovered were found to be in excellent working condition after fourteen years of service.

Roadway grading

Grading of the roadway was begun on Feb. 11, 1946 and was completed Aug. 28. Three 30-cu. yd., two 20-cu. yd. and one 12-cu. yd. LeTourneau carryalls handled the dirt on short hauls up to 2,500 lin. ft. Material to be transported to greater distances was loaded with the 2½-cu. yd. shovel and hauled by trucks and Mississippi Wagons as far as 3 mi. This equipment has excavated and placed from 40,000 to 73,000 cu. yd. per month working for a time on a two-shift basis.

Laying of the crusher run base is now the major construction operation. A 4,000-lb. plant owned and operated by the Granite Rock Co. is furnishing the slurry mix at Aromas and it is being trucked to the job by the contractor. Spreading is being accomplished in three 4-in. courses through a 12-ft. wide bulldozer type spreader box. Two Bros pneumatic tired rollers are being used to compact the first two layers and to give initial compaction on the top layer. Very little blading is being required on the first and second spreads. After spreading and initial compaction of the top layer the base is checked for grade and cross slope. Spotting and blading to a true plane and finish-rolling with a 12-ton tandem roller is then required.

Finishing of the shoulders and the central dividing strip is then being accomplished with a ¾-cu. yd. clamshell, a 10-ft. blade and a 12-ton tandem roller. The final operation of slurry rolling and brooming and spreading of SC-2 prime coat will then finish the base and shoulders for paving. An average of 1,600 tons of crusher run base is being laid per 10-hr. shift working 5 days per week.

Plant mixed surfacing will be laid in two courses of 1½ in. each by a gasoline engine driven, bituminous spreading and finishing machine with material furnished by the Granite Rock Co. plant at Aromas and trucked to the job. It is planned to use a 16-ton tandem roller to compact the surfacing.

Structure excavation and backfill for small diameter corrugated metal pipes and underdrains has been performed by hand but machine tamped with pneumatic tools. Trenches for large diameter pipes and reinforced concrete boxes have been excavated with a ¾-cu. yd. dragline and have been back-filled with heavy equipment.

Reinforced concrete structures have been poured with a 3-sack mixer and buggies, with two pneumatic vibrators used in compacting. On several of the larger structures a ¾-cu. yd crane and bottom dump bucket has been used.

One reinforced concrete box was poured with transit mixers furnished by Talcott Lumber Co. of Salinas and it is anticipated that the curbs and headwalls and one remaining structure will be poured by this equipment.

A Class "C" Fine asphaltic emulsion sealcoat will be placed on the 23-ft. central roadway and will complete the job.

Personnel

Adolph Bauer is superintendent for A. Teichert and Co., Inc., the contractor, with Jim Stinson, assistant and W. E. Weeshoff, engineer and purchasing agent.

G. T. McCoy is chief engineer of the Division of Highways. The work is being done under supervision of C. E. Waite, district construction engineer, and Lester H. Gibson, district engineer for District V of the Division of Highways, with headquarters at San Luis Obispo.

Olympia's New Water Supply Source Creates Unusual Construction Need

Collection basin at McAllister Springs will be semi-circular structure formed by cast-in-place concrete piles driven closely together though with no solid connection—Batter-driven piles will resist any movement of the adjacent hill or other unstable ground into the lagoon

DEVELOPMENT of an entirely new water supply source is the primary objective to be obtained by construction of the facilities now planned by the city of Olympia, Wash. While the change to the new source of supply will involve the construction of a complete new collection and transmission system, it will not require the abandonment of any large part of the present system. The water source is to be a series of springs known as McAllister Springs, the development of which will require some unusual construction not frequently found in water supply projects.

History of development

Olympia, capital of Washington, is situated at the extreme upper end of Puget Sound about 26 mi. southwest of Tacoma and about 50 mi. south southwest of Seattle. Because it has access to deep water transportation through Puget Sound, relatively low cost electric power, and potentially at least adequate quantities of pure water, the city has definite industrial possibilities. It has in fact some small industrial development at the present time. Its population in 1946 is estimated at 15,500.

The present water supply source consists of four deep wells located within the city limits which have during present years proved to be far from satisfactory. Because of a peculiarity in the ground strata above the water bearing sands a number of wells have been lost in past years through shearing of the well casings. In 1944 the wells were unable to meet the peak water demands of the city's users, and again in 1945 they failed to deliver the required capacity. Last year it became necessary during peak demand in the later summer and fall months to provide an emergency supply by pumping from a small creek which runs through the present watershed and the town.

As far back as 1927 the city fathers recognized the fact that additional sources of water supply would eventually have to be found, and in that year an engineering consultant was employed to investigate a new source of supply. These investigations indicated that the most practicable source was McAllister Springs situated about 8 mi. east of the city between the towns of Lacey and Nisqually, and just to the north of the old Olympia-Tacoma highway. In 1941 the city purchased the land surrounding the springs as a preliminary to their development as the city's primary source of domestic water supply.

McAllister Springs

The springs are apparently fed by a group of four or five small lakes located on higher ground and 2 to 4 mi. south. The springs emerge at the foot of a hill and flow into a 300 by 1,000 ft. lagoon surrounded by a low, swampy area covered with brush. The main body of the springs is situated along a line perhaps 200 ft. long at the head of the lagoon, but at least three springs appear 100 ft. or more out in the lagoon. At the north end of the lagoon the water enters a small stream flowing north and about 4 mi. from the lagoon enters an arm of Puget Sound.

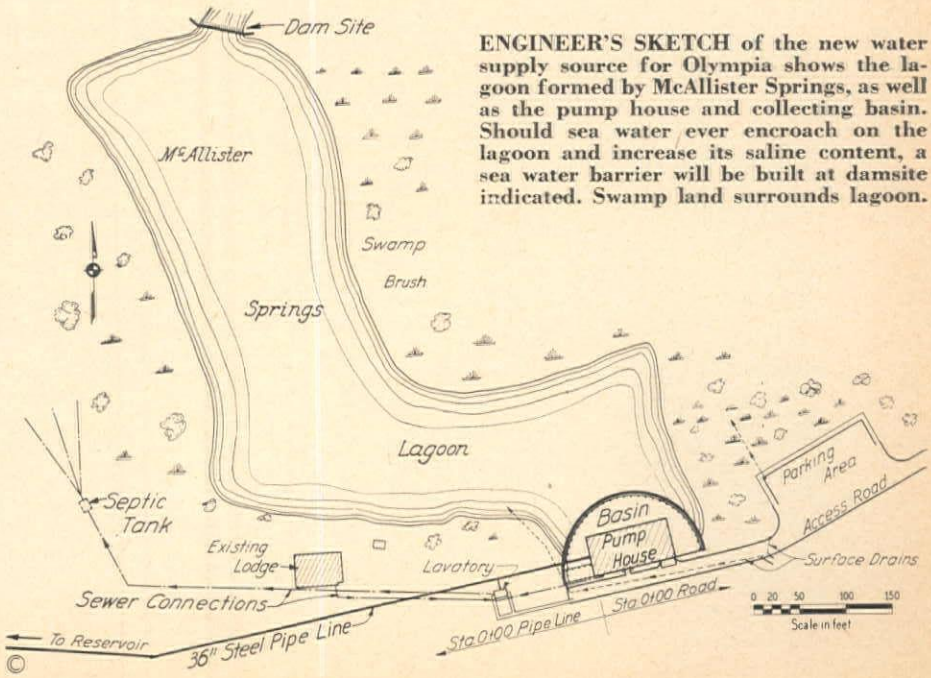
In 1944 the city employed the present consulting engineering organization to make a further study of available water sources and the springs were again selected as the most feasible. After submission of a preliminary report the firm was employed to design the collection and transmission system which is now ready to be placed under construction.

Investigation of the springs indicated that a reliable yearly flow of at least 20 mgd. could be obtained from this source and the system is designed for that capacity. The present maximum demand on the city system is 4.5 mgd. A salinity investigation was of primary importance because the lagoon is sufficiently low in elevation to be affected by tides from the Sound. Salt content in the lagoon at high tide is about 12.8 ppm., and a mile below the lagoon at the same period it is 16.6 ppm. From that point downstream the salinity increases rapidly until it equals that of the Sound. Further investigation of this problem is in progress and it is possible that a salt water barrier will be constructed across the lagoon outlet if it is found that extremely high tides will materially increase the salt content. Such a barrier would probably be an earthfill dam, but it is not contemplated for construction under the present plan.

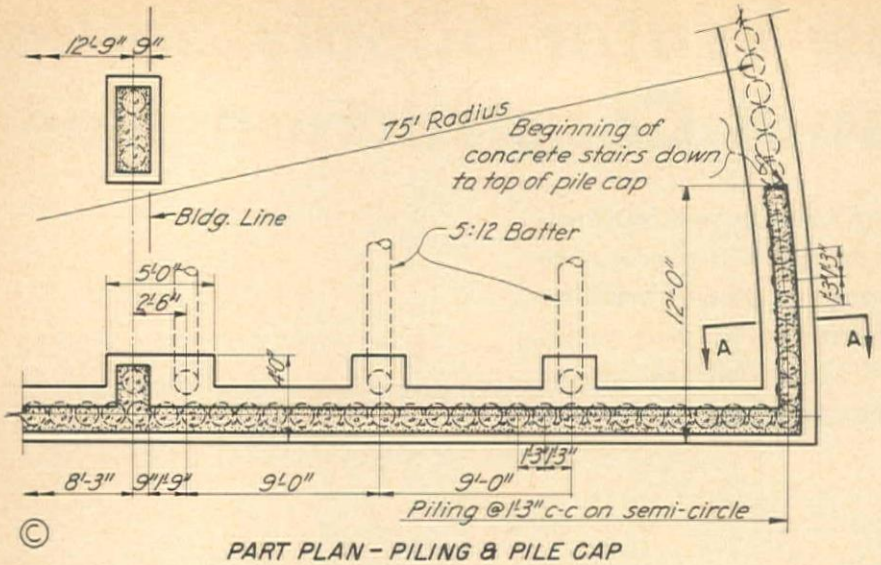
Collection structure

Principal units of the water supply system are a collection structure, pumping plant, pressure line, intermediate storage reservoir, and a 7-mi. gravity pipe line leading to the two existing city reservoirs. Of these the collection structure is probably the most interesting.

Situated at the head of the lagoon immediately adjacent to the principal spring area, the collection basin will be a semi-circular structure formed by concrete and steel piles driven closely together but with no solid connection between the piles to permit percolation of the water into the basin. However, a continuous pile cap will unify the entire structure and with 5 on 12 batter piles at 9-ft. centers along the straight side of



ENGINEER'S SKETCH of the new water supply source for Olympia shows the lagoon formed by McAllister Springs, as well as the pump house and collecting basin. Should sea water ever encroach on the lagoon and increase its saline content, a sea water barrier will be built at damsite indicated. Swamp land surrounds lagoon.



PART PLAN – PILING & PILE CAP

HAVING LOST previous wells because of ground shear, Olympia makes sure this time that ground around its new source is stabilized by an extensive piling and pile cap system which will resist any movement of the hill into the lagoon.

the semi-circle the structure will resist any movement of the hill into the lagoon.

Cast-in-place concrete piles 20 ft. long with 1-ft. cross-section will be driven on 1¼-ft. centers with longitudinal reinforcing extending above the pile top so that it may be hooked into the 2½ x 1½-ft. concrete pile cap. A 150-ft. tangent will form one side of the structure while the remainder will be closed in a 75-ft. radius curve (see accompanying drawings). The tangent wall will butt against the hill where it comes down to the lagoon with a gravel blanket outside the pile line to prohibit clogging of the spaces between piles with earth, while the circular section will extend into the lagoon. Where the pile wall butts against earth it will be surmounted by a 3-ft. 9-in. wall 1 ft. thick with a 2½ by 1-ft. parapet. As the line of piles extends out into the lagoon the surmounting wall will be stepped down to the pile cap which will extend all of the way around the structure.

Intake facilities

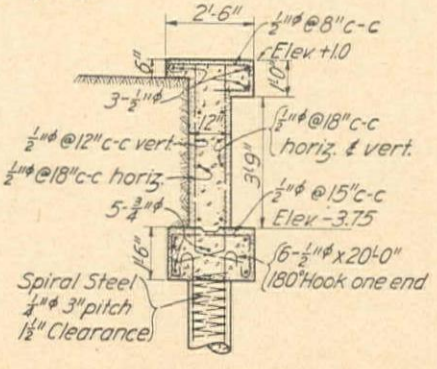
Inside the collection basin, which incidentally will be excavated to a depth of about 10 ft., will be located a 42 by 90-ft. reinforced concrete pump house supported on concrete piles with the south side resting on the tangent wall of the collection basin. The 36-in. steel pressure pipe line to the storage reservoir, originating in the pump house will have a common header which will collect the discharge of eight pumps, four on each side of the header. The present installation contemplates the placing of pumps on only one side with the other left to future development when demand necessitates. Three 3,000-gpm. pumps and one 2,000 gpm. pump, all of the horizontal type, will pump against the 300-ft. head to deliver water from the collection basin to the storage reservoir a half mile away.

Additional facilities which will be required at the collection basin include an access road between the old Tacoma road and the pump house, a separate lavatory for use of the pump operators, and a complete sewage disposal system which will be of the septic tank type.

From the header at the intake pumps a 36-in., electrically welded 5/16-in. plate steel pipe line 3,725 ft. long will lead to a new storage reservoir. Located on private right-of-way the line will have one railroad and one highway crossing. The reservoir will be located sufficiently high to permit water to flow by gravity to the city reservoirs 7 mi. to the west. An access road to the reservoir is included in the construction program. The new reservoir will be an open, concrete-lined structure 203 by 151 ft. in its maximum dimensions with circular ends and a tangent center section.

With a capacity of 2,000,000 gal. the reservoir will have a 16-ft. water depth and a 3-ft. freeboard. Thickness of the slab lining will be 7 in. A chlorination station will be provided at the new reservoir, and bypass connections will permit the pumps to deliver water directly to the gravity line whenever cleaning of the reservoir becomes necessary. Operation of the system will be completely automatic in that operation of the pumps will be controlled by the water level in the reservoir. Pumps will be turned off and on in any combination depending upon the water demand.

THIS SKETCH shows the cast-in-place concrete pile and pile cap held by hooked reinforcing steel. Above this can be added a 3-ft., 9-in. wall 1 ft. thick with 2½ by 1-ft. parapet.



SECTION A-A

Gravity pipe line

Design of the 37,748-ft. gravity line extending from the new reservoir to the two existing city reservoirs provides for four alternate types of construction. The various types of pipe included 5/16-in. electrically welded steel pipe with field welded joints, centrifugal concrete pipe in classes ranging from 120 to 190, lock-joint steel reinforced concrete pipe with the same classification range, and asbestos-cement pipe.

About 1,500 ft. from the reservoir the line encounters an alder swamp and a cultivated marshy field. For about 2,200 ft. it may be necessary, depending upon the results of tests to be carried out, to carry the pipe on a pile bent. In this case a two-pile bent of creosoted timber on 12-ft. centers will be used. Concrete pile caps will be 4½ by 2 by 2 ft. with a small saddle for the pipe.

For the greater part of its length the pipe line will parallel the old Tacoma highway. Purchase of the right-of-way has not been necessary here since it is owned by Thurston County, however several construction problems will be encountered. The line has been placed 13 ft. north of the edge of the concrete paving and on this side are power and telephone pole lines. Location of each pole has been checked and some will have to be moved to make way for the pipe. Part of the highway is on fills and here the pipe will lie on a side hill. To prevent any movement the line will be placed on pile bents at these locations, using two-pile creosoted timber bents on 22-ft. centers with 5 by 1¼ by 1-1/6-ft. concrete caps.

In addition there will be two railroad crossings and two crossings of the highway on the gravity lines. It is contemplated that all railroad and highway crossings by both the pressure and gravity pipe lines will be constructed by jacking underneath existing grades.

Bids received

Early in September bids were opened for construction of the entire system as outlined here. Only one bidder submitted figures, offering a price of $1,574,-151 for steel pipe and $1,604,352 for centrifugally cast concrete pipe. This bid was rejected by the city council and new bids will probably be called for in the near future, possibly before the appearance of this article.

Organization

James W. Carey & Associates, consulting engineers of Seattle, have been engaged in the preliminary investigations, design of the system as outlined here, and will supervise construction of the project for the city of Olympia.

Charles H. Williams is city engineer and water superintendent for Olympia with general charge of the water supply system.

Morrison-Knudsen Co., Boise, Idaho, was the sole bidder for construction of the complete system.

Steel Frame Building to House Pump Testing Laboratory in Los Angeles

Byron Jackson Co. enlarge Vernon plant with new 180 x 375-ft. structure and other buildings—Testing tank with 400,000-gal. capacity and special settings for pump tests are features of the project constructed by C. L. Peck

IN AN EXPANSION of manufacturing facilities to meet post-war demands for pumps and their accessories, Byron Jackson Co. have constructed a group of new buildings on the south side of East Vernon Avenue, east of Charles Street, in the city of Vernon, Calif. The new manufacturing facilities consist essentially of a large machine shop building with a smaller connecting machine shop building, a storage building, a pattern shop, and a pattern storage building. A service shop will be moved to the new location from another Byron Jackson plant. These buildings will augment the manufacturing facilities of the existing Byron Jackson plant on the north side of Vernon Avenue opposite the new plant.

The new buildings have been designed primarily with a view to economy of construction and operation and for maximum utility in service. Various methods of construction were considered for the different buildings to achieve these results and except for one building, a multi-story pattern storage building, steel frame construction with brick and corrugated iron walls were considered best adapted to the needs of the buildings.

Machine shop

Largest of the new buildings, the large machine shop is an enclosed steel frame structure 180 ft. wide and 375 ft. long between outside column lines, with an open extension along the east side 60 ft. wide and 400 ft. long. The small machine shop located west of the southwest end of the larger building, and separated from the larger shop by a 25-ft. truck passage, is also a steel frame structure and is connected to the larger building by a common roof. Both shops are 27 ft. 8 in. high from finished floor elevation to the bottom chord line of roof trusses.

Walls of the machine shop buildings are constructed of brick below window sills and of corrugated iron siding above windows and above window sills at building corners. Continuous steel sash are provided in all walls except at corners and doors. The roof is of saw-tooth design consisting of 25-ft. panels approximately 10 ft. high at the tooth faces. Steel trusses form the saw-teeth. Continuous windows are provided in the vertical tooth faces, and all front, side and roof surfaces of the saw-tooth construction, except the windows, are covered with corrugated iron. Swartwout 10-ft. ridge ventilators have been provided at the ridges of the roof. The saw-tooth trusses are spaced 20 ft. on centers and are supported on steel columns and on carrying trusses 25 ft. on centers which span 60 ft. transversely between the columns.

The carrying trusses also support crane runway rails which run the entire length of the building to provide crane runways 55 ft. wide in the three 60-ft. spans between columns. Crane runways are also provided in the open extension on the east side of the building, in the small shop building, and in the truck passage between the buildings. Monorail bridge cranes, furnished by Industrial Construction Co., operate in the crane runways, and cross-overs are provided in the runway system to permit single crane cabs to travel from bay to bay in the main building, to the open extension, to the truck passage and to the small shop building. In this way the crane system serves directly all loading and unloading facilities at the two buildings and operates as a carrier in and between the buildings.

ARDELL LETCHER, surveyor, was in charge of line and levels in placing steel and concrete for the new buildings. In the background is one of the spirally reinforced columns in the new structure.

Pump test laboratory

In the northwest corner of the large machine shop building, a pump test laboratory has been constructed for the pursuit of original research on new and improved horizontal and vertical centrifugal pumps and submersible electric motor designs, and to meet the demand for a large number of commercial and acceptance tests. Of a total of 11,000 sq. ft. of floor space especially devoted to test activity, a test tank occupies 3,500 sq. ft. of space. The tank varies in depth from 11 to 30 ft., permitting filling to a maximum capacity of 400,000 gal. The floor over the tank is divided into twenty 5½x10 ft. rectangular openings at regular intervals. Intervening spaces will permit concentrated loading to 10 tons on heavy rails welded to the substructure and grouted into the concrete. Slotted adjustable cast iron bases are provided for pump and driver test assemblies. Service facilities include compressed air at 150 lb. per sq. in., high vacuums, and auxiliary water supply of 100 gal. per min. at 100 lb. per sq. in. pressure.

Suppression head tanks of 1,000 and 5,000-gal. capacity will be used for running closed circuit tests. Superimposed on these circuits are a vacuum pump connected through a barometric loop for removing dissolved air in the test water, and a heat exchanger for dissipating the heat horsepower absorbed in the relatively small amount of water circulated in tests of this nature. Proper planning has resulted in convenient arrangements of equipment to permit rapid and easy assembly of prefabricated piping sections with venturi meters and the necessary control valves. Numerous Byron Jackson submersible electric motor pumps will provide positive suction head to test units requiring this feature. Complete electrical equipment has been provided for running standard commercial tests as well as exhaustive tests to determine motor characteristics.

Tool and service buildings

Adjacent to the pump test laboratory inside the machine shop building is a three-deck steel frame structure approximately 25 by 34 ft. in area, with the first and second floors for tool rooms, and the third floor for a crane servicing platform. The first floor is common with the first floor of the building; the second and third floors are constructed of steel decks with concrete slabs over the decks.

The floor of the large machine shop is a 6-in. concrete slab on fill, surfaced with wood block flooring over most of the floor area, and treated with floor hardener in the aisles and other areas where extreme wearing service is needed. The floor of the small machine shop is a 6-in. concrete slab on fill, treated with floor hardener.

Adjoining the northwest corner of the large machine shop building, a one-

CONSTRUCTION PROGRESS at the Byron Jackson pump testing laboratory. Top, as grading was first begun with dragline and trucks; next, steel frame of main building in place; next, walls under construction; bottom, concrete office building.

story electrical building is provided, with a transformer vault, to house required electrical equipment for operation of the machine shop and testing laboratory.

The new storage building, for general storage, is 96 ft., 4 in. wide, 226 ft., 8 in. long, and 12 ft., 6 in. high from finished floor surface to bottom of trusses, with reinforced brick walls, steel columns, steel frame monitor, steel roof framing and steel roof decks. Light is provided by continuous monitor sash on all sides and by windows in the east walls of the building, all steel sash. The long side walls of the building are continuous solid brick without openings, except for three doors in one side, in order to utilize wall space for storage.

Pattern shop

The pattern shop, requiring 4,800 sq. ft. of floor surface in one story, is designed to dimensions of 50 ft. width and 102 ft. length between outside column lines and with a height of 15 ft., 6 in. from the finished floor elevation to the bottom line of trusses. The building is designed with structural steel framing and with exterior walls of reinforced brick to the height of window sills and corrugated iron siding above and between the windows. The roof is of sawtooth construction formed with steel trusses to a height of approximately 10 ft., with continuous steel sash approximately 7 ft. high. The floor is a 5-in. concrete slab on fill. Other features of construction include corrugated iron roof, Swartwout 10-ft. ridge ventilators, steel sash and industrial metal doors.

For the new pattern storage building, which presented the problem of obtaining sufficient storage space for required pattern storage within a limited area, a 3-story reinforced concrete building was considered most practical and economical. With outside dimensions of 101 ft., 6 in. by 121 ft., 6 in., 11,700 sq. ft. of floor space has been obtained on each floor, with allowance for an elevator shaft and a stair well. Ceiling heights were established at 15 ft., 6 in. for the first story, 12 ft. for the second story and 14 ft. for the third story.

The design provided for walls, floors, roof and columns of reinforced concrete, and to support the required storage live load of 125 lb. per sq. ft., flat slab construction was considered most suitable for the second and third floors. Similar flat slab design was then also used for the roof. With natural grade nearly level, it was possible to provide for construction of the first floor on fill and a 5-in. thickness of slab was considered adequate for the storage loading.

Flat slab design followed conventional practice, with square column capitals and round columns. A slab thickness of 7 in. was required for the second and third floors and 6 in. for the roof. A 20-

ft. spacing of columns in each direction permitted economical design of the slabs with two-way reinforcement. Provision was made in the second floor design for suspension of crane beams from the first story ceiling along one side of the building. U-bolts have been inserted in the slab for attachment of the crane beams.

Miscellaneous features

Windows in exterior walls have been kept to a minimum so that storage space will be restricted as little as possible and steel sash have been used for the required windows. Industrial metal doors have been provided as needed.

The main stairway from the first floor to the third floor, constructed in the stair well, is of reinforced concrete construction. An auxiliary stairway to serve as a fire escape, located outside the building adjacent to the southeast corner, consists of steel channel stringers and 10-ga. bent sheet metal one-piece treads and risers, bent to form pans for concrete treads and for exposed metal risers, with stair landings of reinforced concrete construction supported on steel channels.

A 40-ft. length of the north wall of the pattern storage building serves as a dividing wall between that building and the pattern shop and suitable sheet metal separation joints have been provided where walls of the two buildings adjoin and where the roof of the pattern shop abuts the wall of the storage building.

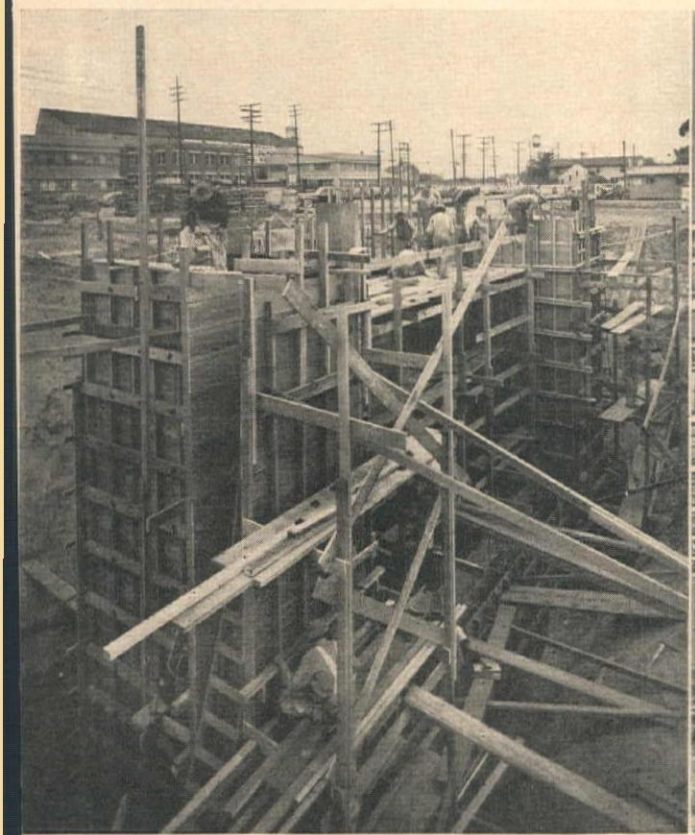
Inside and outside surfaces of the concrete walls of the pattern storage building were formed with plywood to obtain reasonably smooth surfaces for good appearance. Ceiling surfaces of the flat slab floors and column surfaces were formed with steel forms.

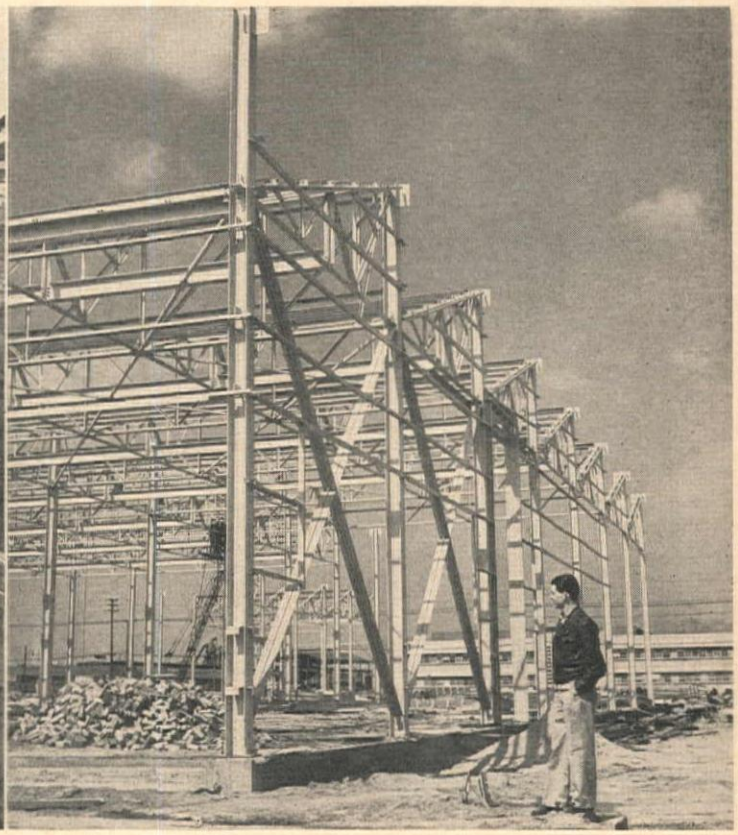
An area 25 ft. wide and 60 ft. long, in a corner between the pattern storage building and the pattern shop, serves as a loading and unloading space for the two buildings and is covered by a steel canopy supported from the storage building. The canopy is cantilevered from columns of the building with trusses and is covered on sides and top with corrugated iron.

Organization

The buildings of the new plant described in this article were designed by Edward Cray Taylor and Ellis Wing Taylor, architects and engineers, Los Angeles for Byron Jackson Co., and were constructed by C. L. Peck, contractor, Los Angeles.

CONSTRUCTION CLOSE-UP, left, of form work for the deep end of the new Byron Jackson test laboratory which will contain extensive testing and pump research facilities. Structural steel detail makes a pattern against the sky as a lone employee, Joel Hicks, right, looks over the partially erected sawtooth frame, which he helped design.





BPA Power Lines From Columbia River Plants May Extend Into Southern Idaho

DIRECTORS of the Burley Irrigation District in southern Idaho were told recently by Ellery R. Fosdick, Washington, assistant director of the Bureau of Reclamation's branch of power utilization, that the Bonneville Power Administration would begin surveys shortly for high voltage transmission lines into southern Idaho.

Fosdick's statement was the first intimation that BPA was now seriously considering extension of its lines from its Columbia River power plants into southern Idaho. Such extensions were advocated in years past by public power enthusiasts, particularly those urging utilization of southeastern Idaho's vast phosphate beds, but the long lines needed were believed not feasible.

Fosdick, M. M. Smith, Washington, attorney for the power branch, and Don S. Campbell, Boise, regional power manager, met with the irrigation district directors to discuss the possible transfer of the district's rights to power revenues from the Minidoka power system.

The directors were told that federal power would no doubt be made available in southern Idaho in the future at rates considerably below those currently prevailing, and that revenues from the Minidoka power system would be reduced from present figures. The Bureau of Reclamation men suggested that the district give careful consideration to the effect of such sale upon its ability to repay its share of the construction cost of the Minidoka irrigation project, toward which power revenues are applied.

Bulk of the power from the Minidoka dam is used for pumping during summer and in winter is sold by the district for commercial purposes in the Burley and Rupert areas. The plant has a rated capacity of 13,400 kw.

State Engineers Stress Cooperation

By JOHN M. SERVER, JR.
Editor
Western Construction News

COOPERATION was the keynote of the 19th Annual Convention of the Association of Western States Engineers held at Jackson, Wyo., Sept. 10-13. Not only the word, but the spirit was felt throughout the meeting—cooperation between the various Western States, and also cooperation of those states with the various federal engineering agencies.

Well over 100 persons, including Governors, State Engineers and their associates from the seventeen Western States, and representatives of federal offices were in attendance. Reports were read from each of the states, detailing activities of the Engineer's office during the past year, and the federal agencies outlined their future plans for development of the water resources of the West.

The convention was presided over by C. S. Clark, president of the association, and chairman of the Texas Board of Water Engineers. The opening speaker was Gov. Lester C. Hunt of Wyoming, who welcomed the engineers to his state, and proceeded to expound the theory that if "taking water off the land," in other words flood control, was deemed to be a national responsibility, to be paid for with federal funds, then "putting water on arid lands" to render them productive, in other words reclamation, should with equal reason also be considered a national responsibility. This theme was elaborated on by several speakers in the course of the meetings.

Federal guests

Guest speakers from federal agencies included Secretary of Interior Krug; Reclamation Commissioner Michael Straus; Arval Anderson, U. S. Forest Service; Col. Theron D. Weaver, Division Engineer, U. S. Army Engineers, Portland, Ore.; Dr. C. S. Howard, C. G. Paulsen and Dr. O. E. Meinzer, U. S. Geological Survey; Edgar A. Reeves, Soil Conservation Service; and John C. Beebe, Federal Power Commission.

Each of these men told of the activities of his department, and how it was geared into the plans and activities of the local state government, expressing every desire to cooperate and confer with state officials, and requesting similar helpfulness on the part of the latter.

Straus, evidently directing a counter-offensive against the almost certain re-examination of reclamation law and the activities of the Reclamation Bureau by the next Congress and the probable enactment of laws requiring the Bureau to observe more carefully the letter of the statutes, appealed for "liberalization of the reclamation laws." In detailing the liberalization he desired, he spoke of three factors: a greater per cent of non-reimbursable funds for irrigation projects, the reduction of interest rate on power facilities built in conjunction with irrigation projects, and extending the repayment period for Bureau projects to the "useful life of the project."

He emphasized Public Law 732, enacted by the last Congress, which permits the Secretary of Interior to declare non-reimbursable whatever share of the cost of a project he desires, as being allocated to the benefit of fish and wildlife, and suggested similar laws covering salinity control, recreation, flood control, and other benefits arising as incidentals to reclamation work.

Straus himself added much to the spirit of cooperation, by omitting from his prepared speech two pages which dealt with highly controversial subjects, large land holdings and the distribution of power generated at federal projects. It is unfortunate, however, that these two pages were included in the releases of the speech which were distributed to the press.

The representatives of the Geological Survey presented papers on water quality in the Western States, both surface and ground water supplies, and in conjunction with representatives of the Forest Service, asked the support of the engineers for an adequate mapping program in the Western States.

Reeves, Wyoming state conservationist for the Soil Conservation Service, a luncheon speaker, made the point that the work of all government agencies, both federal, state and local, is for the benefit of the people, and that projects should be considered primarily with regard to the values accruing to the citizens of the area.

Also in attendance were Gov. John C. Vivian of Colorado and Gov. Dwight Griswold of Nebraska, both of whom gave brief addresses.

Engineer reports

Each State Engineer reported on the activities of his office. Some of the interesting facts reported were: Montana (Fred E. Buck) has just completed a general testing laboratory which will be available for use by commercial interests as well as state agencies.

California (Gordon Zander, speaking for Edward Hyatt) is much concerned about ground water supplies in Southern California, and encroachment by salt water in that area. Water deficits will have to be made up by additional Colorado River water or rectification of sewage.

Nebraska (Wardner Scott) noted the only serious case of non-cooperation, by reading letters indicating the unwillingness of Army Engineers to conform to State water right requirements, even though such action was specifically ordered in the 1944 Flood Control Act.

Arizona (O. C. Williams) outlined briefly the project to bring Colorado River water to central Arizona, and plans for Charleston dam on the San Pedro River, with a correlated program to recharge depleted ground water in the vicinity of Tucson.

Utah (Ed Watson) is also planning an extensive diversion program for Colorado River water, to operate through an exchange system, and bring needed water to the central Utah basin.

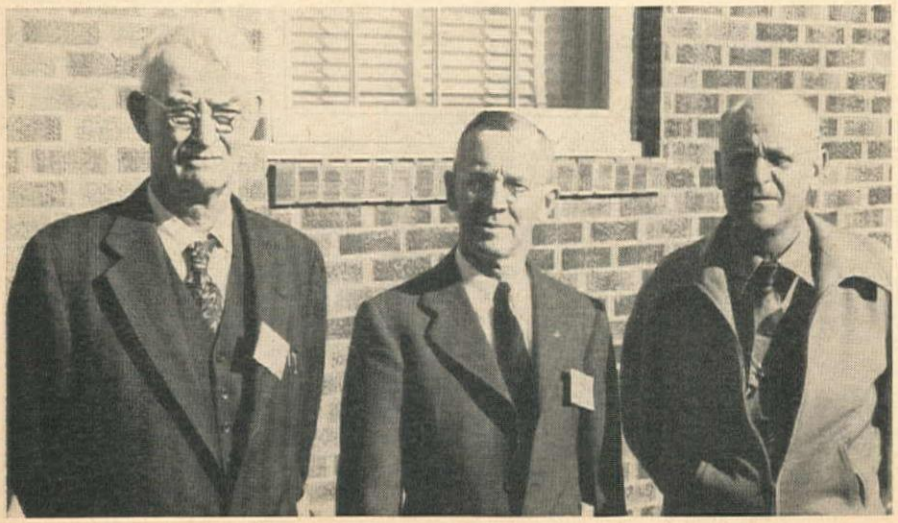
Nevada (Alfred Merritt Smith) told of the comprehensive ground water survey being undertaken there, with a view of using much of this storage for irrigation.

Washington (Charles Bartholet) discussed a $4,000,000 revolving fund used by the state to assist small irrigation districts in emergencies or difficult periods.

Colorado (M. C. Hinderlider) described several trans-mountain water diversion projects of the Bureau of Reclamation and the city of Denver.

Other evidences of cooperation were

MARK KULP, State Reclamation Engineer of Idaho, center, was elected new president of the Association of Western State Engineers; O. C. WILLIAMS, right, Arizona State Land Commissioner, was selected as vice-president; and C. S. CLARK, Texas Water Engineer, and retiring president, was named a member of the Executive Board.



widespread approval of the "compact" method of settling water division problems on interstate streams; discussions of the "inter-agency" committees now working on the Columbia and Missouri rivers and suggested extension of this plan to other basins; the harmonious studies now under way by the upper basin states of the Colorado River watershed, concerning division of their share of the waters of that stream; an address by Alfred M. Smith of Nevada appealing for the State Engineers to take the lead in bringing together all agencies having anything to do with water in his state, and pointing to the conspicuous success of such a program in Nevada; appeals by each governor who spoke, for recognition and aggressive action for Western unity.

Resolutions

The convention adopted resolutions which further promoted the spirit of cooperation, and rejected several proposed resolutions which might have contributed to disharmony.

Principal ones adopted were: Urging Congress to make available sufficient funds to the Geological Survey to match all state money for stream and underground water gaging; asking stronger laws requiring federal agencies to comply with state water laws; support for a comprehensive mapping program in the West; approval of the "compact" and "inter-agency committee" plans; and a request that the Secretary of the Interior appoint a committee to consider proposed changes in the reclamation laws, and study existing conditions to determine what revisions in law or practice might be necessary for reclamation in the West, this committee to report to Congress; unanimous approval of the appointment of Don McBride, formerly state engineer of Oklahoma, as secretary-manager of the National Reclamation Association, with a pledge of support in his activities.

A resolution supporting Commissioner Straus' appeal for a higher percentage of non-reimbursable funds for reclamation was tabled, when members indicated this suggestion needed a great deal more thought, and the opinion was expressed that such a program would seriously hamper, rather than help, Western reclamation, because Eastern congressmen would be reluctant to vote such funds.

Officers

New officers elected for the ensuing year were: president, Mark Kulp, State Reclamation Engineer of Idaho; vice-president, O. C. Williams, State Land Commissioner of Arizona; and executive board member, the retiring president, C. S. Clark.

It is planned to hold the next meeting in Idaho, but both place and time were left to the discretion of the executive board.

Arrangements for the Jackson convention were under the direction of L. T. Bishop, state engineer of Wyoming and A. C. Cook, of Texas. Details were handled by Misses Wilma Hageman and Josephine Corazza of Bishop's office.

FWA Planning Advances for More Western Communities

ADVANCE PLANNING FUNDS approved by the Federal Works Agency as loans to Western communities in recent weeks include the following projects. These funds are advanced to assist local agencies in the preparation of plans and specifications for local public works and are to be repaid without interest when construction is begun.

Arizona

Holbrook was allotted three advances: $1,140 for a new water storage tank, estimated to cost $26,250; $2,610 for a water distribution system, to cost $57,550; and $2,125 for grading and paving, estimated at $56,798. Nogales received $12,000 to plan water system extensions and a reservoir, which will cost $269,100. Phoenix received $10,000 advance to assist in planning a new fire station which will cost $265,000, and $20,000 to design sewage disposal plant improvements, estimated to cost $730,000. The State University was granted $14,600 for planning a men's dormitory, estimated at $447,284.

California

Advances in California with the project and estimated cost were as follows: Costa Mesa, $18,000, sanitary system and treatment plant, $438,000; Dos Palos School District, $3,060, elementary school addition, $56,355, and $3,720, cafeteria building, $68,485; Lake Arrowhead School District, $10,208, new elementary school, $300,000; Redondo Beach, $2,647, grading and paving Redondo Beach Boulevard, $115,771, and $957, paving and storm drain, $31,914; Riverside County, $19,125, new County government building, $430,000; Santa Barbara, $15,732, sewage treatment plant, $777,287; Santa Rosa, $6,000, water system extensions, wells and reservoir, $114,000; Vallejo School District, $6,600, Junior College additions, $139,920, and $3,500, maintenance building, $74,200.

Hawaii

The Board of Public Parks & Recreation, Honolulu, has received five advances: $3,122, park development, $65,562; $8,750, community gymnasium, $183,750; a similar advance for a like purpose in another community; $650, field office comfort station, $13,650; $1,050, comfort station shelter, $22,050.

Idaho

Dietrich was advanced $950 to plan a new water system and fire protection, estimated to cost $32,100; and Montpelier received two advances: $750, to plan a water system expansion, estimated to cost $27,250, and $1,800 to prepare plans for a sewage treatment plant and outfall, which will cost $64,300.

Montana

The State Board of Education received an advance of $6,960, to finance plans for a girls' dormitory at Eastern Montana Normal School in Billings, estimated to cost $185,000.

Nevada

The State of Nevada has been allotted $23,000 for planning a new State highway building, estimated to cost $485,000, and Washoe County received $40,000 to design a sanitary sewer trunk system and disposal plant at Reno, which is estimated to cost $1,022,300.

New Mexico

Espanola was granted $2,800 to plan a sanitary sewer system which will cost $102,148, and Las Cruces received $12,000 to lay out a new city hospital, which will probably cost $427,000.

North Dakota

Grenora has received an advance of $846 to design additions to the water and sewage systems, which will cost $31,000.

Oregon

Phoenix was advanced $4,250 for preparation of plans and specifications for a sanitary sewer system and treatment plant, estimated to cost $99,500.

South Dakota

Pierre School District was granted an advance of $1,980 to plan a stadium and high school addition, which will cost $69,500.

Texas

Amarillo received $5,250 to plan park improvements, estimated to cost $159,000; Baylor County was allotted $8,000 to plan airport facilities, estimated to cost $375,300; Odem received an allocation of $5,722 for improvements to the existing water system, which are expected to cost $149,870. Temple received the following eight planning advances: $5,000, water supply main, $125,900; $2,609, extensions to water distribution system, $92,192; $1,852, park improvements, $65,439; $14,405, street improvements, $508,979; $1,659, resurfacing existing streets, $58,623; $3,500, sewer facilities, $105,900; and $11,114, extensions to storm sewer system, $394,203.

Utah

American Fork has received $950 to plan a swimming pool, which will cost $27,000; Clearfield was granted $7,000 to design a community building and swimming pool, estimated to cost $200,000; Midvale City received $3,800 to design a sewage disposal plant and outfall, to cost $106,500; Smithfield was allotted $4,260 to plan a memorial building to house city offices and club rooms, to cost $120,220; South Summit School District was granted $7,400 to plan an elementary school at Kamas, estimated to cost $209,200; and Weber County was given $28,000 to design a War Memorial building at Ogden, which will probably cost $1,444,000.

Imagineering Builds Concrete Homes

Complete with walls, roofs, eaves, room outlets, light fixture boxes and electrical conduit, homes are turned out one every 24 hrs. by the 62,300-lb. Tournalayer machine which delivers them storm-proof, rodent - proof, termite - proof and fire-proof—one answer to the current housing shortage

TAKE A TRAILER as wide as five automobiles, some huge hollow steel forms, a lot of concrete, four electric hoists and a couple of days' work—and what do you have?

An attractive, modern, four-room house if you are using a 62,300-lb. Tournalayer developed by R. G. LeTourneau, Inc., in the Longview, Tex., plant to provide homes for workers there.

Concrete houses of varying designs, reinforced with steel mesh throughout and laid by the Tournalayer in a matter of hours, emerge from steel forms complete with walls, roof, eaves, room outlets, light fixture boxes and electrical conduit. Produced by on-site production methods, they are claimed to be fireproof, termite proof and windproof.

This mammoth mobile house-making machine is comprised of a two-wheeled prime mover coupled to a huge U-shaped trailer on which is detachably mounted the immense outer hollow steel form of the basic four-room structure. In addition to the outer form, a base and two inner forms complete the necessary molds to build the house.

Form work

The two inner steel forms, secured to the base, shape the inside of the walls and ceiling. A 5-in. space between the two inner forms provides a 5-in. partition for the full length of the structure. The outer box-like form, open at top and bottom, when lowered over the inner forms, leaves a 5-in. space between the two forms to make the outside walls. This space flares out at the bottom to 12 in. for foundation and bearing area. Thus the conventional separate grade beam becomes an integral part of the basic structure.

The outer form also shapes the outer surface of the house and eaves. A mixer pours concrete into the top of each form, care being taken to see that concrete is vibrated to work it closely around windows and doors. Then the roof is poured. It takes less than two hours to pour the 32 to 38 cu. yd. of concrete needed. When the concrete has set, and the house is ready to be transported to its permanent site, a worker enters the inside of the chambers and by turning a crank, the walls of the inner form come inward, 2 in. away from the concrete.

Lifting mechanism

Four electric hoists are mounted on the trailer unit; one is mounted on each side toward the rear and one in front at the middle of the large cross beam forming a three point suspension for independent leveling of the house; then there is a main hoist which raises the house from all three points at once. The output for these cable hoists is from four 50-ft. lb. motors. The suspension cables are fastened to the outside form in three places only. At each of the three suspension points is a special crank for making fine adjustments longitudinally and transversely. This is for the purpose of squaring the house while lowering it onto its permanent base. The outer form can be expanded to release the outside steel forms from the concrete by means of eccentric expansion hinges at the four corners. To release the trailer from the form and connect it to another form, it is only necessary to pull three pins.

In a radical departure from conventional concrete construction, the Tournalayer lifts the outside form and the concrete house together bodily over the top of the inside form. After clearing the top of the inner form, it pulls away, lowers its load into a traveling position and starts toward the building site. After the house is lowered into position a simple mechanical device moves the four sides of the outside form outward clearing the house all around. Then the form is hoisted over the top of the house and returned to the central point for re-use. It is only necessary to have ground 35 ft. wide to travel on and a flat base on which to place it. The inside form need never be moved from its original location until all houses in the area have been poured.

Weights and measurements

The entire weight of the Tournalayer with concrete house suspended in outer form is estimated at approximately 215,000 lb. The house itself will weigh around 50 tons or less. Flotation for the huge machine is gained by the use of large 30 x 40, 34-ply pneumatic tires. Each tire will measure approximately 9 ft. high and 36 in. in width.

The concrete house, as initially released from the forms, measures 32 ft 8 in. long, 24 ft. wide and 10 ft. high, and is made up of reinforced insulating type concrete. All walls are 5 in. thick, the

A CONCRETE house encased in the outer form of the house laying machine is lifted off inner forms (above) and carried in one piece to a final building site (below). Finishing touches will be added here

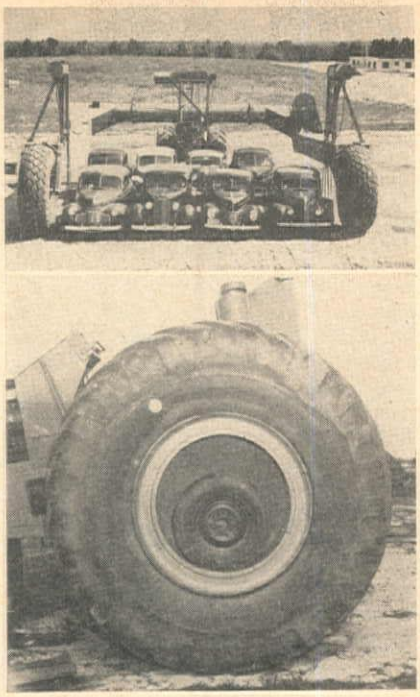
roof being 8 in. thick at the outside sloping inwardly to 5 in. at the center for drainage. The floor plan design may be varied according to the ingenuity of architects and contractors. And larger homes, with one or two stories, and any shaped roof are produced by placing two or more single-unit structures side to side or one on top of the other.

There are several factors which will largely determine the total number of houses a contractor builds each month, all depending upon the degree of efficiency in the contractor's own construction methods and his facilities. Time required for concrete placing will vary as to type of equipment used. A complete house has been poured in 1 hr., 14 min. by one method. Contractors should have fast concrete mixing and pouring facilities and a heavy-lifting mobile crane. Time required for a house to remain in the forms will vary according to type of cement and aggregate used. Houses are removed from the forms at the Longview plant between 16 and 24 hr. after pouring.

Immediately after a house is removed from the inner forms, and while the house is being carried in the outer form to its permanent lot, the inner forms can be prepared for the next house. It is estimated that less than three hours are required to get ready to pour another house.

Prefabricated fixtures

Prefabrication of many of the various items that go into the structure will greatly speed mass production of homes. Conduits, of which approximately 180 ft. will be sufficient for most units, are cut in advance and bent into shape. Window bucks of wood, steel or aluminum may be prepared for mass assembly against inner forms. Reinforcing steel is prefabricated and placed in position against each side and top of inner forms in sheets and securely fastened together at the corners. Even openings for windows and doors are cut in advance, according to the individual house plan. In the employee housing project in Longview, approximately 5,000 ft. of



SIZE OF giant machine is seen in these pictures. Top, eight cars are parked in trailer's arms. Below, ordinary 6.00 x 16 automobile tire is dwarfed in comparison to 30x40 9-ft. high pneumatic tires.

⅜-in. and ¾-in. reinforcing steel rod is used in each unit.

The LeTourneau company will not go into the home building business. The Tournalayer is leased to the home building industry on a monthly rental basis for use in constructing housing projects of 50 or more units, hence no prices are quoted for finished homes. This is judged to be a builder's prerogative, and, of course, would be based on local building material costs, local labor costs, size of the project and operating efficiency of the builder. The only prices quoted by the company are rental prices of their equipment. However, it is contemplated that the individual home will be well within reach of the veteran and sale price would fall below the $6,000 dividing line figure set by the National Housing Administration.

Model homes

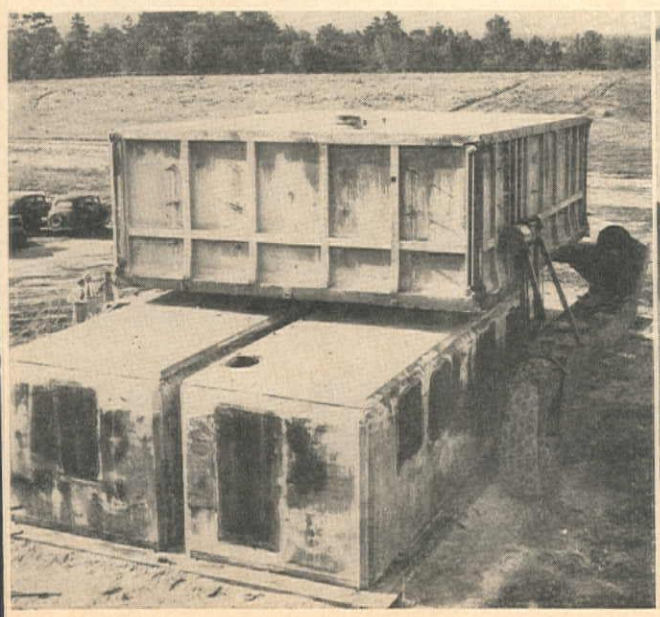
Assembly and marketing headquarters for the Tournalayer center at a new $5,000,000 installation at Longview, Tex. Here a new factory which is manufacturing the machine is rapidly nearing completed stages. All who are interested in this new method of mass house production may visit model homes, completely furnished and decorated, which are on display on the Longview grounds.

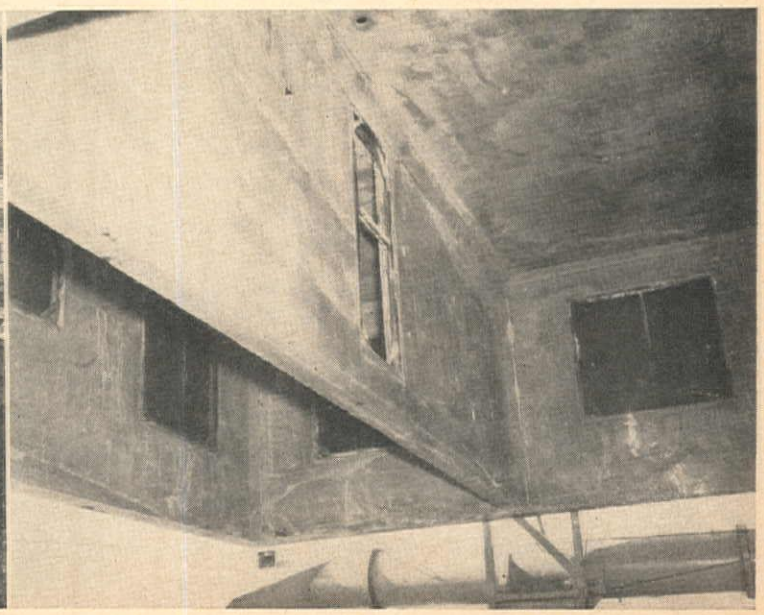
AT LEFT Tournalayer places completed basic house on building site ready for workmen to complete, while at right machine lifts concrete house bodily off inner form.

Pre-Hearing Conferences Aid Oregon Safety Code

REVISION OF the Oregon Safety Code now in progress has been aided considerably by a policy of pre-hearing conferences with engineering contractors and with representation of labor groups. In order to simplify the final hearings on proposed revisions, the Oregon State Industrial Commission through J. Grady, safety engineer for the accident prevention division, who is supervising revision of the code, arranged for a series of conferences with contractors and with labor representatives.

At these conferences it has been possible for individuals and interested groups to make suggestions for changes and to argue the merits and disadvantages of controversial points. Arrangements for the conferences with the contractors were made by the Portland Chapter of the Associated General Contractors, of which A. G. Harding is secretary-manager. At the public hearings on the revised safety code, scheduled for late June, it is expected that proceedings will be greatly expedited due to the results of the pre-hearing conferences.





CONSTRUCTION DESIGN CHART

LXXVI.... Unbalanced Tensile Reinforcing

By JAMES R. GRIFFITH
Birch-Johnson-Lytle
Seattle, Wash.

BALANCED tensile reinforcing might be called "ideal" reinforcing. Under such conditions, both steel and concrete stresses are at their maximum allowable values when subjected to flexure under the maximum bending moment. However, it is a condition seldom realized. Usually there will be found no combination of commercial reinforcing bars which will exactly fulfill the requirements. It is likewise customary to dimension overall beam sizes by full inches, or at least by never less than ½-in. increments. There was a time when the designer tried to dimension beams so as to prevent the necessity of expensive hand ripping of form lumber. Modern power saws have largely eliminated the excuse for this procedure. My personal habit is to first select a beam section, in full inches, which will meet the requirements of shear. In order to allow for a possible revision in dead-load, I will use a shear value some lower than the maximum allowable.

Regardless of how the beam section has been determined, the designer is then faced with the problem of selecting the necessary amount of reinforcing steel. As an example, let us assume the following conditions as given for a rectangular beam:

Bending moment, $M = 62$ ft. kips = 744,000 in. lbs.

$f'_c = 2500$ psi.

$f_s = 20{,}000$ psi.

$b = 12$ in.

$d = 18\frac{1}{2}$ in.

In the February 1947 issue, a chart will be given for balanced tensile reinforcing for $f'_c = 2500$ and $f_s = 20{,}000$, similar to that published in the August 1946 issue. However, for the time being we must compute the desired values and have the following for balanced conditions:

$$M = K\,b\,d^2 = 196 \times 12 \times 18.5^2$$
$$= 806{,}000 \text{ in. lb.}$$
$$= 67.2 \text{ ft. kips}$$
$$A_s = p\,b\,d = 0.0113 \times 12 \times 18.5$$
$$= 2.51 \text{ sq. in.}$$

It will thus be seen that the beam section selected, when fully reinforced, is good for a larger moment than that given. For the given conditions we have

$$K = \frac{M}{bd^2} = \frac{744{,}000}{12 \times 18.5^2} = 181.5$$

The maximum allowable compressive stress for 2500-lb. concrete is $f_c = 0.45\,f'_c = 0.45 \times 2500 = 1125$ psi. A solution line has been drawn on the accompanying chart through the values $K = 181.5$ and $f_s = 20{,}000$. Had the line been drawn through the allowable value of $f_c = 1125$, it would have indicated an excessive steel stress. The steel is thus said to control. From the solution line on the chart the following values were obtained:

$p = 0.0105$

$f_c = 1065$ psi.

Thus the required area of reinforcing steel is

$$A_s = p\,b\,d = 0.0105 \times 12 \times 18.5$$
$$= 2.33 \text{ sq. in.}$$

as compared with the 2.51 sq. in. required for balanced reinforcing. Now selecting four ⅞-in. round bars with an area of $A_s = 2.4$ sq. in., we then have

$$\text{Actual } p = \frac{A_s}{b\,d} = \frac{2.4}{12 \times 18.5} = 0.0108$$

If another solution line (not shown) were drawn on the chart through the values

$p = 0.0108$

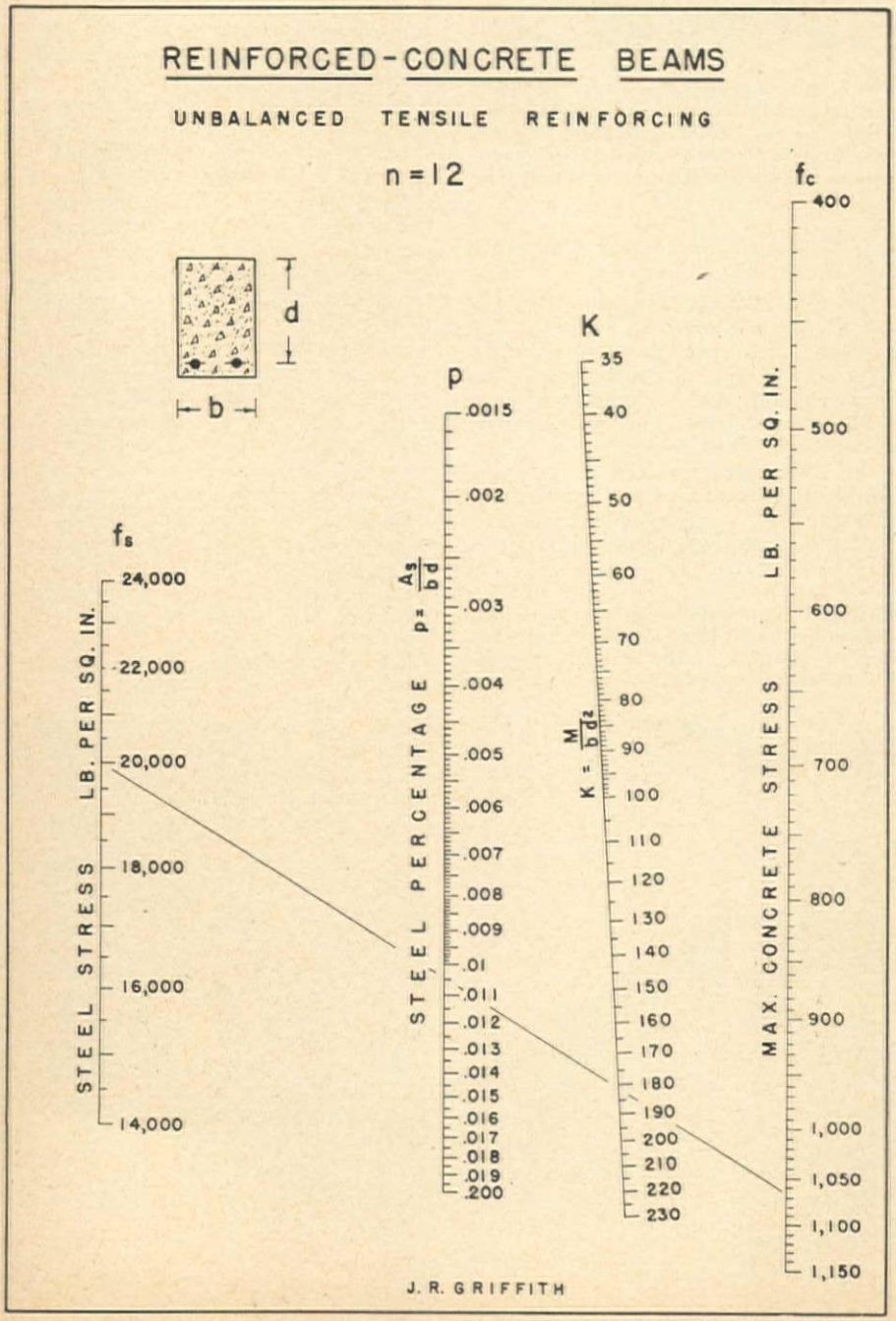
$K = 181.5$

the following stresses would be noted:

$f_s = 19{,}300$ psi.

$f_c = 1050$ psi.

Using the chart, variations in beam section or reinforcing size may be determined.



THE NEW steel manuals of the American Institute of Steel Construction will be available in October. The price is $2.00. Orders may be sent to William H. Popert, Acting Representative of AISC, 1227 Russ Building, San Francisco.

HOW IT WAS DONE

JOB AND SHOP TIPS FROM THE FIELD

No Nails in Timber Scaffold

A NEW SCAFFOLDING system utilizing timber for all structural members, but leaving the timbers in good condition for any type of reuse has been recently introduced in the Portland area by a metal fabricator who makes the nailless, screwless, and boltless connections. In the photographs appearing on this page the scaffolding was set up in downtown Portland for a building cleaning job, but the scaffolding system would be equally applicable to any construction job where scaffolding is a necessary part of the construction equipment.

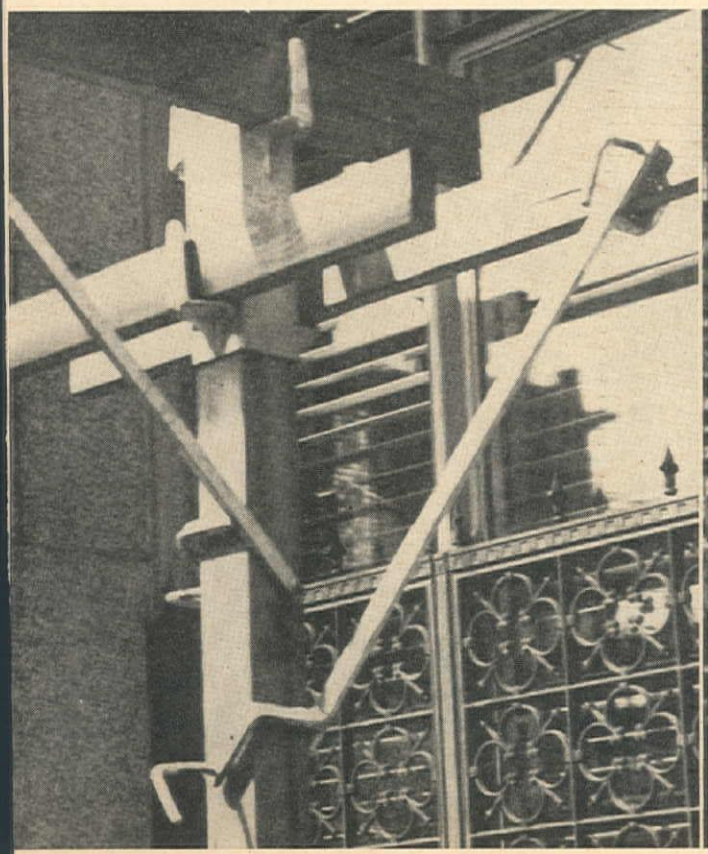
The basic unit of the connection group is a 4x4x18-in. steel shoe which slips over the end of the 4x4-in. vertical member and permits a butt joint to be made (photo at lower left). On each side of the shoe is placed a welded steel bracket, two on opposite sides high on the shoe and two on the other opposite sides low, which take the 2x6 or 2x4-in. horizontal bracing between uprights. In this particular scaffolding job the larger horizontal member was used in the longitudinal bracing and the smaller in the bracing normal to the building face, but convenience will dictate the arrangement.

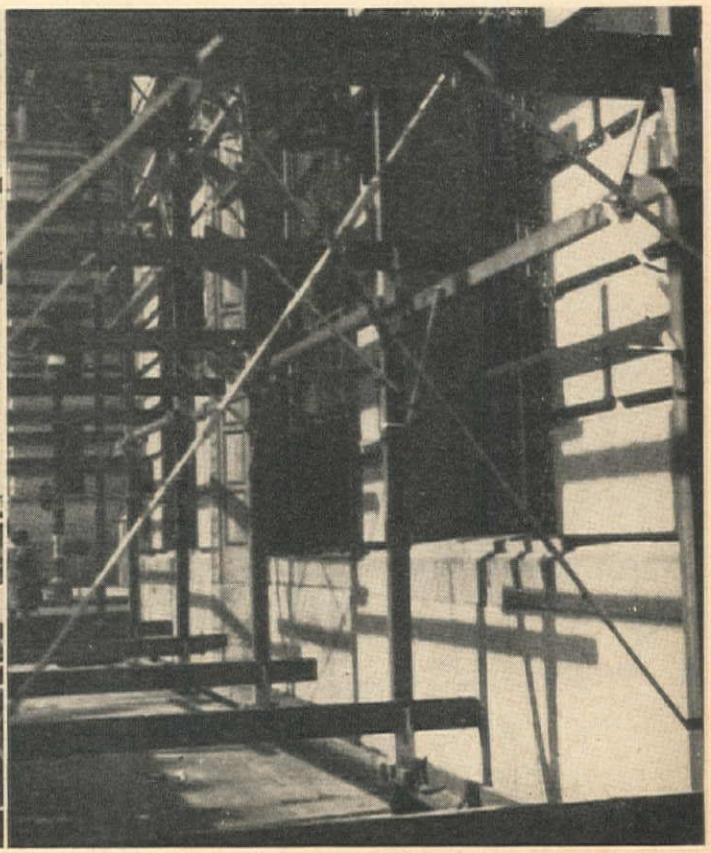
These joints are further strengthened by diagonal braces consisting of a flat steel strip about 3 ft. long with a 4x4 angle welded near one end and a 2x4-in. angle near the other end to form two U's which slip onto the 4x4 upright and 2x6 horizontal members respectively. A large bolt that can be tightened by hand is threaded through each U and clamps the brace in place.

Sway bracing, placed between each set of uprights perpendicular to the building, is made up of two round steel rods about 10 ft. long with a forged U at one end to fit the 4x4 uprights and with a clamping arrangement similar to the smaller brace. The other end is threaded to take a turnbuckle. Two of these rods connected by a turnbuckle form one leg of the X-bracing.

For intermediate horizontal bracing or walkway supports where no joint of the uprights is required a three-sided shoe similar to those used at the butt joints is used. This shoe with one side open has only one pair of brackets for the horizontal members and is held in place by use of a hand clamp like those used for the cross bracing.

STEEL SHOE holds timbers at lower left; sway bracing at right; overall picture of the nailless scaffold, above.





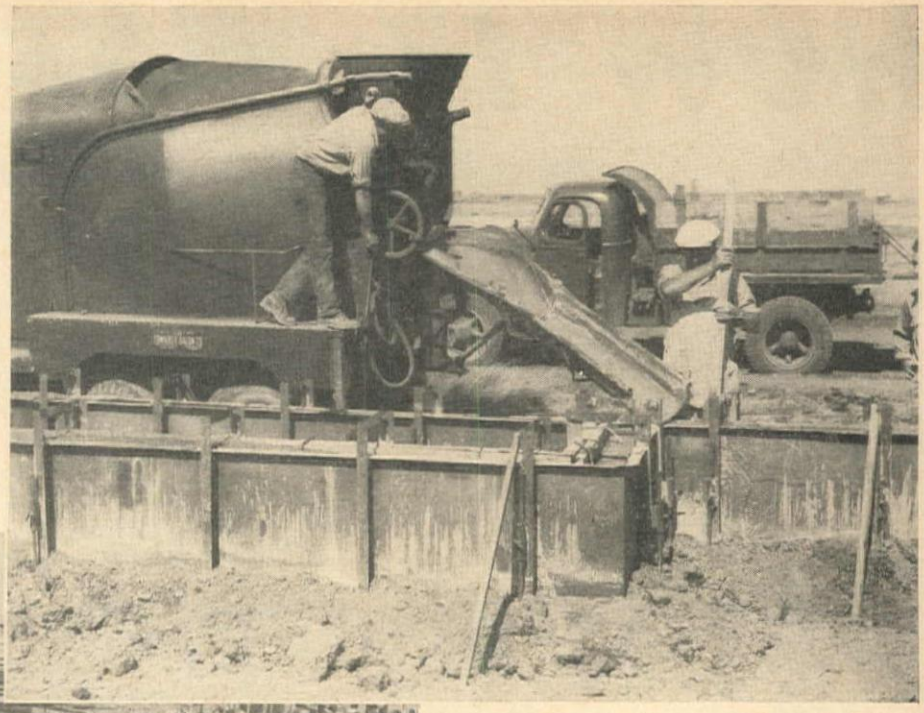
Steel Foundation Forms Speed Work

BY SWITCHING to the use of steel foundation forms Conway & Culligan, home builders of the San Francisco Bay area have materially speeded construction of the 500-unit veterans homes project which the organization has under way in San Mateo.

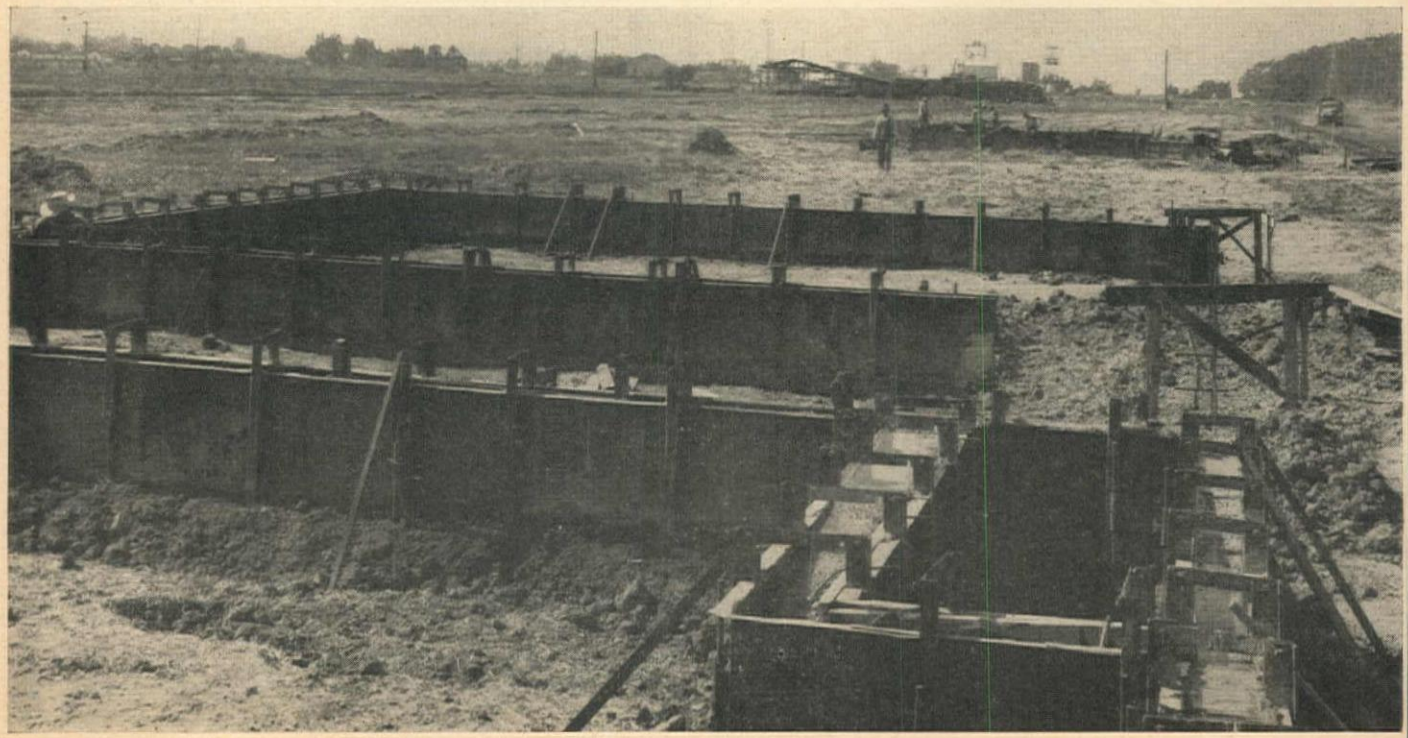
Designed to provide for both the footing and foundation wall in a single pour, the forms are made from light-weight sheet steel in interlocking panels which may be lengthened or shortened as required for individual jobs. The form faces are highly polished for ease in stripping, and before each pour are brushed with crankcase oil.

The forms are braced at about 3-ft. intervals by angles welded to the outside of the forms and displacement during pouring is prevented by cross straps bolted to these angles above the forms. About every third brace has a vertical sleeve welded to the angle, and through this sleeve a steel rod can be driven into the ground just outside the footing to hold the form in place. Additional security is provided by an angle bolted to the top of the form brace and extending diagonally to the ground.

(Bank of America photos)



STEPS IN construction of 500 veterans' homes in San Mateo are pictured here. Immediately above, ground is leveled in preparation for steel frames, while at upper right concrete is poured from the mixer into the forms. Below, concrete hardens.



NEWS OF WESTERN CONSTRUCTION

OCTOBER, 1946

Largest Class of Engineers Registered in California

TWO HUNDRED civil engineers, 26 land surveyors, and two structural engineers have been granted licenses to practice their profession in California by the State Board of Registration for Civil Engineers. This is by far the largest number of licenses ever issued in one group, according to Mark Falk, president of the Board.

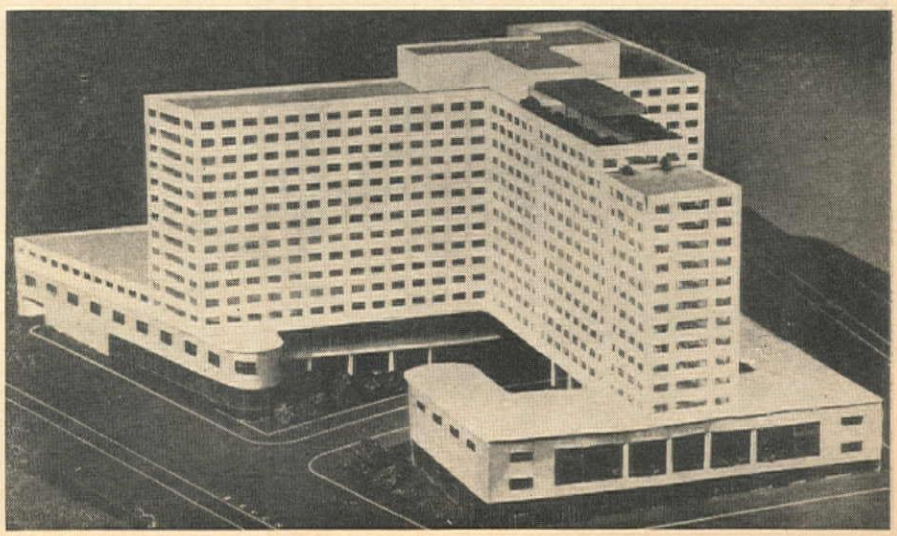
Civil engineers licensed in Northern California include: **Robert W. Hollis, Jr.,** and **Albert E. Simmons,** Albany; **Julian L. Bardoff, A. L. Cowin, James H. Dunn, V. L. Hanson, George A. Hess** and **Paul A. Martin,** Alameda; **Francis B. Blanchard, H. G. Crowle, Harold A. Davis, Harold S. Kellam, Jr., George J. Marr, Eric O. Moorehead, E. M. Shanley, Richard M. Starns, Jr., George J. Taylor, Edward T. Telford** and **Edward L. Tinney,** Berkeley; **Joe T. Castelan,** Concord; **D. Maurice Berry,** Davis; **Ray L. Walker,** El Cerrito; **E. L. Blomquist, R. A. Miller, D. E. McCollum** and **Arthur W. Root,** Eureka; **James J. Breen, Jr.,** La Honda; **Eugene R. Mastin** and **J. Edward Sheehy,** Los Altos; **Gerry H. Brumund,** Marysville; **James M. Mullen,** Menlo Park; **D. J. Bleifuss,** Mountain View; **Timothy J. Canty, John H. Cline, Jr., George A. Hall, Bert G. Huntington, Richard F. Lovejoy, John Francis Meehan, Edward H. Morjig, Lewis R. Knerr, Erik Rettig, James A. Spence** and **Bernard T. Westkamper,** Oakland; **G. L. Harrison,** Orinda; **Randolph L. Stanley,** Palo Alto; **Lyle A. Abrott,** Pleasanton; **L. D. Ewen, R. N. Putnam** and **Charles L. Sweet,** Redding; **Robert S. Barker, Aldo Crestetto, James J. Doody, John M. Haley, A. H. Helmkamp, William E. Ladue, William H. McBride, D. Harold McMillan, Stevan S. Pavitt, Arthur C. Showman, E. R. Stowell, Carl A. Werner, Bing Q. Wong** and **Arlos M. Yaeger,** Sacramento; **Manley W. Edwards** and **Swan A. Erickson,** San Carlos; **Philip J. Coffey, Charles D. DeMaria, L. C. Gaberel, Lyman R. Gillis, Otto Hoefler, A .W. Miner, Thomas F. Mullen, Byron L. Nishkian, Andres Fjeldsted Oddstad, Jr., Oliver Sweningsen, Jr.,** and **S. Myron Tatarian,** San Francisco; **Joseph F. Sally,** San Lorenzo; **Charles T. Ledden** and **Donald Suggs,** San Mateo; **Clifford E. Pehl, Sr.,** Sausalito; **Samuel E. Bistline, William J. Fleming, George C. Hennis** and **Carl M. Heynen,** Stockton; **Raymond P. O'Neill,** Suisun; **William A. Jones,** Vallejo; **A. E. Rhoades, Jr.,** Westwood; **Scott H. Lanthrop** and **R. I. Nicholson,** Yuba City.

Central California men to receive licenses were: **Scott G. Ladd** and **J. C. Reaves, Jr.,** Bakersfield; **H. W. Porter,** Fresno; **William L. Hurd,** Hughson; **William K. Fink,** Los Banos; **Lowell H. Shifley,** Merced; **Oliver E. Deatsch,** Modesto; **John M. Chaffee,** San Luis Obispo.

In Southern California the new licensed civil engineers are: **Harold L. Cronk, Carl H. Hoyem, Harry H. Lembke, Roger A. Lillicrop** and **Fred G. Sieck,** Alhambra; **Frederik G. Freriks** and **Glenn W. Hutchinson,** Altadena; **Donovan Southworth,** Balboa; **Neil J. Cummins,** Bell; **George B. Ralph,** Beverly Hills; **Rupert O. Alen,** Burbank; **Wallace B. Swan,** Compton; **Philip S. Deiwert,** Fontana; **Frank J. Baudino, Arthur C. Bravo, John T. Dibble, Carl William Johnson, Fred S. Lohman, William F. Mullen** and **William F. Ropp,** Glendale; **Jehiel H. Lehman,** Hollywood; **Harold L. Manley,** North Hollywood; **R. S. Holman,** Huntington Park; **William J. Matthews, Charles P. Morgan** and **Paul J. Prout,** Long Beach; **Joseph S. Allen, H. George Altvater, John A. Bonell, Jr., W. M. Bonner, Jr., Maxwell F. Burke, Albert F. Bush, Carl A. Carlson, Adolph A. Cohan, Stephan J. Collins, C. Martin Duke, Jr., Frederick Faulkner, Jr., Edmund Feldman, Zelik Holzman, F. C. Horowitz, Albert S. Hughey, Lloyd B. Knox, Thomas M. Leps, Jack M. Lyerla, Carl C. Mackprang, Wayne MacRostie, D. F. Moran, J. Rawson Palmer, Rufus W. Putnam, Frank M. Schmidt, Houston L. Standefer, Charles Stanley St. John, Max W. Strauss, Robert O. Thomas, Henry C. Vanden Bossche, Carl J. Verner, William R. Wilkinson, Ernest A. Withers, Chester Woo, Walter J. Wood, Robert W. Woodbury** and **John W. Young,** Los Angeles; **Edward F. Gabrielson** and

SCALE MODEL OF NEW STATLER HOTEL FOR LOS ANGELES

THE NEWEST hotel in the Statler chain will soon be erected at Seventh and Figueroa streets in Los Angeles. As illustrated in the scale model, the $14,000,000 structure will be built around a plaza, with sprawling wings which will make every room an outside exposure. On the roof will be a "sky bar." The building will occupy the entire block bounded by 7th, Figueroa and Wilshire, with plaza opening on 7th.



Russell F. Kimball, La Jolla; A. Leslie Miller, Oceanside; Edgar G. Crawford, Charles H. Dodge, Donald B. Graff, Dimitri N. Melnokov, William E. Patchett, R. W. Shaffer, Robert M. Wilkerson and Percy H. Wilson, Pasadena; W. E. Milburn, Redondo Beach; C. Worth Gaylord, Michael G. Glenn and Wayne W. Ivans, San Bernardino; Harold C. Foster, Le Roy Edmund Hanson, J. Phillip McClure and Joseph P. Sinclair, San Diego; Theodore C. Peterson, San Fernando; Walter E. Bedke, Edward Koehm and Carleton Leigh King, San Gabriel; Perry S. Hagerman and John H. Norman, San Marino; Harvey F. Ludwig, San Pedro; Irvan F. Mendenhall, Santa Maria; Elbert J. Tate, Santa Paula; Omar J. Lillevang, South Gate; L. K. McNeil, Upland; Clifford P. Stoddard, Van Nuys; Charles R. Gallagher, Ventura; Richard R. Bradshaw, Walnut Park; Alden W. Carr and Samuel E. Woods, Jr., Wilmington; Victor A. Miller and A. Franklin Starbuck, Whittier.

Civil engineer licenses issued to men outside the state went to George H. Miehls, Detroit; G. Donald Kennedy, Chevy Chase, Md.; Walter H. Wheeler, Minneapolis, and William J. Bobisch, Omaha.

Structural engineers registered were: O. B. Christensen, Los Altos, and E. S. Pankhurst, Los Angeles.

Receiving licenses to practice as land surveyors were: Leslie M. Talley, Arcadia; G. W. Bridges, Berkeley; Francis Malone, Beverly Hills; D. S. Hamner, Burbank; George C. Bestor, Carmel; Eugene Sorin, Escondido; Roger F. Wilson, Glendale; E. Lee Scott, Hollywood; Winston I. Keerl, Laguna Beach; Edwin A. Rosecrans, Lancaster; V. F. Case, Long Beach; F. G. Somner, Jr., and Howard W. Young, Los Angeles; E. B. Henry, Modesto; J. Richard Newton, Ontario; Arthur J. Sullivan, San Bernardino; Sidney H. Smyth, Jr., San Francisco; William M. Hunt, San Jose; Charles P. Porter, San Luis Obispo; F. L. Gibbs, Santa Ana; Park L. Verner, Santa Clara; Robert Angermeier, Stockton; Harry Rolfs, Taft; H. E. Harney, Vallejo; Leslie Liess and R. C. Nelson, Van Nuys.

AGC Seeks to Rescind Moratorium On Southern California Building

THE 11 WESTERN chapters of the Associated General Contractors of America, Inc., in their conference at Phoenix, Ariz., Sept. 16-17, unanimously adopted a resolution urging Wilson Wyatt, National Housing Expediter, and John Small, Civilian Production Administrator, to rescind the 60-day moratorium imposed on all commercial building construction in eight Southern California counties.

Since all commercial building construction now in progress was authorized only after a showing that it was essential to the economy and reconversion of the area, the chapters felt an unjust hardship existed.

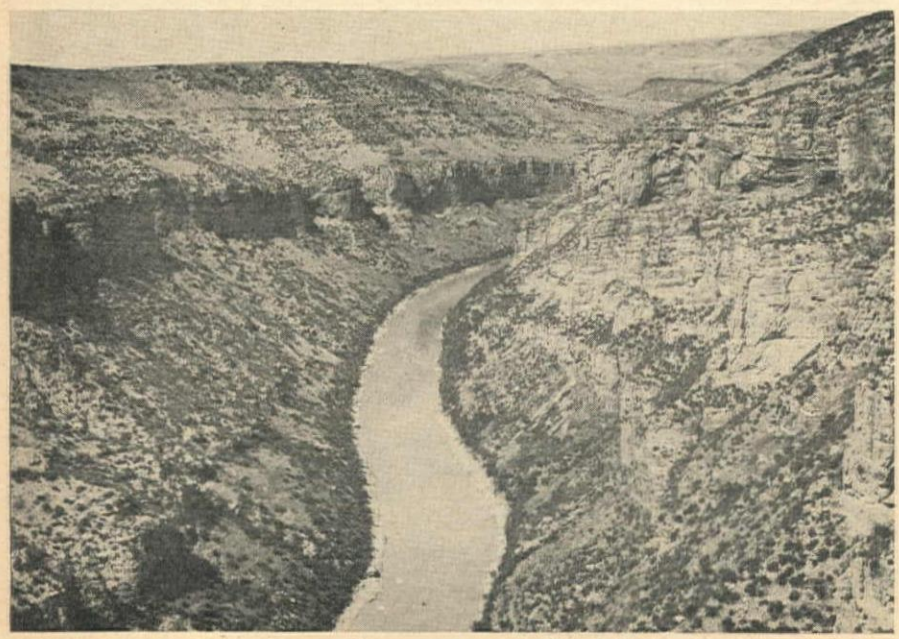
They recommended completion of all buildings so authorized (1) because it provided needed employment, thereby aiding veterans who desired to avail themselves of the benefits of the Veterans Housing program; (2) its completion would help provide jobs for thousands of returning veterans and for the more than a million people who came to Southern California to engage in vital war-time production; and (3) the 75 per cent supply of most of the critically needed materials already reserved for use in veterans' housing construction was sufficient to render the moratorium unnecessary.

The chapters pledged their continued full support to the Veterans Housing program.

Copies of the resolution have been forwarded by each chapter to Wyatt, Small, Western Congressmen, and John Steelman, Reconversion Director.

LOCATION OF PROPOSED YELLOWTAIL DAM IN BIG HORN CANYON

THE PROPOSED SITE of Yellowtail Dam on the Big Horn River, 35 mi. south of Hardin, Mont., lies in the near foreground. This dam is part of the Hardin Unit of the Missouri Basin development program and will extend irrigation to 45,000 acres of new land and supplement the supply to 1,800 acres now under irrigation. A power plant with an installed capacity of 75,000,000 kw. is also included in the plans.



Army Engineers Build Reserve Fleet Sites

ARMY ENGINEERS will develop and construct five, and possibly six, permanent Reserve Fleet sites for the United States Maritime Commission. The Commission has transferred $10,000,000 to the Engineers to cover the estimated cost of this program.

The five assured sites will be located in the James River, at Lee Hall, Virginia; Brunswick River, Wilmington, North Carolina; Tensaw River, Mobile, Alabama; The Neches River, Beaumont, Texas; and Suisun Bay, Benicia, California. The sixth site under consideration is one of two located in the Columbia River area. These locations do not include certain sites which will be utilized for a period of two or three years each while disposition is being made of certain over-age, damaged or unwanted types of vessels. According to information available, the Reserve Fleet Division of the Maritime Commission will be required to maintain in permanent reserve approximately 2,500 merchant vessels.

To some extent, the locations of the sites was determined by the number of vessels finishing their last voyages in the Atlantic, Gulf and Pacific ports. While it previously appeared that two permanent sites would be necessary on each of the three coasts, fewer ships than were anticipated have been terminating their last pre-reserve voyages in Pacific ports. This led to holding up one Pacific site. Inquiry by the Reserve Fleet Division of the Maritime Commission indicates that less than 900 Commission-owned ships will end their careers in Pacific ports. If this information proves correct and it is taken into consideration that from 400 to 500 of these ships will not be required for permanent reserve, only one site may be necessary on the Pacific coast.

The Suisun Bay site can accommodate approximately 500 vessels and now has about 360 vessels moored in it. It was originally selected as a temporary site but has now been made permanent.

Two sites in the Columbia River area are under consideration.

WASHINGTON NEWS
. . . for the Construction West

By ARNOLD KRUCKMAN

ST. LOUIS, MO.—This second letter, written in the progress of the swing around the Continental area of the United States, comes from a point overlooking the Chain of Rocks in the Mississippi River, at St. Louis. Just a short distance to the north, the mighty yellow Missouri River pours its waters brought from the Rockies, into the Mississippi, which the storied Father of Waters carries to the Gulf of Mexico.

It is strikingly apparent here in St. Louis that the people, including the business community, apparently are indifferent to the potentials involved in the whole Missouri Valley Authority project. The Post-Dispatch, the Pulitzer newspaper, has persistently tried to whip up public interest; and the St. Louis Chamber of Commerce has established committees to function on the subject, but there is little public response. Business people say the farmers, and other agricultural interests of the State, are almost wholly uninterested.

Whatever sporadic stimulus is evident is said to stem chiefly from occasional lunch club meetings when the business people come under the influence of the magnetic personality of Brig. Gen. Lewis A. Pick. The people in and below St. Louis are mainly interested in the improvement of the Missouri River when the project increases the facilities to transport bulk cargoes on the rivers. There is a greatly revived interest in river traffic, particularly since New Orleans has been made the second "free port" of the United States. The Mississippi Valley looks upon New Orleans as the magnified outlet for its commerce with South America, Australia, South Africa, Asia, and Europe. In the Southwest, and in the great Mid-Continent area, sloping south from St. Paul and Minneapolis, they see New Orleans rapidly developing as the New York of the Gulf Coast. For this reason, if not for many others, this great region is bound to contest with the West for Federal funds to bring about further and very ambitious waterway improvements and allied public works.

The Colorado River

The topic has very special significance in the light of the unhappy controversy which is developing among the seven States of the Colorado River Compact. The future relations of the six states of the Colorado Basin, and the State of California, especially Southern California, will come to their first climax in November. The new Colorado River Basin States Committee then meets for the ostensible purpose of giving further consideration to the Colorado River Basin report of the Bureau of Reclamation. The trend will at that time be clear as it is reflected in the action of Gov. Warren of California.

As part of the proceeding discussed in these columns last June by Mr. Scattergood, of Los Angeles, California's Colorado River Board formally withdrew from participation in the functions of the over-all Committee of Sixteen, which included two representatives from each of the seven States, the delegates being the appointees of the Governor of each State. The California group advised the Committee of Sixteen the State did not think it was in the best interest of the State, nor for the best protection of its rights and interests in the Colorado River water to continue to participate as members of the Committee. California did, however, indicate it was willing to send observers to sit in at the deliberations of the other States, whether these deliberations took place jointly or severally, concerning matters affecting the Colorado River. Nevada later independently followed the example of California.

California Poses Problem

The action obviously wiped out the long-standing over-all Committee of Sixteen. The other States immediately proceeded to reorganize under the name of The Colorado Basin River States Committee, the representatives of each State to continue to function on the new committee. At the same time the new unit advised Gov. Warren of its action, and invited him to designate two delegates from California to function officially on the new committee. Patently these delegates would be a minority, and would be obliged to accept the same responsibilities assumed by the other delegates. There is much conjecture over whether the Governor will appoint the delegates. The general assumption is that he will either decline or ignore the invitation.

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Meanwhile the four upper Basin States also have held meetings. They met with the Governors of the upper States and agreed to initiate compact negotiations for the allocation of that part of the Colorado River water allocated under the original compact to the upper basin. This involved determination by each of four of the upper basin States of their respective obligations to meet deliveries at Lee's Ferry as required by the compact. The first meeting at Cheyenne was followed by a second at Salt Lake City to which came former Reclamation Commissioner Harry Bashore as representative of the President of the United States. The State Commissioners chose him as Chairman. This organization is known as the Upper Colorado River Basin Compact Commission. Another meeting of this group was scheduled to be held in Santa Fe, N. M., late in September. No word has yet come out of this meeting. The fruit should be some interesting data, because this group established a special engineering board to study and submit to the Commission a program of the engineering studies necessary to approach the main subject of water allocations, and the determination of obligations at Lee's Ferry by each of the individual States in the upper basin group. Arizona, like California, appears to have no allies. Her interests obviously lie with California, but this she has for over 20 years refused to acknowledge.

The Columbia Valley

In contrast to the conflicts on the Colorado, it is interesting to contemplate what is going on up in Oregon on the Columbia. You people of the West slope undoubtedly have been fully aware of it, and its implications, for a long time. To the Easterner the Columbia has meant almost solely the Grand Coulee Dam project, and Bonneville. It is doubtful if even the majority of professional men realize what the program on the Columbia signifies as it is envisioned by the Army Engineers.

Obviously the plan has not only vast economic implications, but it clearly is important to the West slope, and particularly to the Pacific Northwest, as a measure for defense and offense. In the sort of war now waged, every means of communication and transportation, which will make supplies more available, are fundamentally important.

Moreover the War Department program means more electrical energy to come from sources widely dispersed. It has been reported, but not by official sources, that when the program is ultimately completed the Columbia will produce, on the main stream and tributaries, a gross of 53,000,000 kw. annually, a total that exceeds electrical energy now produced by all sources in the United States. This electricity would come from 15 or 16 dams, some of which are already operating, some of which have been financed by the action of Con-

gress, and others that have been authorized but not financed, and still others embraced by the over-all plan but neither authorized nor financed.

The complete project

As presently plotted on an unofficial map, Bonneville comes first downstream, and is, of course, already operating, supplying power, and making the Columbia navigable from Portland to The Dalles. The Army Engineers have recommended the next dam to be built at The Dalles, which will make the river navigable to the mouth of the John Day River. The John Day dam will make the stream navigable to Arlington, where another dam is recommended to make navigation easy to the site of McNary dam. Congress has supplied funds to begin the construction of the McNary dam. It would be under way now if the President had not temporarily frozen the funds. There is no doubt the work will begin soon. This dam will make the Columbia navigable past the mouth of the Snake River, as far up stream as Lewiston, Idaho. Congress has authorized, but not provided funds, for 4 to 6 dams on the Snake River itself. The Rock Island dam, built by the Pacific Power and Light Co., is operating, with four 20,000 kw. generators. Beyond that point it is planned to build another dam at Rocky Reach, and then another at Chelan. The dam at Foster Creek has been authorized, and will be financed by Congress promptly. The dam farthest up the stream, Grand Coulee, is operating, with a potential of 1,944,000 kw. power, and ultimate water for 1,200,000 ac. of land.

Dams also are planned on the Willamette, in Oregon, as well as in the Flathead River in Montana, and on the Umatilla. They are all part of the grand program.

It is fascinating to discuss the overall outline with such engineers as Col. Theron D. Weaver, Division Engineer for the Army, with headquarters at Portland. These men make you see what is ahead is a development that will create a St. Lawrence of the West, a stream which will carry freight up to the very base of the Rockies, and bring from the rich areas of Oregon, Washington, Idaho and Montana the grains, minerals, ores, lumber, cement, fuel, vegetables, fruit, and other supplies, which may be distributed from the Portland docks, either as raw materials or as manufactured commodities, to all parts of the world. It is significant to the visitor that in 1944 the bulk cargo brought down the Columbia totaled 40,000 tons, while in 1945 this tonnage had jumped to 800,000.

There is little doubt this miracle work of the engineers will encounter opposition. All great fundamental movements must be accomplished against the rip tide of the status quo. On the other hand any great evolutionary development by the very irresistible quality of its natural inevitableness always wins through. This great program has the added force and impetus of the necessity that springs from the need for defense and offense.

Floyd Hagie, formerly manager of the National Reclamation Association, now is the driving force of the Seattle Chamber of Commerce. This community expects pulpwood production to start immediately in Alaska on a large scale, and it is presently working on the problem of supplying technical and nontechnical workers to Alaska for the $100,000,000 worth of installations to be made by the Army and Navy.

Bonneville power

Both in Seattle and Portland there was much interest in the effort of the Bonneville Power Administration to induce the President to permit the Administration to go ahead with its construction projects, despite the Steelman order. They claim there will be an acute power shortage if the work is interrupted. The BPA offers to reduce the program which involves a few feeder lines, suggesting the plan would postpone the spending of $2,500,000. Both the Bureau of the Budget and the Office of War Mobilization must pass on the appeal.

It is suggested in the Pacific Northwest that in Washington, D. C., the BPA constantly urges greater effort and more funds on the plea of an imminent power shortage, while elsewhere the BPA sends forth its sales force to persuade the industries of the country that water power is now going to waste in the stream, and that electricity is so bountiful in the Pacific Northwest it may be purchased sometimes at less than 2 mills per unit.

The published plan, sponsored by Bernard M. Baruch, suggesting an atomic energy plant to make electric power at a cost for operation only 26 per cent higher than a coal-burning plant, has not made much impression in the hydro-electric areas of the West. In this particular case the Department of Interior power folk say they are obedient servants of Congress, and that they will not initiate any atomic program, or change the present method of producing power by building multipurpose dams, until Congress decides the policy. The Baruch people apparently think the atomic power projects might be started very soon.

The freeze

The word also has come West that despite the freeze order no flood control projects will be held up so long as there is a remote prospect that human lives may be endangered. The general idea prevalent among Government people seems to be that almost all projects which involve power, and supply of water, must proceed "to insure that customers will receive prompt services in emergencies."

As one travels through the West the impression is unavoidable that often CPA is not very stringent in hampering industrial construction. But there seems to be rigid enforcement of the 27 per cent cut in the building of the structures which house new generators, and the erection of private utility hydroelectric plants. Line extensions, and other facilities, which do not involve building structures, are unmolested.

It is also apparent that few exemptions are given to utility employees who are drafted into the armed services. Only those who are absolutely essential to reconversion may be deferred. Any industry is eligible to claim essentiality. CPA is the agency which must approve the deferment of supervisory, technical, or scientific personnel; Selective Service Form 42A, to be obtained from local draft boards, must be filed in triplicate with CPA.

This reporter has found strikes everywhere, and has found that most strikes have small basis for being. The strike psychology is one of the most puzzling aspects of the present condition in American industry. In many instances those who are extremely well paid strike for reasons which have nothing to do with wages, comfort or privileges. In one such instance in the mid-west 10,000 workers had been on strike from very highly paid jobs for 20 weeks, chiefly, apparently, because the employer would not recognize the professional strike managers. It was demonstrable that most of the workers actually were out of sympathy with the strike leaders, but the workers feared to go back to their jobs against the counsel of these professionals.

Meanwhile this reporter also found that throughout the country bankers reported for the first time in five or six years many applications had been received for $200 and $300 personal loans; and credit managers say there has been a great increase in applications for credit privileges. It also was said by bankers and others that securities have been sold in increasing volume both by smaller holders and large holders. Moreover, everywhere, despite Government reports to the contrary, local associations reported that sales have fallen off since June, and continue to drop.

Scrap Shortage Causes Steel Production Drop

A SHARP DROP in the national steel production rate can be expected in a few weeks because the flow of scrap has fallen so seriously, according to the American Iron and Steel Institute.

Already steel production is being lost because of the acute shortage of iron and steel scrap, which has grown worse recently because certain normal sources of supply have been withholding scrap tonnages from the market following the expiration of OPA.

A number of open hearth furnaces over the nation cannot be put into operation because of the shortage of scrap, the report stated. Inventories of scrap at steel mills average only 10 to 14 days' supply at present and in some cases it is reported that certain plants have only 1 to 2 days' inventory.

Unless receipt of scrap improves quickly, the steel industry will be forced to take open hearth furnaces out of operation, with the result that for months to come, consumers may find it increasingly difficult to obtain steel. It is imperative that everyone help to start scrap flowing promptly.

Engineers Wanted In Alameda County

THE COUNTY of Alameda, California, is seeking qualified candidates for three positions: Building official, chief deputy building official and deputy building official.

They will be filled through a civil service examination to be held on Saturday, Nov. 2. Applications and information may be obtained from the Alameda County Civil Service Commission, Court House, Oakland, and must be filed or postmarked not later than Oct. 24, 1946.

The building official post will pay $450 per month, which will be increased to $483.33 Jan. 1, 1947; chief deputy, salary $375, $402 Jan. 1; and deputy, $310, $331 Jan. 1.

A civil engineer or architect with considerable building experience is desired for the building official and chief deputy posts. For the deputy position engineering or architectural training is not required but extensive building experience is a pre-requisite.

There is no residence requirement for admission to the examinations. Any qualified U. S. citizen is eligible to apply. The written examination will be held in Oakland and in as many other locations as the number of applicants justifies.

Positions are created for a new building inspection department whose job it will be to enforce the provisions of a building code recently adopted by the Board of Supervisors to cover the rapidly growing unincorporated area of Alameda County.

Provo River Contracts Wait Taxpayer Consent

NEW PROVO River project contracts which cost some $6,293,650 more than prewar estimates, will be submitted to Salt Lake City electors for approval sometime this fall.

The Bureau of Reclamation and the Secretary of the Interior have approved the new contracts for the aqueduct, which calls for an expenditure of $8,043,650 compared to a prewar $5,550,000, and the Deer Creek division, which costs $11,400,000 as against the prewar $7,600,000.

Taxpayers must approve the contracts before work starts on the project.

Metropolitan Water District officials, Hampton C. Godbe, executive secretary, and Fisher Harris, general counsel, stress that completion of the much-publicized Salt Lake Aqueduct is "necessary to realize on the tremendous investment that has been made already.

"If we quit now," Godbe said, "we'll have no aqueduct, no water and no money with which to pay for the project. But we expect that with project completion we shall receive such an enormous demand for water that the project will become self-supporting. We also have hopes of building up enough revenue to allow for improvements."

The district election may be held concurrent with the general election, with the proposition whether contracts as drawn are to be carried out being presented on a separate ballot, or an election apart from the fall political battle may be called in December.

District officials are: S. A. Kennedy, chairman; Blair Richardson, vice chairman; George W. Snyder, secretary-treasurer; D. A. Affleck, city commissioner of water works and water supply; and J. A. Nelson, comptroller.

Bids Advertised for Reservoir in Burbank

CONTRACTORS are invited to bid on the construction of a distribution water reservoir for the City of Burbank, Calif. Bids will be publicly opened Nov. 12.

The reservoir will be located near the foothills in the northeastern part of the city on land that was purchased for the purpose three years ago. It will be of rectangular reinforced concrete construction with concrete roof, covered with 20 in. of earth and having a capacity of 25,000,000 gal. to the spillway level. The reservoir will have an average depth of 26 ft. from floor to roof, and will be divided by a partial height division wall between the two halves. Roof is designed to be supported on concrete columns arranged in 20-ft. square bays.

The project was engineered by the Public Service Department, of which J. H. McCambridge is general manager.

Inquiries by prospective bidders should be addressed to City Manager H. K. Stites, Burbank, Calif. Copies of plans and specifications are available from him.

The project was planned before the war but postponed because of war restrictions and material shortages.

Kansas City Co-op Plans $16,000,000 Pipeline

PLANS FOR construction of an oil pipeline from the Permian Basin sector of southeastern New Mexico and West Texas, routed through North Texas producing areas, to Valley Center, Kans. are under consideration by Consumers Cooperative Assn., Kansas City, Mo.

The pipeline would cost an estimated $16,000,000. A firm to be known as Midway Pipeline Co. would be incorporated to handle the program. Stock would be subscribed by participants.

The trunk line would originate near the southeast corner of New Mexico with an extensive feeder system connecting with fields in Lea, Eddy and Chaves counties. Production in Eddy and Chaves counties now is restricted and subject to pipeline proration because local refineries and the single trunk line outlet are insufficient to handle the crude oil from those fields.

Senator Carl A. Hatch (N. Mex.), and U. S. Land Commissioner John E. Miles have approached CPA officials in Washington to impress upon them the importance of the project, and to obtain priorities for pipe for the project. Pipe and pumping station equipment may not be available until late in 1947.

Joining with the Kansas City cooperative are other independently owned and cooperative refineries in the Middle West with a combined capacity of 65,000 bbl. of crude oil daily.

Power Expansion in Oregon

THE FIRST of a 6-unit power expansion program will be started at Toketee Falls on the North Umpqua River some 80 mi. east of Roseburg, Ore., by the California Oregon Power Co., of Medford, Ore., as the result of its approval by the Federal Power Commission.

The expansion program, which calls for a total expenditure of $3,200,000, includes construction of a 25,000-kw. generating plant which will get its power from the river which drops 100 ft. a mile for 4 mi. above Toketee Falls.

Also planned is a transmission line extending from the project to the company's substation at Dixonville, a short distance from Medford.

OBITUARIES . . .

John Arrington, 70, widely-known Washington and Alaska construction engineer, died Sept. 17 in Seattle where he had lived since 1920. He built some of the State Capitol buildings at Olympia, and University of Washington buildings, including Anderson, Philosophy and Education halls. He also engineered the construction of Navy bases at Sand Point, in Seattle, and Sitka, Kodiak and Dutch Harbor in Alaska. He retired in 1943 when Seabees took over completion of his Alaska jobs where he represented the Navy as general manager of civilian construction of three naval bases.

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U. M. Kress, 64, engineer of water service for the Union Pacific R. R. at Denver, Colo., and one of the foremost railroad chemists in the country, died early in September. Entering the service of the railroad as assistant chemist in 1903, he later became a member of the research and standards staff which engineered the erection of the company's first water softener. Before moving to Denver, he was stationed at Columbus, Neb., and at Cheyenne, Wyo.

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Clarence A. Godfrey, 69, prominent Sacramento building contractor, and native of Virginia City, Nev., died Sept. 16 in Sacramento. He had been engaged in the contracting business with his brother, Charles E. Godfrey, until Charles' death 12 years ago.

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Robert Wesley Lamberton, for 19 years a member of the Bureau of Reclamation staff at Guernsey, Wyo., died in Scottsbluff, Neb., recently, after a lingering illness. He was 58 years of age.

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Fred W. Guttermann, civil engineer for the city of Los Angeles, Calif., died on September 12, at the age of 48.

PERSONALLY SPEAKING

Col. Edward H. Walter has assumed duties as district engineer at the U. S. Engineer Office, Fort Peck, Mont., succeeding **Lt. Col. H. H. Roberts.** Walter will be in charge of project planning and supervision of all army engineer activities in the Fort Peck District under the Missouri River development plan.

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Colonel Frank L. Beadle, executive officer of the Portland District, Army Engineers, in September was awarded the Oak-leaf Cluster to the Legion of Merit for his services as island engineer of Tinian, Marianas Islands, and later as chief of staff to the island commander and commanding general of Tinian's Army garrison force. At the same time, **John W. Miles,** now assistant to the chief of the engineering division of the Portland District, was awarded the bronze star for service as a lieutenant colonel with the construction division of the chief of engineers, European theater of operations. The awards were presented at a ceremony in the Portland District office by **Colonel O. E. Walsh,** district engineer.

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L. Deming Tilton, City Planning Director for San Francisco, Calif., has resigned from his position, effective Oct. 1. Tilton ended a long-standing controversy with members of the City Planning Commission over matters of policy by withdrawing from the post, and enters private practice as a consulting engineer. Tilton has served as director of planning for Santa Barbara, San Diego and Orange counties, and was regional director of the National Resources Planning Board when he accepted the San Francisco position.

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Lt. Col. Sam G. Neff, Cody, Wyo., was appointed chief of the construction division of the District Army Engineer Office, Denver. A graduate of University of Wyoming, he has had a variety of assignments with the engineer corps, starting with assignment on water research surveys of the Missouri River in 1928. In 1940 he was in charge of construction of airfields, army bases and fortifications in Newfoundland. Later, he was district engineer in Providence, R. I., and then in Kansas City.

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John J. Thomas has been appointed planning engineer for Alameda County, Calif. During the war he served as a lieutenant (j.g.) in the U.S.N.R. He was attached to the command of the Seventh Fleet and saw extensive service in the Southwest Pacific as a specialist in photo interpretation and photogrammetry. Before the war he was a member of the Michigan State Planning Commission. He is a member of the American Society of Planning Officials.

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Col. N. F. Jamison is now president of Transworld Management Corp., with offices at 1114 S. Hope St. in Los Angeles, while **Walter S. Parker** is secretary and treasurer. Both men were formerly with the Metropolitan Water District of Southern California. Jamison was the District's labor employment officer. Parker recently returned to the States after two years of personnel work with Bechtel-McCone and Bahrein Petroleum Co. in the Persian Gulf.

COL. EDWARD H. WALTER

Transworld Management will hire engineering, construction and office men for foreign and domestic projects of major construction firms.

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Fred H. Kennedy, supervisor of the Toiyabe National Forest, Reno, for the last three years, has been named assistant chief of range management and wild life division of the regional forest offices in Portland, Ore. He will be succeeded by **Clarence E. Favre,** now chief of range management and wild life division of regional offices in Ogden, Utah. Kennedy was assistant supervisor of Lewis and Clarke Forest, with headquarters in Great Falls, Mont., for many years. Favre has served as supervisor of Humboldt Forest, Elko, and Bridger National Forest at Kemmerer, Wyo.

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Recently granted certificates to practice professional engineering in Oregon are the following: **Neeland Ashla,** Portland; **Paul Page Austin,** San Francisco, Calif.; **Harry M. Dewey,** Portland; **Sigmund Ivarsson,** Seattle, Wash.; **George T. Koch,** Detroit, Mich.; **Paul R. Revis,** Burns; **Cecil H. Storms,** Richland, Wash.; **Harry J. Woebler,** Portland. The out-of-state applicants have been granted certificates on a reciprocity basis.

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Four veteran members of the Montana Highway Department have received merit awards for a minimum of 25 years of service from the American Assn. of State Highway Officials. They are: **P. G. Poore,** Helena, road location engineer and department employe for 25 years; **W. G. Keifner,** Helena, equipment engineer and employe for 26 years; District Engineer **Robert L. Ewing,** Wolf Point, 27-year veteran; and District Engineer **Myron C. Lockey,** Kalispell, 27-year employe.

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Emil C. Jensen, Seattle, succeeds **Roy M. Harris,** as chief of the public health engineering division, Washington State Department of Health. Harris resigned to enter public health work in Venezuela for Standard Oil. Jensen has been head of the department's sanitary engineering section for last 1½ years. He was previously district engineer for Spokane area for two years and for Yakima district for one year.

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Admiral Ben Moreell, Chief of the Bureau of Yards and Docks since 1937, has retired from active service in the Navy. He has accepted a position as president of The Turner Construction Co., New York. **J. Archer Turner,** president since 1941, becomes chairman of the board of the company, succeeding **Henry C. Turner,** founder of the company, who retires. Admiral Moreell was once Public Works officer at the Puget Sound Navy Yard in Washington.

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N. P. Neilson of Pueblo, Colo., was elected president of the Rocky Mountain Sewage Works Assn. at the annual convention of the association in Santa Fe, New Mex. in September. Other officers elected were: vice-president, **H. J. Watson** of Cheyenne, Wyo.; secretary, **C. H. Coberly** of Denver, Colo.; trustee, **Charles J. Caldwell** of Santa Fe.

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E. J. Maupin, Jr., Fallon, Nev., contractor, was elected president of Western Chapters Conference of Associated General Contractors of America, at their meeting in Phoenix, Ariz., in September. **Arthur L. Atherton** of Seattle, Wash., was named vice-president. **Charles L. Hill,** secretary-manager of the Nevada chapter, was named secretary of the Western division. Hill and **C. V. Isbell,** Reno, were Nevada delegates to the session.

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Walter L. Dickey, chief engineer of the San Francisco, Calif., contracting firm of Erbentraut & Summers, has resigned to locate with **Myron C. Gould,** industrial engineer of San Francisco. Dickey, who served in the Civil Engineer Corps with the rank of Commander during the war, was in charge of construction at the naval drydocks built at Hunters Point, San Francisco.

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Norman J. Hatch, employee of the State Highway Department in Helena, Mont., for the past 17 years, left the middle of September for Fairbanks, Alaska, where he will be in the employ of a private construction company. Hatch held the position of maintenance office manager for the highway department at the time of his resignation.

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A. P. Gumlick, veteran member of Denver Board of Water Commissioners, was re-elected president at the board's annual meeting, late in August. Others re-elected were **George F. Hughes,** secretary, and **John Burgess,** assistant secretary.

Elected to new posts were **Karl C. Brauns,** first vice president, and **George R. Morrison,** second vice president.

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J. B. Franzini, a member of the American Society of Civil Engineers in Los Angeles, Calif., is moving to the northern part of the state where he will be connected with the Civil Engineering Department of Stanford University. Before entering the Navy, where he served as a lieutenant for two years, Franzini was an instructor at the California Institute of Technology in Pasadena.

Fred O. Jones, chief geologist for the Bureau of Reclamation's Columbia Basin Project, left Coulee Dam, Wash., on Sept. 10th for China, where he will supervise geological investigations for the Chinese Government for its giant Yangtze Gorge dam, 1,000 mi. up the Yangtze river, near Ichang. Jones has been with the Bureau for the past six years, and expects to stay in China for at least two years. His successor at Coulee Dam has not yet been named.

Idaho contractors, Moody & Davis, composed of **George Moody** and **Elwood Davis,** have just completed the movement of 20,000 sq. ft. of buildings from the Coos Bay, Ore., shipyards, to the new Idaho Steel Products Co. plant in Boise, Ida. Design and engineering for the moving job was furnished by Engineer Services of Boise, a new firm owned by **John L. Hoffman** and **William D. Alexander.**

Clarence Burch, Oklahoma Department of Natural Resources, has been appointed Chairman of the Oklahoma Planning and Resources Board to replace **Don McBride,** who resigned August 1st to become Secretary-Manager of the National Reclamation Association. Burch was formerly Mcbride's chief assistant.

Munson White Dowd has joined the staff of the Metropolitan Water District of Southern California as assistant engineer in the Hydrographic Division. He has done engineering work in both the U. S. Indian Service and the Bureau of Reclamation, and is a graduate of California Institute of Technology. His father, **J. M. Dowd,** is chief engineer of the Imperial Irrigation District.

Ralph S. Bristol has been appointed regional supervisor of operation and maintenance for projects of the Bureau of Reclamation in New Mexico, Oklahoma and Texas, as well as parts of Colorado and Kansas. Recently he had been assistant chief of the Bureau of the Budget field service at Denver, Colo.

B. C. McDonald has been elected president of the newly organized Los Angeles Chapter of the American Society of Safety Engineers, a division of the engineering section of the National Safety Council. Other officers are: Ernest Ditcher, vice-pres.; **Walter Smith,** secretary, and **F. C. Lynch,** treas. Elected to executive committee were **T. F. Halpin, Charles Sherrard** and **Elmer Juckett. Ed S. LaBart** was named chairman of public relations committee.

Carl H. Kadie, Jr., until recently a lieutenant commander with the Navy's construction forces in the Caribbean theater, has been named District Engineer in charge of the newly-created Delta District of the Central Valley Project in California. The Delta District is the fifth such area organization set up in Region II of the Bureau of Reclamation.

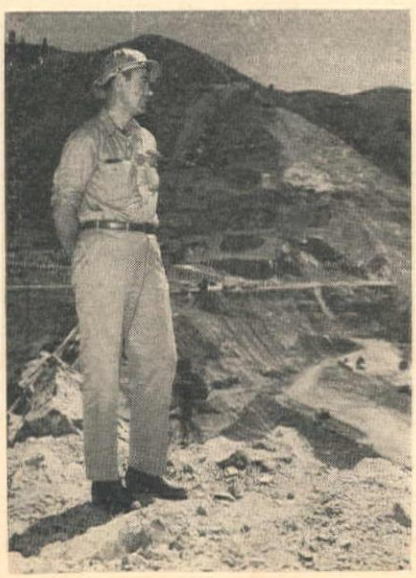
Donald S. Walter was recently appointed construction engineer for the Bureau of Reclamation at Anderson Ranch Dam in southwestern Idaho, the highest earth-fill dam in the world. It is about 84 per cent complete. Walter has previously held positions of responsibility at Boulder, Friant and Grand Coulee dams. He is the son of the late **R. F. Walter,** former chief engineer for the Bureau.

SIX FORMER San Francisco District Engineer commissioned officers are presented the Army Commendation Ribbon by COL. GEORGE MAYO, CE, San Francisco District Engineer (extreme right). Left to right, RAYMOND E. HOYT, WILLIAM B. WRIGHT, GEORGE R. HIMMELMAN and LEO F. MULLEN, all former lieutenant colonels, and PAUL L. VREDENBURG and GRANT L. MINER, former majors. All "demonstrated leadership, efficiency and initiative," while in the service.

Lt. Col. Robert E. Snetzer, Omaha, Neb., was made Executive Officer and Operations Officer, Seattle District, U. S. Army Engineers, during September. Col. Snetzer was called to active duty in 1940 and served throughout the war, receiving the Purple Heart, the Bronze Star, as well as the Croix de Guerre awarded by the French government for services in the liberation of France. He received his discharge last March from the Army of the United States and was appointed to the Regular Army on July 1.

Champ C. Magruder is now instructor in the department of mechanical engineering at New Mexico College of A. & M. A., Las Cruces, New Mex. He has classes in the theory of applied mechanics, engineering drawing, manufacturing processes and thermodynamics. Engineering enrollment at the University of New Mexico now approximates 400.

DONALD S. WALTER



Scott P. Hart has been appointed materials engineer for the Montana State Highway Department, an appointment he had previously received in 1941 just before he was called to active military duty. Since 1923, Hart served as highway district engineer, maintenance engineer and materials engineer. As surfacing and maintenance are to have first attention in road improvement plans, his new post is one of utmost importance.

F. H. Marvin, Tacoma, was seated as the new president at the Pacific Coast Association of Port Authorities convention in Long Beach late in August. **Thomas Coakley,** San Francisco, and **J. A. Earley,** Seattle, were named vice-presidents. **F. W. G. Sergant,** Vancouver, B. C., was elected secretary-treasurer.

A Utah chapter of the National Electric Construction Assn. has been organized. **A. N. Sisam,** A. N. Sisam Electrical Service Co., is president; **A. M. Strand,** Strand Electrical Service, treasurer; **Fred C. Wolters,** Wolters Electric Co., and **M. E. Dansie,** M. E. Dansie Electric Co., directors.

B. Loyal Smith has been named county engineer at Walla Walla, Wash., succeeding **Nelson M. Collier,** resigned. Smith is a structural engineer in the Portland District Office of the Army Engineers. Previously he had served as a deputy in the county engineer's office and also in the city engineer's office.

C. A. Davidson, as conservationist of the U. S. Forest Service, Berkeley, Calif., is doing advance planning for the Department of Agriculture on flood control surveys in the Pacific Coast states.

Joseph Monroe has been appointed airport engineer for the State of Colorado. He had been airport inspector for the Civil

Aeronautics Administration at Denver. In his new position, he will be adviser to small communities on problems of airport construction.

* * *

Phil Roberts, veteran construction man of Boise, Idaho, has been named to the post of city building inspector, succeeding **J. Ray Shoop.** Shoop tendered his resignation a year ago, but continued in office until Roberts' recent appointment.

* * *

R. C. Briggs, after serving for a year as technical adviser to the Venezuelan government, has returned to his former position of hydraulic engineer in the San Francisco, Calif., office, U. S. Geological Survey.

* * *

Arthur E. May, Jr., has been named city engineer of Bend, Ore., to fill the vacancy created by the resignation of **Jack Taber,** who becomes assistant manager of the Bend Chamber of Commerce.

* * *

James A. Marsh, consulting engineer of Salt Lake City, Utah, has been appointed chief geologist of the Union Pacific Railroad Co. His territory will extend from Omaha, Neb. to the Pacific Coast, and he will make his headquarters at Los Angeles, Calif.

* * *

John J. Downey, Silver Springs, Md., has been appointed hydraulic engineer for the Washington Suburban Sanitary Commission at Hyattsville, Md. He has charge of future water supply studies, surveys and borings of the commission.

* * *

Weller Probasco is the new city engineer of Newberg, Ore., and will have supervision of the water, street and sanitary departments. He is a former resident of Salem.

* * *

E. W. Lane was recently appointed hydraulic consulting engineer with the Bureau of Reclamation in Denver, Colo. Lane had previously been with the Bureau from 1929 to 1935, and at one time was professor of hydraulic engineering at the University of Iowa, and had been engaged by private engineer firms and governmental agencies.

E. W. LANE

MAJOR GENERAL PHILIP B. FLEMING, Federal Works Administrator, (left), presents Medal of Merit to THOMAS H. MacDONALD, Commissioner of Public Roads Administration, for outstanding services during the war.

Harry P. Rees has been named city building inspector of San Clemente, Calif., succeeding **E. R. Bartlett.**

Carl M. Hoskinson was recently promoted to the position of superintendent of the Sacramento, Calif., city water department. He had been chief engineer for the department for 22 years, and his new appointment combines the duties of superintendent and chief engineer.

* * *

Frank Knapp, formerly with the Soil Conservation Service at Albuquerque, New Mex., now heads up the Engineering Water Rights Section of the U. S. Bureau of Reclamation.

* * *

Sidney F. Bamberger and **John Lyon Reid** have opened an office at 110 Market Street, San Francisco, Calif., for the practice of architecture and engineering.

* * *

Col. Leroy Bartlett has become commanding officer of the 12th Engineers at Fort Lewis, Wash. He succeeds **Col. Lloyd A. Cross.**

* * *

Johannessen & Girand, engineers, have announced the removal of their offices to the fourth floor, First National Bank Bldg., Phoenix, Ariz.

SUPERVISING THE JOBS

W. R. Larsen is general superintendent for Carson Construction Company, Great Falls, which is erecting the Federal Public Housing Authority project there. Assistant general superintendent is **V. F. Coryell. Coleman Mulligan** is resident engineer and **Albert Weems** is inspector. **Cody Coryell, Walter Benema,** and **Lloyd Mohn** are carpenter foremen; **George Meek** is equipment foreman; **Robert Milne,** rigger foreman, and **Herman Haines,** laboratory foreman. **D. P. Lynch** is office manager. The project which started in July will probably be completed by the last of November. Some 150 units are being erected by the Carson concern.

* * *

George A. Nugent is general superintendent for Peter Kiewitt & Sons who is doing the construction work on the Dayton-Kane Road in Sheridan County, Wyo. The project is being built for the Bureau of Public Roads. **Fred Lowell** is general bridge superintendent; **Edward Temple** is general highway superintendent. Others on the job are **Buford E. Irion,** project engineer; **Glen Roberts,** resident engineer. Foremen are **R. H. Duncan,** grade foreman; **E. L. Pearson,** bridge foreman; **Duval Miller,** laboratory foreman; and **Ernie Shireman,** grade foreman at night. **Rex Moss** is office manager.

* * *

W. F. Spilker is project manager for R. L. Bair Co. of Spokane, Wash., on the building of a medical center building costing $750,000 in Spokane. **Walt Halin** is general superintendent, with **Rod McInnis** and **Art Brown** in foreman positions. **Jack R. Wyatt** is an equipment operator on the job. Office manager is **H. D. Johnson.** Among the subcontractors are Sparling-Smith Steel Co., **M. A. McCart,** foreman; James Smyth, plumbing; and Power City Electric Co., electrical.

* * *

H. Vistendahl is engineer in charge of the new $135,000 fish cannery being built at San Diego for the Peoples Fish Enterprise Company. F. E. Young & Co. are general contractors on the job. Electrical outlay plans are being drafted by California Electrical Works under direction of **E. Bruce Love,** San Diego electrical engineer. The building, which is now nearly 75 per cent complete is the first reinforced concrete structure in this field to be built on the West Coast.

* * *

Doug Pravitz, pre-war superintendent for J. E. Haddock, Ltd., on construction at Vancouver, Wash., is now superintendent for Dan J. Malarkey, general construction contractor of Portland, Ore., who holds contracts on the Redmond and Madras veteran housing projects in Oregon. Prior to joining the Navy as a Sea Bee, Pravitz was project manager on portable dwelling and school building construction in southern California.

* * *

Vern Johnson, project manager, **Ray A. Crosman,** general superintendent, and **Edgar Bryan,** steel foreman, are at work on the reinforced concrete office building being erected at E. Boone & Ruby Sts. in Spokane, Wash. for W. P. Fuller Co. Busboom and Rauh, with head office in Salina, Kansas, holds the contract. Spokane Steel & Supply Co. of Spokane is subcontractor and **R. L. Young** is superintendent for this firm.

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THE MEN who are directing construction of Byron Jackson's new pump plant at Vernon, Calif., are left to right: LES HICKMAN, timekeeper; PAUL HARDY, payroll clerk; LUTHER M. HILL, superintendent; BILL PARR, general foreman; FRED JENSEN, carpenter foreman; ARDELL LETCHER, surveyor; DALE DEARMIN, labor foreman; AL DOWNING, steel foreman; and JACK COLBERT, material checker.

At the power plant which is being erected 4½ mi. west of Cody, Wyo., by the Bureau of Reclamation, **L. D. Bekker** is general superintendent and **W. J. Franklin** is project manager for Samuel & Franklin-Gibbons & Reed Co., which has the $366,399 contract. **W. H. Brinton** is job engineer; **A. L. Paul**, steel foreman; **A. L. Nelson**, excavation foreman; **H. B. Hamilton**, carpenter; and **R. W. Hawkins**, office manager. The job which started the last of August will not be completed until late in October, 1947.

* * *

Charles Keiffer is general superintendent for the Gus J. Bouten Construction Co. job at 2018 No. Monroe St., Spokane, Wash., where the company is constructing a garage and sales room for Fred Jaremko. **E. A. Morse** is carpenter foreman.

* * *

Jack Skei has the job of superintending erection of San Francisco's first multiple-story steel frame "skyscraper" since the war. The building is being erected for the Matson Co. on Main Street between Market and Mission Streets. Swinerton & Walberg are general contractors. Bethlehem Pacific Coast Steel Corp. is fabricating the 800 tons of structural steel required by the job. **Leland S. Rosener**, engineer, designed the structural steel frame.

* * *

Men supervising the job of building the access road to Hungry Horse Dam, Hungry Horse, Mont., for the Bureau of Reclamation, are General Superintendent **Les Smith**, Project Manager **Harry Anderson**, Resident Engineer **John Officer** and General Foreman **Bill Sorsen**. Birch-McLaughlin and C & F Trucking Co. are contractors. Work started Sept. 1, but will not be completed until September of 1947.

* * *

Axel Malmstrom is employed as general superintendent on the bridge over Steffan's Creek in Kosmos, Wash. Contract was let by the State of Washington to Rumsey & Co., Seattle. Malmstrom is being aided by the following foremen: carpenter, **George Anderson** and **Fred Michel**; concrete, **R. L. Peterson**.

* * *

R. D. "Buck" Buckingham is general superintendent and **Kenneth Lawrence**, resident engineer, for the Union Construction Co., which is constructing the E. Shore Road, Flathead Lake, Polson, Mont. **Clarence Handy** is grade foreman and **Tony Wells** is mechanic. **George T. Rogers**, **Bob Tolman**, **Cecil A. Green**, **Wendell Fredricks**, **Louis Johnson**, **William Cato**, **Marvin L. Wolff** and **Harry E. Elam** are operators. **Paul Stephan** is powderman.

* * *

W. L. Richards is general superintendent for Gus J. Bouten Construction Co., which has the contract to erect a 50 x 142-ft. store building and warehouse for Inland Electric Co., Spokane, Wash. Building is a 2-story structure with full basement.

* * *

Fred Lowell is general superintendent for Peter Kiewit Sons' Co., who are building the overpass at Ranchester, Wyo., for the Public Roads Administration. **Fred Shores** is his assistant, and **Ivan Christensen** is student superintendent.

* * *

Chiro Delich, assisted by **Bob Delich**, drilling foreman, **Bob Lukin** and **M. P. Elich**, grading foremen, is working on the highway construction from Randall to Yakima in Washington. Also among the personnel on this job are equipment operators **Ed Hamilton** and **Scotty Mullins**. **R. P. Mason** is office manager. This contract was awarded by the Federal Public Roads Administration to Lucich & Co. of Seattle.

* * *

G. J. "Pat" Patterson is general superintendent for Montana Engineering & Construction Co., Helena, Mont., which is erecting a townsite housing project for the Bureau of Reclamation at Hungry Horse, Mont. The project is composed of 25 units, 50 dwellings and double garages, and will cost $280,000. It was started June 1, and is expected to be finished by January 1. Work on the dam itself will not start until June, 1947.

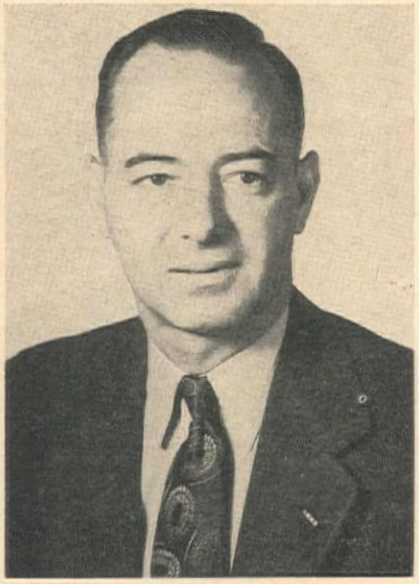
* * *

C. R. Irwin is general superintendent and **Grant Hahn**, project manager, for the 78

PLAYING IMPORTANT ROLES in the construction of a pumping plant for the Bureau of Reclamation's 5,397-ac. Pasco unit of the Columbia Basin Irrigation Project of south-central Washington are, left to right, J. D. HANFORD, inspector for the Bureau; W. S. TILSON and V. A. KELLY, foremen for the James Construction Company of Seattle, Washington, contractor for the $188,547 pumping plant.

dwellings which their firm, Hahn & Irwin, are building in Spokane this year. Some 53 homes costing between $6,000 to $10,000, each are under construction. Carpenter foremen are **R. K. Leonard, Jack Sundberg** and **O. D. Hire.** The firm says that seven of every 10 men working for them are war veterans.

* * *



ROBERT C. SMITH will serve as labor relations official for Bureau of Reclamation in the West Coast States. He will have headquarters in Sacramento, Calif.

* * *

O. C. Steves is general superintendent for Connolly-Case-Kiewit, contractors, who have the 'on the rock contract" at the Santa Catalina Island quarries for the Long Beach breakwater. **Tony Ferlet** is day superintendent; **G. W. Newberry,** night superintendent, and **Carl Gustafson,** powder superintendent. **Mike C. Kelly** is master mechanic and **F. L. Koehler,** office manager.

* * *

Frank Bolin is general superintendent and **Don B. DeVore** project engineer for the overpass at Gore Hill, Great Falls, Mont. Dudley Construction Co. is the contractor, and project is being built for the Montana State Highway Department. The 174-ft. steel and concrete overpass on the Great Falls-Helena Road, will cost $54,800.

* * *

Otis Williams & Co. has the contract for building the $124,392 Alkali Creek drain and two storm drains at Cody, Wyo., for the Bureau of Reclamation. **Otis Williams** is general superintendent, **Earl McGary** is general foreman, and **Kenneth Vaughan** is office manager. The job started the middle of June but will probably not be completed until January of 1947.

* * *

In addition to personnel already mentioned at work on the Civic Stadium, Seattle, are **J. A. "Jerry" Moore,** resident engineer for Puget Sound Bridge & Dredging Co., the contractor; **J. B. French,** project manager; **Carl G. Anderson,** general superintendent; **W. R. Seymour,** carpenter superintendent; **Charles T. Norris** and **L. A. Zeman,** both foremen carpenters; **A. W. Diemert,** laboratory foreman; **Ralph Randall,** engineering assistant. Other key men are **W. E. Lehman,** job accountant; **E. D.**

Devener, purchasing agent; **A. E. Busse**, paymaster. **Jack Raymond** is stenographer; **Robert Mundt** and **R. A. Kenworthy**, sawmen.

* * *

R. E. Buckingham is general superintendent and **D. W. Buckingham** and **Clarence Anderson** plant foremen for E. C. Powell, Great Falls, Mont., contractor, who has the job of hauling 40,000 tons of rock for surfacing a 2½-mi. stretch of highway at Whitehall, Mont. The project is being built for the State Highway Department.

* * *

J. J. "Jack" Charlton and **Eric Plath** are general superintendent and project manager, respectively, for Gus T. Bouten on the erection of a box factory at 2nd and Spokane Sts., in Spokane, Wash., for Anslie Bros. Construction is of steel and concrete. Foremen on the job are: carpenter, **Bill Perry**; labor, **Paul Stansburry**; steel, **Kenney Webster**; and brick, **Tommy Gow.**

* * *

Alfred Jensen is general superintendent of surfacing being done east of Whitehall, Mont. for the State Highway Department. Alfred Jensen & Son have the truck contract. **Melvin** and **Raymond Jensen** are truck operators. The job will last about six months.

* * *

Frank E. Romig is general superintendent for G. H. Moen on the erection of a power plant in Naches, Wash., for the Pacific Power & Light Co. Key men on the job are: steel foreman, **William Sissom**; labor foremen, **Joe Evans** and **Don Lamb. Earl Eby** is resident engineer at the site.

* * *

Gerald Hallenback, Whitefish, Mont., is inspector of general construction on the highway to the Hungry Horse Dam which is being erected by the U. S. Bureau of Reclamation in Montana. He is also concrete engineer on the project. Hallenback has worked on many Western construction jobs. He was inspector of general construction for the Bureau of Reclamation at Shasta Dam, Calif., foreman of general construction and supervisor for the U. S. Engineers at Fort Peck, Mont., for six years; and also worked for the War Department on the Black Hills Ordnance Depot.

* * *

H. Bergendahl is general superintendent for Dudley Construction Co. on its job of constructing a steel warehouse and office building for the Bureau of Reclamation at Hungry Horse, Mont. Warehouse will be equipped with a traveling crane 70 x 380 ft.

* * *

Ed Ranniger is general superintendent on the paving of 18 blocks of streets and four tennis courts for the city of Cheney, Wash., and the Cheney School District. This contract was awarded to the Inland Asphalt Co. of Spokane at $28,000.

* * *

Richard A. Coppage is a dragline operator at Castle Rock, Wash., where 7 mi. of logging road are under construction.

UNIT BID SUMMARY

Dam . . .

Washington—Grant County—Bur. of Reclam.—Earthfill

J. A. Terteling and Sons, Inc., Boise, Ida., submitted the low bid of $1,770,592 to the Bureau of Reclamation, Coulee Dam, Wash., for construction of Long Lake dam and appurtenant structures about 2½ mi. northeast of Stratford. The principal features involved are an earth dam across the Long Lake basin, an outlet works through the left abutment of the dam and an open channel spillway around the left abutment of the dam. The dam will be about 1,900 ft. long at the crest and will have a maximum height of about 111 ft. above the stream bed. The main body of the dam will consist of a moistened and rolled embankment of clay, sand, and gravel with outer sections of sluiced sand, gravel, and cobbled fill. The upstream and downstream slopes will be covered with rock fills. A concrete cutoff wall with footing extending into bedrock will be constructed in a cutoff trench extending the full length of the foundation of the dam. An open channel about 550 ft. in length with a maximum cut of about 60 ft. will be excavated in rock around the left abutment to provide an uncontrolled emergency spillway. The outlet works will consist of an open cut inlet channel, a trashrack structure and transition, a concrete lined tunnel 7½ ft. in diameter, a gate chamber located near the axis of the dam in the outlet tunnel, a vertical concrete lined access shaft 6 ft. in diameter with a steel shaft cover, and an open cut outlet channel. The discharge through the outlet works will be controlled by a 4x4-ft. pressure slide gate. Bids were received as follows:

(1) J. A. Terteling & Sons, Inc. $1,770,592
(2) Utah Construction Co., and Winston Brothers Co. 1,775,657
(3) Morrison-Knudsen Co., Inc. 1,867,155
(4) McLaughlin, Inc. $1,904,045
(5) N. Fiorito Co. 1,971,110
(6) W. E. Kier Co., Guy F. Atkinson Co., & Bressi & Bevanda Constructors 2,074,740

		(1)	(2)	(3)	(4)	(5)	(6)
90,000	cu. yd. excav., strip. borrow	.28	.40	.25	.40	.30	.30
195,000	cu. yd. excav., all cl., in emerg. spillway ch.	1.15	1.375	1.00	1.50	1.25	1.50
140,000	cu. yd. excav., all cl., for dam found.	.95	.885	1.50	1.50	.75	.80
1,300	cu. yd. excav., all cl., for ftg. of emb. cutoff wall and spillway grade wall	14.60	31.60	15.00	12.00	25.00	20.00
9,000	cu. yd. excav., com., open cut for outlet	.70	.71	.75	.60	.80	.75
3,000	cu. yd. excav., rock, open cut for outlet	1.20	2.20	2.90	2.50	.80	2.50
2,500	cu. yd. excav., all cl., tunnel and shaft	32.00	34.75	30.00	17.00	26.00	20.00
12,000	lb. furn. and place steel-tunnel liner pl.	.15	.35	.25	.20	.25	.40
30,000	cu. yd. load and haul mtl. from canal excav.	.47	.45	.70	.60	.45	.50
270,000	cu. yd. excav., com., in bor. pit 1, & tr. to dam emb.	.47	.47	.45	.40	.45	.50
560,000	cu. yd. excav., com., in bor. pit 2, & tr. to dam emb.	.47	.455	.50	.44	.45	.50
365,000	cu. yd. excav., com., in bor. pit 3, & tr. to dam emb.	.47	.43	.55	.44	.45	.50
165,000	cu. yd. excav., com., in bor. pit 4, & tr. to dam emp.	.60	.65	.75	.70	.70	.70
900,000	cu. yd. earth fill in emb.	.21	.225	.225	.25	.40	.41
350,000	cu. yd. sluiced sand, gravel, and cobble fill	.21	.12	.20	.25	.40	.41
5,000	cu. yd. tamp or puddle earthfill	3.65	2.40	3.00	5.00	1.50	3.50
230,000	cu. yd. rock fill in emb.	.21	.19	.25	.20	.25	.26
1,000	lin. ft. constr. 8-in. drain w. uncem. jts. emb. in gr.	3.00	3.15	1.50	1.50	2.00	1.50
300	lin. ft. constr. 12-in. drain w. uncem jts. emb. in gr.	3.65	3.90	2.00	2.00	2.50	1.75
360	lin. ft. drill weepholes	1.45	1.20	2.00	4.00	2.00	2.50
4,000	lin. ft. drill gr. holes betw. 0 and 35 ft.	2.95	2.75	2.50	3.00	2.75	2.00
3,000	lin. ft. drill gr. holes betw. 35 and 60 ft.	2.95	2.75	3.00	3.00	2.75	2.50
1,000	lin. ft. drill gr. holes betw. 60 and 110 ft.	3.65	2.75	3.50	3.00	3.50	3.00
3,000	lin. ft. drill gr. holes with perc. drill	1.45	1.45	1.00	2.00	1.00	1.75
6,000	lb. place gr. pipe and fit.	1.10	.30	.30	.40	.30	.30
8,000	cu. ft. pressure grout	2.20	2.60	2.50	3.00	3.00	1.50
4,000	cu. ft. pressure grout with packers	2.90	3.20	2.50	3.50	3.50	1.50
9,000	bbl. furn. and hand. cement	5.20	4.65	4.00	3.40	4.00	3.50
1,200	cu. yd. conc. in footing of emb. cut off wall	29.00	15.80	15.00	25.00	25.00	21.00
750	cu. yd. conc. in emb. cutoff wall, exc. ftg.	51.00	39.50	40.00	38.00	40.00	40.00
150	cu. yd. conc. in spillway grade wall	29.00	23.70	20.00	25.00	25.00	20.00
850	cu. yd. conc. in tunnel lining	44.00	45.80	50.00	48.00	40.00	45.00
175	cu. yd. conc. in shaft and gate-chamber	51.00	66.00	70.00	60.00	90.00	75.00
75	cu. yd. conc. in trashrack str. and transition	73.00	63.20	70.00	60.00	50.00	70.00
300	cu. yd. conc. in curb walls on emb.	44.00	47.40	50.00	42.00	40.00	65.00
116,000	lb. place reinf. bars	.04	.04	.05	.05	.07	.04
40,000	lb. install high pres. gate and cond. ftg.	.07	.085	.10	.20	.20	.20
3,300	lb. install high pres. gate control piping	.75	.60	.25	.65	.20	.50
11,000	lb. install trashrack metalwork	.13	.095	.08	.50	.15	.10
5,400	lb. install misc. metalwork	.75	.35	.20	.65	.15	.50

Bridge and Grade Separation . . .

California—Placer & Eldorado Counties—State—Steel Girder

H. W. Ruby, Sacramento, submitted the low bid of $249,627 to the California Division of Highways, Sacramento, for construction of a structural steel girder bridge across the North Fork of the American River about 2 mi. east of Auburn. Bids were received as follows:

(1) H. W. Ruby $249,627
(2) Henry J. Oser & Joe Garrick & Co. ... 254,541
(3) Lord & Bishop $269,872
(4) Fredrickson & Watson Construction Co. 318,348

		(1)	(2)	(3)	(4)
Lump sum,	clearing and grubbing	$5,000	500.00	115.00	900.00
11,400	cu. yd. roadway excavation	1.25	1.00	1.00	1.75
400	cu. yd. stripping	5.50	2.00	3.00	4.50
470	cu. yd. struc. exc., Type A	5.50	5.00	30.00	36.00
1,500	cu. yd. struc. exc., Type B	5.50	2.00	7.50	4.50
500	cu. yd. struc. backfill	2.00	4.00	2.00	2.50
Lump sum,	dev. water supply and furn. water equip.	$2,500	$1,500	100.00	$1,100
180	M. gal. applying water	3.00	2.00	3.00	3.60
Lump sum,	finishing roadway	300.00	400.00	550.00	$1,200
1,700	cu. yd. gravel base	2.30	3.00	4.00	4.25
3	ton asphaltic emulsion (seal coat)	50.00	40.00	30.00	42.00
29	ton screenings (seal coat)	7.00	7.00	5.00	10.00
26	ton liquid asphalt SC-3 or SC-4 (B.S.T.)	35.00	40.00	22.00	36.00
4,000	sq. yd. prep., mixing and shaping surf. (B.S.T.)	.25	.15	.20	.50
110	cu. yd. Class "A" P.C.C. (footing blocks)	25.00	20.00	20.00	48.00
1,105	cu. yd. Class "A" P.C.C. (structures)	40.00	48.00	55.00	66.00
780,000	lbs. structural steel	.16	.17	.16	.182
5,500	lbs. cast steel	.35	.33	.50	.475
500	cu. yd. rubble masonry	23.00	30.00	25.00	20.00
140	lin. ft. masonry parapet	5.00	5.00	6.00	4.00

(Continued on next page)

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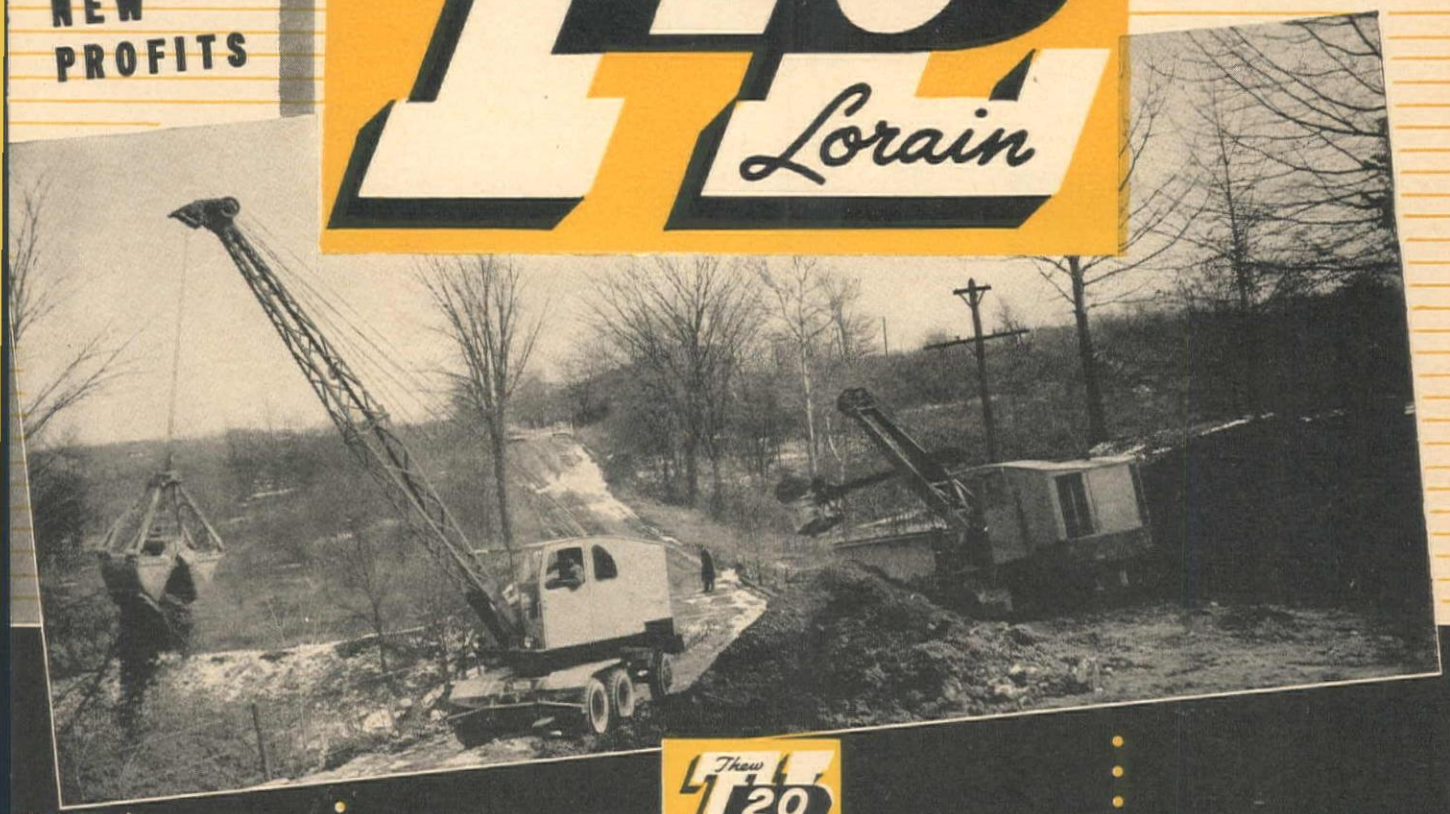

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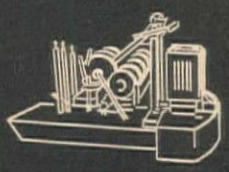

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The Tractor & Equipment Co., Sidney, Montana
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Wortham Machinery Co., Cheyenne, Wyoming
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THE THEW SHOVEL COMPANY . . . . . LORAIN, OHIO

33 ea. monuments	7.50	5.00	6.00	5.75
200 lin. ft. moving and reconstructing guard railing	3.00	1.50	2.00	3.00
75 lin. ft. pipe handrail	4.00	2.50	3.00	5.00
20 ea. culvert markers and guide posts	4.00	5.00	4.00	5.00
216 lin. ft. 18-in. C.M.P. (16 gauge)	2.70	3.00	3.00	3.00
24 lin. ft. 36-in. C.M.P. (12 gauge)	8.00	7.50	8.00	8.00
231 lin. ft. salvaging exist. pipe culverts	1.00	2.00	2.00	1.80
50 lin. ft. relaying salvaged C.M.P.	1.00	2.00	2.00	1.80
113,000 lb. bar reinf. steel	.09	.09	.08	.10
Lump sum, removing existing bridge	$3,500	$3,500	$5,000	$7,000
Lump sum, misc. items of work	$5,000	$4,000	$1,000	$3,000

Oregon—Polk County—State—Conc. and Steel

Philpott & Buckingham, Portland, submitted the low bid of $38,960 to the Oregon State Highway Department, Salem, for the construction of Mill Creek bridge on the Dallas-Coast highway. Bids were received as follows:

(1) Archie R. Averill $39,895
(2) Philpott & Buckingham 38,960
(3) C. W. Manning $43,770

	(1)	(2)	(3)
All Req., removal of old bridge and provision for traffic	$7,900	$8,500	$8,000
All Req., shoring, cribbing, etc.	900.00	300.00	$1,000
80 cu. yd. structural excavation	5.00	6.00	6.00
10 cu. yd. struc. excav. below elev. shown	15.00	10.00	20.00
290 cu. yd. Class A concrete	48.00	48.00	54.00
64,000 lb. metal reinforcement	.08	.08	.09
51,000 lb. structural steel	.155	.14	.17
400 lin. ft. metal handrail	9.00	8.50	10.00

Washington—Stevens County—State—Conc. and Steel

MacRae Bros., Seattle, submitted the sole bid and were awarded the contract by the Washington Department of Highways, Olympia, for construction of an overcrossing of the Great Northern Railway at Northport and a bridge over the Columbia River, also at Northport. Bid was received as follows:

OVERCROSSING (F.A.S. No. SG-192(4))	
180 cu. yd. structure excavation	10.00
288 cu. yd. concrete Class A in place	40.00
50 cu. yd. concrete Class F in place	40.00
88,000 lb. steel reinf. bars in place	.08
271 lin. ft. reinf. conc. br. rail. in place	7.00
2 only, bridge drains compl. in place	70.00
BRIDGES, PIERS & APPROACHES (F.A.S. No. S-192(3))	
200 cu. yd. solid rock excav. incl. haul	24.00
250 cu. yd. special excav. incl. haul	5.00
5,700 cu. yd. structure excavation	22.50
1,120 cu. yd. concrete Class A in place	40.00
3,160 cu. yd. concrete Class F in place	40.00
65 cu. yd. concrete Class G in place	40.00
2,360 cu. yd. concrete Class H in place	40.00
439,000 lb. steel reinf. bars in place	.08
16,500 lb. structural steel in place	.25
508 lin. ft. steel bridge railing in place	10.00
4 only, bridge drains, complete in place	70.00

Utah—Emery and Grand Counties—State—Conc. Piers

F. R. Knowlton, Layton, Utah, submitted the low bid of $102,509 to the State Road Commission of Utah, Salt Lake City, for construction of the substructure for a concrete and steel bridge over the Green River near the town of Green River. The State will supply the cement. Bids were received as follows:

(1) F. R. Knowlton $102,509
(2) Victor Newman 117,915
(3) Engineers' estimate $92,234

	(1)	(2)	(3)
1,814 cu. yd. excavation for structures "wet"	24.00	22.50	15.00
1,366 cu. yd. excavation for structures "dry"	5.00	7.50	2.50
1,320 cu. yd. conc. Class "A"	31.00	38.50	38.00
90,293 lb. reinforcing steel	.08	.12	.0825
200 lin. ft. rock filled wire baskets	20.00	25.00	20.00

Highway and Street...

Utah—Box Elder County—State—Pave.

W. W. Clyde & Co., Springville, was low bidder at $447,259 to the State Road Commission for constructing a combination Portland cement concrete and bituminous plantmix surfaced road, 5.3 mi. long, from Willar to Brigham City. Unit bids submitted follow:

(1) W. W. Clyde & Co. $447,259
(2) Parson & Fife and L. T. Johnson Co. 450,074
(3) Olof Nelson Co. 455,499
(4) Gibbons & Reed 547,724
(5) Reynolds Construction Co. 571,122
(6) J. B. & R. E. Walker, Inc., and W. W. Gardner $571,638
(7) Strong Co. 476,338
(8) Engineers' estimate 456,062

	(1)	(2)	(3)	(4)	(5)	(6)	(8)
68,005 sq. yd. 7-in. conc. pave.	2.40	2.38	2.20	2.50	3.00	2.65	2.75
1,890 sq. yd. 6-in. conc. pave.	2.40	2.30	2.20	2.50	3.00	2.30	2.75
14,750 ton plantmix bitum. surf.	2.25	2.20	1.80	2.50	2.75	3.00	2.00
154,000 gal. bitum. mat., 200-300 pen.	.09	.10	.10	.11	.14	.105	.09
42,800 gal. bitum. mat., Type MC-1	.12	.11	.11	.13	.14	.1125	.11
23,550 gal. bitum. mat., Type RC-4	.125	.12	.12	.13	.14	.115	.11
1,140 ton cover material	2.00	2.00	2.50	3.80	4.00	4.00	3.00
52,500 ton cr. rock surf. crse.	.60	.65	.75	.78	1.10	.95	.60
108,000 cu. yd. unclass. excav.	.25	.27	.25	.36	.30	.43	.30
356,000 sta. yd. overhaul, Class "A"	.012	.015	.015	.02	.02	.02	.015
17,000 yd. mi. overhaul, Class "B"	.15	.16	.15	.20	.20	.20	.15
1,620 1,000 gal. watering	1.50	1.60	2.00	2.50	2.00	1.75	2.00
1,535 hr. rolling	4.50	3.50	4.50	6.75	5.00	5.65	4.00
2,070 cu. yd. channel excav.	.50	.60	.50	1.00	1.00	1.25	.35
Lump sum, clear and grub	$8,750	$5,000	$5,000	$17,000	$11,000	$1,500	$7,500
16,192 lin. ft. 15-in. conc. irrig. pipe	1.40	1.48	1.45	2.25	1.40	1.70	1.10
2,600 lin. ft. 15-in. conc. pipe	2.50	2.34	2.50	3.45	2.35	2.78	2.15
4,401 lin. ft. 18-in. conc. pipe	3.20	3.04	3.25	4.15	3.00	3.40	2.60
381 lin. ft. 24-in. conc. pipe	4.15	4.10	4.00	5.15	4.00	4.40	3.65

(Continued on next page)

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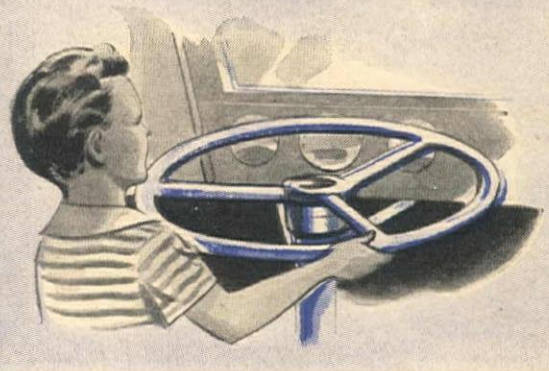

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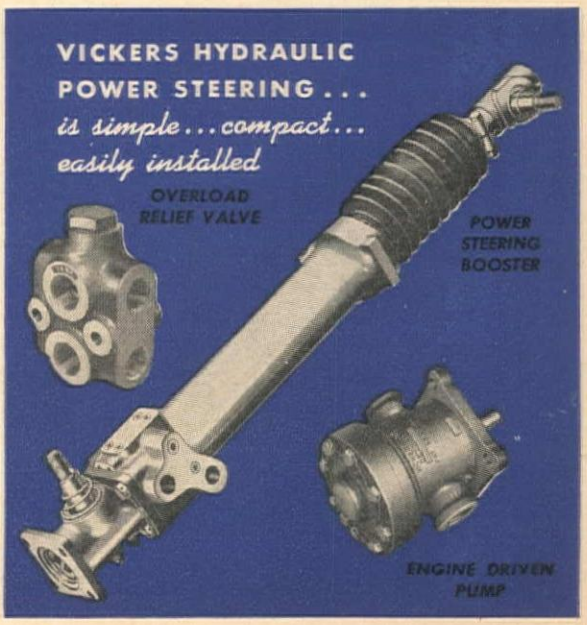

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129	lin. ft. 18-in. conc. pipe syphon	4.50	3.75	3.90	5.60	4.00	4.25	3.50
597	lin. ft. 24-in. conc. pipe syphon	5.00	4.87	4.75	6.50	5.00	5.00	4.15
2	ea. 24-in. conc. tees	25.00	30.00	33.50	58.00	40.00	39.50	7.00
64	lin. ft. relay 15-in. C.G.M. pipe	1.00	.60	1.00	1.50	2.00	1.00	.50
10	lin. ft. 15-in. C.G.M. pipe	2.00	1.88	1.80	3.20	2.00	2.20	1.60
1,170	lin. ft. lay 1½-in. C.I. pipe	.30	.25	.22	.50	1.00	.50	.10
1,865	lin. ft. lay 2-in. C.I. pipe	.30	.25	.25	.50	1.00	.60	.15
1,060	lin. ft. lay 3-in. C.I. pipe	.35	.30	.30	.54	1.00	.75	.20
1,750	lin. ft. lay 4-in. C.I. pipe	.40	.30	.45	.54	1.00	.90	.25
9,248	lin. ft. lay 8-in. C.I. pipe	.45	.35	.60	.56	1.50	1.20	.50
10	ea. install fire hydrants	25.00	20.00	50.00	50.00	100.00	60.00	5.00
13,200	cu. yd. struc. excav.	1.25	.60	1.30	1.50	2.00	2.25	1.00
488	cu. yd. conc., Class "A"	35.00	35.00	45.00	55.00	50.00	40.00	35.00
330	cu. yd. conc., Class "B"	34.00	35.00	45.00	28.00	50.00	40.00	30.00
80,700	lb. reinf. steel	.075	.07	.09	.08	.08	.0975	.09
14,700	lb. struc. steel	.20	.18	.30	.25	.20	.31	.12
21,400	sq. yd. remove exist. pave.	.50	.78	.75	.67	.75	.90	.50
23,230	sq. yd. break exist. pave.	.20	.42	.30	.28	.25	.45	.20
2	ea. R.R. crossing signs	250.00	250.00	300.00	190.00	100.00	175.00	75.00
2	ea. advance warning signs	50.00	100.00	75.00	160.00	100.00	50.00	35.00
900	lin. ft. r/w fence, Type "A"	.17	.24	.15	.22	.30	.20	.12
39,950	lin. ft. r/w fence, Type "B"	.20	.27	.20	.24	.40	.25	.18
1,520	lin. ft. r/w fence, Type "C"	.55	.50	.50	.55	1.00	.68	.25
23	ea. 4-ft. gates	12.00	12.00	15.00	19.00	15.00	17.75	10.00
118	ea. 14-ft. gates	25.00	.22	20.00	32.00	35.00	33.50	20.00
3	ea. 16-ft. gates	30.00	25.00	25.00	35.00	40.00	38.00	25.00
140	ea. r/w markers	5.00	3.00	5.00	5.00	5.00	4.25	2.25

California—Mendocino County—State—Grade & Surf.

Guy F. Atkinson Co., South San Francisco, submitted the low bid of $1,322,643 to the California Division of Highways, Sacramento, for 3.8 mi. of grading and plant mix surfacing between Bromley Creek and Fort Bragg on State Highway 1. The State will supply railroad rails for erection of debris rack. Bids were received as follows:

(1) Guy F. Atkinson Co. $1,322,643
(2) United Concrete Pipe Corp. & Ralph A. Bell 1,568,257
(3) Stolte, Inc. & E. B. Bishop $1,673,445
(4) J. H. Pomeroy & Co., Inc. 1,769,698
(5) Haddock Engineers, Ltd. 1,909,521

		(1)	(2)	(3)	(4)	(5)
33	ac. clearing and grubbing	325.00	530.00	800.00	860.00	$1,550
166,000	cu. yd. roadway excavation	.35	.56	.67	.83	.78
1,000	cu. yd. structure excavation, Type A	15.00	42.00	30.00	25.00	47.00
600	cu. yd. structure excavation, Type B	10.00	20.00	12.00	19.00	47.00
6,700	cu. yd. structure excavation, Type C	3.00	4.40	2.50	6.00	3.75
2,500	cu. yd. ditch and channel excavation	1.25	1.20	1.75	3.50	3.20
2,400	cu. yd. imported borrow	2.00	3.00	3.40	4.50	2.50
1,470,000	sta. yd. overhaul	.005	.006	.01	.01	.02
24,100	sq. yd. compacting original ground	.05	.20	.06	.16	.075
19,000	cu. yd. imported base material, Type A	3.10	4.80	4.70	5.30	4.20
8,000	cu. yd. imported base material, Type B	2.90	4.80	5.30	4.55	4.20
20,300	sq. yd. prep. slopes (slope erosion protection)	.30	.10	.18	.70	.20
1,000	lb. rye grass seed (slope erosion protection)	.50	1.25	.60	.55	2.10
Lump sum,	dev. water and furn. water. equip.	$2,500	$2,000	$2,400	$2,900	$14,000
2,100	M. gal. applying water	1.85	1.50	2.00	2.20	1.35
186	sta. finishing roadway	15.00	16.00	10.00	12.00	20.00
66	ton. liquid asphalt, SC-2 (prime coat)	25.00	38.00	26.00	28.00	37.00
165	ton sand (prime coat and shoulders)	6.00	5.00	6.00	6.50	5.00
19	ton liquid asphalt, MC-2 (shoulders)	26.00	40.00	44.00	37.00	50.00
9,800	ton mineral aggregate (P.M.S.)	4.10	8.00	6.15	5.50	6.00
490	ton paving asphalt (P.M.S.)	20.00	30.00	25.00	24.00	37.00
47	ton asphaltic emul. (sl. ct. and curing sl.)	26.00	36.00	35.00	38.00	43.00
20	ton liquid asphalt, SC-6 (seal coat)	26.00	39.00	36.00	38.00	37.00
700	ton screenings (sl. ct.)	4.10	6.00	6.00	7.50	7.00
4,250	cu. yd. Class "A" P.C.C. (structures)	67.50	83.50	68.00	88.00	90.00
1,065	cu. yd. Class "A" P.C.C. (footing blocks)	30.00	35.00	37.00	40.00	40.00
593	cu. yd. Class "A" P.C.C. (arch ribs)	120.00	140.00	112.00	120.00	215.00
782	lin. ft. concrete railing	5.00	10.00	9.00	16.00	11.00
2,640,000	lb. furnishing structural steel	.12	.09	.16	.096	.12
2,640,000	lb. erecting structural steel	.03	.05	.04	.047	.06
16,750	lin. ft. furnishing steel piling	2.50	2.70	3.30	3.10	4.00
468	ea. driving steel piles	100.00	40.00	51.00	57.00	70.00
46	ea. steel pile splices	16.00	30.00	22.00	16.00	50.00
10	cu. yd. P.C.C. (curbs)	45.00	70.00	61.00	70.00	70.00
50	cu. yd. sacked concrete riprap	25.00	40.00	42.00	70.00	50.00
88	ea. monuments	4.00	10.00	6.00	14.00	8.50
400	lin. ft. metal plate guard railing	2.80	3.00	3.00	4.00	3.30
64	ea. culvert markers and guide posts	4.00	10.00	6.00	6.00	5.00
6.6	mi. timber property, fences	$2,000	$2,500	$5,100	$5,800	$3,700
10	ea. timber drive gates	50.00	30.00	60.00	24.00	52.00
63	lin. ft. 12-in. R.C.P. (standard strength)	2.00	4.00	3.00	3.50	2.00
1,209	lin. ft. 18-in. R.C.P. (standard strength)	3.00	4.50	4.00	5.00	3.10
45	lin. ft. 24-in. R.C.P. (standard strength)	5.00	5.00	5.00	8.00	5.00
8,450	lin. ft. 8-in. perf. M.P. underdrains (16 gauge)	1.20	1.30	1.50	2.80	1.40
2,300	lin. ft. 12-in. perf. M.P. underdrains (16 gauge)	1.60	1.70	2.00	3.70	1.80
12,300	cu. yd. filter material	3.10	4.00	6.00	7.00	4.25
120	lin. ft. 8-in. C.M.P. downdrains (16 gauge)	1.50	1.30	2.00	2.00	1.35
6	ea. spillway assemblies	30.00	25.00	50.00	50.00	35.00
90	lin. ft. salvaging existing pipe culverts	2.00	1.50	2.50	6.00	1.50
3,700	sq. yd. cement treated gutters	2.50	2.50	1.25	5.40	3.50
1,350	lb. placing R.R. rails (debris rack)	.10	.25	.12	.10	.40
766,000	lb. furnishing bar reinforcing steel	.055	.05	.06	.052	.058
766,000	lb. placing bar reinforcing steel	.03	.04	.02	.033	.027
7,500	sq. yd. obliterating existing road	.10	.20	.12	.65	.40
Lump sum,	removing existing bridges	$10,000	$10,000	$7,000	$23,000	$20,000
Lump sum,	misc. items of work	$2,500	$5,000	$6,000	$8,000	$11,000

Washington—King County—State—Grade & Pave

Northwest Construction Co., Seattle, Wash., submitted the low bid of $273,790 and was awarded the contract by the Washington Department of Highways, Olympia, for constructing 4.458 mi. of grading, concrete paving and structures on Primary State Highway 5 between Auburn and Enumclaw. Bids were received as follows:

(1) Northwest Construction Co. $273,790
(2) N. Fiorito Co. $315,625

		(1)	(2)
30.4	ac. clearing	225.00	300.00
16.8	ac. grubbing	250.00	300.00
266,150	cu. yd. uncl. excav. incl. haul of 600 ft.	.23	.26
1,880	cu. yd. com. tren. excav. incl. haul 600 ft.	1.20	2.00
336,380	cu. yd. sta. overhaul	.01	.02
1,163	M. cu. yd. sta. overhaul	5.00	5.00

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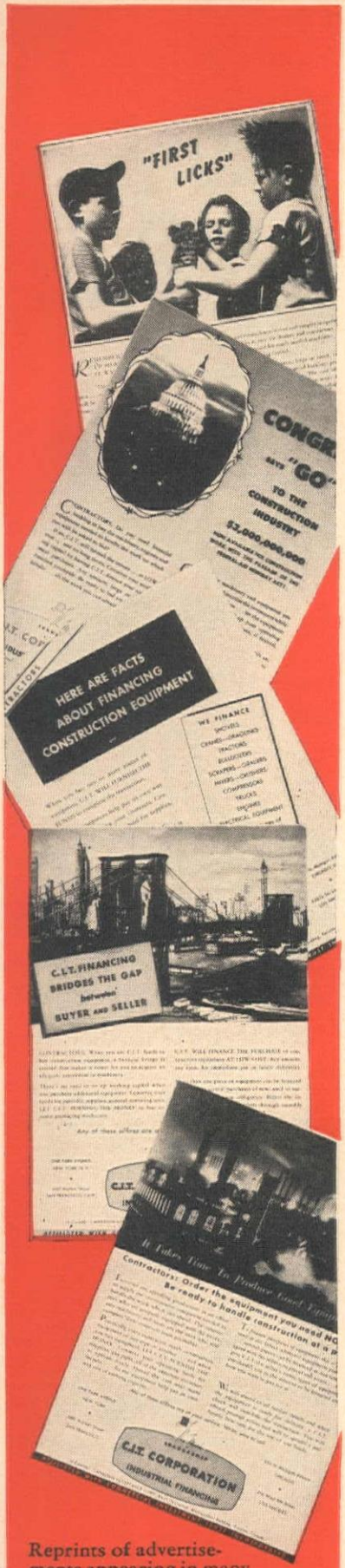

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2,910	cu. yd. struct. excav.	2.00	2.00
850	cu. yd. excav. unsuit. mat. incl. haul	1.00	1.50
22,750	lin. ft. slope treatment	.10	.15
235.5	sta. finish roadway	15.00	15.00
390	cu. yd. gravel backfill in place	4.00	5.00
28,610	cu. yd. sel. rdwy. bor. in pl. incl. haul	.70	1.00
6,700	cu. yd. cr. st. surf. top crse. in pl. on rdwy.	2.30	3.00
400	cu. yd. cr. st. surf. top crse. in stockpile	2.00	2.50
	MINERAL AGGREGATE FOR NON-SKID SINGLE SEAL TREAT. SCH. A IN STKPL.		
380	cu. yd. coarse cr. screenings ⅝-in. to ¼-in. stockpile	3.00	3.50
120	cu. yd. fine cr. screenings ¼-in. - 0-in. stockpile	3.00	3.50
	MISCELLANEOUS ITEMS		
3,540	cu. yd. sand fill. in pl. incl. haul	1.50	1.50
177	M. gal. water	3.00	3.00
26,143	sq. yd. cem. conc. pave. std. 14 da. mix 8-in. sec. in pl.	2.75	2.95
2,029	sq. yd. cem. conc. pave. high early str. 8-in. sec. in pl.	3.00	3.50
1,590	lb. pave. reinf. Type No. 2 in place	.10	.15
950	only, dowel bars with rubber caps in place	.35	.35
88	lin. ft. pave. headers No. 3 in place	3.00	2.00
4	only, temp. br. acr. pave. (take-dn. type) in pl.	75.00	75.00
	LIGHT BITUMINOUS SURFACE TREATMENT METHOD A		
2.3	mi. prep. constr. and finishing	350.00	250.00
75	ton bitum. cem. MC-2 in place	35.00	40.00
550	cu. yd. furn. and placing cr. cover stone	3.00	3.50
	MISCELLANEOUS		
85	cu. yd. concrete Class A in place	40.00	65.00
12,350	lb. steel reinf. bars in place	.10	.10
160	only reinf. conc. r/w markers in place	5.00	7.00
1	only, reinf. conc. Fed. Aid marker in place	20.00	25.00
10,010	lin. ft. beam gd. rail Type No. 1 or 2 des. No. 6 in place	1.70	1.90
31	only, reinf. conc. spot posts in place	7.00	7.00
25	only, emb. prot. (Calco or equal) Type A sp. in. in pl.	35.00	25.00
55	cu. yd. hand placed riprap in place	10.00	10.00
8,010	sq. yd. rem. exist. conc. pave.	.40	.60
227	lin. ft. rem. exist. guard rail	.50	.50
120	lin. ft. relay. wat. pipe ¾-in. diam.	.80	.50
130	lin. ft. relay. wat. pipe 1-in. diam.	.90	.50
970	lin. ft. relay. wat. pipe 1½-in. diam.	1.00	.50
33	lin. ft. relay. conc. pipe 12-in. diam.	1.00	1.50
50	lin. ft. galv. iron wat. pipe ¾-in. in place	.90	.75
50	lin. ft. galv. iron wat. pipe 1-in. in place	1.00	.85
25	lin. ft. galv. iron wat. pipe 1½-in. dia. in place	1.25	1.00
906	lin. ft. bit. ctd. cor. met. culv. pipe Type No. 2 No. 16 ga.—8-in. dia. in pl.	1.75	1.45
558	lin. ft. bit. ctd. cor. met. culv. pipe Type No. 2 No. 16 ga.—12-in. dia. in pl.	2.25	1.75
578	lin. ft. bit. ctd. cor. met. culv. pipe Type No. 2 No. 16 ga.—18-in. dia. in pl.	2.90	2.55
54	lin. ft. bit. ctd. cor. met. culv. pipe Type No. 2 No. 12 ga.—36-in. dia. in pl.	8.00	7.00
500	lin. ft. pl. conc. or V.C. dr. pipe 8-in. in pl.	1.00	.70
365	lin. ft. pl. conc. or V.C. sew. pipe 8-in. in pl.	1.25	.70
207	lin. ft. std. reinf. conc. pipe 18-in. in pl.	3.00	2.50
313	lin. ft. std. reinf. conc. pipe 48-in. in pl.	13.50	12.50
216	lin. ft. extr. str. reinf. conc. pipe 36-in. in pl.	9.00	11.00
230	lin. ft. extr. str. reinf. conc. pipe 72-in. in pl.	30.00	27.60

Utah—Salt Lake County—State—Surf.

Olof Nelson Construction Co., Logan, with a bid of $239,044 was low on construction of 8.6 mi. of 2½-in. plantmix bituminous surfacing on 21st St. between Salt Lake City and Magna. The roadway is to be 40 ft. wide with 26 ft. of surfacing. The following bids were submitted:

(A)	Olof Nelson Construction Co.	$239,044	
(B)	W. W. Clyde & Co.	244,174	
(C)	Reynolds Construction Co.	252,031	
(D)	B. D. Palfreyman	278,320	
(E)	Carl E. Nelson Co.	278,785	
(F)	Sumsion & Glenn	296,905	
(G)	Floyd S. Whiting	$298,483	
(H)	Gibbons & Reed Co.	309,699	
(I)	A. O. Thorn & Sons Const. Co.	317,756	
(J)	Deal Mendenhall Construction Co.	339,144	
(K)	Utah Construction Co.	393,809	
(L)	Engineer's estimate	252,358	

(1) 7,300 gal. bituminous material, Type MC-1
(2) 214,600 gal. Bit. Matl., Type 200-300 pene.
(3) 36,800 gal. bitum. matl., Type RC-4
(4) 20,000 ton plant mixed bituminous surf.
(5) 50,000 ton cr. rk. or cr. grav. surf. course
(6) 59,200 ton gravel or cr. rk. base course
(7) 1,850 ton cover material
(8) 195,000 cu. yd. unclassified excavation
(9) 890,000 sta. yd. overhaul, Class "A"
(10) 140,000 yd. mi. overhaul, Class "B"
(11) 125 cu. yd. channel excavation
(12) 3,805 1,000-gal. watering
(13) 2,900 hr. rolling
(14) 51 lin. ft. 12-in. concrete pipe
(15) 1,812 lin. ft. 18-in. concrete pipe
(16) 591 lin. ft. 24-in. concrete pipe
(17) 141 lin. ft. 30-in. concrete pipe
(18) 220 lin. ft. 36-in. concrete pipe
(19) 750 cu. yd. excavation for structures
(20) 118 cu. yd. concrete, Class "A"
(21) 23,900 lb. reinforcing steel
(22) 2,400 lb. structural steel
(23) 18,600 lin. ft. fence, Type "B"
(24) 2 ea. 4-ft. gates
(25) 20 ea. 14-ft. gates
(26) 200 ea. right-of-way markers
(27) 1.0 mi. obliteration of old road
(28) 2 ea. F. A. P. markers

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(L)
(1)	.10	.10	.10	.10	.10	.11	.10	.10	.10	.105	.10
(2)	.08	.085	.08	.095	.09	.11	.07	.085	.10	.085	.09
(3)	.11	.11	.10	.10	.10	.12	.10	.11	.10	.105	.10
(4)	2.00	1.80	2.00	2.18	2.00	2.80	2.40	2.50	2.50	3.00	2.00
(5)	.65	.68	.75	.72	.86	.80	.90	.88	.85	1.17	.65
(6)	.60	.66	.65	.65	.80	.75	.90	.86	.80	1.12	.60
(7)	3.00	2.75	3.00	3.00	3.00	3.50	3.00	2.30	4.00	3.25	2.50
(8)	.18	.20	.19	.21	.20	.25	.25	.30	.30	.20	.20
(9)	.01	.012	.01	.015	.01	.0125	.01	.01	.015	.015	.015
(10)	.12	.10	.12	.18	.15	.11	.15	.12	.15	.15	.12
(11)	1.00	1.00	2.00	1.00	3.00	.50	1.00	.30	1.00	3.00	.30
(12)	1.25	1.25	1.00	1.25	1.75	1.50	2.00	2.00	1.50	2.00	2.00
(13)	3.50	3.50	4.00	4.00	4.00	4.00	4.00	4.00	5.00	4.50	4.00
(14)	2.00	2.00	2.00	3.50	2.00	2.00	2.50	2.50	2.00	2.40	1.80
(15)	2.30	2.65	2.50	4.00	2.84	2.50	3.50	3.10	3.00	2.85	2.50
(16)	3.30	3.90	3.50	5.00	3.65	3.50	4.50	4.15	4.00	3.90	3.50
(17)	4.40	4.90	6.00	6.00	4.60	5.00	5.00	5.75	5.00	4.65	4.50
(18)	5.95	6.50	6.50	8.00	6.00	6.50	8.00	7.10	6.00	6.00	6.30
(19)	2.00	1.50	2.00	2.50	3.00	2.00	2.00	1.25	2.50	3.00	1.00
(20)	34.00	35.00	30.00	33.00	45.00	35.00	30.00	44.00	40.00	35.00	35.00
(21)	.07	.08	.08	.07	.07	.08	.08	.09	.08	.07	.09
(22)	.25	.25	.20	.20	.30	.20	.10	.14	.40	.15	.20
(23)	.22	.18	.30	.28	.20	.18	.15	.34	.20	.25	.20
(24)	10.00	15.00	20.00	12.00	10.00	9.00	10.00	12.50	15.00	14.00	5.00
(25)	20.00	25.00	35.00	24.00	25.00	24.00	20.00	21.50	30.00	30.00	20.00
(26)	3.00	3.00	5.00	3.00	7.00	2.50	3.00	6.00	4.00	4.00	2.50
(27)		100.00									150.00
(28)	15.00	20.00	10.00	10.00	15.00	15.00	10.00	7.50	15.00	7.00	10.00

Wyoming—Niobrara County—State—Surf.

Northwestern Engineering Co., Rapid City, with a bid of $283,934, was low to the Wyoming Highway Department on grading, draining, base course surfacing, roadmix oil treatment, stone chip seal coat and miscellaneous work on 12.7 mi. of the Lusk-Nebraska State Line road and was awarded the contract for the work. Unit bids follow:

(1) Northwestern Engineering Co. $283,934
(2) Summit Constructing Co. 291,869
(3) Knisely-Moore Co. 317,784
(4) Blanchard Bros. 326,842
(5) Peter Kiewit Sons Co. 329,969
(6) Inland Construction Co. $347,050
(7) H. W. Read 354,014
(8) Warrington Construction Co. 369,774
(9) Engineer's estimate 254,077

		(1)	(2)	(3)	(4)	(5)	(6)	(9)
409,000	cu. yd. excav.	.28	.25	.33	.33	.285	.39	.18
491,000	cu. yd. sta. overhaul	.015	.015	.015	.015	.015	.015	.015
18,100	cu. yd. mi. haul	.20	.20	.20	.20	.15	.21	.15
245	cu. yd. structure excav.	2.00	2.50	1.50	1.00	2.50	2.25	1.25
395	cu. yd. excav. for pipe culv.	2.00	2.00	1.00	1.00	2.00	2.25	1.00
3,200	M. gal. watering (emb.)	1.65	2.50	1.50	2.00	2.00	2.00	2.00
115	hr. sheepsfoot roller	5.00	3.50	3.25	5.00	5.00	3.00	3.00
1,035	hr. pneumatic tired roller	4.60	4.50	6.00	3.50	5.00	3.85	4.00
1,040	lin. ft. 18-in. C.M.P.	2.65	2.00	2.00	2.35	3.00	2.35	2.00
550	lin. ft. 24-in. C.M.P.	3.50	3.00	3.00	3.10	5.00	3.60	3.00
226	lin. ft. 30-in. C.M.P.	4.50	4.00	4.00	4.05	6.00	4.40	4.00
168	lin. ft. 36-in. C.M.P.	6.50	6.50	6.00	5.85	9.00	6.90	5.75
716	lin. ft. relaying pipe	2.00	1.50	1.00	2.50	1.50	2.45	.85
505	cu. yd. Class 1 riprap	5.00	10.00	5.00	5.00	7.00	7.00	4.00
100	cu. yd. grouted riprap	8.00	12.50	7.00	10.00	10.00	17.00	9.75
400	hr. mechanical tamping	4.00	4.50	4.00	4.00	7.00	3.50	3.00
94,000	lin. ft. standard R.O.W. fence	.11	.15	.13	.11	.135	.11	.09
110	ea. end panels	5.50	10.00	10.00	14.00	10.00	8.50	8.00
135	ea. brace panels	3.50	8.00	6.00	8.00	10.00	7.00	6.00
2,464	lin. ft. portable show fence	1.40	1.50	1.00	1.50	1.35	.94	.85
17,000	ton cr. gravel surf. (¾-in. max.)	.76	.96	.85	.85	1.25	.90	1.00
55,700	ton cr. gravel base crse. (1-in. max.)	.76	.86	.85	.85	1.00	.86	.90
1,800	ton stone chips	4.40	5.00	5.00	7.00	6.00	5.35	4.00
933	ton S.C. liquid asph. SC-3	21.00	19.50	23.00	23.00	20.00	25.50	23.00
470	ton. base treatment MC-0	23.00	23.00	24.00	27.00	30.00	27.60	23.00
155	ton seal coat RC-2	23.00	23.50	24.00	27.50	30.00	28.40	24.00
260	ton seal coat RC-4	23.00	23.50	25.00	27.00	30.00	28.40	24.00
235,700	sq. yd. processing roadway	.035	.042	.05	.06	.055	.03	.055
840	M. gal. watering (base)	1.65	2.20	2.00	2.00	2.00	2.00	2.00
465	hr. roller operation (base)	6.00	5.00	3.50	3.50	5.00	3.85	4.50
5,600	lin. ft. shaping and tamping curb	.20	.25	.15	.20	.20	.10	.20
80	lin. ft. shaping and tamping spillway	1.00	1.00	.75	1.00	1.00	.70	.65
232	lin. ft. 8-in. C.M.P.	1.50	1.40	1.50	1.50	1.50	1.35	1.50
8	ea. embankment protectors	25.00	20.00	25.00	25.00	50.00	22.00	20.00
4	ea. R. C. project markers	20.00	20.00	20.00	25.00	15.00	17.00	20.00
25	ea. right-of-way markers	5.00	10.00	7.00	10.00	10.00	11.00	8.00
1	ea. remove and reset cattleguard	150.00	50.00	60.00	50.00	100.00	75.00	55.00
2.1	mi. old road obliteration	200.00	100.00	200.00	100.00	300.00	225.00	225.00
	(Non-participating in Federal Aid)							
1.8	mi. remove and reset tel. line	150.00	300.00	300.00	150.00	500.00	300.00	150.00
15	ea. 16-ft. tel. poles (material)	10.00	8.00	20.00	7.50	20.00	15.00	5.00
60	rod tel. wire (material)	.50	.50	.60	.25	.70	.30	.25

Washington—King County—State—Grade & Pave

R. L. Moss & Co., Zenith, Wash., submitted the low bid of $216,559 and was awarded the contract by the Washington Department of Highways, Olympia, for 1.5 mi. of grading and asphaltic concrete paving from Seattle north to N. 115th St. on Primary State Highway 1. Bids were received from the following:

(1) R. L. Moss & Co. $216,559
(2) Northwest Construction Co. 230,471
(3) Washington Asphalt Co. $238,956
(4) Superior Construction Co. 256,724

		(1)	(2)	(3)	(4)
	Lump sum, clear and grub	$2,900	$6,000	$8,000	$12,000
12,880	cu. yd. uncl. excav. incl. haul	1.00	.90	1.00	.80
3,100	cu. yd. excav. of unsuit. mater. incl. haul	1.00	1.50	2.00	.90
9,697	cu. yd. structure excavation	1.25	1.75	1.75	1.80
79	sta. finish roadway	25.00	15.00	18.00	18.00
4,371	cu. yd. sp. backfill in pl. incl. haul	1.25	1.45	1.50	4.50
230	cu. yd. gravel backfill	3.50	4.00	4.50	6.00
5,410	cu. yd. cr. st. surf. base crse.	3.50	3.00	3.50	3.80
1,090	cu. yd. sand filler in place incl. haul	3.50	2.00	3.50	3.80
70	M. gal. water	3.00	3.00	3.00	3.20
	TYPE I-1 ASPHALTIC CONCRETE PAVEMENT				
4,084.7	ton Class C wearing course	6.25	6.70	6.25	6.60
7,262.5	ton Class F leveling course	6.25	6.70	6.25	6.60
	CEMENT CONCRETE PAVEMENT, HIGH EARLY STRENGTH				
100	sq. yd. high early strength 9-in. section	4.25	5.00	5.50	3.90
45	sq. yd. high early strength 6-in. section	4.00	4.00	4.00	3.40
	MISCELLANEOUS ITEMS				
2,028	sq. yd. cem. concr. driveways—high early strength	2.75	3.00	3.05	5.40
7,014	sq. yd. one crse. concr. sidewalk std. 14-day mix	2.00	1.90	2.00	2.25
6,989	lin. ft. integral concr. curb and gutter	1.40	1.60	1.70	1.30
4,453	lin. ft. var. hgt. integ. concr. curb and gutter	1.50	1.70	1.85	1.70
55	only, sp. concr. catch basins with CIFr. and Gr.	90.00	80.00	90.00	75.00
32	only, st. br. or conc. manhole (under 10-ft.)	130.00	150.00	160.00	130.00
1	only, st. br. or conc. manhole (over 10-ft.)	200.00	250.00	225.00	150.00
1	only, st. sew. manhole (Seattle std.) over 10-ft.	200.00	250.00	225.00	150.00
1	only, sp. inlet (Seattle std.) compl. in pl.	40.00	55.00	50.00	60.00
72	cu. yd. conc. Class B	52.00	48.00	50.00	65.00
10	cu. yd. conc. Class G	50.00	42.00	45.00	55.00
3,645	lbs. steel reinf. bars	.10	.10	.10	.12
277	lin. ft. pipe hand rail	2.25	2.30	2.35	2.25
5	cu. yd. hand-placed riprap	20.00	20.00	20.00	8.00
2	only, reinf. conc. Fed. Aid markers	5.00	25.00	22.00	40.00
5,160	lin. ft. Type A reflect. curb	1.50	1.50	1.55	1.20
3,938	lin. ft. Type C reflect. curb	1.75	1.80	1.85	2.00
1	only, remov. exist. manhole	25.00	100.00	95.00	30.00
66	only, remov. exist. sp. conc. catch basins	10.00	20.00	20.00	15.00
	Lump sum, remov. exist. conc. steps and walls	100.00	250.00	225.00	$1,000
97	lin. ft. remov. exist. conc. curb	.20	.60	.50	.30
1,313	sq. yd. remov. exist. conc. sidewalk	.30	.40	.40	.80
382	sq. yd. remov. exist. conc. pvt.	.70	4.00	3.00	1.80
3	only, remov. and reset exist. monument cases	10.00	20.00	18.00	10.00
3,528	lin. ft. relay. conc. pipe 12-in.	1.00	.90	1 00	1.50
81	lin. ft. relay. conc. pipe 18-in.	1.50	1.50	1.40	2.50
1,242	lin. ft. plain conc. or VC sew. pipe 6-in.	.90	.80	.80	.80

1,888 lin. ft. pl. conc. or VC sew. pipe 8-in.	1.00	1.00	1.10	1.20
4,804 lin. ft. pl. conc. or VC pipe 12-in.	1.50	1.50	1.50	1.60
357 lin. ft. pl. conc. or VC pipe 18-in.	2.25	2.75	3.00	3.00
75 lin. ft. pl. conc. or VC pipe 24-in.	3.25	4.50	4.25	4.00
40 lin. ft. lay conc. pipe 24-in. (pipe furn.)	1.50	2.25	2.10	4.50
309 lin. ft. st. reinf. conc. pipe 18-in.	2.50	3.50	3.50	3.50

Nevada—Lander County—State—Grade and Gravel Surf.

Isbell Construction Co., Reno, was awarded the contract on a low bid of $350,943 by the Nevada Department of Highways, Carson City, for construction of 38.45 mi. of Route 8A from Austin north. Work includes grading, gravel surfacing, and construction of a reinforced concrete bridge on timber piles. Bids were received as follows:

(1) A. S. Vinnell Co. $468,884
(2) Isbell Construction Co. 350,943
(3) Nevada Constructors, Inc. 361,888
(4) Dodge Construction Co., Inc. $375,507
(5) Hunt & Frandsen 355,501

	(1)	(2)	(3)	(4)	(5)
Lump sum, signs	$7,000	$1,000	500.00	500.00	400.00
2,904 lin. ft. remove fence	.14	.10	.05	.05	.07
413,424 cu. yd. roadway excav. A	.34	.25	.30	.32	.36
20,959 cu. yd. roadway excav. B	1.10	1.25	.90	1.25	.85
3,409 cu. yd. drainage excav.	.90	1.00	.60	.50	.45
966 sta. V-Type ditches	4.00	5.00	5.00	5.00	3.00
9,931 cu. yd. borrow	.34	.25	.35	.40	.25
542,175 yd. sta. overhaul	.01	.015	.015	.015	.015
2,287 yd. mi. overhaul	.20	.20	.20	.20	.20
1,735 cu. yd. structure excavation	1.75	1.50	1.25	1.50	1.50
3,473 cu. yd. backfill	1.40	1.00	.90	1.00	1.00
8.43 mi. reshape roadway	$1,000	400.00	250.00	528.00	250.00
Force Account, roadside cleanup					
70 M gal. water	15.00	5.00	2.50	7.50	3.00
48,362 ton Type 1 gravel base	.92	.50	.50	.55	.45
98,646 ton gravel surface	1.15	.80	.85	.75	.67
238 cu. yd. Class A conc.	50.00	50.00	50.00	50.00	50.00
169 cu. yd. Class B conc.	70.00	50.00	50.00	50.00	50.00
114 cu. yd. Class D conc.	50.00	50.00	50.00	50.00	50.00
59,460 lb. reinf. steel	.12	.12	.12	.10	.10
127 lin. ft. struct. steel rail	20.00	7.50	1.25	6.00	7.50
0.10 MFBM untr. Douglas fir	500.00	250.00	200.00	245.00	250.00
915 lin. ft. tr. tim. piles (haul only)	.50	.25	.30	.20	.30
26 each drive tim. piles	90.00	100.00	70.00	40.00	60.00
Lump sum, load test	$1,500	$2,500	250.00	800.00	250.00
3,010 lin. ft. 18-in. cor. metal pipe (dipped)	3.20	3.00	3.00	3.50	3.00
1,602 lin. ft. 24-in. cor. metal pipe (dipped)	5.00	4.00	4.25	5.00	4.50
670 lin. ft. 30-in. cor. metal pipe (dipped)	6.40	5.00	5.25	6.00	5.00
694 lin. ft. 36-in. cor. metal pipe (dipped)	8.00	7.50	7.00	8.00	7.50
80 lin. ft. 8-in. perf. underdrain	1.75	1.50	2.00	2.50	1.25
9 cu. yd. drain backfill	14.00	2.50	5.00	5.00	2.00
58,919 lin. ft. construct fence	.17	.20	.20	.20	.125
9 each 14-ft. std. steel gates	100.00	40.00	55.00	50.00	40.00
17 each 16-ft. std. steel gates	120.00	40.00	60.00	50.43	50.00
152 each monuments	11.00	6.00	5.00	6.00	5.00
11,429 ton sel. mtl. surface	1.00	.50	.50	.40	.42
2 each 26-ft. sp. cattle gd.	$2,500	$1,200	977.00	$1,000	300.00
2 each 16-ft. std. timb. cattle gd.	$1,500	750.00	538.00	500.00	500.00
Force Account, misc. work	250.00	250.00	250.00	250.00	250.00
41 each set monuments	8.50	4.00	3.00	3.50	1.00

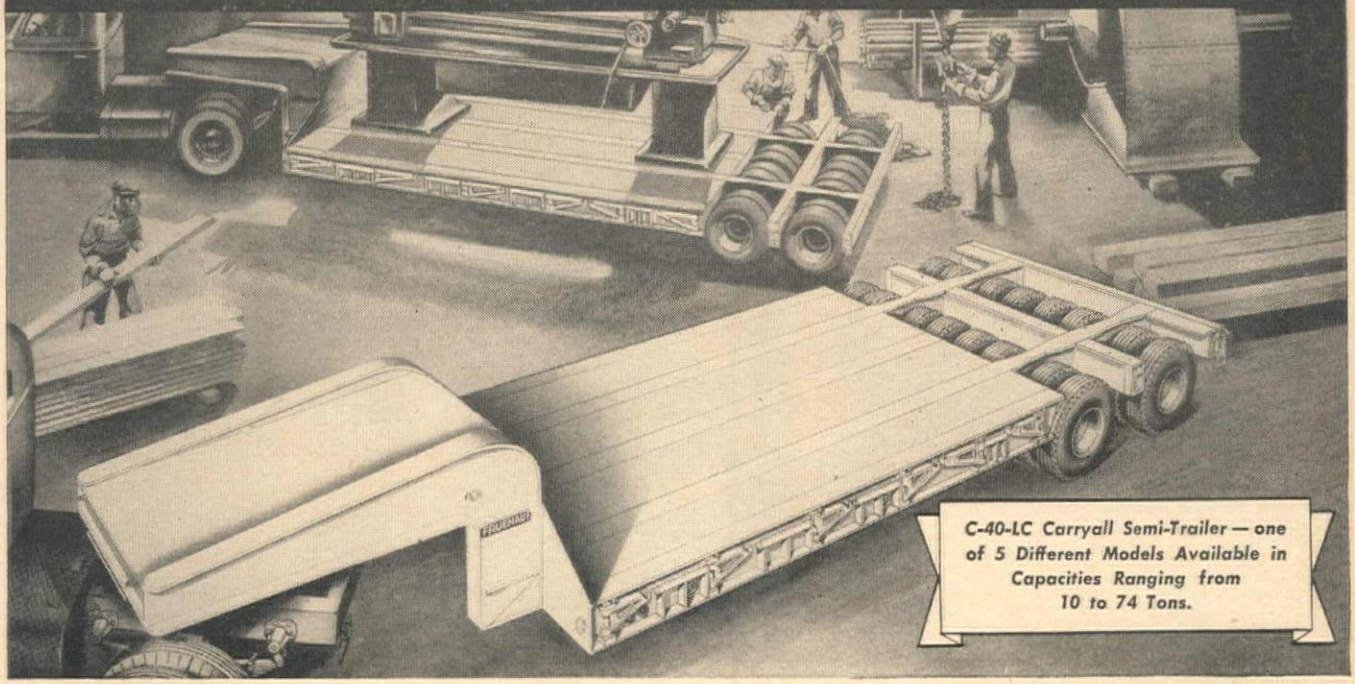
California—San Bernardino & Riverside Counties—State—Grade & Surf.

Peter Kiewit Sons Co., Arcadia, Calif., submitted the low bid of $413,905 to the California Division of Highways, Sacramento, for 5.8 mi. of grading and surfacing with plant mix on cement treated base between 0.5 mi. east of Ontario and Mira Loma. Existing bridge structures and culverts are to be widened under the plans for the work. Bids were received from the following:

(1) Peter Kiewit & Sons Co. $413,905
(2) Griffith Co. 437,731
(3) Geo. Herz & Co. 449,828
(4) N. M. Ball Sons $505,927
(5) Matich Bros. 528,319
(6) J. E. Haddock, Ltd. 592,677

	(1)	(2)	(3)	(4)	(5)	(6)
135 cu. yd. rem. conc.	50.00	16.00	13.00	10.00	12.00	38.00
305 sta. clear and grub	35.00	17.00	31.50	22.00	20.00	38.00
150 ea. remov. trees and stumps	30.00	14.00	9.85	50.00	25.00	25.00
10,500 cu. yd. roadway excav.	.50	.40	.41	.50	.50	.44
3,000 cu. yd. struct. excav.	1.70	2.00	2.30	2.45	2.00	3.20
60 cu. yd. ditch and channel excav.	1.60	2.00	2.90	2.45	2.00	2.50
30,000 sta. yd. overhaul	.01	.015	.02	.01	.02	.02
190,000 sq. yd. compact. orig. gr.	.015	.03	.02	.045	.04	.03
48,500 cu. yd. imported borrow, Cl. "A"	.67	.75	.86	1.15	1.10	1.25
131,000 cu. yd. imported borrow, Cl. "B"	.67	.70	.64	.74	.73	.80
Lump sum, dev. water sup. and furn. water equip.	$2,200	$5,700	$4,200	$3,000	$7,500	$18,000
7,500 M. gal. apply water	1.65	1.50	2.35	1.65	2.50	1.95
305 sta. finishing roadway	10.00	4.00	11.50	10.00	15.00	25.00
28,500 ton min. agg. (cem. tr. base)	1.60	2.50	2.35	2.50	3.00	3.00
10,700 bbl. Portland cement (cem. tr. base)	2.65	2.60	2.60	3.00	2.40	3.00
70 ton asph. emuls. (curing sl. and pt. bdr.)	21.00	45.00	74.50	45.00	70.00	45.00
18,500 ton min. agg. (P.M.S.)	2.00	2.25	2.15	2.80	3.05	3.10
925 ton paving asph. (P.M.S.)	14.00	15.00	14.25	15.00	14.00	16.00
92 ton asph. emuls. (seal ct.)	18.35	28.00	26.50	26.00	30.00	33.00
900 ton screenings (seal ct.)	4.40	3.50	5.00	3.00	5.00	4.75
720 lin. ft. raised bars	1.50	1.00	.90	.65	1.00	1.00
9 M.F.B.M. tr. Douglas fir timber	224.00	210.00	255.00	200.00	330.00	400.00
1,350 cu. yd. Cl. "A" P.C.C. (struct.)	40.30	38.00	42.70	46.00	40.00	63.00
454 lin. ft. P.C.C. rail	10.00	7.70	10.30	12.00	13.00	8.00
1,600 lb. struct. metal	.30	.27	.30	.30	.50	.45
157,500 lb. furn. bar reinf.	.05	.055	.06	.062	.05	.05
157,500 lb. plac. bar reinf.	.04	.031	.04	.015	.03	.038
440 lin. ft. furn. Douglas fir piling	1.50	1.40	2.35	2.00	2.70	1.40
22 ea. driving timber piles	50.00	37.00	29.00	50.00	27.00	50.00
1,200 lin. ft. furnishing conc. piling	3.00	4.00	3.35	3.20	4.00	3.10
40 ea. driving conc. piles	81.00	60.00	85.00	100.00	75.00	90.00
90 cu. yd. rock fill matl.	8.00	11.00	7.00	5.00	5.00	10.00
90 ea. monuments	5.00	5.00	8.70	4.75	5.00	7.50
26 ea. guide posts	3.80	4.00	6.50	4.75	10.00	4.00
34 ea. culv. markers	3.90	4.00	7.75	4.75	10.00	5.00
5.7 mi. property fences	$1,480	$1,200	$1,380	$1,200	$1,500	$1,450
104 lin. ft. 18-in. C.M.P. (16 ga.)	2.80	2.80	2.40	2.80	3.00	2.25
1,526 lin. ft. 24-in. C.M.P. (14 ga)	3.75	4.00	3.50	4.00	3.90	3.50
196 lin. ft. 36-in. C.M.P. (12 ga.)	6.50	7.00	6.60	7.00	7.00	6.60
18,500 lin. ft. remov. exist. irrig. lines	.30	.25	.14	.60	1.00	.50
Lump sum, misc. items	$1,500	$1,200	650.00	$1,250	$2,000	$2,800

New FRUEHAUF CARRYALLS PACKED WITH *New* FEATURES



C-40-LC Carryall Semi-Trailer — one of 5 Different Models Available in Capacities Ranging from 10 to 74 Tons.

New Frame All welded construction for maximum strength. Cross members are spaced to give greater support to the floor.

New Floor High quality hardwood is now laid longitudinally between the 4 longitudinal frame members. This new design offers three important advantages:

1. *Saves Weight*—eliminates a fifth longitudinal beam, previously used only to support the flooring. Flooring is now supported by cross members.
2. *Lowers Deck Heights* from 2¼ to 3¾ inches, depending on model. Flooring is now flush with main members—not laid on top of them.
3. *Longer Life* under the tough wear and tear of self-propelled machinery. The floor boards are now better protected from the "bite" of lugs.

New Brake Controls This new design assures positive braking, equal on all wheels. On all models having hollow walking-beams, brake controls are mounted inside. This provides protection from water, dirt and permits brakes to function properly.

New Gooseneck Tandem-axle tractor operation is provided for all models except C-15. Model C-25 and C-40 are available with long or short goosenecks. C-50 and C-65 Models have long goosenecks only.

New Skidrails Installed on both sides and across rear. They support any load within the capacity of the Carryall.

New Front Gear Full Trailer models are available in all capacities (except the C-65 model.) Entire gear assembly may be easily removed to operate Carryall as Semi-Trailer, with no further change.

● NOW in production—the latest in Fruehauf Carryalls! Available in 5 capacities—all *engineered* to insure fast, safe, economical movement of heavy loads over seemingly impossible terrain.

Consult your nearest Fruehauf Transportation Engineer. He'll give you many more facts and help you select the best equipment to handle your heavy jobs easier. His experience is certain to save you time and money!

★ ★ ★

World's Largest Builders of Truck-Trailers

FRUEHAUF TRAILER COMPANY

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Los Angeles • San Diego • San Francisco
Salt Lake City • Fresno • Phoenix • Seattle
Billings • Portland • Spokane
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FRUEHAUF TRAILERS FRUEHAUF TRAILERS *"Engineered Transportation"*

Irrigation . . .

Washington—Grant County—Bureau of Reclam.—Earthwork & Struct.

Utah Construction Co., San Francisco, Calif., and Winston Brothers Co., Los Angeles, Calif., in a joint venture submitted the low bid of $3,977,137 (Schedules I and II combined) to the Bureau of Reclamation, Denver, Colo., for construction of 12.3 mi. of the east low canal of the Columbia Basin project from 12 to 20 mi. north of Moses Lake, Wash. The work is divided into two schedules. Schedule I includes a concrete check in the main canal, a 154-ft. concrete turnout structure, Crab Creek siphon No. 1 3,201 ft. long and 19½ ft. inside diam., Crab Creek siphon No. 2 1,400 ft. long, both within 1½ mi. of the north end of the work, and Broken Rock siphon No. 1 881 ft. long, near the south end of the work. Schedule II includes 6,600 ft. of unlined canal with 72-ft. bottom width, 8,025 ft. of unlined canal with 36-ft. bottom width, and 44,739 ft. of concrete lined canal with 20-ft. bottom width, all sections having a designed capacity of 4,500 sec. ft. Bids were received as follows:

	Schedule I	Schedule II	Total
(1) Utah Construction Co. & Winston Bros. Co.	$1,104,334	$2,872,803	$3,977,137
(2) J. A. Terteling & Sons Co.	1,280,675	2,781,031	4,061,706
(3) Bressi & Bevanda Constructors, Inc., W. E. Kier Construction Co., and Guy F. Atkinson Co.	1,470,020	2,854,326	4,324,346
(4) Morrison-Knudsen Co., Inc.	1,494,308	3,094,115	4,588,424

SCHEDULE I		(1)	(2)	(3)	(4)
111,000	cu. yd. excav., com., for struct.	.30	.465	.50	.40
41,000	cu. yd. excav., rock, for struct.	1.80	1.50	2.00	1.50
10,000	sta. yd. overhaul	.02	.02	.04	.03
96,000	cu. yd. backfill	.35	.20	.25	.40
19,000	cu. yd. compacting backfill	2.30	2.50	2.50	2.75
27,100	cu. yd. concrete in structures	18.70	24.00	31.75	27.00
40,500	bbl. furn. and hand. cement	4.25	4.50	3.75	5.50
8,900,000	lb. placing reinf. bars	.023	.025	.024	.035
680	sq. ft. place elastic fill. mtl. in joints	1.00	1.00	1.20	1.00
520	lin. ft. place rubber waterstops	1.20	1.00	1.20	1.00
125,000	lb. place metal water stops	.12	.20	.12	.14
1,700	lb. install blowoff valves and connect.	.25	.30	.30	.14
154,000	lb. install gates and hoists	.10	.10	.09	.07
7,000	lb. install misc. metalwork	.35	.30	.35	.07
1,100	lin. ft. instaling electrical metal conduits	1.20	1.00	1.10	1.00
200	lb. install elect. cond. and gr. wires	1.20	1.00	1.25	1.00

SCHEDULE II		(1)	(2)	(3)	(4)
1,557,000	cu. yd. excav., com., for canal	.18	.13	.18	.20
1,123,000	cu. yd. excav., rock, for canal	.90	.75	.78	1.00
191,000	sta. yd. overhaul	.02	.02	.03	.03
344,000	cu. yd. compact. emb.	.15	.32	.28	.20
1,000	cu. yd. excav., com., for drain. chan. and dikes	1.00	1.00	1.00	.65
200	cu. yd. excav., rock, for drain. chan. and dikes	4.00	2.00	6.00	3.00
7,800	cu. yd. excav., com., for struct.	.90	1.00	1.50	1.00
250	cu. yd. excav., rock, for struct.	3.00	2.00	6.00	3.00
119,000	sq. yd. prep. rock found. for conc. lining	1.15	1.00	1.10	1.30
366,000	sq. yd. trim. earth found. for conc. lining	.58	.60	.70	.65
4,900	sq. yd. backfill	.35	.40	.40	.65
3,200	cu. yd. compact. backfill	2.30	2.50	3.00	3.00
800	sq. yd. dry-rock paving	5.00	2.50	6.00	5.00
470	cu. yd. conc. in struct.	50.00	50.00	75.00	70.00
30,800	cu. yd. conc. in reinf. canal lining	11.00	12.00	11.70	10.00
30,800	cu. yd. conc. in unreinf. canal lining	11.00	12.00	11.70	10.00
91,000	bbl. furn. and hand. cement	4.10	4.50	3.75	4.75
43,000	lb. place reinf. bars in struct.	.035	.04	.04	.035
1,741,000	lb. place reinf. bars in canal lining	.029	.0325	.025	.03
290	sq. ft. place elastic fill. mtl. in jt.	1.00	1.00	1.20	1.00
123	MBM erect. timber in structures	100.00	100.00	90.00	85.00
10,000	lin. ft. constr. underdrains with uncem. jt.	1.15	1.00	1.75	1.75
2,000	lin. ft. lay. sewer pipe with cem. jt.	.58	1.00	1.00	.65
275	lin. ft. lay. 18-in. diam. conc. pipe	2.30	1.50	2.50	1.60
45	lin. ft. lay. 24-in. diam. conc. pipe	3.25	1.80	3.50	2.00
7,000	lb. install. 18-in. diam. steel pipe	.20	.80	.25	.10
4,500	lb. install. gates and hoists	.20	.20	.25	.07
250	lb. install. misc. metalwork	.50	.50	.45	.10

Washington—Franklin County—Bureau of Reclamation—Canals

J. A. Terteling & Sons, Inc., Boise, Ida., bid low at $714,223 to the Bureau of Reclamation to do the earthwork, lateral lining, pipe line and structures on the Pasco pump lateral, sublaterals and waste-water ditches, Columbia Basin Project. Bidders and unit amounts they submitted follow:

(1) J. A. Terteling & Sons, Inc. ..... $714,223 (2) Goodfellow Bros., Inc. $730,121

		(1)	(2)
116,000	cu. yd. excavation for laterals	.64	.90
1,200,000	sta. cu. yd. overhaul	.025	.01
106,000	cu. yd. compacting embankments	.45	.70
17,000	cu. yd. excavation for pipe trenches	.40	1.00
4,400	cu. yd. excavation for structures	.75	1.00
171,400	sq. yd. trimming foundations for lining	.45	.10
88,800	sq. yd. applying soil sterilants	.16	.02
4,600	cu. yd. backfill about structures	.25	1.00
4,600	cu. yd. compacting backfill about structures	3.50	1.00
17,000	cu. yd. backfill of pipe trenches	1.50	.60
1,200	cu. yd. concrete in structures	55.00	54.00
99,000	lb. placing reinforcements bars	.04	.15
26,400	sq. yd. concrete lateral lining 3 in. thick	1.87	2.25
10,000	sq. yd. concrete lateral lining 2 in. thick	1.65	1.60
46,000	lin. ft. making, preparing, and filling joint grooves in conc. lining	.03	.10
500	sq. yd. pneumatically applied mortar lateral lining, 2 in. thick	1.75	1.50
28,600	sq. yd. pneumatically applied mortar lateral lining 1½ in. thick	1.50	1.20
31,200	lin. ft. joint grooves in pneumatically placed mortar lining	.10	.10
88,800	sq. yd. asphaltic lateral lining, except asphalt	1.65	2.00
750	tons furnishing asphalt for asphaltic base course	40.00	30.00
60	tons furnishing asphalt for sealing treatment	40.00	30.00
240	sq. yd. dry-rock paving	5.00	5.00
31	M.F.B.M. erecting timber in structures	100.00	90.00
200	lin. ft. laying 12-in. diameter concrete pipe	.70	1.00
4,700	lin. ft. laying 15-in. diameter concrete pipe	1.00	1.30
9,100	lin. ft. laying 19-in. diameter concrete pipe	1.20	1.80
4,900	lin. ft. laying 21-in. diameter concrete pipe	1.40	2.30
7,350	lin. ft. laying 24-in. diameter concrete pipe	1.60	2.90
290	lin. ft. laying 30-in. diameter concrete pipe	2.00	4.00
1,500	lin. ft. laying 42-in. diameter concrete pipe	2.60	5.00
10,000	lb. installing gates and miscellaneous metalwork	.20	.25

TOUGH ON A LEDGE... EASY ON YOUR LEDGER

You can make short work of the toughest rock with this Blue Brute combination. Start with the New Worthington Wagon Drill, that swings its WD-40 Drifter into action at any angle . . . a fast, powerful drilling machine with a lot of improvements that make it the most versatile performer in its field.

Follow up with Worthington Hand-Held Drills. For example, the WJ-55 . . . medium weight, yet ideal for heavy work and a clean driller at depths up to 20 feet. Your runners will like its ease of operation . . . *you* will appreciate its ability to cut away more footage in less time.

And for always dependable power — a Worthington Portable Compressor. The 315′ is typical. Engine and compressor are joined in a single housing, with three-point suspension, and both are lubricated with full force feed . . . while the easy-breathing Feather* Valves get *all* the air power out of every drop of fuel — gently, positively.

Tough on a ledge, these three . . . but more than kind to your ledger. Because like all Worthington Blue Brutes they're built for continuous, trouble-free service at lowest operating cost . . . one of the outstanding reasons why *there's more worth in Worthington.*

*Reg. U. S. Pat. Off.

H6-13

KNOW YOUR BLUE BRUTES

Your Blue Brute Distributor will gladly show you how Worthington-Ransome construction equipment will put your planning on a profitable basis. His name is listed on page 130. Blue Brutes include:

RANSOME EQUIPMENT

Pavers, Concrete Spreaders**, Concrete Mixers, Concrete Placing Equipment, Big Mixers, Finishing Machines**, Pneumatic Placing & Grouting Equipment, Truck Mixers, Plaster & Bituminous Mixers, and accessories.

WORTHINGTON EQUIPMENT

Diesel and gasoline engine driven Portable Compressors from 60 to 500 cu ft. capacity in mountings to suit all jobs; Rock Drills and Air Tools in a wide range of weights and sizes; Contractors' Pumps**.

**To be announced

Get more WORTH from air with WORTHINGTON

BUY BLUE BRUTES

Compressors from 60 to 500 cu. ft. capacity in mountings to suit all jobs. Rock Drills and Air Tools that have always set the pace for easy operation — available in a wide range of weights and sizes.

WORTHINGTON

Worthington Pump and Machinery Corporation, Worthington-Ransome Construction Equipment Division Holyoke, Mass.

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 may be secured concerning employment conditions, wage rates, etc., by writing directly to the contractor. When available, the names of the supervisory personnel will be published in the "Supervising the Jobs" columns.

CONTRACTS AWARDED

Large Western Projects . . .

H. C. Price Co., Bartlesville, Okla., will receive $3,750,000 from Southern California and Southern Counties Gas Co., Los Angeles, Calif., for the construction of a 214 mi. portion of the Texas-California pipeline between Santa Fe Springs and Blythe, Calif.

Morrison-Knudsen Co., Inc., San Francisco, Calif., was awarded by the Peiping-Hankow Railroad Co. of China a contract for the design and construction of a bridge across the Yellow River, China. The cost will be $6,000,000 or $7,000,000.

Stone and Webster Engineering Corp., Redondo Beach, Calif., was awarded a $1,837,000 contract for the construction of a reinforced concrete building at Redondo Beach by the Southern California Edison Co. of the same city.

Fredrickson Bros., Emeryville, Calif., received $512,573 for the construction of 5 bridges and paving of Hwy. Rt. 7 near Vacaville, Calif. The Division of Highways at Sacramento made the award.

Nettleton & Baldwin Construction Co., Seattle, Wash., will move buildings from hospital in Spokane and other buildings from Vancouver and Port Orchard to the campus grounds at Cheney, Wash. The Eastern Washington College of Education Board at Cheney awarded the $521,420 contract.

Norgaard & Shaw of Dallas, Tex., are to alter and add to a water plant at Dallas. The $562,110 contract was let by the City Council of Dallas.

J. E. Haddock Co. of San Pedro will build for itself 540 apartment units between Gaffey and Alma Streets, San Pedro, Calif., to cost $3,000,000.

Morrison-Knudsen Co., Inc., San Francisco, Calif., receives $500,000 for the construction of a dam for Pit River power plant near Fall River Mills, Shasta Co., Calif., by the Pacific Gas & Electric Co. of San Francisco.

Slate Construction Co., Tangent, Ore., was awarded a $347,178 contract by the Public Roads Administration, Portland, to grade and surface the Clackamas River road in Mt. Hood National Forest, Ore.

The Austin Co., Oakland, Calif., will build a maintenance and overhaul base for $1,750,000 at the San Francisco Airport for the United Air Lines Co. of San Francisco.

S. Birch & Sons Construction Co. of Great Falls, Mont., will receive from the Bureau of Reclamation at Washington, D. C., $401,377 for construction of streets, curbs and gutters, sewage and water systems at the Hungry Horse project, near Kalispell, Mont.

R. F. Ball Construction Co. of Houston, Tex., received $850,000 from the Federal Housing Authority, Fort Worth, to convert barracks into housing units at Georgetown, Temple and Waco, Tex.

MacRae Bros., Seattle, Wash., were awarded $471,502 by the Department of Highways, Olympia, to construct a bridge over the Great Northern Railroad tracks and for piers and approaches to the Columbia River bridge at Northport, Stevens Co., Wash.

PACIFIC WIRE ROPE COMPANY
LOS ANGELES 21, CALIF., U.S.A. *BRANCHES:*
SAN FRANCISCO HOUSTON PORTLAND

J. W. Bateson, Dallas, Tex., receives $850,000 to construct a 7-story office building at Midland, Tex., from the Midland Office Bldg., Inc., of the same city.

Zoss Construction Co., Hollywood, Calif., will build 772 family dwelling units at the Hanson Dam site, San Fernando Valley, Calif. The $1,869,894 contract was let by the Federal Public Housing Authority, San Francisco.

Nathan Wohlford, Dallas, Tex., was awarded a $500,000 contract for the construction of a garage and office building in Dallas by the Continental Trailways, Dallas.

N. M. Ball Sons, Berkeley, and **Harms Bros.,** Sacramento, Calif., will grade and surface 4.6 miles of highway between Schilling and Shasta, Shasta Co., Calif. The $494,627 award was made by the Division of Highways at Sacramento.

Highway and Street...

Arizona

MARICOPA CO.—**Arizona Sand & Rock Co.,** Box 1522, Phoenix—$9,681 to widen sts. beginning at 19th Ave. and Buckeye Rd. and extending E. to 17th St., Phoenix—by State Highway Department, Phoenix. 9-13

MARICOPA CO.—**Daley-Tulloch Construction Co.,** 2400 S. 16th, Phoenix—$37,160 for improvement of Harvard St., Greenfield Acres—by Harvard Street Improvement District, Phoenix. 9-20

MARICOPA CO.—**Daley-Tulloch Construction Co.,** 2400 S. 16th, Phoenix—$11,152 to improve 10th St., betw. Pierce and Roosevelt Sts., Phoenix—by City Commission, Phoenix. 9-20

California

KERN CO.—**Rand Construction Co.,** Box 1339, Bakersfield—$25,372 for 6.3 mi. road mix surfacing betw. Rt. 143 and Cottonwood Creek—by Division of Highways, Sacramento. 9-26

LOS ANGELES CO.—**Fred D. Chadwick,** 4335 Brewster Ave., Lynwood—$12,593 for st. improvements in vicinity of Compton—by County Board of Supervisors, Los Angeles. 9-20

LOS ANGELES CO.—**Griffith Co.,** 1030 S. Broadway, Los Angeles—$68,002 to improve Southern Ave., betw. Long Beach Blvd. and Burk Ave., South Gate—by City Council, South Gate. 9-13

LOS ANGELES CO.—**R. R. Hensler,** 816 Allen Ave., Glendale—$121,731 to improve Wilber Ave. betw. Los Angeles River and Linnet St., Los Angeles—by Board of Public Works, Los Angeles. 8-30

LOS ANGELES CO.—**Sully-Miller Contracting Co.,** 1500 W. 7th St., Long Beach—$13,974 to improve Ocean Blvd., betw. 55th Pl. and 72nd Pl., Long Beach—by City Council, Long Beach. 9-13

MENDOCINO CO.—**C. M. Syar,** Box 1431, Vallejo—$29,966 to grade at Red Bank Creek and Lost Creek, betw. Boonville and Yorkville—by Division of Highways, Sacramento. 9-17

MERCED CO.—**Nelson Material Co.,** Merced—$48,010 for .8 mi. grade. and pave J St., betw. so. line of 16th St. and so. city limits, Merced—by City Council, Merced. 9-25

ORANGE CO.—**Sully-Miller Contracting Co.,** 1500 W. 7th St., Long Beach—$26,987 to patch and resurface Ash St., Date St. and other sts. in Brea—by City Council, Brea. 9-20

PLACER CO.—**Fredrickson & Watson Construction Co.,** 873 81st Ave., Oakland—$182,335 for 1.7 mi. grade. and surf., betw. Rt. 37 and Wise Canal, Auburn—by Division of Highways, Sacramento. 9-17

SAN BERNARDINO AND RIVERSIDE COS.—**Peter Kiewit Sons Co.,** 442 Post St., San Francisco—$413,905 for 5.8 mi. grade, surf. and widen existing bridge structs. and culverts, E. of Ontario and Mira Loma—by Division of Highways, Sacramento. 9-26

SAN DIEGO CO.—**V. R. Dennis Construction Co.,** Box F, Hillcrest Station, San Diego—$18,380 for .06 mi. hwy. widening, 9th and Luneta Dr., Del Mar—by Division of Highways, Sacramento. 9-13

SAN FRANCISCO CO.—**Charles L. Harney,** 625 Market St., San Francisco—$11,991 to grade and pave, also install sewers on Wawona St., betw. 43rd and 44th Aves., San Francisco—by Department of Public Works, San Francisco. 9-26

SAN FRANCISCO CO.—**Charles L. Harney,** 625 Market St., San Francisco—$11,685 to seal coat Sunset Blvd., betw. So. Dr.

of Golden Gate Park and Sloat Blvd., San Francisco—by Department of Public Works, San Francisco. 9-18

SAN JOAQUIN CO.—**A. Teichert & Son,** Box 1133, Sacramento—$60,045 to widen street, Charter Way, from California to Eldorado St., Stockton—by City Council, Stockton. 9-16

SAN JOAQUIN CO.—**A. Teichert & Son,** Box 1133, Sacramento—$39,849 to widen street, Charter Way, from Wilson Way to Pilgrim St., Stockton—by City Council, Stockton. 9-16

SAN MATEO CO.—**L. C. Smith,** 1st and Railroad Aves., San Mateo—$209,097 for street improvements in Hillside Unit No. 3, San Mateo—by City Council, San Mateo. 8-30

SANTA CLARA CO.—**Granite Construction Co.,** Box 900, Watsonville—$148,645 for 4.5 mi. grade. and pave. on Leavesley and Ferguson Rds., betw. Gilroy and junct. of Ferguson rd. with State Hwy. 32—by Division of Highways, Sacramento. 9-26

SHASTA CO.—**N. M. Ball Sons,** Box 430, Berkeley, and **Harms Bros.,** Box 2220, Rt. 4, Sacramento—$494,627 for 4.6 mi. grade. and surf. betw. Schilling and Shasta—by Division of Highways, Sacramento. 9-6

Colorado

WELD CO.—**Peter Kiewit Sons Co.,** 1950 S. Colorado Blvd., Denver—$333,550 for 8 mi. new interstate hwy., from U. S. Hwy. 34 N. on State Hwy. 85—By State Highway Department, Denver. 9-10

Idaho

CANYON CO.—**Lobnitz Bros.,** Sonna Bldg., Boise—$49,986 for 5.6 mi. reconditioning and surf. of Apple Valley rd., betw. Parma, Ida., and Nyssa, Ore.—by Bureau of Highways, Boise. 9-10

CASSIA CO.—**Hoops Construction Co.,** Box 431, Twin Falls—for subbase and surf. on 5.5 mi. of Beetville rd., 1 mi. of Church rd. and 2.3 mi. of View-West rd.—by Bureau of Highways, Boise. 9-21

ELMORE CO.—**Nick Burggraf,** Box 397, Idaho Falls—$43,661 for 6.8 mi. drain. struct., surf. and seal coat of Mt. Home-Grandview rd.—by Bureau of Highways, Boise. 9-10

JEROME CO.—**H. A. Gardner,** 685 NW. Main, Blackfoot—$109,805 for 12.1 mi. roadbed reconditioning and surf., Tipperary Corner-East rd., J. Coulee rd. and Saunders Corner rd.—by Bureau of Highways, Boise. 9-4

LATAH CO.—**McAtee & Heath,** Box 2188, Spokane, Wash.—$34,462 to pave and resurface various sts. in Moscow—by City Council, Moscow. 9-13

MADISON CO.—**Nick Burggraf,** Box 397, Idaho Falls—$24,989 for 1.9 mi. selected borrow subbase and roadmix bitum. surf., Salem-Sugar City rd.—by Bureau of Highways, Boise. 9-21

MADISON CO.—**H. A. Gardner,** 685 NW. Main, Blackfoot—$39,275 for 4.4 mi. roadbed reconstr., surf. and seal coat, Moody rd. from Moody Junction-W.—by Bureau of Highways, Boise. 9-21

POWER CO.—**Lobnitz Bros.,** Sonna Bldg., Boise—$31,979 for 1.9 mi. surf. and seal coat S. Hwy. No. 37, betw. Rockland and Roy—by Bureau of Highways, Boise. 8-31

New Mexico

BERNALILLO CO.—**D. D. Skousen,** Springer Bldg., Albuquerque—$116,926 for 3.9 mi. grade., leveling, watering and surf. on State Rd. 10—by State Highway Department, Santa Fe. 10-1

COLFAX CO.—**G. I. Martin,** 520 S. Tulane, Albuquerque—$135,317 for constr. of 2 box type culverts and 4.4 mi. grade., watering and rolling, leveling, etc., on U. S. Hwy. 64, betw. Taos and Cimarron—by State Highway Department, Santa Fe. 9-27

ROOSEVELT CO.—**Wheeler & Trotz,** Albuquerque—$111,334 for 10.8 mi. grade., drain., structs., leveling and surf. on U. S. Hwy. 70, betw. Portales and Clovis—by State Highway Department, Santa Fe. 9-27

Oregon

CLACKAMAS CO.—**State Construction Co.,** Tangent—$347,-778 to grade and surf. Clackamas River Rd., Mt. Hood National Forest—by Public Roads Administration, Portland. 9-16

CROOK AND JEFFERSON COS.—**Rogers Construction Co.,** Portland—$407,668 for 1.9 mi. regrade., 26.3 mi. surf., also furnish 18,600 cu. yds. of crushed rock in stockpiles, Madras-Prine-

ville Section, secondary hwy.—by State Highway Commission Salem. 9-2

DOUGLAS CO.—**Robert A. Heintz & Co.,** 8101 NE. Union Portland—$276,109 for 6 mi. of grade. and ballast on Little River timber rd., 30 mi. E. of Roseburg—by Public Roads Administration, Portland. 9-20

MULTNOMAH CO.—**Edlefsen-Weygandt Co.,** Box 5626, Portland—$16,455 to furnish and place topsoil cover material on Front Ave. section of Pacific Highway-W.—by State Highway Commission, Salem. 9-24

WALLOWA CO.—**Halvorson Construction Co.,** 1st National Bank Bldg., Salem—$86,677 for 6. mi. grade. Crow Creek timber access rd., E. of Enterprise—by State Highway Commission Salem. 9-21

WASCO CO.—**United Contracting Co.,** Stock Exchange Bldg. Portland—$18,481 to surf. and grade portions of Eighth and Ninth Sts., The Dalles—by City Council, The Dalles. 9-1

Texas

BEXAR CO.—**Colglazier & Hoff,** 326 Seguin Rd., San Antonio —$13,908 for .2 mi. grade on Hwy. 87, from French Pl. to Granado St., San Antonio—by State Highway Department, Austin 9-1

COLLINGSWORTH CO.—**Wallace & Bowden,** 5513 E. Grand Ave., Dallas—$60,821 for 12.8 mi. grade. and structs. on FM 338, from Wellington to Dodson—by State Highway Department, Austin. 9-2

CRANE CO.—**L. L. Cooper,** Crane—$53,194 for 6.3 mi. grade base and surf. on lateral rds., Crane—by County Judge, Crane 9-1

GOLIAD CO.—**Heldenfels Bros.,** Ship Channel, Corpus Christi —$205,184 for 14.2 mi. grade. and structs. from .5 mi. W. of Charco to Hwy. 239, near Goliad—by State Highway Department, Austin. 9-1

GRAYSON CO.—**Wallace & Bowden,** 5513½ E. Grand Ave. Dallas—$30,756 for 16 mi. underseal for conc. pave. from Sherman to Whitesboro, on U. S. Hwy. 82—by State Highway Department, Austin. 9-1

GUADALUPE CO.—**Holland Page,** Box 1181, Austin—$106,459 for 5.5 mi. reconstr., grade., base and surf. on Hwy. 123 from T&NO tracks in Seguin to Geronimo—by State Highway Department, Austin. 9-1

JACK CO.—**Brazos Valley Construction Co.,** Majestic Bldg. Fort Worth—$93,359 for 3.4 mi. grade. and structs. beginning 5.3 mi. N. of Jacksboro—by State Highway Department, Austin 9-2

KENDALL CO.—**Schwope Bros.,** 1014 W. Laurel St., San Antonio—$88,867 for 10.6 mi. grade., drain. and surf. on FM 475 to Kendall-Comal Co. line—by State Highway Department Austin. 9-

KLEBERG CO.—**A. N. McQuown,** 2414 Jarratt St., Austin— $92,084 for 11.3 mi. grade, drain. structs., flex. base and surf. rd. in Kingsville—by County Judge, Kingsville. 9-

LA SALLE CO.—**M. B. Killian & Co.,** Sunset Rd., San Antonio —$73,518 for 6.8 mi. grade., struct., flex. base and surf. on FM 133, betw. Dimmitt Co. line and Artesia Wells—by State Highway Department, Austin. 9-

MASON AND SAN SABA COS.—**Brazos Valley Construction Co.,** Majestic Bldg., Fort Worth—$191,875 for 24.7 mi. grade, drain, structs. and base on FM 386 from Mason to Fredonia and Pontotoc—by State Highway Department, Austin. 9-2

MOORE CO.—**Bell & Braden,** Herring Hotel Bldg., Amarillo— $15,806 for .4 mi. base and surf. on FM 119, betw. N. property line Central Ave., Sunray to 120 ft. N. of N. property line, Lan Ave.—by State Highway Department, Austin. 9-

OLDHAM AND DEAF SMITH COS.—**O. M. Lander,** Waxahachio—$80,345 for 5.2 mi. grade., structs., base and surf. from Vega S.—by State Highway Department, Austin. 9-

PRESIDIO CO.—**C. Hunter Strain,** Box 1057, San Angelo— $31,657 for 5.2 mi. grade., drain. structs., base and surf. on FM 170, from U. S. Hwy. 67—by State Highway Department Austin. 9-

YOAKUM AND GAINS COS.—**Ernest Loyd,** Box 1120, Fort Worth—$167,853 for 23.9 mi. grade., structs., flexible base and surf. on FM 396 and 181 from Hwy. 214 to Bennett and from Seminole to Andrews—by State Highway Department, Austin 8-

YOUNG CO.—**Ernest Loyd,** Box 1120, Fort Worth—$77,215 for 10.4 mi. structs., flex. base and surf. from Loop 132 to 10 mi. W. of Olney—by State Highway Department, Austin. 9-18

ZAVALLA CO.—**H. R. Henderson & Co.,** Marshall — $85,446 for 14.3 mi. grade, structs., base and base preservative from U. S. Hwy. 83 in La Pryor to FM 117 in Batesville—by State Highway Department, Austin. 9-20

Utah

BEAR LAKE CO.—**Allen C. Hunsaker,** Brigham City—$48,986 for 4.2 mi. base and surf. on Ovid-Riverdale rd., from Ovid to Liberty—by State Road Commission, Salt Lake City. 9-21

IRON CO.—**Floyd S. Whiting,** Box 158, Murray—$158,503 for 12.2 mi. bitum. surf., Hwy. 56, New Castle-Modena rd.—by State Road Commission, Salt Lake City. 9-21

SALT LAKE CO.—**Gibbons & Reed,** 259 W. 3rd South St., Salt Lake City—$15,000 to pave various sts. in Salt Lake City—by City Commission, Salt Lake City. 9-2

SANPETE CO.—**Floyd S. Whiting,** Box 158, Murray—$132,611 for 11.4 mi. bitum. surf. betw. Gunnison and Mayfield and Mayfield and Sterling—by State Road Commission, Salt Lake City. 8-31

WASATCH CO.—**A. O. Thorn & Sons Construction Co.,** Springville—$47,608 for 9.7 mi. surf. on U. S. Hwy. 40, betw. Heber and Summit Co. line—by State Road Commission, Salt Lake City. 9-16

Washington

GARFIELD CO.—**Poe Bros.,** Clarkston—$14,363 for 1 mi. grade., drain. and surf. Bell Plain rd.—by County Commission, Pomeroy. 9-17

KING CO.—**J. B. Covello,** Seattle—$10,888 to pave alley, block 6, Exposition Heights and 52nd Ave. SW., Seattle—by City Council, Seattle. 9-13

KING CO.—**Northwest Construction Co.,** 3950 6th Ave. NW., Seattle—$133,567 to pave 35th Ave. SW., Seattle — by City Council, Seattle. 9-13

KING CO.—**Northwest Construction Co.,** 3950 6th Ave. NW., Seattle—$52,289 for .4 mi. clear., grub., grade and pave, on State Hwy. No. 1-K, near Des Moines—by Department of Highways, Olympia. 9-20

KING CO.—**Northwest Construction Co.,** 3950 6th Ave. NW., Seattle—$45,075 to pave alley, block 1, H. E. Nelson addition, Seattle—by City Council, Seattle. 9-13

MASON CO.—**J. F. Forbes,** Olympia—$48,915 to oil roads in commissioner districts one and three—by County Commission, Olympia. 8-30

OKANOGAN CO. — **Acme Asphalt Co.,** 7619 Aurora Ave., Seattle—$25,313 for 23.8 mi. non-skid, single seal coat on State Hwy. No. 10, betw. Omak and Tonasket—by Department of Highways, Olympia. 9-20

PEND OREILLE CO.—**Max J. Kuney Co., Inc.,** N. 120 Ralph, Spokane—$185,288 for 11.7 mi. clear., grub., grade. and surf. State Hwy. No. 6-B, near Davis Lake—by Department of Highways, Olympia. 9-20

PIERCE CO.—**E. W. Price,** Bremerton—$47,478 for .9 mi. clearing, grubbing, grade. and surf. on Arletta-Cromwell Rd.—by Department of Highways, Olympia. 9-16

SNOHOMISH CO.—**P. J. Anderson & Sons,** 13501 Aurora Ave., Seattle—$15,786 for .2 mi. clear., grub., grade., and surf. Sultan Basin Rd.—by Department of Highways, Olympia. 9-16

SNOHOMISH CO.—**Associated Sand & Gravel Co.,** 2508 Colby Ave., Everett—$17,541 to improve 26th St., betw. Colby and Hoyt Ave., Everett—by City Council, Everett. 9-21

SNOHOMISH CO. — **Erickson Paving Co.,** 1550 N. 34th St., Seattle—$57,176 for 4.5 mi. clearing, grubbing, grade. and surf. of Filbert Rd., betw. Alderwood Manor and Thrashers Corner — by Department of Highways, Olympia. 9-16

WALLA WALLA CO.—**Diesel Oil Sales Co.,** 2155 Northlake, Seattle—$12,634 to oil 6.3 mi. of Lyons Ferry rd., N. of Prescott—by County Commission, Walla Walla. 9-11

WHITMAN CO.—**Harold Mast,** Colfax—$70,990 for 2.7 mi. of clear., grub., grade. and surf. of Malden-Pine City Rd.—by Department of Highways, Olympia. 9-16

YAKIMA CO.—**C. E. O'Neal Co., Inc.,** Box 268, Ellensburg—$13,125 to grade and surf. W. Second Ave., from the Christian church W. to the Big Y warehouse, Zillah. —by Department of Highways, Olympia. 9-24

Wyoming

CARBON CO.—**H. W. Read,** 706 W. 19th St., Cheyenne—$161,545 for 6.3 mi. grade., drain. and surf. on Rawlins-Medicine Bow Rd. — by State Highway Department, Cheyenne. 8-28

LARAMIE CO.—**H. W. Read,** 706 W. 19th St., Cheyenne — $40,520 for 6.2 mi. grade., drain. and surf. of the Albin connection rd.—by State Highway Department, Cheyenne. 8-28

NATRONA CO.—**Blanchard Bros.**, Tramway Bldg., Denver, Colo.—$34,312 for 5.5 mi. oil treat. surf. near Casper—by State Highway Department, Cheyenne. 8-28

NATRONA CO. — **Forgey Construction Co.**, Casper—$239,485 for 10.2 mi. grade., drain. and surf. on Midwest Casper Rd.—by State Highway Department, Cheyenne. 8-28

SHERIDAN CO.—**Big Horn Construction Co.**, Sheridan—$9,306 for .4 mi. grade., drain. and surf. of Sheridan-Big Horn Rd.—by State Highway Department, Cheyenne. 8-28

TETON CO.—**Inland Construction Co.**, 3867 Leavenworth St., Omaha, Neb.—$158,698 for 3.7 mi. grade., drain., surf. on Jackson-Wilson Rd.—by State Highway Department, Cheyenne. 8-28

Bridge . . .

Arizona

COCHISE CO.—**Packard Contracting Co.**, Luhrs Tower, Phoenix—$34,632 to constr. 5-span box culvert and approaches and widen 2-span conc. bridge at Moffetts Wash, N. of Douglas—by State Highway Department, Phoenix. 9-13

California

IMPERIAL CO. — **Tanner Construction Co.**, Box 1832, Phoenix, Ariz.—$24,267 to repair 8 timber bridges near Winterhaven—by Division of Highways, Sacramento. 9-4

ORANGE CO.—**E. S. & N. S. Johnson**, Chapman Bldg., Fullerton — $61,445 for constr. of 7 bridges across Ladd, Silverado and Santiago creeks—by County Board of Supervisors, Santa Ana. 8-30

ORANGE CO.—**Fred D. Kyle Co.**, 39 Congress St., Pasadena—$38,075 for constr. of reinf. conc. and steel bridge over Trabuco creek, near San Juan Capistrano — by County Board of Supervisors, Santa Ana. 8-30

PLACER AND EL DORADO COS.—**H. W. Ruby**, Rt. 9, Box 5315, Northrup Ave., Sacramento—$249,626 to build structl. steel girder bridge and to grade and surf. approaches, N. fork of American River, 2 mi. N. of Auburn—by Division of Highways, Sacramento. 9-17

RIVERSIDE CO.—**E. G. Perham**, 1128 Stearns Drive, Los Angeles—$22,026 to repair 5 timber bridges near Indio—by Division of Highways, Sacramento. 9-18

SANTA CRUZ CO.—**Granite Construction Co.**, Box 900, Watsonville—$88,995 to constr. reinf. conc. bridge and grade and surf. approaches at Waddell Creek—by Division of Highways, Sacramento. 9-17

SOLANO CO.—**Fredrickson Bros.**, 1259 65th St., Emeryville—$512,573 for 5.7 mi. grade. and pave. and constr. of 5 bridges, Hwy. Rt. 7 near Vacaville to .5 mi. N. of Sweeney Creek—by Division of Highways, Sacramento. 9-18

SONOMA CO.—**Kiss Crane Company**, 2700 San Pablo, San Pablo—$127,700 for constr. of steel and conc. bridge across Russian River at Hacienda, and removal of present bridge—by Division of Highways, Sacramento. 9-20

YUBA CO.—**C. C. Gildersleeve**, Willows—$11,614 to repair steel and timber bridge, approx. 370 ft. long—by County Board of Supervisors, Marysville. 9-26

New Mexico

SAN JUAN CO.—**J. H. Ryan**, Box 513, Albuquerque—$110,196 for constr. of substructure conc. and steel bridge on U. S. Hwy. 44, betw. Bloomfield and Cuba—by State Highway Department, Santa Fe. 9-27

TAOS CO.—**Lowdermilk Bros.**, 140 S. Elati St., Denver, Colo. — $649,337 for constr. of concr. and steel bridge, 3 conc. box type culverts and 7.8 mi. miscellaneous constr. on State Hwy. 3, betw. Questa and Taos—by State Highway Department, Santa Fe. 9-27

Texas

BANDERA CO. — **Jack Freeland Co.**, Eagle Pass — $113,339 for constr. of low water Medina River bridge and approaches on S. Hwy. No. 16, near Medina—by State Highway Department, Austin. 9-5

TRAVIS CO.—**Austin Bridge Co.**, Box 1590, Dallas—$250,000 for constr. of 6-lane overpass, Central Blvd., over Hall St. Austin—by State Highway Department Austin. 9-2(

Utah

CACHE CO.—**Parson & Fife Construction Co.**, Brigham City, and **L. T. Johnson** Ogden—$311,077 for constr. of conc. bridge and 8.2 mi. grade. road on U. S. Hwy. No 11, betw. Box Elder Co. line and Wellsville — by State Road Commission, Salt Lake City. 9-2(

EMERY AND GRAND COS. — **F. R Knowlton**, Layton—$102,509 for constr. o

substructure of conc. and steel bridge, U. S. Hwy. 50, E. of Green River—by State Road Commission, Salt Lake City. 9-21

WEBER CO.—**Hunsaker Sand & Gravel Co.**, Brigham City—$12,765 for 4.1 mi. surf. betw. Eden and Liberty, and bridge constr. over N. fork of Ogden River—by State Road Commission, Salt Lake City. 8-31

Washington

COWLITZ CO.—**Peter Kiewit Sons Co.**, 403 W. 45th, Seattle—$114,898 to remove 2 timber bridges and replace with 2 conc. box culverts; and to clear, grub, grade and surf. on West Side Rd.—by Department of Highways, Olympia. 9-20

KING CO.—**General Construction Co.**, Box 3244, Seattle—$76,015 for constr. of Magnolia Blvd. conc. bridge at W. Howell St. across 32nd Ave. W., Seattle—by City Council, Seattle. 9-6

KING CO.—**Rumsey & Co.**, 3810 Airport Way, Seattle—$21,916 to constr. timber trestle, University Way, Seattle—by City Council, Seattle. 8-30

KITTITAS CO.—**Northwest Hauling Co.**, 2318 S. Tacoma Way, Tacoma—$47,324 to constr. steel and concr. overcrossing State Hwy. No. 3, near Swauk Creek—by Department of Highways, Olympia. 9-16

PIERCE CO.—**Sam Bergesen**, Box 971, Rt. 10, Tacoma—$14,741 to improve portion of Lemons Beach-Steilacoom county rd. and to constr. conc. bridge—by County Commission, Tacoma. 9-20

STEVENS CO.—**MacRae Bros.**, 2733 4th St., Seattle—$471,502 for reinf. conc. bridge over Great Northern RR tracks, and reinf. conc. piers and approaches to Columbia River bridge at Northport—by Department of Highways, Olympia. 9-20

Wyoming

LARAMIE CO.—**Inland Construction Co.**, 3867 Leavenworth St., Omaha, Neb.—$108,467 for constr. of 2 conc. slab bridges and drain, resurf. of 8.1 mi. of Pine Bluffs-Albin Rd.—by State Highway Department, Cheyenne. 8-28

LARAMIE CO.—**Roush Construction Co.**, Alliance, Neb.—$99,229 for constr. of I-beam span bridge and culverts on Cheyenne-Wheatland Rd.—by State Highway Department, Cheyenne. 8-28

Asia

CHINA—**Morrison-Knudsen Co., Inc.**, 1 Montgomery St., San Francisco, Calif.—$6,000,000 or $7,000,000 for design and constr. of bridge to cross Yellow River—Peiping-Hankow Railroad. 9-1

Water Supply . . .

California

RIVERSIDE CO.—**K. W. Construction Co.**, 275 S. "E" St., San Bernardino—$7,580 for water distribution and storage system for Riverside Co. Fair, Indio—by County Board of Supervisors, Riverside. 9-20

SACRAMENTO CO.—**Pacific Pipe Line Construction Co.**, 2128 San Pablo Ave., El Cerrito—$75,491 to install water mains, 16th and D Sts. to 50th and F Sts., Sacramento—by City Council, Sacramento. 9-24

Idaho

KOOTENAI CO. — **Walter Varnum**, Coeur d'Alene—$60,000 to constr. 1,000,000

gal. water reservoir on Tubbs Hill, Coeur d'Alene—by Washington Water Power Company, Coeur d'Alene. 9-13

Montana

YELLOWSTONE CO. — **Riedesel Construction Co.**, 3225 9th Ave. N., Billings—$203,800 for constr. of waterworks improvements, Billings—by City Council, Billings. 9-20

Oregon

LINCOLN CO.—**J. H. Keller**, Dallas—$11,500 for constr. of 250,000 gal. reinf. conc. reservoir, Yachats—by City Water District, Yachats. 9-20

MULTNOMAH CO.—**American Pipe & Construction Co.**, 518 NE. Columbia Blvd., Portland — $117,538 for fabricating and erecting 1,000,000-gal. steel water tank for St. Johns district, Portland—by City Council, Portland. 9-17

MULTNOMAH CO.—**E. E. Settergren**, Henry Bldg., Portland—$47,157 for constr. of 2 covered conc. reservoirs, Maplewood—by City Council, Maplewood. 9-3

WASHINGTON CO.—**Halvorson Construction Co.**, First National Bank Bldg., Salem—$101,608 for constr. on Unit "B" of 5,000,000-gallon reservoir and connecting pipe lines, Forest Grove — by City Council, Forest Grove. 9-20

WASHINGTON CO.—**C. T. Malcom & Co.**, N. Columbia Blvd., Portland—$52,515 for constr. on Unit "A" of 5,000,000-gallon reservoir and connecting pipe lines, Forest Grove—by City Council, Forest Grove. 9-20

Texas

DALLAS CO.—**Norgaard & Shaw**, 2933 Henderson St., Dallas—$562,110 for additions and alterations to water plant, Dallas—by City Council, Dallas. 9-18

Washington

KING CO.—**Brazier Construction Co.**, 25th NW., Seattle—$15,146 for conc. foundation of Magnolia Bluff elevated steel tank and tower, Seattle—by City Council, Seattle. 9-20

KING CO.—**Valley Construction Co.**, 7708 Rainier Ave., Seattle—$4,696 for watermains in 24th Ave., Seattle—by City Council, Seattle. 9-20

KING CO.—**Valley Construction Co.**, 7708 Rainier Ave., Seattle — $2,526 to install water mains in W. Trenton St., Seattle—by City Council, Seattle. 9-13

Canada

BRITISH COLUMBIA — **General Construction Co., Ltd.**, Vancouver, B. C.—$74,500 for constr. of new intake and pump house, Kamloops—by City Council, Kamloops. 9-26

Sewerage . . .

California

ALAMEDA CO.—**Central California Construction Co., Inc.**, 116 Erie St., San Francisco—$82,219 to constr. sewage pumping station and connecting sewage lines, San Leandro—by City Council, San Leandro. 9-17

ALAMEDA CO.—**John Pestana**, 16411 E. 14th St., San Leandro—$132,173 to install storm sewer in Davis St., betw. Gardner Blvd. and San Francisco Bay, San Leandro—by City Council, San Leandro. 9-18

CONTRA COSTA CO. — **John Pestana**, 16411 E. 14th St., San Leandro—$199,929 for sanitary sewers, pumping plant and grade. road, San Pablo—by Sanitary District, San Pablo. 9-18

LOS ANGELES CO.—**P. & J. Artukovich**, 13305 So. San Pedro St., Los Angeles—$159,230 for constr. of cannery waste sewer, Los Angeles Harbor—by Harbor Commission, Los Angeles. 9-13

LOS ANGELES CO. — **Bosko Construction Co.**, 3726 Lee St., Los Angeles—$13,251 for sanitary sewer system in Normandie Ave., betw. Redondo Beach Blvd. and 146th St., Gardena—by City Council, Gardena. 9-13

LOS ANGELES CO.—**Contracting Engineers Co.**, 2310½ W. Vernon Ave., Los Angeles—$158,400 to constr. pumping plant with force main for cannery waste sewer at Fish Harbor, Terminal Island—by Harbor Commission, Los Angeles. 9-13

LOS ANGELES CO.—**Nick R. Gogo**, 2518 Hill Dr., Los Angeles—$29,423 to install sanitary sewers in Halbrent Ave. and Camarillo St. Sewer District, Los Angeles—by Board of Public Works, Los Angeles 9-13

LOS ANGELES CO. — **Nick R. Gogo**, 2518 Hill Dr., Los Angeles—$10,116 to install sanitary sewers in Fryman Rd. and Iredell St. Sewer District, Los Angeles.—by Board of Public Works, Los Angeles 9-13

LOS ANGELES CO.—**Mike Miller Co.,** 877 N. Bunker Hill Ave., Los Angeles—$347,129 for sewer system trunk lines in various sts. in Arcadia—by City Council, Arcadia. 8-30

ORANGE CO.—**Charles J. Dorfman,** 124 N. La Brea Ave., Los Angeles—$416,674 for C.I. sewer siphon line, etc., in various sts. of Sanitary Lateral Sewer District No. 4, Laguna Beach—by City Council, Laguna Beach. 9-20

SAN FRANCISCO CO. — **Duncanson & Harrelson,** 690 Market St., San Francisco—$42,715 to replace storm water outfall, Baker St., San Francisco—by Department of Public Works, San Francisco. 9-13

SAN JOAQUIN CO. — **A. E. Downer,** 1429 N. Baker St., Stockton—$31,541 for storm water sewers in Fairview Terrace, Stockton—by City Council, Stockton. 9-26

SAN MATEO CO. — **Freethy-Fogelberg Co.,** 1432 Kearney St., El Cerrito—$41,803 for sewage pumping plant, main, etc., Lomita Park—by Lomita Park and Capuchino Sanitary District, Lomita Park. 9-4

SAN MATEO CO.—**M. J. Lynch,** Barneveld & Oakdale Aves., San Francisco—$41,327 for field drain. system at San Francisco Municipal Airport—by Public Utilities Commission, San Francisco. 9-26

SANTA CLARA CO.—**Louis L. Fitinghoff,** 674 Stockton Ave., San Jose—$38,923 to install sanitary sewers in Maude, Mathilda and California Aves., Sunnyvale—by City Council, Sunnyvale. 9-18

SHASTA CO.—**J. P. Brennan,** 1343 Butte St., Redding—$233,916 for constr. of sewage disposal plant and outfall sewer at Redding—by City Council, Redding. 9-6

VENTURA CO. — **Ventura Pipe Line Construction Co.,** 901 N. Olive St., Ventura—$21,513 for sanitary sewers in Virginia Park and E. 5th St. subdivisions, Oxnard—by City Council, Oxnard. 9-6

Nevada

WASHOE CO.—**John B. Powers,** 2284 Lakeside, Reno—$7,091 to install sewer line, Huyck Subdivision, Fourth St., Sparks—by City Council, Sparks. 9-16

Oregon

LANE CO.—**H. C. Werner,** Eugene—$10,765 to constr. 5224 ft. of 8-in. sanitary sewers, Eugene—by City Council, Eugene. 9-13

TILLAMOOK CO. — **Lord Bros.,** 4507 SE. Milwaukie St., Portland—$22,500 for constr. of storm and sanitary sewer at Nehalem—by City Council, Nehalem. 9-7

TILLAMOOK CO. — **Lord Bros.,** 4507 SE. Milwaukie St., Portland—$14,983 to constr. sewer system at Wheeler—by City Council, Wheeler. 9-13

Texas

CROSBY CO. — **Panhandle Construction Co.,** Lubbock—$39,466 for constr. of sewage disposal plant and sewer system, Lorenzo—by City Council, Lorenzo. 9-17

FALLS CO.—**J. D. George,** 3808 Dover St., Houston—$50,267 for sewage treatment plant and sewer system at Lott—by City Council, Lott. 9-18

POTTER CO.—**W. S. Dickey Clay Pipe Co.,** Texarkana—$42,870 to install sanitary sewer system, Amarillo—by City Council, Amarillo. 9-18

Utah

SALT LAKE CO.—**J. B. & R. E. Walker, Inc.**, 21 S. 10 West St., Salt Lake City—$27,075 to install storm sewers on Fifth West, from Second to Fourth South and on Second South, from Fifth to Sixth West Sts., Salt Lake City—by City Commission, Salt Lake City. 9-2

UTAH CO.—**Enoch Smith Sons Co.**, 1441 Beck St., Salt Lake City—$63,685 to install sewers in Sewer District No. 32, Provo—by City Council, Provo. 9-7

Washington

KING CO.—**Valley Construction Co.**, 7708 Rainier Ave., Seattle—$10,674 for constr. of storm sewers, 14th to 17th Aves., SW., White Center—by County Board of Commissioners, Seattle. 9-10

PIERCE CO.—**Gallagher, Kirk & Thomas**, Perkins Bldg., Tacoma—$35,840 to install sewers betw. E. "B" and E. "I" Sts., from E. 57th to 70th, Tacoma—by City Council, Tacoma. 9-3

SPOKANE CO.—**Weller Bros.**, 633 Madelia, Spokane—$140,997 to constr. trunk and lateral sewer, Garland Ave., Spokane—by City Council, Spokane. 9-17

Waterway . . .

California

LOS ANGELES CO.—**Shannahan Bros.**, 6193 Maywood Ave., Huntington Park—to furnish and place approx. 22,000 tons of stone for 1900 ft. sea wall at Redondo Beach—by State Purchasing Agent, Sacramento. 9-20

SACRAMENTO CO.—**Louis Biasotti & Son**, Box 587, Stockton—$17,189 for levee setbacks at Nile, 35.9 mi. W. levee Sacramento River and Hollenbecks, Miner Slough—by U. S. Engineer Office, Sacramento. 9-23

SAN DIEGO CO.—**Franks Dredging Co.**, Silver Strand Highway, Coronado—$133,649 for dredging and filling, betw. Jersey Court and San Jose Place on Mission Bay—by City Council, San Diego. 9-20

SAN DIEGO CO.—**McNamara & Yount**, Architects Bldg., Los Angeles—$139,500 for reconstr. of existing pier structure at Oceanside—by City Council, Oceanside. 8-30

SAN FRANCISCO CO.—**M. B. McGowan, Inc.**, 625 Market St., San Francisco—$16,838 to reconstr. fender lines S. of Pier 54 and repair adjacent bulkhead wharf, San Francisco—by State Harbor Commission, San Francisco. 9-20

Washington

PIERCE CO.—**General Construction Co.**, Box 3244, Seattle—$284,600 to dredge Sitcum waterway, Pier 1 extension and fill "quadrangle" on Port of Tacoma terminal property, Tacoma — by City Council, Tacoma. 9-18

PIERCE CO.—**Woodworth & Co., Inc.**, 1200 E. "D" St., Tacoma — $26,084 for constr. of 2 units of sea wall on E. shore of Henderson Bay, near Purdy—by County Commission, Tacoma. 9-20

Dam . . .

California

SHASTA CO. — **Morrison-Knudsen Co.**, 111 Sutter St., San Francisco—$500,000 for constr. of dam and related structs. for Pit River No. 1 power plant, near Fall River Mills—by Pacific Gas & Electric Co., San Francisco. 9-11

Power . . .

California

NAPA CO.—**Sam Bisset**, 1428 Alhambra Blvd., Sacramento—$7,880 for power line at Berryessa Peak Lookout Station—by Division of Architecture, Sacramento. 9-13

SAN DIEGO CO.—**Theodore Scott**, 4405 S. Normandie Ave., Los Angeles—$26,568 for constr. of 7 mi. of line, Campo—by Mountain Empire Electric Cooperative, Inc., Campo. 9-9

Kansas

ALLEN CO.—**J. R. Foree Contracting Co.**, 421 Rutledge, Topeka—$100,541 for 103.3 mi. of line to serve 149 members—by The Cooperative Power and Light Co., Inc., Iola. 9-9

Montana

CASCADE CO. — **Cahill-Mooney Construction Co.**, 220 East Front St., Butte—$292,145 for constr. of 304 mi. of line to serve 331 consumers—by Sun River Elec-

tric Cooperative, Inc., Corvallis. 9-3

SHERIDAN CO. — **Walden, Robbins & Needham,** Hugo, Okla.—$12,999 for clearing of 222 mi. of line to serve 538 consumers—by Sheridan County Electric Cooperative, Inc., Westby. 9-3

STILLWATER CO. — **Lewis Construction Co.,** 1311 Division St., Billings—$202,056 for 152.7 mi. of line to serve 250 members—by Beartooth Electric Cooperative, Inc., Red Lodge. 9-16

Nebraska

RED WILLOW CO.—**Crawford Electric Co.,** North Platte—$226,394 to constr. 283.7 mi. of line to serve 322 members—by McCook Public Power District, McCook. 9-16

Oklahoma

WASHITA CO.—**J. & J. Construction Co.,** Oklahoma City—$109,936 for constr. of 117.5 mi. of line to serve 237 members—by Kiwash Electric Cooperative, Inc., Cordell. 9-16

Texas

LUBBOCK CO.—**The Electric & Construction Co.,** Borger—$24,627 for constr. of 111.5 mi. line—by South Plains Electric Cooperative, Lubbock. 9-9

Washington

SAN JUAN CO. — **Montgomery Electric Co.,** Montgomery, Ala.—$145,317 for 69 mi. of line to serve 147 members—by Orcas Power and Light Co., Eastsound. 9-9

Building . . .

Arizona

MARICOPA CO. — **M. W. Bobo,** 1462 McKinley, Phoenix — $200,000 to constr. factory bldg. at 959 E. Jackson St., Phoenix —by Coronado Furniture Co., Phoenix. 9-10

MARICOPA CO. — **Shumaker & Evans Construction Co.,** 3000 N. Central Ave., Phoenix — $78,104 for relocation of 52 dwelling units, Chandler — by Federal Public Housing Authority, San Francisco, Calif. 9-3

MARICOPA CO. — **Shumaker & Evans Construction Co.,** 3000 N. Central Ave., Phoenix—$58,500 to erect 30 dwelling units at Falcan Field Airport, Mesa—by Federal Public Housing Authority, San Francisco. 9-20

MARICOPA CO. — **Del E. Webb,** Box 4066, Phoenix — $90,000 for reinf. conc. grain elevator at 310 S. 24th Ave., Phoenix —by Allied Grain Co., Phoenix. 8-30

MARICOPA CO.—**Womack Construction Co.,** 1712 S. Central Ave., Phoenix—$400,000 for addition to milk and creamery plant on S. Third Ave., Phoenix—by Borden Company, Phoenix. 9-20

MOHAVE CO.—**Green Lumber Co.,** Laurel, Miss.—$55,000 to deliver 25 two-bedroom, type 2, prefab. or precut dwellings to Davis Government Camp on schedule 2 —by Bureau of Reclamation, Denver, Colo. 9-20

California

ALAMEDA CO.—**The Austin Company,** 618 Grand Ave., Oakland—$500,000 for constr. of one-story, heavy mill-type bldg. and steel frame warehouse bldg. at Newark

—by Leslie Salt Co., San Francisco. 9-11

ALAMEDA CO.—**Christensen & Lyons,** 3454 Harlan St., Oakland — $370,000 for constr. of 2-story manufacturing plant at 708 Addison St., Berkeley — by Challenge Cream and Butter Assn., Oakland 9-19

ALAMEDA CO.—**Christensen & Lyons,** 3454 Harlan St., Oakland—$67,000 for one-story, conc. warehouse bldg., 300 Brush St., Oakland—by W. S. Plywood Corp., Oakland. 9-6

ALAMEDA CO.—**R. F. Johnson,** 2036 San Pablo Ave., El Cerrito—$100,000 to constr. 2-story medical-dental bldg., 2434 Haste St., Berkeley — by Mrs. Creede Bishop, Berkeley. 9-20

ALAMEDA CO. — **Willis F. Lynn,** 1040 Folger Ave., Berkeley—$95,500 to constr. structl. steel frame warehouse bldg., Berkeley—by A. M. Castle & Co., Emeryville. 9-16

ALAMEDA CO.—**Willis F. Lynn,** 1040 Folger Ave., Berkeley — $95,500 to constr. of one-story, prefab. steel warehouse bldg. on lower Main St., Alameda—by United Engineering Co., Alameda. 8-30

ALAMEDA CO.—**The John J. Moore Co.,** 959 33rd St., Oakland—$140,000 for constr. of steel frame industrial bldg., Seventh and Gilman Sts., Berkeley—by Trailmobile Co., Berkeley. 8-30

ALAMEDA CO. — **Parker, Steffens & Pearce,** 135 South Park, San Francisco—$200,000 for constr. of 3-story, reinf. conc. newspaper plant, Oak St., betw. Santa Clara and Lincoln Aves., Alameda — by Alameda Times-Star, Alameda. 9-26

ALAMEDA CO.—**E. P. Seemans,** Oak Road, Walnut Creek—$150,000 to constr. swimming pool, tennis courts, clubhouse, etc., one mi. SW. of Walnut Creek—by Sun Valley Swimming & Tennis Club, Oakland. 9-19

ALAMEDA CO.—**Shale Abraham Ortzow,** 1511 Jackson St., Oakland — $70,000 for constr. of 25-room, one-story medical-dental bldg., Estudillo Ave., San Leandro —by A. L. Velarde, San Leandro. 9-5

ALAMEDA CO.—**N. H. Sjoberg & Son,** 5604 E. 16th St., Oakland — $150,000 to constr. one-story, reinf. conc. and steel frame diesel engine house bldg., at W. Oakland Yard, Middle Harbor Rd., Oakland—by Western Pacific Railroad Co., San Francisco. 9-11

CONTRA COSTA CO.—**Dinwiddie Construction Co., Inc.,** Crocker Bldg., San Francisco—$175,000 for constr. of masonry and steel coach garage at 21st St. and Macdonald Ave., Richmond—By Key System, Oakland. 9-26

CONTRA COSTA CO. — **Glimme Construction Co.,** 411 15th St., Oakland—$51,028 for constr. of steel frame and conc. block bldg. at Walnut Creek—by Mount Diablo Motor Sales Co., Walnut Creek. 9-5

CONTRA COSTA CO. — **Swinerton & Walberg Co.,** 225 Bush St., San Francisco —$732,360 for constr. of process laboratory bldg. at Richmond—by Standard of California, San Francisco. 9-17

CONTRA COSTA CO. — **Swinerton & Walberg,** 225 Bush St., San Francisco—$60,000 for temp. quonset type bldgs. at SW. corner Central and Solari Sts., Pittsburg—by Coca-Cola Bottling Co. of California, Oakland. 9-5

FRESNO CO.—**J. T. Cowan,** Brix Bldg., Fresno—$100,000 to rebuild warehouse in Fresno—by Fresno Warehouse Co., Fresno.

KERN CO. — **Ernest A. Kaiser,** 8825 Olympic Blvd., Beverly Hills—$121,604 to erect 101 dwelling units at Bakersfield—by Federal Public Housing Authority, San Francisco. 9-20

LOS ANGELES CO.—**Baruch Corp.,** 621 S. Flower St., Los Angeles—$150,000 for constr. of reinf. masonry storage bldg., 4224 District Blvd., Vernon—by Federal Ice & Cold Storage Co., Vernon. 9-24

LOS ANGELES CO.—**Buff Construction Co.,** 402 E. Broadway, Glendale—$120,000 for constr. of ten 8-room, frame and stucco duplex dwellings on Parish and Lamer Sts., Burbank—by Royal Leonard, Burbank. 9-6

LOS ANGELES CO.—**M. Feigenbaum,** 5036 W. Jefferson Blvd., Los Angeles—$105,000 to constr. 2-story, brick factory bldg., 1500 S. Broadway, Los Angeles—by Ted Saval, Los Angeles. 9-20

LOS ANGELES CO.—**Finecraft Inc.,** 736 N. Highland Ave., Los Angeles—$73,000 to constr. 8-unit frame and stucco apartment bldg. at 8613-19 W. Olympic Blvd., Los Angeles—by Kay & Associates, Los Angeles. 9-6

LOS ANGELES CO.—**Geo. S. Fruehling,** 1031 S. La Brea Ave., Los Angeles—$528,000 for constr. of 44 one-story, 4-unit, frame and stucco apartment bldgs. on Florence, Naomi and Catalina Sts., Burbank — by Southland Properties, Inc., Burbank. 8-30

LOS ANGELES CO.—**J. E. Haddock Co.,** Miner St., San Pedro—$3,000,000 for constr. of approx. 540 apartment units to be built on 41-acre tract betw. Gaffey and Alma Sts., San Pedro—by self. 9-6

LOS ANGELES CO.—**Gordon R. Howard,** 1031 S. La Brea Ave., Los Angeles—$139,000 for 2 apartment bldgs., at 6212-16 La Mirada St., Los Angeles—by self. 9-6

LOS ANGELES CO.—**Roy L. Kent Co.,** 117 W. Lexington Dr., Glendale—$95,000 to constr. 16 five-room, frame and stucco dwellings on 7400 and 7500 Eton Ave. blocks, Van Nuys—by J. W. Kent, Van Nuys. 9-20

LOS ANGELES CO.—**J. H. Kunz,** 3142 Halm Ave., Los Angeles — $181,000 for constr. of seven, 16-room, frame and stucco apartment bldgs. on Silverlake Terr. and Ivanhoe Dr., Los Angeles—by David Orin and John Lindsay, Los Angeles. 8-30

LOS ANGELES CO.—**Lawrence Bros., Inc.,** 1016 S. La Cienega Blvd., Los Angeles—$150,000 for constr. of 3-story, frame and stucco apartment bldg. at 2127 Cahuenga Blvd., Los Angeles—by Lawrence Bros. Investments, Los Angeles. 9-6

LOS ANGELES CO.—**L. A. Lefevre,** 4916 Ben Ave., Van Nuys—$100,000 to constr. 45-room, reinf. conc. and wood dwelling at 4850 Woodman Ave., Van Nuys—by Congregation of Holy Cross, Notre Dame University, South Bend, Ind. 9-20

LOS ANGELES CO.—**The McCarthy Co.,** 1138 S. Broadway, Los Angeles—$247,400 for 35, six-room, frame and stucco residences in the 9300, 9400 and 9500 blocks, Ingleport Ave., Venice—by self. 9-13

LOS ANGELES CO.—**McNeil Construction Co.,** 5860 Avalon Blvd., Los Angeles—$200,000 to constr. one-story, hollow conc. masonry office and warehouse bldg. at NW. corner of Leonis Blvd. and Alcoa Ave., Vernon — by Las Vegas Land & Water Co., Los Angeles. 9-13

LOS ANGELES CO.—**J. A. McNeil Co.,** 714 W. Olympic Blvd., Los Angeles—$100,000 to constr. one-story, steel frame

and stucco service bldg., 636 S. Central Ave., Los Angeles—by L. A. Transit Lines, Los Angeles. 9-20

LOS ANGELES CO.—**Wm. J. Moran Co.,** 1011 S. Fremont Ave., Alhambra—$400,000 for one- and part 2-story, reinf. conc. cold storage plant, 10 W. Magnolia Blvd., Burbank—by Freese-It Corp., Burbank. 9-6

LOS ANGELES CO.—**Harvey A. Nichols Co.,** 936 E. Slauson Ave., Los Angeles—$118,629 for general alterations to Civic Center Bldg., 205 S. Broadway, Los Angeles—by County Board of Supervisors, Los Angeles. 9-20

LOS ANGELES CO.—**Normandie Building Co.,** 4015 W. Jefferson Blvd., Los Angeles—$80,000 for constr. of 20-family, frame and stucco apartment bldg. at 1601 N. Normandie Ave., Los Angeles—by self. 8-30

LOS ANGELES CO.—**Sapp Construction Co.,** 1845 S. Beverly Glen Blvd., W. Los Angeles—$100,000 to repair 4-story, fire-damaged factory bldg., 412-16 E. 9th St., Los Angeles—by A. & J. Realty Co., Los Angeles. 9-20

LOS ANGELES CO.—**Sapp Construction Co.,** 1845 S. Beverly Glen Blvd., W. Los Angeles—$70,000 for constr. of a brick textile bldg. at 910-12 Wall St., Los Angeles—by B. & S. Realty Co., Los Angeles. 9-6

LOS ANGELES CO.—**Stone and Webster Engineering Corp.,** 7th and Hermosa St., Redondo Beach—$1,837,000 for reinf. conc. and structl. steel frame bldg. at Redondo Beach—by Southern California Edison Co., Redondo Beach. 8-30

LOS ANGELES CO. — **Stronach Construction Co.,** 115 N. Robertson Blvd., Los Angeles—$100,000 for constr. of one-story and mezzanine, reinf. conc. bank bldg. at 10th and Beach Sts., Lancaster—by Bank of America, Los Angeles. 9-20

LOS ANGELES CO.—**United Concrete Pipe Corp.,** Box 1, Station H, Los Angeles—$424,519 for constr. of launcher bridge, connecting bridge, etc., for Navy project on shores of lake formed by Morris Dam—by General Tire & Rubber Co. of California, Los Angeles. 8-30

LOS ANGELES CO. — **Werner-Carlson,** 8525 Melrose Ave., Los Angeles—$100,000 for constr. of a 12-unit, frame and stucco apartment bldg. at 813-19½ Leverling Ave., W. Los Angeles—by Meyer H. Fox, Los Angeles. 9-6

LOS ANGELES CO.—**Zoss Construction Co.,** Box 1167, Hollywood—$1,869,784 for constr. of addtl. 772 family units at Hanson Dam site, San Fernando Valley—by Federal Public Housing Authority, San Francisco. 9-23

MENDOCINO CO.—**M & K Corp.,** Financial Center Bldg., San Francisco—$101,136 to erect 84 dwelling units at Willits—by Federal Public Housing Authority, San Francisco. 9-6

RIVERSIDE CO.—**Daley Brothers,** 426 Bryant St., San Francisco—$67,500 for constr. of 50 dwelling units at Riverside—by Federal Public Housing Authority, San Francisco. 8-30

RIVERSIDE CO. — **R. H. Grant Construction Co.,** 170 W. Amado Rd., Palm Springs—$80,000 to constr. one-story bank and store bldg. at Fargo and Bliss Aves., Indio—by Bank of America, Los Angeles. 9-20

RIVERSIDE CO.—**Shumaker & Evans Construction Co.,** 3974 Wilshire Blvd., Los Angeles—$60,200 for 50 dwelling units at Coachella—by Federal Public Housing Authority, San Francisco. 8-30

SACRAMENTO CO. — **Fred G. Haase,** 2728 Capitol St., Sacramento—$175,500 for constr. of frame and stucco dwellings, Hedgemont, Sacramento—by self. 9-4

SAN BERNARDINO CO. — **George B. Thatcher Co.,** 4074 Laurel Canyon Blvd., North Hollywood—$86,688 for constr. of 72 dwelling units at Redlands—by Federal Public Housing Authority, San Francisco. 9-13

SAN DIEGO CO. — **O. L. Carpenter,** Spreckels Theater Bldg., San Diego—$174,170 for constr. of 12-classroom, frame and stucco school bldg. at 70th and Powers Sts., La Mesa—by La Mesa-Spring Valley Union School District, La Mesa. 9-10

SAN LUIS OBISPO CO.—**A. Madonna,** 1028 Chorro St., San Luis Obispo—$68,084 for constr. of conc. foundations for 4 steel bldgs. at Calif. Polytechnic School, San Luis Obispo—by Division of Architecture, Sacramento. 9-6

SAN LUIS OBISPO CO. — **Oliver M. Rousseau,** 755 Tehama St., San Francisco—$120,160 to build 80 dwelling units at San Luis Obispo—by Federal Public Housing Authority, San Francisco. 9-13

SAN LUIS OBISPO CO.—**Stolte, Inc.,** 1405 San Antonio Ave., Alameda—$90,559 for constr. of 39 steel barracks bldgs. on school grounds at San Luis Obispo—by Division of Architecture, Sacramento. 9-6

SAN MATEO CO.—**The Austin Co.,** 618 Grand Ave., Oakland—$1,750,000 to constr.

maintenance base and overhaul base at San Francisco Airport—by United Air Lines, San Francisco. 9-19

SAN MATEO CO.—**Moore & Roberts,** 693 Mission St., San Francisco—$150,000 for constr. of 8-classroom, reinf. conc. and frame school bldg., Brunswick St., Daly City—by Roman Catholic Archbishop of San Francisco. 9-25

SAN MATEO CO.—**Peter Sorensen,** 927 Arguello St., Redwood City—$205,036 for constr. of 2 one-story, conc. and steel frame classroom bldgs. at corner of Charter and Stambaugh Sts., Redwood City—by City Elementary School District, Redwood City. 9-10

SANTA CLARA CO.—**Ernest A. Hathaway,** 1275 Glen Eyrie Ave., San Jose—$100,000 for constr. of steel and brick factory bldg., at 153 W. Julian St., San Jose—by Eggo Food Products Co., San Jose. 8-30

SANTA CLARA CO.—**Earl Heple,** 494 Delmas Ave., San Jose—$60,000 for one-story, reinf. conc., steel frame drive-in restaurant bldg., Park Ave. and Calaveras St., San Jose—by J. A. Buzolich, San Jose. 9-19

SANTA CLARA CO.—**Peter J. Pasetta,** 2390 Park Ave., Santa Clara—$65,000 for constr. of 3 corrugated steel factory bldgs., Pasetta Tract, Santa Clara—by Dickinson Co., Chicago, Ill., T. R. Merrill, Salinas and S. A. Smith, Bakersfield. 9-12

SOLANO CO.—**Utah Constrution Co.,** 1 Montgomery St., San Francisco—$174,000 for constr. of fireproof storage bldg. at Vallejo—by General Mills, Inc., San Francisco. 9-4

SONOMA CO.—**Joseph A. Bryant,** 1815 Capitol St., Vallejo—$177,300 for constr. of family dwelling units in Petaluma, Santa Rosa, Sebastopol, Sonoma and Healdsburg — by Federal Public Housing Authority, San Francisco. 8-30

STANISLAUS CO.—**Hans Pearson,** 217 Ramona Ave., Modesto — $150,000 for constr. of 2-story, reinf. conc. church, at 12th and M Sts., Modesto—by First Baptist Church, Modesto. 9-10

TULARE CO.—**Taylor & Wheeler,** 245 Clinton, Fresno—$200,000 to constr. one-story, 32-bed reinf. conc. hospital bldg., betw. Crespi Ave. and the Santa Fe Railroad tracks at Exeter—by Exeter Hospital Association, Exeter. 9-6

Idaho

BANNOCK CO. — **Brennan & Cahoon Construction Co.,** Box 507, Pocatello—$100,000 for constr. of pressed brick structure, located ½ mi. W. of Pocatello—by Zweigart Packing Plant, Pocatello. 9-28

Oregon

BENTON CO.—**Halvorson Construction Co.,** 1st National Bank Bldg., Salem—$68,291 for constr. of senior high school addition at Corvallis—by School Board, Corvallis. 9-10

CLACKAMAS CO. — **H. J. Settergren,** 5627 NE. 26th St., Portland—$115,894 for constr. of 2-story, brick veneer school bldg., Clear and First Sts., Oregon City — by Clackamas Co. School District No. 62, Oregon City. 9-20

CLATSOP CO. — **John Helstrom,** 649 Jerome Court, Astoria—$95,000 for constr. of medical-dental bldg., Astoria—by Board of Management, Astoria Clinic, Astoria. 9-9

MULTNOMAH CO.—**Austin Co.,** Dexter Horton Bldg., Portland—$40,000 for one-story addition to bldg., 303 W. Hudson St., Portland—by Trumbull Electric Manufacturing Co., Portland. 9-20

Texas

BEXAR CO.—**F. L. Scott and Son,** 123 Beal St., San Antonio—$51,000 for constr. of church, social hall and educational bldg. at Pleasanton Rd. and Gerald Ave., San Antonio — by Harlandale Presbyterian Church, San Antonio. 8-28

DALLAS CO.—**J. J. Fritch,** 7000 Harry Hines Blvd., Dallas—$453,338 to constr. 4 units of proposed 36-unit market shed, Dallas—by City Council, Dallas. 9-18

DALLAS CO. — **O'Rourke Construction Co.,** 1001 Commerce St., Dallas—$250,000 for constr. of one-story warehouse and office bldg. at 3201 Manor Way, Dallas—by Firestone Tire & Rubber Co., Akron, Ohio. 9-9

DALLAS CO.—**State Fair Association,** Dallas—$175,000 for constr. of additions to bldgs., etc., at fair grounds, Dallas—by self. 8-30

DALLAS CO.—**Nathan Wohlford,** 6702 Cedar Springs, Dallas—$500,000 for constr. of garage and office bldg., Dallas—by Continental Trailways, Dallas. 9-18

MIDLAND CO.—**J. W. Bateson,** Irwin-Keasler Bldg., Dallas—$850,000 for constr. of 7-story office bldg., Midland—by Midland Office Bldg., Inc., Midland. 9-4

TARRANT CO.—**Cain & Cain,** Majestic Bldg., Fort Worth—$80,000 to completely remodel store at Fort Worth—by Everybody's Store, Fort Worth. 9-11

WILLIAMSON, BELL AND MC LENNAN COS.—**R. F. Ball Construction Co.,** 3200 W. Dallas Ave., Houston—$850,000 to convert barracks into housing units at Georgetown, Temple and Waco—by Federal Housing Authority, Fort Worth. 8-27

Utah

CACHE CO.—**Alton M. Berntson,** Logan—$50,000 for constr. of newspaper bldg., Logan—by Mr. Rasmussen, Logan. 9-14

Washington

GRANT CO.—**American Bridge Company,** Pittsburgh, Pa. — $82,558 for constr. of structl. steel warehouse at Grand Coulee Dam—by Bureau of Reclamation, Washington, D. C. 9-13

JEFFERSON CO. — **Norge Construction Co.,** 5008 Admiral Way, Seattle—$96,387 for constr. of one-story, conc. block gymnasium, Chimacum — by County School District No. 49, Chimacum. 9-19

SPOKANE CO.—**Nettleton & Baldwin Construction Co.,** 1109 N. 36th St., Seattle—$521,420 to move 17 bldgs. from Baxter hospital in Spokane, and others from Vancouver and Port Orchard to campus at Cheney—by Eastern Washington College of Education Board, Cheney. 9-19

WHATCOM CO. — **Chisholm & Elford,** 1726 State St., Bellingham—$261,000 for constr. of 3-story, reinf. conc. dormitory bldg. at Bellingham—by Western College of Education, Bellingham. 9-16

WHATCOM CO.—**Gaasland Construction Co.,** 1161 Ellis St., Bellingham—$84,700 for constr. of 40-family housing project on Huntoon Drive and Twenty-first St., Bellingham—by Federal Public Housing Authority. 9-21

Wyoming

FREMONT CO. — **Dawson, Corbett & Shelp,** Rawlins—$203,815 for constr. of office bldg., 2 dormitories and 16 other bldgs., Boysen Unit, Wyo., Mo. Basin Project—by Bureau of Reclamation, Thermopolis. 8-31

Territories

Hawaii

HAWAII—**E. E. Black & Co.,** Honolulu—to alter and add to Royal Hawaiian Hotel, Honolulu—by Matson Navigation Co., San Francisco. 9-12

Canada

BRITISH COLUMBIA — **E. A. and George Diffner,** 2594 Grant St., Vancouver—$91,000 for constr. of 2-story, 6-room, wood frame school bldg. at Burkeville, Sea Island—by School Board, Burkeville. 9-20

BRITISH COLUMBIA — **Sullivan Construction Co., Ltd.,** 736 Granville St., Vancouver—$200,000 for constr. of first portion of 4-story addition to hospital bldg., Victoria—by Board of Management, St. Joseph's Hospital, Victoria. 9-20

Miscellaneous . . .

Arizona

PIMA CO.—**L. M. White Contracting Co.,** W. St. Marys Rd., Tucson—$80,288 for sts., curbs, sewers, water works, etc., in Broadway and S. Park Ave. Dist., Tucson—by City Council, Tucson. 9-13

California

ORANGE CO.—**Sully-Miller Contracting Co.,** 1500 W. 7th St., Long Beach—$104,818 for st. work, sewer and water improvements at Newport Beach—by City Council, Newport Beach. 9-6

SANTA CLARA CO. — **Louis Angelus,** 604 MacArthur Blvd., San Leandro—$71,000 for constr. of curbs and gutters in "Old Burbank" and Rose Lawn Ter., San Jose—by Burbank Sanitary District, San Jose. 9-26

VARIOUS COS.—**H. C. Price Co.,** Union National Bank Bldg., Bartlesville, Okla.—$3,750,000 for constr. of 214 mi. of 30-in. pipeline, portion of Texas-Calif. natural gas pipeline, Santa Fe Springs to Blythe—by Southern California and Southern Counties Gas Co., Los Angeles. 9-24

Washington

GRANT CO.—**Noble Co.,** 1860 7th St., Oakland, Calif.—$60,762 to supply equip. for unloading, storing and batching bulk cement at Odair, near Coulee City, and at Coulee Dam, for irrigation structs. — by Bureau of Reclamation, Coulee Dam, Wash. 9-12

YAKIMA CO. — **Worthington Pump & Machinery Corp.,** Harrison, N. J.—$179,652 for 15 outdoor pumping units to serve 27,000 ac. of Roza division of Yakima project—by Bureau of Reclamation, Boise, Ida. 9-6

Wyoming

FREMONT CO.—**W. E. Barling, Inc.,** Meeteetse—$144,265 for constr. of extension to sewer and water systems, Lander—by City Council, Lander. 9-2

NATRONA CO.—**Colorado Portland Cement Co.**, Denver—$168,828 for 56,000 bbl. of cement for start of Kortes dam and power plant, near Casper—by Bureau of Reclamation, Washington, D. C. 9-25

PROPOSED PROJECTS

Sewerage . . .

Texas

POTTER CO—Construction of sanitary sewer extension and outfall line to cost about $1,100,000 is being planned by the City Council of Amarillo.

Dam . . .

Oregon

DOUGLAS CO.—The California-Oregon Power Co., 216 W. Main St., Medford, plans to call for bids in a few months for construction of a tunnel, earthfill dam, powerhouse and transmission line on its North Umpqua River, 3-unit power development program; the cost will be approx. $3,375,000.

Texas

HILL CO.—Bids will soon be called for the $20,000,000 Whitney Dam on Brazos River, 38 mi. upstream from Waco.

Power . . .

California

SAN BERNARDINO CO.—Mesa Electric Cooperative, Inc., of Phelan received a $225,000 loan for the purchase and installation of two 500 kilowatt diesel generating units—by Rural Electrification Administration, Washington, D. C.

SHASTA AND HUMBOLDT COS.—Pacific Gas & Electric Co., 245 Market St., San Francisco, plans to construct a 110-mile transmission line, as well as a switching station at Freshwater; cost will be about $2,237,500.

Montana

CARBON CO.—Beartooth Electric Cooperative, Inc., Red Lodge, received a loan of $70,000 to complete previously approved construction and for 15 mi. of new line to serve 52 consumers—by Rural Electrification Administration, Washington, D. C.

HILL CO.—Hill County Electric Cooperative, Inc., Havre, received $515,000 for 380 miles of line to serve 361 rural consumers—by Rural Electrification Administration, Washington, D. C.

Washington

KLICKITAT CO.—County Public Utility District No. 1, White Salmon, received loan of $320,000 for improvement of its rural-electric facilities—by Rural Electrification Administration, Washington, D. C.

MASON CO.—County Public Utility District No. 1, Hoosport—received REA approval of loan of $63,000 for construction of 22 miles of line to serve 127 consumers.

TRADE WINDS

News of Men Who Sell to the Construction West

CALIFORNIA

W. R. Grieg has been appointed Western regional manager, floor covering division, THE PARAFFINE COMPANIES, INC., with headquarters at the home office, 475 Brannan Street, San Francisco. He will be in charge of Western sales activities for linoleum, felt base floor covering, mastipave and allied lines for Pabco. Before his promotion he was manager of the Los Angeles district for Pabco.

E. F. Seagrave, veteran Pabco Central District Sales Manager, has resigned to enter a building material distribution firm in Reno, Nevada. **Norman L. Favors** will succeed him as sales manager, building materials, with headquarters at San Francisco. **E. F. Pless** continues as assistant district sales manager.

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T. L. Kishbaugh, formerly vice-president and merchandising manager of Earle M. Jorgensen Co., Los Angeles, has become associated with the new Los Angeles plant of JOSEPH T. RYERSON & SON, INC. warehouse steel distributors. He has a wide acquaintance among steel processors and fabricators in the Southern California area. In 1942 and 1943 he headed the Alloy division of the Warehouse Branch of the Steel division of the WPB in Washington, D. C.

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New California Division Manager of the Lighting Sales Department of SYLVANIA ELECTRIC PRODUCTS INC. is **John T. Burdick.** His offices will be at 555 South Flower St., Los Angeles. He has been affiliated with the sales department of Sylvania Electric since 1944. He is a member of the Illuminating Engineering Society and the Los Angeles Electric Club.

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Lee H. Chamberlain, long active in machinery and equipment sales on the Pacific Coast is president and general manager of BUILDERS-PACIFIC, INC., a new California corporation and affiliate of Builders Iron Foundry of Providence, R. I. Headquarters will be at 921 University Avenue, Berkeley and the Los Angeles office is at 2085 Belgrave Avenue, Huntington Park. Concern will represent other affiliates of Builders Iron—Builders-Providence, Inc., instrument house; The Omega Machine Co., manufacturers of volumetric and gravimetric feeders; and Proportioneers, Inc., manufacturer of pumps; as well as Walker Process Equipment Inc., of Aurora, the Aurora Pump Co., and The Ludlow Valve Mfg. Co. of Troy, N. Y. **Harold W. Leeson** will handle sales and service in the Los Angeles area and will have charge of maintenance and repair service throughout the state.

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Joshua Hendy Iron Works, Sunnyvale, has received orders for machines for manufacture of fibre glass from OWENS-CORNING FIBREGLAS CORP. for use in its new Kansas City factory. Comprising four large units of six sections each, the recently perfected machines will cost several hundred thousand dollars to build. They will produce superfine filaments of glass to be used as insulation material and in a wide range of other products, including bed rolls, comforters, pillows and garments.

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Roland H. Taylor is newly appointed senior vice president of INDUSTRIAL EQUIPMENT CO. He was formerly general manager of the company's Northern California branch at Oakland. **P. W. Cunningham** succeeds Taylor as Northern California manager. He has been superintendent of shops. **Wallace W. Colley** is vice

Upper left, P. W. CUNNINGHAM; right, J. C. FRUSH; center, R. H. TAYLOR; lower left, W. W. COLLEY and P. LAMB of the company.

president and manager of the firm's Los Angeles division. **J. C. Frush** and **Pat Lamb** are sales manager of the northern and southern divisions, respectively. Industrial Equipment has opened a branch in Reno. **E. L. Pine** is resident representative there.

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For the first time in its corporate history, the Board of Directors of UNITED STATES STEEL CORP. held a regular meeting in San Francisco. The meeting was held September 24 during an inspection tour by the Board of the corporation properties in Utah and California. Company officials visited and inspected the Geneva Steel Plant which they operated during the war for the government and which they recently purchased; the Ironton, Utah, plant of Columbia Steel; the Pittsburg Works of Columbia Steel; the Alameda plant of United States Steel Products Co.; the Oakland plant of the Cyclone Fence Division of the American Steel & Wire Co., another subsidiary; the Torrance plant of Columbia Steel and the Los Angeles plant of U. S. Steel Products Co.

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Merle L. Cripe and **C. A. Cook** have been advanced to vice-presidents at THE RICHKRAFT CO., Chicago. Cripe assumes charge of the research department. Cook, in addition to his new duties as vice-president, continues as Western sales manager in charge of the Richkraft offices in Oakland, Calif.

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The Soule Equipment Co., of Oakland, with branches at Sacramento and Stockton, has been appointed specialized Distributor of R. G. LE TOURNEAU, INC.'s railroad sales and service agreement. Soule has responsibility for sales and service to 21 railroads. The concern is also authorized general LeTourneau distributor in its territories.

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E. H. Laycock is division service manager in charge of all MACK TRUCKS service operations on the Pacific Coast. He succeeds **George Duesler** who has been assigned special duties which will include supervision of all restoration work and modernization of the company building in Los Angeles. Duesler will take part in Mack's new off-highway truck program. Laycock was formerly Mack's Cincinnati service manager.

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George Chenoweth now has charge of coaster brake sales in the eight western states for NEW DEPARTURE, division General Motors Corp., Bristol, Conn. His headquarters will be at 870 O'Farrell St., San Francisco 9. **L. M. Woodward,** Pacific Coast manager, will devote full time to greatly expanded industrial engineering and sales activities for the ball bearing division, with offices in Los Angeles, San Francisco and Seattle.

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ARMCO DRAINAGE & METAL PRODUCTS, INC., on Sept. 30, began operating the business previously carried on by CALIFORNIA CORRUGATED CULVERT CO., OREGON CULVERT & PIPE CO., and WASHINGTON CULVERT & PIPE CO., wholly owned subsidiaries of the AMERICAN ROLLING MILL CO. Armco is in turn a wholly owned subsidiary of The American Rolling Mill Co. Personnel of the former companies will continue to serve the trade in their new capacities as officials and employees of the successor company.

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Ray E. Latham is sales manager of BEARING SALES CO., Los Angeles. He has been actively identified with the bearing industry on the Pacific Coast for over 20 years and previously was Coast manager of distributor sales for the Fafnir Bearing Co. Bearing Sales are factory distributors for several manufacturers and maintain a complete service for users of ball and roller bearings.

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Clifford A. Sharpe has been named works manager of GAR WOOD INDUSTRIES, INC., in charge of the company's manufacturing operations in Detroit, Wayne and Marysville, Mich., Newport News, Va.; Findlay, Ohio; Mattoon, Ill.; and St. Paul, Minn. Sharpe had been vice-president in charge of manufacturing of Consolidated-Vultee Aircraft Corp., and more recently assistant to the general manager of Hughes Aircraft Co.

New director of industrial relations for

the firm will be **W. Gerard Tuttle,** who was formerly director of industrial relations of the San Diego division of Consolidated-Vultee Aircraft Corp.

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G. R. (Nick) Nicolai has been appointed Branch Manager of the GRINNELL COMPANY OF THE PACIFIC's new branch in Sacramento. He was formerly a sales engineer at the Grinnell Company's San Francisco office. The new branch warehouse will extend the company's service as a distributor of pipe, valves and fittings, pipe hangers, unit heaters and other piping supplies.

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SOULE EQUIPMENT CO. has moved its Sacramento branch to new, specially designed quarters at 300 Soule St., West Sacramento, off the US 40 highway. The new building, which contains 20,000 sq. ft. of floor space and is located on a 5-ac. plot, is served by a direct spur track. **Andy Lee** is Sacramento manager for the concern, Northern California distributors for LeTourneau, Bucyrus-Erie, Diamond Iron Works, Pioneer Electric, Snytron, Grace lubrication equipment, American Rubber Co., Wisconsin and Briggs & Stratton engines.

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PACIFIC NORTHWEST

V. G. Lindenberg is the new Industrial Lift Truck manager of the Seattle office, 2219 Fourth Avenue, of the HYSTER COMPANY. He is a well known materials handling engineer and has represented the Hyster Company in the East and South during the past three years.

New Western Division Sales Manager of the HYSTER COMPANY, Portland, Ore., is **Ray Ronald.** He will have charge of sales

RONALD LINDENBERG

in both the Tractor Equipment and Industrial Lift Truck Western divisions of the company. He is well known in engineering, construction and materials handling fields.

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Harry Keisler has been appointed vice-president and manager of all operations of the DULIEN STEEL PRODUCTS, INC., of Washington. He has been with the company for some 10 years. **Gilbert E. Rosenwald** will be assistant manager and assistant secretary. **Louis Dulien,** president, Seattle resident for the last 50 years, is moving to Beverly Hills, Calif., and at present will spend about half of his time in Seattle and the other half in Los Angeles, where the company maintains large offices and yards.

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Howard Oxsen has been promoted to manager of the Seattle branch house of FAIRBANKS, MORSE & CO., succeeding **John F. Marquitz** who will be assigned new duties elsewhere. Oxsen is a "quarter-century" man with the company, having first joined the repair parts department of the organization in San Francisco in early 1917. He was diesel engine department manager of the San Francisco branch from 1938 to 1945.

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E. I. DUPONT DE NEMOURS & CO. has made the following personnel appointments: **Melvin F. Wood,** assistant chief engineer, succeeding **Granville M. Read** who became chief engineer when **Everett G. Ackart** retired; **J. P. Martel** as manager of the design division, succeeding Wood; **F. W. Pardee Jr.,** as assistant manager of the design division; and **R. P. Genereaux** as assistant to Pardee on special assignment. Both Martel and Genereaux are Westerners, Martel coming from Pueblo, Colo., and Genereaux from Seattle.

The duPont Co. has announced plans to build a $1,000,000 plant at West Toledo, Ohio, on the same site as the company's present finishes plant. It will be a two-story structure providing manufacturing, office and warehouse facilities.

The duPont concern on Aug. 31 turned over to GENERAL ELECTRIC CO. all

of the duties and activities it had performed in its contract with the government in the atomic energy program at the Hanford Engineer Works at Richland, Wash. It had designed, constructed and operated the Hanford plant for four years.

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INTERMOUNTAIN

Wayne Watts has been made sales manager in charge of all service activities for J. K. WHEELER, INC., distributor for Le Tourneau, Link-Belt, Worthington and other construction equipment lines in Salt Lake City. Wheeler has recently returned from Caracas, Venezuela, where he was manager of the equipment division of GENERAL ELECTRIC INTERNATIONAL. During the war he was civilian equipment supervisor with the U. S. Army Division Engineers at Salt Lake City.

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AMONG THE MANUFACTURERS

Ebbe C. Anderson has been named Research and advertising manager for P. & F. CORBIN, makers of Locks and Builders' Hardware, New Britain, Conn., replacing Frank A. Eustace who resigned August 16.

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HAROLD C. CONNERS, left, and H. R. FOSNOT will head Chicago area sales activities for GRAVER TANK AND MANUFACTURING CO. of East Chicago, Ind. Both war veterans, Conners will handle steel plates, and Fosnot will represent the process equipment division in water conditioning equipment.

☆ ☆ ☆

Wickwire Spencer Steel, division of COLORADO FUEL AND IRON CORP., has moved its general sales manager's office from 500 Fifth Ave., New York, to 361 Delaware Avenue, Buffalo 2, New York. Involved in the move were **A. G. Bussmann,** vice president in charge of sales, and **H. C. Allington,** assistant general sales manager. The Wire Department general office under **C. G. Matthews** also moved to Buffalo, as did the Market Research Department under **Henry Davis.** The Wire Rope Department was moved to the plant at Palmer, Mass., July 22. **A. S. Rairden** is in charge. **Percy Jenkins** has been appointed Eastern district sales manager, with offices at 500 Fifth Ave., New York 18. The New York City sales office will hereafter be known as the Eastern district sales office.

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Don Cummins, youngest brother of **C. L. Cummins,** company founder and president of CUMMINS ENGINE CO., INC., has been appointed quality manager to serve as final authority on decisions affecting the quality of Cummins engines. Formerly director of research, he plans an integrated program to control the quality of Cummins

engines to fully meet the specifications of the operators in the field. He will have full charge of all inspection departments, including inspection of purchased materials. He also will be in charge of an intensified program to interpret and teach the "user's point of view" to every member of the Cummins organization, from employees to top management.

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A new vice-president and general manager at AMERICAN WELL WORKS, Aurora, Ill., **Alvin Haas,** has come to the company after 15 years as general manager of YATES AMERICAN MACHINERY CORP. **W. N. "Doc" Remsburg** was recently appointed chief engineer of American Well's sanitary division, and **Gerald E. Hauer,** sanitary engineer formerly with GENERAL CHEMICAL CO., has joined Remsburg's staff.

Another step in the development program of American Well Works was the purchase of the Atlas Foundry in Chicago to produce grey iron castings.

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Lloyd B. Poole has been appointed director of sales for the Butler Descaler, inclusive of the anti-scale and anti-corrosion device for cooling systems of internal combustion engines. Before coming to BUTLER ENGINEERING CO., of New Orleans, La., he had been associated with Firestone Tire & Rubber Co., National Carbon Co., and L. Sonneborn Sons, Inc.

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LIDGERWOOD MFG. CO. has established executive offices at 7 Dey Street, New York 7, N. Y.

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Fred S. Cresswell has been appointed manager of NATIONAL CLAY PIPE MANUFACTURERS, INC., with offices in Washington, D. C. The nonprofit association was formed two years ago to undertake a national program looking to the wider application of clay pipe in both drainage and sewerage projects. Cresswell was a Washington staff member of the Clay Sewer Pipe Association of Columbus, Ohio, and the Clay Products Association of Chicago, before going into service where he served as a lieutenant in the Navy.

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A new concern recently organized by **Bert E. Holub** is HOLUB INDUSTRIES, INC., of Sycamore, Ill., which is manufacturing electrical and mechanical products. Holub resigned in January as general sales manager of IDEAL INDUSTRIES after 24 years with the company. His former assistant at Ideal, **Gordon W. Wetzel,** is sales manager of the Holub firm.

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THE MARMON-HERRINGTON CO. of Indianapolis has elected **Russell L. White,** prominent Indianapolis banker and business man, to its board of directors. His election increases membership on the board to nine. White is president of Indiana National Bank, Indianapolis, president of White Baking Co., Dayton, O., and president of White Baking Co., St. Louis, Mo. Company now manufactures all-wheel-

drive trucks, and postwar products include a new front-wheel-drive delivery vehicle, known as DeliVr-All, and a line of modern trolley coaches.

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Importance of the open license system, by which the oil refining industry makes new developments in oil processes to oil companies, was stressed in the recent election of **E. F. Liebrecht** to a vice-presidency of M. W. KELLOGG CO., petroleum engineers of Jersey City and New York. General patent attorney for Kellogg since 1940, Liebrecht is an exponent of the open license system.

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CHAIN BELT CO. has materially increased their plant capacity through the purchase of the heavy ordnance plant constructed for the Defense Plant Corp. in West Milwaukee. Present plans call for its use in the manufacture of chain belts and some construction machinery. Building has a frontage of 860 ft. and a depth of 360 ft., with an area of some 317,500 sq. ft. The plant was built in 1943.

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THE PIERCE GOVERNOR CO., INC., of Anderson, Indiana, has purchased the production rights, tools and inventory of the centrifugal governor section of the King-Seeley Corporation of Ann Arbor, Mich. Production of the governor is being moved to Anderson and regular manufacture of the governors will be resumed there without engineering or design change. There will be no immediate change in the former "Handy-Servo" distributor organization or in the established sales policy.

Wendell Richards, district sales representative in Pittsburgh, Philadelphia and Baltimore, for R. G. LE TOURNEAU, INC., of Peoria, Ill., has been promoted to post of Market Research Manager. He has been with the company since 1935.

Other personnel shifts are those of **Cloyd Richards,** assistant service manager, named

Left to right, front, C. F. ZIMMERMAN and O. A. WILLIAMS; center, CLOYD RICHARDS and H. C. McQUARRIE; rear, WENDELL RICHARDS, Market Research Manager, R. G. LeTourneau Co.

General Service Manager, succeeding **C. F. Zimmerman,** who transferred to the sales department as district sales representative in Ohio, Indiana and Michigan. **O. A. "Jack" Williams** becomes Eastern Sales Manager to succeed **Harry Conn,** resigned. Williams formerly held the post Zimmerman now takes. **Harold R. McQuarrie,** formerly eastern credit manager, becomes Assistant to Domestic Sales Manager, and will serve as departmental coordinator.

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A direct factory branch of HERCULES MOTORS CORP., Canton, O., has been opened in Los Angeles to supply the West Coast with equipment. **W. W. Cromley,** vice-president in charge of West Coast operations, is assisted by **Oliver Kelly, Herbert Wirshing** and **Walter Batty,** who will handle sales activities to manufactuers, dealers and to the retail trade. In addition to the factory branch, a group of distributors will serve all the 11 western states. The firms that will sell and service are LOGGERS & CONTRACTORS MACHINERY CO., Portland, Ore.; DIESEL MOTOR & EQUIPMENT CO., Phoenix, Ariz.; STAR MACHINERY CO., Seattle; BAY ENGINE & PARTS CO., San Francisco; ENGINE SUPPLY CO., Denver; SAWTOOTH CO., Boise, Ida.; HAYES MANUFACTURING CO., LTD., Vancouver, B. C.; BROWN-BEVIS EQUIPMENT CO., Los Angeles, and H & B SALES CO., Long Beach, Calif.

☆ ☆ ☆

J. N. Forker has been named general manager of the new Tar Products division and **Dan M. Rugg,** general manager of the new Chemical division, KOPPERS CO., INC. Other appointments are those of **W. Reed Morris** as general manager of the new Gas and Coke division, Kearny, N. J.; **J. F. Byrne** on special assignment for Engineering and Construction division; and **M. T. Herreid** as manager of Koppers plants at Granite City, Ill., and St. Paul, Minn. All five are vice-presidents of the concern.

George M. Walker has been appointed manager of the new control section attached to the office of **Gen. Brehon Somervell,** president; and **J. C. Macon, Jr.,** has been made general sales manager of the tar sales department. **T. C. Keeling** is sales manager of the new chemical division.

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James B. Hayden, vice-president in charge of sales, INDUSTRIAL BROWNHOIST CO., Bay City, has resigned his position, and **Max Riebenack III** has been elected by the board of directors to fill the post. Other changes in the sales organization are: **H. D. Wright,** director of sales, Eastern seaboard, headquarters in New York City; **C. H. White,** director of sales, South and West, headquarters in Chicago; **James A. Peppard** continues as district sales manager of central region, headquarters in Cleveland; **A. P. Lyvers,** district sales manager of Chicago office; and **Stanley See,** district sales manager of Philadelphia office.

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L. G. Schraub, vice-president and general manager of UNION WIRE ROPE CORP., 21st and Manchester, Kansas City, Mo., has been elected to the board of directors of the company.

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The sales development and engineering service divisions of ALLEGHENY LUDLUM STEEL CORP. have been consolidated under the managership of **W. B. Pierce.** Pierce will co-ordinate and extend the company's co-operation with users and fabricators of stainless steel on their prob-

lems of applications and uses. He came to the company in 1945 after war work as chief of the stainless steel branch of the War Production Board.

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On Aug. 1, 1946 **Charles R. Cox** succeeded **J. Lester Perry** as president of CARNEGIE-ILLINOIS STEEL CORP. Perry became assistant to the president of UNITED STATES STEEL CORP. of DELAWARE. Cox joined NATIONAL TUBE CO., another U. S. Steel subsidiary, as general superintendent of the Ellwood works in 1934 and rose rapidly to president in 1943. **John E. Goble** took Cox's place as president of National Tube after serving as vice-president in charge of sales since 1936. **Arthur C. Wilby,** with U. S. Steel since 1909, was elected vice-president of U. S. Steel Corp. of Delaware. Since 1938, Wilby has been in charge of public relations for subsidiaries in the Chicago district.

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Harry Carl Ehrick, 59, widely-known HUBER MFG. CO. chief engineer, died Aug. 23 in Marion, Ohio. He joined the Huber staff in the early 1930's serving at first as production engineer. In 1939 he left the concern to go with BUCKEYE TRACTION DITCHER CO., at Findlay, as works manager. He returned to Huber in June, 1944.

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Two promotions at JOHN A. ROEBLING'S SONS CO., Trenton, N. J., were announced recently. **Forest S. Burtch** was appointed manager of sales, wire rope division, and **William Hobbs, Jr.,** took Burtch's place as manager of sales, aircord division. Both men have traveled extensively throughout the United States as Roebling consultants.

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Ernest S. Theiss has been named chief engineer of the DAVEY COMPRESSOR CO., Kent, O. He comes from the post of assistant professor, Mechanical Engineering Department, College of Engineering, Duke University. He was formerly secretary of A.S.M.E. Region IV and was chairman of and speaker for the 1946 A.S.M.E. delegates conference.

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E. A. Tice has joined the corrosion engineering section of the development and research division of THE INTERNATIONAL NICKEL CO., INC., at New York, as a corrosion engineer. He was previously associated with Bethlehem Steel in their research department in a similar capacity.

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Roy D. Smith recently took over the Sparling Steel Co. of Spokane, Wash., and same will be known as the Spokane Steel & Supply Co. **W. R. Keizer** is estimator and lay-out man. **D. C. Hatch** is office manager and **O. C. House** is his assistant.

Don Sparling, formerly of the Spokane firm of Sparling Steel Co., is now with Sparling Steel Co. of Seattle.

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THE TIMKEN ROLLER BEARING COMPANY, Canton, Ohio, has made three operating appointments of importance in the Steel and Tube Division. They are: **H. R. McLaren,** formerly superintendent of tube mills, now assistant general superintendent; **J. P. Wargo,** assistant superintendent of tube mills and finishing departments, now superintendent of tube mills; and **R. R. Elsasser,** manager of company's Newton Falls, Ohio, plant, as assistant superintendent of tube mills.

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 Street, San Francisco 5, California.

Cast-Weld Buckets

Manufacturer: Electric Steel Foundry, Portland, Ore.

Equipment: New cast-welded dipper for excavators.

Features claimed: A general purpose, cast-welded dipper having in its fabrication the rugged qualities of heavy cast manganese wearing parts and the inflexible, light weight construction of welded structural side and back members, it is a truly modern design offering economies of weight and maintenance cost to the users of excavation buckets or dippers. The new units are offered in sizes ranging from ⅜ cu. yd. capacity to 5 cu. yd., with larger size on special order.

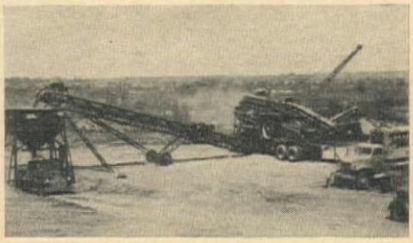
A special line of coal stripping and loading dippers is offered with teeth set on a flatter pitch than is commonly used for rock work.

Crushing and Screening Plants

Manufacturer: Pioneer Engineering Works, Inc., Minneapolis, Minn.

Equipment: Diesel electric crushing and screening plant.

Features claimed: No. 46-VE is a portable semi-electric powered duplex crushing and screening plant. The screens and conveyors are driven by electric motors powered by a Diesel electric plant. The roll crusher is driven by V-belts from the jaw crusher, which in turn is driven by a flat belt to a Diesel motor. A clutch provides



for starting and stopping the crusher without interrupting the drive to the generator. The operating height of the plant is approximately 14½ ft. and when in transit only 12½ ft. Moving weight is 64,000 lb. The plant is mounted on a truck supported on three axles and pneumatic tires. A 40 x 22-in. roll crusher is provided.

Traveling Mixing Plant

Manufacturer: Wood Manufacturing Co., Los Angeles, Calif.

Equipment: One-man traveling mixing plant.

Features claimed: Wood Roadmixer Model 36 is a low cost, one-man operated, self-propelled, pneumatic tire-mounted traveling mixing plant designed for maneuverability, speed and capacity. It handles soil cement, tar, cut-back asphalts and emulsified asphalts, making a thorough mix in one pass. It handles up to 4-cu. ft. windrows and produces from 100 to 150 tons of ready-to-spread mix per hour. A main feature of Model 36 is its extreme maneuverability in small areas, and it does not damage pavements, being full rubber mounted. For mixing it has five speeds, ranging from 11.5 to 71 ft. per minute. The hydraulic-power lift on the mixing drum raises the drum a full 12 in., and steering is by hydraulic power. The ample power of the engine is efficiently utilized to provide the utmost in traction and mixing action; and this engine controls the tractive effort and provides power for the mixing drum as well as for the liquid binder pump and hydraulic system.

Tandem Roller

Manufacturer: Huber Manufacturing Co., Marion, Ohio.

Equipment: Variable weight roller.

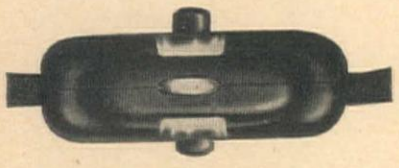
Features claimed: A fluid coupling improves the performance of this new tandem roller and prolongs the life of its entire gear train and completely eliminates the roller's usual master clutch. It consists primarily of two parts, a driver, which is bolted to the flywheel, and an impeller connected directly to the transmission input shaft. Engine power is transmitted through the medium of oil. Therefore, the roller's engine cannot be stalled due to any overload and the roller cannot run away if the engine cuts out for other reasons. The roller is powered with a 6-cyl. gasoline engine and operates at speeds varying from 1.95 to 3.62 mph. Without ballast the roller weighs 5 tons, but loaded with ballast it weighs 8 tons.

Appliance Switch

Manufacturer: Trilmont Products Co., Philadelphia, Penna.

Equipment: Heavy-duty appliance switch.

Features claimed: A new heavy-duty appliance switch can be used for replacement or attached to electric appliances now in use will prolong their life, avoid waste of current and reduce hazards of fire, accident and shock. It will operate on electrical de-



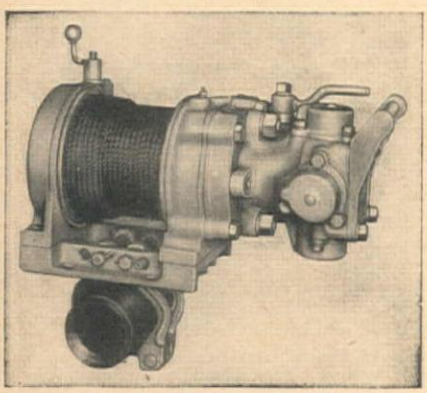
vices rated up to 2.5 kw AC or DC, 125 or 250 volts, and carries UL listing of 20 amp. at 125 volts. A miniature neon lamp, visible from three directions serves as a warning glow-light indicating the current is on. It is a double-pole single-throw switch. When the switch is thrown off, both power lines are severed inside, a safety factor. One year warranty made for switch.

Air-Winch

Manufacturer: Sullivan Division, Joy Manufacturing Co., Michigan City, Ind.

Equipment: Small air-powered hoist.

Features claimed: AW-80 Air-Winch is a new, small, lightweight, air-powered hoist capable of lifting 500 lb., but only weighing 85 lb. It has a rope capacity of 150 ft. of ¼-in. rope, is only 18 in. long, 9½ in. high



and 11 in. wide. It is powered by a simple, four-cylinder, reversible, piston-type air motor and is light enough for one man to move quickly from place to place. A conveniently operated brakelever holds the load firmly and prevents drum from spinning.

Waterproof Coating

Manufacturer: Truscon Laboratories, Inc., Detroit, Mich.

Equipment: Waterproof coating for rough, porous walls.

Features claimed: Tite-Wall is the name of a newly marketed coating which may be used on practically any rough, porous surface, but especially on concrete and cinder block. It is mixed with water, and thus economical; it paints out like an oil paint. When applied in two coats it has remarkable water-resisting properties. Tite-Wall spreads out easily under a brush, though the new type of deep pile roller is a successful instrument of application; or it may be sprayed on with a power sprayer. It comes in white and five tints, packed in either one or six gallon steel containers.

Etcher

Manufacturer: Ideal Industries, Inc., Sycamore, Ill.

Equipment: Ideal E-Z mark etcher.

Features claimed: Marks or lines appearing on a stencil film can be reproduced in

1 to 3 seconds with the Ideal E-Z Mark Etcher. Several hundred reproductions can be made from a single stencil film, making it adaptable for production marking. It will reproduce a stencil pattern on steel, brass, copper, bronze, tin and many other metals. A non-acidous compound is used for the etching fluid. The etcher is compact: 9 x 11

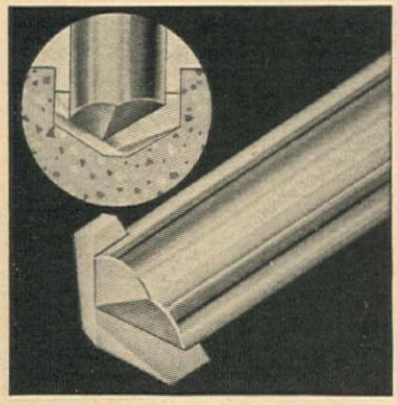
x 7¾ in. high. It is rated at 15 amp., 115 v. AC, 50-60 cy., and weighs 17 lb. Comes complete with sponges, cloth pads, etching fluid, protective fluid and 24 films.

Rotary Drilling

Manufacturer: Kennametal Inc., Latrobe, Pa.

Equipment: Line of Kennadrills for rotary drilling.

Features claimed: For rotary drilling in concrete, brick, slate, marble, limestone,



plaster, glazed tile, asbestos and other nonmetallic construction materials, line of drills for rotary drilling have cutting tips of Kennametal, a cemented carbide harder than tool steel. Tip extends beyond diameter of shank providing annular clearance space around shank for cuttings, minimizing the possibility of binding. No coolant required; tip stays hard and sharp under cutting. They can be used in any rotary type of drill. Nine sizes are available: ¼, 5/16, ⅜ and ½ in. for ¼-in. capacity drills; and ½, ⅝, ¾, ⅞ and 1 in. for ½-in. capacity heavy duty drills.

Pack Type Cutting Torch

Manufacturer: National Welding Equipment Co., San Francisco, Calif.

Equipment: Pack type oxy-acetylene cutting torch.

Features claimed: An improved type of the emergency unit originally designed for the armed services, to be known as PAK-KUT. The entire outfit weighs only 56 lb., including two shadow-proof oxygen cylinders and acetylene tank, regulators, hoses, torches, wrench and other equipment. The entire outfit is mounted in a flame-resistant canvas pack and is packaged in a sturdy, aluminum case when not in use.

A-C Arc Welder

Manufacturer: General Electric Co., San Francisco, Calif.

Equipment: A-C farm and home arc welder.

Features claimed: New A-C farm and home arc welder designed for operation on single-phase lines of limited capacity. Furnished in two ratings, 130 and 180 amp., either with or without capacitors. Two plug-in connections for electrode cable, one for use with 1/16-in. or 5/64-in. electrodes and one for 3/32-in., ⅛-in., and in the larger rating 5/32-in. electrodes. Current scale on front of welder calibrated in electrode sizes rather than amperes. Current adjustments made by hand crank. Several safety features are included. Welder uses lowest possible welding voltage and is enclosed in electrically grounded metal case. Built-in circuit breaker protects against overload. Additional information on new welder given in GEA 4630.

Remote Control

Manufacturer: Harnischfeger Corporation, Milwaukee, Wis.

Equipment: Remote control for truck cranes.

Features claimed: By this remote control panel mounted in the truck cab, the

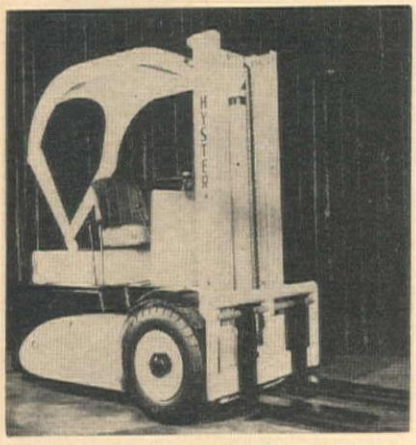
operator can control both the carrier and the crane. The control is operated by compressed air and electricity. The panel is an easily operated push-button instrument board. The buttons operate all functions of the crane and carrier except braking, which utilizes a pull-out switch, allowing air to pass through a double check valve to the rear wheel brakes.

New Lift Truck

Manufacturer: Hyster Co., Danville, Ill.

Equipment: Pneumatic tire fork-type lift truck.

Features claimed: The Hyster "40," a new 4,000-lb. fork-type lift truck, uses a



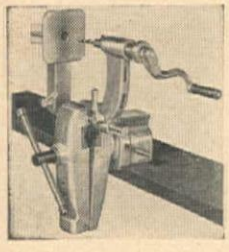
Wisconsin air-cooled motor, a trunnion steering and 7.00 x 12 pneumatic tires. Well adapted for use over any type of indoor or outdoor road surfaces. Now in production at Danville, Ill., Hyster plant.

Twin-Tool

Manufacturer: W. H. Howland, Chicago, Ill.

Equipment: Combination vise and drill.

Features claimed: Twin-Tool, a combination tool which can be used separately or together, is available. One unit is a portable vise that swings on a vertical axis that permits turning to any angle. Easily removed from bench plate and can be quickly fastened to any truck body, tractor, wagon or sturdy base. Jaws are equipped with detachable tool steel jaw plates. Vise is constructed with two sets of integral chill-hardened pipe jaws to handle pipes from ⅜ to 5 in. Jaws will grip hex, square and round head nuts. Second unit is a handy portable drill that operates at low speed and 1,000-lb. pressure. It drills hard steel, glass, spring steel, grader blades, etc. easily. A ratchet handle permits fractional turns in tight places. Pressure screw has a 2-in. feed and a 10-P thread. Mandrel is ½-in. B.S. type. An almond chuck with ½-in. arbor can be used.



Truck-loading Device

Manufacturer: Cascade Manufacturing Co., Portland, Ore.

Equipment: Loading device for dump trucks.

Features claimed: The Cascade Scrape-Loader is a maintenance tool requiring no power plant or power take-off from the truck motor. One man operates the 1/6 cu. yd. scraper in the ditch, the driver remains in the truck. The Scrape-Loader is adaptable to any standard dump truck and conforms with legal height and width limits of different states. The boom, pivoted at its base, swings out over the ditch; the scraper is pulled along the ditch while the truck travels forward by means of a cable attached to a drawbar which projects out from the truck below the boom. This drawbar is hinged to drop down out of the way when not in use. The hoist is a winding drum attached to a rear wheel of the truck. Backing the truck provides the power for raising the scraper from the ditch. The operator guides the bucket to desired unloading position by means of a trip line and then trips the load. The truck then travels forward and scraper is returned to the ditch, landing in the exact spot from which it was lifted.

Concrete Mixer

Manufacturer: Chain Belt Company, Milwaukee, Wis.

Equipment: Rex end discharge mixer.

Features claimed: The new 3½ S tilting mixer weighs 150 lb. less than the former side discharge model. The new model has a wheel tread of 62 in., about the same as an automobile, making it easier to trail and spot on the job. A lower center of gravity is obtained by cradling the mixer body between the wheels, resulting in faster and safer towing. Other features include a choice of two engine sizes, an enclosed

roller chain motor-drum drive, an all-welded pressed steel drum bowl, a ring gear driving the drum that can be easily replaced when wear occurs. The tilting control is by a large hand wheel equipped with a safe ratchet-type lock.

Tractor Excavator

Manufacturer: Trackson Co., Milwaukee, Wis.

Equipment: Model IT4, Traxcavator.

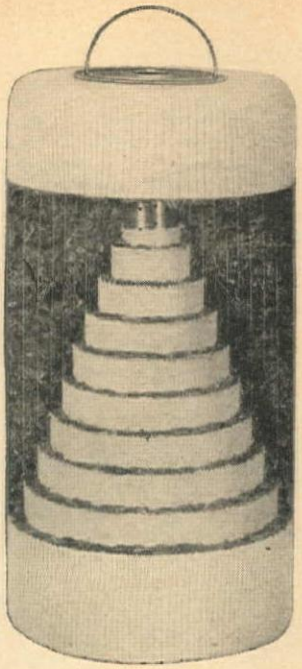
Features claimed: A new model Traxcavator which mounts on and is powered by a Caterpillar D4 tractor, this machine performs at a lower net cost per yard with easier handling and greater output. The bucket is 1 cu. yd. in capacity and can be used for digging, grading, loading or material handling. The bucket is wider than the tractor tracks so that it can trim alongside curbs and walls. The bucket can be dumped from any point of the lift and has a digging range from 14 in. below the track line to 56 in. above. The hoist is positive and dependable and is driven from the front power take-off of the tractor through a V-belt drive.

Engine-Life Filter

Manufacturer: C. M. Fuller Co., Los Angeles, Calif.

Equipment: Filter for cleaning oil.

Features claimed: Micro-filtration of oil by triple-trapping is featured in this Engine-Life filter made in different cartridge sizes to fit all cases. Long threaded, lint-free textiles compose the filtering media, scientifically compacted to uniform density. It is said to thoroughly cleanse contaminated oil, removing all damaging foreign substances without altering or reducing additives present in many lubricants. Since the fluid velocity is the same throughout the filtering media, there is uniform deposition of abrasives, contaminants, etc., with no tendency to block or clog one area from another. A flexible circular seal is an integral part of the element, and the cylindrical perforated core is made from heavy, non-corroding alloy steel.



Welding Head

Manufacturer: The Lincoln Electric Co., Cleveland, O.

Equipment: Improved welding head.

Features claimed: New, improved welding head, LAF-2 has been designed to accommodate 3/32 in. electrode as well as electrode wire ranging from 1/8 to 7/32 in. Its controls have been modified to simplify arc starting. To reduce installation time, two receptacles are mounted in the automatic control box and plugs are attached to one end of the cable coming from the welder supply and one end of the cable

coming from the head itself. A new, simplified wire straightener has also been added. The "Lincolnweld" process is designed for use with direct current, using a bare metallic electrode which is fed through a granular flux deposited on the joint to be welded.

Tandem Rollers

Manufacturer: Buffalo-Springfield Roller Co., Springfield, Ohio.

Equipment: Streamlined tandem rollers.

Features claimed: To complete tandem roller line, 4 new models of streamlined rollers to supplement 3 others announced earlier in the year. The new sizes are 5-8 tons, 6-9 tons, 8-12 tons and 10-14 tons and can be powered with either gasoline or Diesel engines. A new simplified 4-speed forward and reverse transmission has been added and increased operator vision is provided by cutting away a section of the drive roll hooding, and the sprinkler tank capacity has been increased. All the well-known Buffalo-Springfield principles are included in the new lines.

Pipe Threader

Manufacturer: Ridge Tool Co., Elyria, O.

Equipment: Geared pipe threader.

Features claimed: A quick-setting workholder and new balanced loop handles are two innovations on the 4P geared pipe threader. The first enables the threader to be set exactly to size before being placed on the pipe, with all bothersome bushings eliminated. The balanced loop handles on the enclosed gear case prevent slipping or tipping over, making it easy to pick up and put straight on the pipe, and easy to carry with one hand. A twin-anchored drive shaft turns in oilless bronze bearings. The gear is fully enclosed, packed in grease, protected from dirt and wear. The new 4P is provided with four sets of five high-speed steel dies to cut clean, accurate threads, standard or tapered, drip threads and short nipples.

Portable Water Treatment Plant

Manufacturer: Proportioners, Inc., Providence, R. I.

Equipment: Water treatment and filtration units.

Features claimed: These units are designed for field use and can be carried to the job on a light truck. River or pond water pumped by a gasoline engine-driven pump is treated by a chlorine solution and forced through a diatomaceous earth filter, thus producing pure, clean water which is available in quantities from 4,000 to 16,000 gal. per day. The process being mechanical, the operator does not need a knowledge of chemistry. The unit is thought to offer great possibilities for construction crews, exploration parties and other groups operating far from safe water supplies.

Insulation Tester

Manufacturer: Ideal Industries, Inc., Sycamore, Ill.

Equipment: Insulation resistance tester.

Features claimed: This new instrument will check insulation in either AC or DC equipment. It is entirely self contained and has no batteries or external power supplies. All power is provided by small internal generator operated by a slowly turning hand crank. The test range is from 0 to 100 megohms; test leads 10 ft. long; weight with carrying case is 3½ lb.; dimensions 3⅜ x 6 x 3¼ in. Insulation leaks can be discovered with this machine before failure.

Truck Crane

Manufacturer: Koehring Co., Milwaukee 10, Wis.

Equipment: Koehring truck crane.

Features claimed: The new Koehring 304 truck crane has a lifting capacity of 40,000 lb. with outriggers, 15,800 lb. without outriggers. Both are 85 per cent ratings. The same base machine used by Koehring on their 304 crawler model is utilized on the 304 truck crane. It is designed for easy handling on street or highway. It can go anywhere a truck can go. Hinged boom folds easily, saves time whenever machine is moved. Booms are available in lengths up to 110 ft. Jib boom extensions are offered in 15 to 30 ft. sizes. Removable outriggers are optional equipment.

Ball Bushing

Manufacturer: Thomson Industries, Inc., Long Island, N. Y.

Equipment: Ball bushing for linear motion.

Features claimed: The development of ball bushings for linear motion compares with ball bearings for rotary motion. This firm has standardized and produced a round shaft type ball bushing. In addition to reduction of wear, friction and maintenance afforded by all types of anti-friction bearings, ball bushings solve two problems inherent to plain sliding linear bearings. They eliminate the consequences of deterioration of the oil film over the exposed shaft surface due to oxidation, and they sharply reduce the dimension requirement which is inherent in plain linear bearings, thus permitting startling design economies. Standard ball bushing sizes vary from ¼-in. shaft size to 4 in. Sizes from ¼ to 1 in. vary in ⅛-in. steps; from 1 to 3 in. in ¼-in. steps and from 3 to 4 in. in ½-in. steps.

Paving Breaker

Manufacturer: Worthington Pump & Machinery Corp., Harrison, N. J.

Equipment: Air pavement breaker.

Features claimed: A new Blue Brute breaker, known as the WB-81, introduces new features which increase its performance, versatility, ease of handling and durability. All component parts are heat treat-

ed forgings and alloys. The new design includes positive action, built-in lubricator, fully cushioned piston and end seating, automatic valve. Self locking nuts are used throughout and the cylinder is precision-ground and hardened.

Corrosion Protection

Manufacturer: Glaspray Process Co., San Francisco, Calif.

Equipment: Zinc corrosion coating.

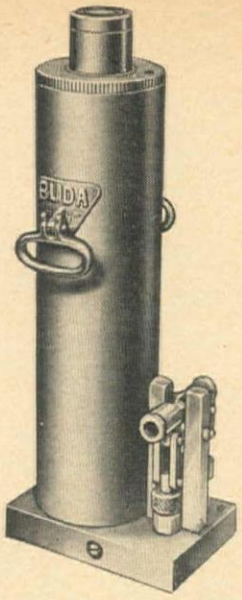
Features claimed: A zinc-coated surface which will maintain effective protection for as much as 12 years against salt water corrosion, the weight of the 10/1000th-in. thickness of fused zinc is far less than a comparable coating of lead and oil paint. In a recent demonstration on the Golden Gate Bridge, workmen first sandblasted all paint and rust from the structural members, then coated them with the new substance using a spray gun which unites powdered zinc with gas and forces it through a flame of approximately 786 deg. F. The flame preheats the steel base so that the zinc coating actually fuses itself with the steel. The Glaspray process is equally designed to coat tin, lead, brass, copper, glass, plastics and many other substances.

Hydraulic Jack

Manufacturer: The Buda Co., Harvey, Ill.

Equipment: Fifty-ton 2-speed jack.

Features claimed: This new hydraulic jack can be operated at a fast speed for quickly raising light or medium loads or at a normal speed for capacity loads. Raising is by easy pumping action and lowering is regulated by a simple control valve. Loads may be held indefinitely at any



height. They are specially designed for high lifting jobs. One of the 50-ton models has a closed height of 12 in., a rise of 7 in. and a weight of 120 lb.; the other has a closed height of 26 in., a rise of 20 in. and a weight of 200 lb.

Acetylene Shape Cutter

Manufacturer: Linde Air Products Co., New York, N. Y.

Equipment: Oxweld shape cutting machine.

Features claimed: This machine is designed to do precision cutting on work of intermediate size. For the first time an attachment is available which makes it possible to mount blowpipes on both sides of the tracing table, making possible high production cutting of identical shapes. The machine has a 36-in. transverse working range. The longitudinal working range is 100 in. and this may be extended by adding sections. The carriage is made of cast aluminum for light weight and rigidity. The tracing head is powered by a 110-volt universal motor providing smooth and accurate blowpipe travel. The machine is equipped for either mechanical or hand tracing.

Portable Ventilator

Manufacturer: The Herman Nelson Corp., Moline, Ill.

Equipment: Self-powered ventilator.

Features claimed: This new portable ventilator was originally developed for the armed forces to permit mechanics to work on boats and planes under intense tropical heat, but it has proved of wide value in the construction field. It can be used in shops, tunnels, manholes, storage tanks and many other tight quarters. A high capacity fan is powered by a light weight gasoline engine or electric motor and a collapsible 14-in. diam. 16-ft. directional air duct of weather-resistant material comes with the fan. Air delivery is adjustable up to 4,500 cu. ft. per min. The ventilator is mounted on a light tubular frame on two rubber-tired wheels and weighs only 87 lb. complete with duct.

Construction Truck

Manufacturer: Four Wheel Drive Co., Clintonville, Wis.

Equipment: Highway construction truck.

Features claimed: A new FWD model HG all-purpose highway construction and maintenance truck with a 4-ton capacity body and such optional equipment as hoist, under-body blade and snow plow fittings. Ample room is assured for mounting under-body scrapers by a clearance of 22½ to 24½ in., depending on tire size. The truck is engineered to grade roads at 5 to 15 mph. It employs a 5-speed transmission of exceptionally rugged design and power is transmitted to front and rear drive shafts through a shock absorbing, silent chain drive. Axle shafts are full floating, relieved of all load carrying strains. Ring gears and pinions are interchangeable between front and rear axles, of spiral bevel design.

LITERATURE FROM MANUFACTURERS...

Copies of the bulletins and catalogs mentioned in this column may be had by addressing a request to the *Western Construction News*, 503 Market Street, San Francisco 5, California.

PORTABLE PYROMETERS—**Wheelco Instruments Company,** Chicago, Ill., has issued a bulletin listing its complete line of portable pyrometers and giving full information concerning the new Extension Type Lance Pyrometer. Pictures of various pyrometers are shown and specifications for the proper selection of extension holders, adapters and thermocouple tips are listed in chart form.

TOURNAPULL JOB RECORDS—**R. G. LeTourneau Inc.,** Peoria, Ill., has prepared a 12-page color folder of actual job records to acquaint equipment owners and operators with the many possible applications of Tournapulls to earthmoving and construction work. Job experiences of eight major contractors on 25 completed projects are presented for study and comparison. Contractors' records and opinions regarding Tournapull versatility, economy and long life, as well as information regarding the various methods used, are presented in the pamphlet. Action photographs illustrate each job.

PERFORATED METAL SCREENS—**Morrow Mfg. Co.,** Pittsburg, Kans., has published a new edition of the Morrow Handbook of Perforated Metal Screens. Called Bulletin 70, it contains illustrations, data tables, specifications and standard practice information on flat, step, conical and cylindrical perforated plate screens. Morrow Mfg. Co. is a subsidiary of McNally Pittsburg Mfg. Corp., Pittsburg.

BUILDING YOUR CAREER IN BRICK AND TILE MASONRY—**Structural Clay Products Institute,** Washington, D. C., has published an illustrated booklet describing the career ahead for young men interested in entering the mason trade. Booklet states that 63,000 additional masons must be trained quickly to break a bottleneck in the veterans' housing program, and tells how to make application for training.

CHOOSING THE RIGHT WIRE FOR THE JOB—**Alloy Metal Wire Co., Inc.,** Prospect Park, Penna., has prepared a new catalog which is designed to help the manufacturer easily choose the wire, strip or rod of uniform dimensions for difficult high temperature or corrosive applications which he needs. Sections are devoted to engineering information on strength, electrical resistivity, modulus of elasticity, heat treatment, temperature limits and magnetic properties. Metals treated are high nickel content alloys, Monel, Nickel, "Z" Nickel, "L" Nickel, Inconel, and specialized Monels for machining and heat treating properties. Catalog D-2.

HOW TO HANDLE WIRE ROPE—**Union Wire Rope Corp.,** Kansas City, Mo., has issued a helpful booklet, "Correct Handling of Wire Rope." It tells how to store rope, how to rewind it, how to coil it, how to put a seizing on it, how to cut it and how to attach it to sockets. Booklet stresses that wire rope should be considered and cared for as high grade steel machinery.

KEEPING COMFORTABLE THE YEAR AROUND—**Surface Combustion Corp.,** Toledo, Ohio, has ready a brochure, "Automatic Heat for Real Living." Sections of the 56-page booklet are devoted to different types of heating, air conditioning and water heating systems. Graphically illustrated throughout, it describes for the layman what heating comfort is and how to get it. Advantages of each system are pointed out.

WHAT DO G. M. DIESELS DO?—**Detroit Diesel Engine Division, General Motors Corp.,** Detroit, Mich., has prepared a little pocket-size book which is as easy to read as a child's book. Written all in verse form and illustrated by Jim Brown, Products News Manager of G. M. Diesel division, for his young son, it nonetheless

brings home the many different applications of Diesels in our every-day lives. Your own children will appropriate it.

PLANNING AN OWNER MANUAL—**Ken Cook Co.**, Milwaukee, Wis., illustrates "How to Plan an Owner Manual"—a 24-page Kenco Teck Guide. Contains valuable suggestions on what to include in an owner manual and how to present the information in the most effective way. It includes sample pages of sectional and cutaway views, flow diagrams, tune-up and maintenance illustrations, trouble charts and exploded parts views. Guide is designed to be used as a work book with space for filling in and laying out the information that would apply to the user's particular product.

TRIP-L-GRIP FRAMING ANCHORS—**Timber Engineering Co.**, Washington, D. C., has ready a new booklet on its Teco Trip-L-Grip Anchors which develop both shear and tension. Leaflet tells 11 reasons why the new anchors can do the job better, and illustrates how to use them. In many instances ledger and blocking pieces are not needed.

AIR-ENTRAINED CONCRETES—**Dewey & Almy Chemical Co.**, Cambridge, Mass., describes the air content of Darex-AEA-treated concrete in a new bulletin now available. Booklet describes what makes it work, and shows air bubbles separating particles of sand. Product, previously sold to the cement manufacturer, now available to construction industry.

A FUTURE WITH A PAST—**Caterpillar Tractor Co.**, Peoria, Ill., chronicles the yesterdays of scientists and inventors who made the world of today one of mechanization. It shows past methods of accomplishing heavy plowing, logging and earthmoving tasks as compared with modern methods. Tribute is paid the "firsts" in the application of such Diesel power.

PRECISION AIR CONTROL—**Lima Locomotive Works, Inc.**, Shovel and Crane division, Lima, Ohio, has published a new 20-page bulletin describing the LIMA Type 802 shovel, crane and dragline. Featuring the application of "Precision" air control, and profusely illustrated, space is given to specifications, capacities, working ranges and illustrations showing details of construction. Type 802 has a capacity of 2 cu. yds., as a crane, 40 tons, and as a dragline, variable. Bulletin No. 82 A.

ARC-WELDING ELECTRODES—**Victor Equipment Co.**, San Francisco, Calif., has ready a 100-page catalog of new G-E Arc-Welding electrodes. Illustrated in color, it tells how welding electrodes are made, tentative specifications of the AWS and ASTM, gives a handy color guide for quick identification of G-E electrodes, tells you how to select electrodes, contains a ready-reference chart for selection of them, describes different types of electrodes and contains operating and engineering data of importance to users of electrodes.

STANDARDIZED DEMOUNTABLE SAND AND GRAVEL PLANT—**Link-Belt Co.**, Chicago, Ill., announces its new standardized demountable sand and gravel preparation plant in Folder No. 2170. It provides economical operation for a sizeable construction or paving job and removal to new locations, several times a year, by comparatively simple dismantling and reassembly. Equipment described includes belt conveyors, scrubber, crusher, double-deck vibrating screens, sand dewatering screw conveyor and necessary power drive units.

COLLECTIVE BARGAINING FOR ENGINEERS — **California Institute of Technology**, Pasadena, Calif., has reprinted the talk of Waldo E. Fisher, Professor of industrial relations, before the Industrial Relations Section of the Institute in August. His address is entitled "Collective Bargaining for Engineers," and he tells why engineers join labor organizations, and their status under the Wagner Act.

DIESEL TRACTORS—**Allis-Chalmers Mfg. Co.**, Milwaukee, Wis., describes its newly improved HD-10 Diesel tractor in a new catalog now ready for distribution. Features talked about are grease-packing and "positive seals," transmission construction, 2-cycle diesel power, and new longer track design. One page is devoted to standard equipment and auxiliary attachments. Ask for MS-402A.

DRINKING WATER FROM BRACKISH WATER—**American Cyanamid Co.**, New York, N. Y., has issued a pamphlet, "FILT-R-STILL Delivers Drinking Water from Brackish Water." Booklet describes how potable water units are capable of producing soft, pleasant-tasting water from almost any inland source. Profusely illustrated, pamphlet includes operating data on a typical successful application of the equipment in supplying water needs of an entire community. Schematic drawings and flow diagrams are included. Company's IONAC ion-exchange resins act as the filtering media.

SILICONE FLUIDS IN HIGH VACUUM DIFFUSION PUMPS—**Dow Corning Corp.**, Midland, Mich., has ready an illustrated booklet which describes two

products, DC 702 and DC 703, silicone fluids for use in high vacuum diffusion pumps. It contains a table of physical properties, vapor pressure curves, a graph of pumping speeds and a demonstration of the inherent stability of these organo-silicon oxide polymers. Complete description of these two products which have been steadily improved since their introduction early in 1945. This is latest and most up-to-date information on them.

STEAM TURBINE POWER PLANTS AND SINGLE HORIZONTAL COMPRESSORS—**Worthington Pump & Machinery Corp.**, Harrison, N. J., describes its "Package Type" steam turbine generator power plant in Bulletin No. WP-1099-B50, and its single horizontal compressors in Bulletin L-640-B1A—both recently published. Profusely illustrated, they show typical installations and contain engineering data and drawings of general arrangement of the plant as well as a schematic diagram. Basic specifications are included.

PREFORMED WIRE ROPE — **Preformed Wire Rope Information Bureau**, Chicago, Ill., abruptly awakens those producers who think that everyone knows their products, how they are made and what they do, in their new book "Preformed Wire Rope—What it is—What it does." Well illustrated, and in three colors, the book tells the story of the development of preformed wire rope and what that development has meant to industry. In non-technical language it tells what the preforming process does to the wires in a rope and what effect it has on the rope's final service. Charts show average differences in service life between preformed and non-preformed wire rope on 10 different machines.

TRANSMITTING INSTRUMENT READINGS PNEUMATICALLY — **Brown Instrument Co.**, Philadelphia, Pa., has prepared a booklet on "Pneumatic Transmission of Instrument Readings over Long Distances"—No. B 59-2. Written by D. P. Eckman and Louis Gess the book contains charts and diagrams as well as explanatory text. Remote transmission explained at length. Sections discuss New-Matic transmission systems, speed of transmission, testing speed, and lists recommendations.

NEW WATERPROOF CONNECTOR—**Cannon Electric Development Co.**, Los Angeles, Calif., has released its bulletin No. W-146 on a new series of waterproof connectors, type "W." Adaptable for use in swamps, lakes, rivers, docks, with underground cable or any outdoor applications. Inserts are phenolic or melamine; shell is brass with standard bright nickel finish. Bulletin illustrates plugs, receptacles and caps.

EXTERIOR FORM STONE—**Formstone Co.**, Baltimore, Md., offers dealers, contractors and firms connected with building trades exclusive franchises to apply Formstone. Franchise includes a complete training course for key men. The product is described in a bulletin now available which shows different treatments of the product and how to apply it. The real stone finish can be used for building new homes or for renewing old homes.

A DEVELOPER AND A PRINTER —**Charles Bruning Co., Inc.**, Chicago, Ill., has put out two new pamphlets, one on Model 158 Developer and the other on Model 40 BW Printer. Primarily for use in printing and developing plans, both machines are simple, efficient, attractive and of moderate price.

OPPORTUNITY SECTION

INDEX TO ADVERTISERS

★ IN THIS ISSUE ★